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A Re-examination of Accruals Quality Following Restatements*

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Abstract

Empirical research from the first years following the Sarbanes-Oxley Act (SOX) in the U.S. suggests that firms improve accruals quality following restatements, but the materiality of restatements has declined since then. This decline may affect firms' responses to restatements, and hence we paper re-examine whether restatements are associated with subsequent improvements in accruals quality in a more recent sample. We compare the changes in accruals quality of firms restating between 2000 and 2014 with that of a control group. We do not find that firms improve accruals quality more than the control group following a restatement, even when we isolate the types of restatements considered to be most material. However, we do find that restatements followed by the most negative stock market reactions are associated with a relative increase in accruals quality, indicating that only restatements deemed very severe by investors lead to subsequent improvements in accruals quality. Our results suggest that firms' responses to restatements have changed concurrently with the trend of fewer and less material restatements in recent years.

Keywords Restatement of corporate earnings; earnings quality; capital markets; materiality; Sarbanes-Oxley Act; enforcement; consequences of earnings misstatements; accrual accounting; difference-in-differences; propensity score matching.

JEL Classification M41; G14; M48.

1 Introduction

Financial restatements are serious events, and prior research suggests a number of negative consequences to them, such as large drops in market prices (Palmrose and Scholz, 2004; Wilson, 2008), an increased cost of capital (Hribar and Jenkins, 2004; Kravet and Shevlin, 2010), worse contract terms (Graham et al., 2008; Karpoff et al., 2008), and managerial turnover (Desai et al., 2006; Hennes et al., 2008). Wiedman and Hendricks (2013) find evidence suggesting that firms respond to these negative consequences by improving accruals quality to signal higher reporting quality.

These papers investigate restatements occurring before 2003, and the nature of restatements has changed substantially since then. Scholz (2014) and Whalen et al. (2018) describe how both the number and severity of restatements have declined since the mid-2000s. In particular, recent restatements tend to be less material, involve fewer accounting issues, restate fewer periods, and are less likely to reduce net income. This trend may stem from improved internal control following SOX, an increase in the number of revision restatements ("little r" restatements), and a number of bulletins from the SEC clarifying the threshold for restating.¹ As a result of the changed nature of restatements, investors' and firms' responses to restatements have changed in recent years (Burks, 2011; Chen et al., 2014; Hirschey et al., 2015). This change calls for a re-examination of accruals quality following restatements using a more recent sample.

We compare the accruals quality of 1,534 firms that have restated once between 2000 and 2014 with a control group matched based on propensity scores. Our measure of accruals quality follows Dechow and Dichev (2002), estimated cross-sectionally in accordance with Jones et al. (2008) and Wiedman and Hendricks (2013). The results indicate that single-restatement firms do not improve accruals quality more than the control group. We therefore cannot attribute any improvement to the restatement and do not find evidence of a disciplining effect of a restatement. We divide our sample into groups with severe restatements, namely restatements involving fraud, SEC investigations, and restatements of earnings. Even for these groups, we do not observe a subsequent improvement in accruals quality.

¹Nagy (2010) finds fewer restatements after the passing of SOX Section 404 Management Assessment of Internal Controls. The declining number of restatements may be offset by an increasing number of non-4.02 item revisions, caused partly by the SAB 108 issued in September 2006 (Scholz, 2014; Tan and Young, 2015).

Finally, we isolate the restatements with very negative stock market reactions to the restatement announcement, an indication that investors deem those restatements material. Our results suggest that the restating firms experiencing the most negative market reactions improve accruals quality significantly more than the control group. Thus, our evidence implies that restatements per se do not motivate firms to change accruals quality, only restatements deemed very severe by financial markets induce measurable corrective actions. These results are robust to several alternative specifications.

Our evidence contributes to the restatement literature by extending our knowledge about the consequences of restatements (e.g., Kravet and Shevlin (2010); Graham et al. (2008); Wilson (2008)) to include the long-term development in earnings quality after a restatement. It also complements Farber (2005), Hennes et al. (2014), and Chakravarthy et al. (2014), who provide evidence that firms attempt to restore the credibility of financial statements after restatements by changing corporate governance and external auditors. In addition, our evidence that restatements do not necessarily improve accruals quality may explain the large frequency of repeated restatements described by Files et al. (2014).

Our study also contributes to the literature by illustrating how the declining materiality of restatements in recent years has changed firms' responses to them. Wiedman and Hendricks (2013) find that firms improve performance-matched accruals quality following restatements between 1997 and 2003. In contrast, our results indicate that firms do not improve accruals quality, on average, after restatements, which suggests that firms' responses to restatements have changed since then. Our results thus corroborate He et al.'s (2019) recent evidence. They find that restatements associated with material weakness disclosures announced between 2003 and 2013 are associated with lower subsequent accruals quality. Combined with evidence that investors' responses to restatements are declining (Scholz, 2008; Burks, 2011), our results suggest that firms' incentives to improve accruals quality have fallen concurrently with investors' responses to them. Our paper also adds to prior research suggesting that firms are more sensitive to the restatement severity in the post-SOX era: Chen et al. (2014) find that the relation between severe market reactions and asymmetric timeliness is more pronounced in the post-SOX era, while Burks (2010) provides evidence that recent restatements are less severe and therefore less likely to lead to management turnover. We find higher post-restatement accruals quality only in

a sub-sample of restatements followed by severe, negative market reactions, which corroborates this notion. Collectively, our results suggest that firms, similar to investors (Burks, 2011), have adapted to the changing nature of restatements in recent years, and focus on changing their reporting practices only after the most material restatements.

Our results suggest that a single restatement in the past is not necessarily followed by improved accruals quality, which makes our paper relevant to several parties. In particular, regulators and auditors should continue to scrutinize firms with past restatements, and investors should exercise caution when evaluating the financial statements of firms with past restatements.

2 Background and Hypotheses

2.1 Improvement in Accruals Quality After a Restatement

We define a restatement as a correction of errors or irregularities in the financial statements.² Prior research suggests that the consequences of restatements are very costly to both the firm and its stakeholders. Outcomes of earnings restatements include increased management turnover (Desai et al., 2006; Hennes et al., 2008) and cost of capital (Hribar and Jenkins, 2004; Kravet and Shevlin, 2010), auditor resignations (Hennes et al., 2014), increased litigation risk (Bardos et al., 2013), and worsened bank loan contracting terms (Graham et al., 2008). The restatement itself is costly in terms of auditors and lawyers (Valdivia, 2008), not forgetting the cost of lost investor and customer confidence and bad publicity (Dao et al., 2014). Several papers also examine the market reactions to restatement announcements. Early research indicates substantial negative market reactions (Palmrose et al. (2004) find -9%, GAO (2002) finds nearly -10%, and Dechow et al. (1996) find -8%), while more recent studies find more modest reactions to restatements (Files et al. (2014) and GAO (2006) both find -1–2%). The drop in negative market reactions over time suggests that market participants have changed their perceptions of restatements (Scholz, 2008, 2014). This change in perception is consistent with Burks (2011), who provides

²Specifically, we follow the definition from Audit Analytics' restatement database: "We define a restatement as a revision of previously filed financial statements as a result of an error, fraud or GAAP/foreign principle mis-application." This definition excludes retrospective revisions for comparative purposes, retrospective application of accounting principles, and changes in presentation as a result of mergers/acquisitions. The restatements are triggered by, for instance, the firm itself, auditors, or through SEC's random sampling of US listed firms.

evidence that the more modest market reactions in the post-SOX period are not followed by stock price drifts. Hence, the smaller reactions do not indicate that investors are confused about restatements, but rather that investors have adapted to the increasing number of less material restatements in the first few years following SOX.

Decreased financial reporting credibility is one important consequence of restatements. For instance, Wilson (2008), Hirshey et al. (2015), and Chen et al. (2014) provide evidence of lower earnings response coefficients after restatements, while Kravet and Shevlin (2010) find increased factor loading on information risk after restatements. These results all indicate that restatements increase investor uncertainty. As noted by Graham et al. (2008), restatements can affect how investors evaluate a firm's cash flows on the one hand (wealth effect) and uncertainty about financial statements in general on the other (information effect). The wealth effect arises because a restatement changes the financial statement numbers, and thus the inputs to investors' valuation estimations. The information effect creates uncertainty about the overall credibility and information quality of the firm's financial statements, leading to higher perceived information asymmetry. Palmrose et al. (2004) point to the higher information asymmetry and provide evidence suggesting that analyst forecast dispersion increases after a restatement.

A related stream of research examines whether firms respond to the lower credibility following restatements. Chakravarthy et al. (2014) suggest that restating firms make great efforts to repair their tarnished reputations, which seems to offset declining investor credibility. Farber (2005) provides evidence that firms with fraud-related restatements change governance mechanisms, but he does not find evidence that these initiatives restore credibility. Dao et al. (2014) and Hennes et al. (2014) report that management and auditor turnovers, respectively, are more likely after a restatement.

Another stream of research examines the earnings quality of firms in the restatement years. Using time-series analyses, Dechow et al. (2011) find that earnings quality is lower in misstatement than in non-misstatement years. Jones et al. (2008) find significant differences in total accruals as well as two versions of the Dechow and Dichev (2002) model in restatement years compared to all Compustat years. Desai et al. (2006) also find evidence of extreme accruals in restatement years. While this research indicates that firms have poor accruals quality in the restatement years, little is known about the long-term consequences on earnings quality following a restatement. One important exception is Wiedman and Hendricks (2013), who examine changes in performance-adjusted accruals quality two years before and after restatements using

a sample of 308 US firms restating during 1997-2003. They argue that firms wish to signal improvement and find that accruals quality improves significantly after a restatement. In a related vein, Chen et al. (2014) provide evidence that restatements transform another dimension of financial reporting quality, namely asymmetric timeliness, and find that 486 firms between 1997 and 2005 report more conservatively after a restatement. These papers both use a turbulent sample period with intense focus on financial reporting credibility following the major restatements of Enron in 2001 and WorldCom in 2002, as well as SOX (Scholz, 2008; Burks, 2011).

In summary, prior research indicates that restating firms have poor earnings quality in the restatement years and that restatements have serious adverse effects on a firm in terms of worsened contract terms, lower stock prices, and decreased financial reporting. A body of literature also suggests that firms take actions to change their disclosure practices after restatements to restore the lost credibility, and a few studies suggest that these actions lead to higher accruals quality and asymmetric timeliness. Therefore, we expect that the severe costs attached to restatements motivate firms to improve accruals quality afterwards. This expectation leads to the following hypothesis, stated in the alternative form:

H1: Restating firms improve accruals quality relatively more than non-restating firms following a restatement

2.2 Differences in Severity of Restatements

While the research outlined previously examines the consequences of restatements per se, another branch of research examines how different restatements entail different consequences. Even though our sample consists of material restatements only, some are unarguably more severe than others. We measure restatement severity in two ways: first, by the characteristics of the restatement and second, by the magnitude of the stock market reaction to the restatement announcement.

A variety of restatement characteristics has been classified as severe in previous research. Restatements involving fraud or earnings management (Hennes et al., 2008; Files et al., 2009; Scholz, 2008) and SEC investigations (Files et al., 2009) are widely believed to be very material.³ Similarly, Badertscher et al. (2012) find that fraud and SEC investigated restatements are highly

³The opposite could also be the case for SEC investigated restatements, though. If a SEC investigation is a result of purely technical matters or judgment disagreements between the firm and SEC, which would not increase the incentives to improve (Palmrose et al., 2004).

correlated with their measure of opportunistic restatements, and their results indicate that firms have greater motivation to change financial reporting behavior after opportunistic rather than non-opportunistic restatements. Some restatement characteristics are also regarded as more severe than others. Scholz (2008) defines severe restatements as those involving core accounts, such as restatements correcting revenue recognition issues.⁴ Palmrose and Scholz (2004) find that the probability of lawsuits increases for restatements that involve core earnings or a large number of financial accounts. Files et al. (2014) and Wiedman and Hendricks (2013) argue that restatements with negative net income statement effects are more severe.

Several studies suggest that investors react more negatively to severe restatements and hence the market reaction to the announcement acts as a proxy for the severity of the restatement (e.g., Scholz (2008), Plumlee and Yohn (2010), Hennes et al. (2008), and Files et al. (2014)). For instance, Wilson (2008) finds that the information content of earnings declines more after restatements with severe negative market reactions, suggesting that these restatements cause greater concerns about the credibility of the financial statements than do less severe restatements. This evidence implies that investors are more concerned about the financial statement quality of these firms. Finally, Chen et al. (2014) present results indicating that restatements followed by negative market reactions increase asymmetric timeliness more than less severe restatements. Interestingly, their results also illustrate that this effect is more pronounced in the years following SOX, suggesting that firms are more sensitive to market reactions in this period. Comparing with the generally lower market reactions to restatements post-SOX described by Burks (2011), it seems that although investors are less concerned about restatements in recent times, they do react negatively to very severe restatements, which in turn triggers firms to change reporting practices.

Thus, we predict that restatements that are considered severe, either due to the characteristics of the restatement or the market reaction to the restatement announcement, are associated with a relatively larger improvement in accruals quality subsequently:

H2: Restating firms improve accruals quality relatively more than non-restating firms if the restatement is severe

⁴In contrast, classification errors and non-core expense restatements are deemed less serious. See an overview of the different classifications in the notes to Table 2.

3 Research Design and Descriptive Statistics

3.1 Sample Selection

We use the Audit Analytics (AA) database to identify restatements between 2000 and 2014.⁵ The sample contains 9,093 Form 8-K and 8-K/A filings under the title "4.02: Non-Reliance on Previously Issued Financial Statements or a Related Audit Report or Completed Interim Review." Thus, restatements caused by, for instance, mergers and acquisitions and unintentional errors are excluded and only material restatements remain in the sample. We delete immaterial restatements in accordance with Hennes et al. (2014) because these firms may have fewer incentives to improve after minor restatements.⁶ In accordance with Hennes et al. (2014), Ettredge et al. (2012), and Wiedman and Hendricks (2013), among others, we exclude firms experiencing more than one restatement in the sample period, to clearly distinguish pre- and post-restatement periods and severe and immaterial restatements. Finally, we exclude financial institutions (SIC 6000-6999) since accruals quality cannot be measured for these firms, and this leaves us with a total of 4,187 firms that have restated between 2000 and 2014.

We then match each restating firm from AA with its financial statement information in Compustat - Capital IQ and stock market data in CRSP, yielding a total of 2,304 restating firms. We use unrestated data in Compustat-Capital IQ when possible.⁷ We prefer using the original, unrestated values for several reasons: First, according to Standard & Poor's, up to 35 percent of the firms in Compustat have restated data values. Second, the sign and magnitude of the difference between the restated and unrestated data values vary significantly on three dimensions: from firm to firm, from time period to time period, and from data item to data item. Thus, it is not possible to predict a priori which data values will differ and in which direction. Third, the difference between the two values is quite material for some data items. All data values have been winsorized at the 1st and the 99th percentiles to limit the effect of outliers.

⁵A different source is the GAO Database, which identifies restatements by searching Lexis-Nexis, SEC filings, and company web sites. Scholz (2008) notes that the Audit Analytics database contains nearly all the restatements that can be found in the GAO Database and through Lexis-Nexis searches. We do not use the GAO Database for two reasons: First, apart from fraud and material errors, the database also contains retrospective changes of accounting principles unrelated to accruals quality, a fact that has been subject to some criticism (Dechow et al., 2010; Hennes et al., 2008). Second, there may be a time-lag from the time when the restatement is detected until it becomes public, and only the announcement date is available in GAO.

⁶Hennes et al. (2014) define immaterial restatements as inflation or currency adjustments by foreign registrants (category 37), errors in GAAP conversion (category 38), retrospective revisions (category 40), SAB 108 changes (categories 49-52), and FIN 48 changes (categories 53-70).

⁷The data code SUMM_STD contains unrestated data. This type of data was not collected before 2004, and in later years it can be missing for some observations. In these cases, we use the standard code STD instead.

We use a difference-in-differences research design to isolate the restatement effect on accruals quality in our regressions. This design holds constant both the time trend of accruals quality by comparing two groups over the same time period, and the unobserved differences between these groups by comparing each firm's accruals quality before and after the restatement (Roberts and Whited, 2013). To obtain the control group we match each restating firm in the restatement year with a Compustat firm that has not restated in the entire sample period using propensity score matching (Rosenbaum and Rubin, 1983). The propensity score matching also mitigates a possible sample selection bias because restating firms are not necessarily random firms (Kedia and Rajgopal, 2011). To form the control group we estimate a logistic regression of the likelihood of restating based on the following variables, all defined in Table A1: *Size*, *ROA*, σCFO , δRev , δInv , *Growth*, *Issue*, δEmp , *Lev*, and *BtoM*. We include variables associated with the likelihood of restating, including factors related to accruals quality (Hribar et al., 2014; Dechow et al., 2011; Beneish, 1999; Badertscher et al., 2012). We attempt to account for the pre-treatment level of accruals quality by matching control firms based on variables affecting this level, such as changes in inventory and receivables. This similarity is important because a large portion of a firm's earnings quality is innate and slow to change (Francis et al., 2005). Untabulated results of the logistic regression indicate that restatement firms have smoother cash flows, in line with Hribar et al. (2014). Smaller firms and firms with high growth are less likely to restate, which is consistent with Beneish's (1999) evidence, but contradicts international evidence from Australia (Ahmed and Goodwin, 2007).⁸

We then use one-to-one matching with replacement to form our control group. In particular, we match each restating firm (*Restater*) to a control firm (*Non-restater*) based on the restatement year and the two-digit SIC code.⁹ We select the control firm with the smallest difference in propensity scores to each restating firm, making sure that the distance between the two propensity scores (the caliper width) does not exceed 0.2 of the standard deviation of the propensity scores as suggested by Austin (2011). We use replacement to maximize the sample size, and hence there are fewer unique non-restating firms than restating firms in the sample. However, the replaced observations with extreme propensity scores are more likely to be matched and

⁸The result of the logistic regression is available upon request. The model fit is R^2 of 0.0573, similar to the 0.05 reported by Hribar et al. (2014), and our percentage of firms correctly classified as restating is 66.1, compared to 63.7% by Dechow et al. (2011).

⁹Note that we match in the restatement year and not in the year in which the restatement was announced. The information about the actual restatement year is a major advantage of the AA database, as mentioned in Footnote 5.

may, therefore, be heavily weighted (Shipman et al., 2017). To solve this issue, we reweight the control firms based on the number of times they are matched as $1/k$ (e.g., a control firm matched two times is weighted $1/2$) in all regressions throughout the paper as suggested by Cram et al. (2009) and Stuart et al. (2013).¹⁰ Thus, control firms that appear more than once in the sample have smaller weights. 1,680 firms obtain a match based on these criteria, and we finally drop 143 firms that do not have the necessary information to estimate a time-varying measure of accruals quality at any point in the sample period. Our final sample thus consists of 1,534 restating firms matched with 1,286 non-restating firms. Our goal is to maximize the sample size, both to ensure the generalizability of our results and to reduce the risk of sample selection bias. In addition, we wish to retain as many firms as possible in our sample because we test our second hypothesis in smaller sub-samples. As a result, we do not require the 2,820 firms to have non-missing information throughout the sample period, and hence our panel data set is unbalanced. Table 1 summarizes the sampling and matching procedure.

An important research design choice is the length of the pre- and post-periods. We need to allow enough time after the restatement for the firm to actually improve, while still keeping the post-period sufficiently short to make it reasonable to conclude that an improvement, if any, is actually caused by the restatement and not by confounding events. We choose the year in which the restatement was announced as the restatement year, to be certain that the firm is aware that one or more events necessitate a restatement.¹¹ Prior research has usually allowed firms one to three years to change after a restatement.¹² A large part of a firm's earnings quality is innate and slow to change (as opposed to, e.g., management guidance, as examined by Gordon et al. (2014)), and therefore we choose a pre- and post period of three years, which is also the minimum number of years needed to observe a trend.¹³ For each restatement firm and its unique match, we define the three years before the announcement year as the *pre-period* and the three years after this year as the *post-period*, thus leaving out the restatement year. Although we match restating and non-restating firms in the actual restatement year, we do not expect to see

¹⁰A table listing the number of times each control firm is matched is available upon request. Around 3% of the control firms appear more than twice in the control sample, and only one control firm appears four times, which is the maximum number of times.

¹¹There is a mean (median) 224 (158) days from the last date of the official restatement (*RES_END_DATE*) to the filing date (*FILE_DATE*). The restatement itself is officially ended at the filing date in around 97% percent of the cases, providing evidence consistent with Karpoff et al. (2008) and Kedia and Rajgopal (2011) suggesting that the violation period proceeds the trigger event and enforcement period.

¹²Farber (2005) examines changes in corporate governance one year after restatements, Gordon et al. (2014) examines changes in management guidance two years after a restatement, while Srinivasan (2005) examines penalties for outside directors three years after a restatement.

¹³Untabulated tests indicate that all our results are robust to extending the pre- and post periods to five years.

changes in accounting practices before the restatement is actually detected (the announcement date). Hence, the *pre-period* corresponds to the restatement period, and the *post-period* covers the three years after the announcement date. This research design resembles that of Wiedman and Hendricks (2013), Chakravarthy et al. (2014), Chen et al. (2014), and Gordon et al. (2014), among others.

3.2 Measuring Accruals Quality

Our measure of accruals quality is based on the model proposed by Dechow and Dichev (2002) and McNichols (2002), estimated cross-sectionally in accordance with Jones et al. (2008) and WH. Accruals quality models are based on the intuition that earnings that map closely into cash flows are of high quality. Dechow and Dichev (2002) argue that the quality of accruals and earnings decreases when the magnitude of estimation errors increases, and their empirical measure of accruals quality maps working capital into operating cash flows. We estimate the following regression:

$$\begin{aligned} \Delta WC_{i,t} = & \beta_0 + \beta_1 CFO_{i,t-1} + \beta_2 CFO_{i,t} \\ & + \beta_3 CFO_{i,t+1} + \beta_4 \Delta Rev_{i,t} + \beta_5 PPE_{i,t} + \mu_{i,t} \end{aligned} \quad (1)$$

where ΔWC is working capital in line with Dechow and Dichev (2002); CFO is operating cash flows; Rev is revenue; and PPE is gross property, plant, and equipment. All variables are scaled by lagged total assets and defined in Table A1.

To obtain a time-varying measure of accruals quality, we follow Jones et al. (2008) and Wiedman and Hendricks (2013) in comparing accruals quality for each firm in our sample to accruals quality of firms in the same industry. In particular, we first estimate Equation 1 cross-sectionally as annual regressions in each two-digit SIC code for all Compustat firms. A minimum of ten observations per two-digit SIC code is required. We use the parameter estimates from Equation 1 to compute the expected level of working capital accruals for all the firms in our sample, and our measure of accruals quality, *LowQuality*, is then the absolute difference between the expected and actual levels of working capital accruals. Large differences between expected and actual working capital accruals signal low accruals quality, and we therefore predict that restaters have higher values of *LowQuality* than do non-restaters.

Accruals quality has previously been used to detect earnings restatements (Jones et al., 2008; Dechow et al., 2011). Dechow and Dichev (2002) argue that their measure of accruals quality captures both intentional and unintentional low earnings quality, i.e., earnings management and errors, making it especially appropriate for a restatement sample such as ours that consists of both fraud, earnings management, and irregularities.¹⁴

3.3 Improvement in Accruals Quality After a Restatement

We use a difference-in-differences research design to isolate the effect of a restatement on accruals quality to ensure that restating and control firms are affected similarly by outside factors, estimated with a multivariate regression to control for possible differences remaining between the two groups despite the matching process (Shipman et al., 2017).¹⁵

We test H1 that restating firms improve relatively more than similar firms, by estimating the following regression:

$$\begin{aligned} LowQuality_{i,t} = & \beta_0 + \beta_1 Restater_{i,t} + \beta_2 Post_{i,t} + \beta_3 Restater \times Post_{i,t} \\ & + \beta_{4-11} FirmControls_{i,t} + \mu_{i,t} \end{aligned} \quad (2)$$

where *LowQuality* is our measure of accruals quality from Equation 1; *Restater* is an indicator variable equaling 1 if the firm has restated during the sample period, and 0 otherwise; *Post* is an indicator variable equaling 1 after the restatement announcement, and 0 otherwise; *FirmControls* is a vector of firm-specific control variables described in the text. All variables are defined in Table A1.

In Equation 2, the coefficient on β_1 captures the average differences in accruals quality between restaters and non-restaters during the pre-restatement period, while β_2 captures the effect of a control firm in the period after a restatement. β_3 is the difference-in-differences estimator and the variable of interest in H1. Recalling that high values of *LowQuality* indicate low quality, we predict a negative coefficient on β_3 , indicating that firms subject to a restatement increase accruals quality relatively more than the control group after a restatement

¹⁴We do not use, for instance, discretionary accruals or income smoothing models, because they assume intentional earnings management.

¹⁵Kothari et al. (2005) and Dechow et al. (2010) discuss a serious concern related to matched samples in earnings quality studies, namely that the firms in the control group have similar incentives to manage earnings as the firms in the treatment group, but this type of earnings management may not have been detected. In particular, Dechow et al. (2010) argue that earnings manipulation and earnings quality issues appear to cluster by industry. However, we do not believe that this is an issue in our sample because Table 2 reveals no particular industry clustering, and the graph in Table 3 illustrates plenty of variation in accruals quality.

announcement. This research design thus measures the average change in quality from the pre- to the post-restatement periods for restaters and compare it with the change of similar firms in the same time period. β_3 therefore isolates the effect of a restatement on accruals quality, controlling for differences across firms and time.

FirmControls covers variables associated with earnings quality suggested by Dechow et al. (2010), *Size*, *LogMV*, and *BtoM*. We also include innate factors (σCFO and *NegEarn*) affecting earnings quality as suggested by Francis et al. (2005). Other variables associated with working capital accruals are restructuring costs (*Restructure*) and capital intensity (*CapitalIntens*) as suggested by Ashbaugh-Skaife et al. (2008). Finally, we include controls for firms in industries with higher suspected litigation risk, in accordance with Wiedman and Hendricks (2013) (*Litigation*).

Because of the difference-in-differences research design where *Restater* is constant, we cannot estimate Equation 2 with firm-fixed effects, and a Hausmann test indicates that random effects assumptions are violated.¹⁶ Instead, Equation 2 is estimated as a pooled OLS with robust standard errors clustered by firm and year in accordance with Petersen (2009), along with indicator variables for each year and two-digit SIC code. This design controls for time trends in short panels like ours (Wooldridge, 2002).

3.4 Differences in Severity of Restatements

To test H2, that restating firms improve relatively more than similar firms if the restatement is considered severe, we use two proxies for restatement severity: First, the characteristics of the restatement and second, the stock market reaction to the restatement announcement.

We consider three proxies for the severity of the restatement characteristics, namely restatements involving fraud, SEC investigation, and restatements with net income effects. To test if these restatements are associated with higher subsequent accruals quality, we re-estimate Equation 2 in three sub-samples: First, all restatements that involved *Fraud*; second, all restatements that were investigated by the SEC (*SEC Investigated*); third, all restatements that restated net

¹⁶Although it would be possible to estimate Equation 2 with firm fixed effects as a generalized difference-in-differences test and exclude *Restater* and *Post*, we deselect fixed effects for two reasons: First, we are interested in disentangling the restatement effect on accruals quality relative to control firms, and hence we need to interpret explicitly on these two variables. Second, fixed effects may produce inefficient estimates when the dependent variable is first differenced, as it is the case with our change in working capital accruals (Roberts and Whited, 2013)

income (*Earnings Restatements*). We also include each restating firm's unique match in all sub-samples to maintain the difference-in-differences design. H2 predicts a negative coefficient on β_3 , indicating that firms subject to severe restatements increase their quality relatively more than the control group after the restatement announcement.

We estimate the stock market reaction to the restatement announcement as the cumulative abnormal return (CAR) in the three-day event window surrounding the restatement announcement, estimated as the difference between the actual return and the market return. We also estimate the CAR on the same date as the restatement announcement for each control firm to have CARs for all firms in the sample.¹⁷ The sample is then partitioned according to the size of CAR such that firms with the most negative market reactions, i.e., CAR below the median, are placed in the sub-sample *HighReaction*, along with their unique match. We then re-estimate Equation 2 in this sub-sample and H2 still predicts a negative coefficient on β_3 , indicating that firms subject to a restatement followed by a very negative market reaction increase their quality relatively more than the control group after the restatement announcement. We include CEO turnover as an additional control variable in this test because negative market returns are associated with management turnover (Hazarika et al., 2012; Hennes et al., 2008).¹⁸

3.5 Descriptive Statistics

The frequency of restatements in our sample presented in Panel A of Table 2 indicates large variations in the first half of the sample period, whereas the second half covers a stable, slightly increasing trend.¹⁹ It is clear that the number of restatements increased significantly in the mid-2000s, which could be caused by changes in SEC's identification procedure (SEC Staff Accounting Bulletin, SAB 99) and the enactment of the Sarbanes-Oxley Act in 2002.²⁰ Scholz (2014) argues that firms in financial distress are more likely to restate and hence the downturn at the beginning of the new millennium may explain the peak in the mid-2000s. Conversely, the booming economy from 2006 to 2008 may explain the drop in the number of restatements

¹⁷While CARs for the restaters are negative on average as expected, some are also positive. For the non-restaters, the CARs are evenly distributed around zero, with a slim majority below 0, a fact that could point at an intra-industry contagion effect as described by Gleason et al. (2008). However, we have tested for this type of effect by regressing the CAR of peer firms (non-restaters) on the CAR of restaters. Untabulated results do not suggest a relation between the two CARs, and therefore do not provide evidence of an intra-industry effect in our sample.

¹⁸We include the indicator variable *CEOTurnover* that equals 1 if a CEO left two years after the restatement and 0 otherwise, similar to Wiedman and Hendricks (2013) and Desai et al. (2006). We follow Hazarika et al. (2012) and isolate CEO turnovers that were not caused by retirement.

¹⁹See Scholz (2008) for an in-depth discussion of the events related to restatements in the early sample period.

²⁰A similar trend is seen internationally, e.g., in Canada (Robbani and Bhuyan, 2010).

in those years. The decline at the end of the sample period can be caused by several events that may affect both the frequency and severity of restatements: First, Nagy (2010) and Rice et al. (2015) provide evidence that the passing of SOX404 lowered the likelihood of restatements through improved internal control over financial reporting (ICGR). Second, the decrease in the number of restatements may be offset by an increase in the number of revisions, so-called "little r" restatements (SAB 108, see Tan and Young (2015)). Our sample only includes Item 4.02 restatements, and hence we do not investigate the less material non-4.02 revision restatements. Third, new materiality guidance by the SEC in 2008 stressed that errors are material only if they are relevant to current investors (Pozen, 2008).

Panel B of Table 2 presents the distribution of restatement classifications as adapted from Scholz (2008).²¹ The annual percentage of restatements concerning revenue recognition has dropped from 25% in 2000 to 15% in 2014, while core expense issues were related to half the restatements in 2000 compared to one third towards the end of the sample period. These numbers confirm that the severity of restatements seems to be declining (Scholz, 2008, 2014). Instead, the most frequent reason for restating in the late sample period is reclassification and underlying events, which consists of repositioning of balance sheet and cash flow items as well as underlying events such as consolidations. Across the entire sample period, the most frequent reason for restating is changes in non-core expenses, which accounts for almost 45% of the total number of restatements. This category includes corrections of income statement items arising from non-operating or non-recurring activities and is generally considered less severe than core expense restatements (around 40% across the sample), which consists mostly of income statement effects stemming from on-going operating expenses. 22.4% of all restatements are caused by reclassification and disclosure, while 20.9% stem from underlying events.

Table 2, Panel C, presents an industry comparison of restating firms in our sample to all Compustat firms. The manufacturing and retail industries seem to be slightly over-represented, whereas mining and construction are slightly under-represented. Apart from these variations, the restatement sample resembles the Compustat sample quite well. Compared to previous research, our restatement sample also indicates over-representation of the computer industry (part of manufacturing in Table 2, Panel C) as in the study by Dechow et al. (2011).

²¹Most firms give more than one reason for restating, and the firm can disclose the cause of the restatement through several different channels, for instance, press releases or Form 8/10K.

Table 3 presents a detailed description of the variable *LowQuality* for restaters and non-restaters, respectively. The development in accruals quality relative to the restatement presented in Panel A reveals that the two groups have similar accruals quality two and three years before the restatement because we matched restating firms with control firms based on variables affecting accruals quality. Recalling that higher absolute values of residuals indicate poor quality, Panel A also reveals that restating firms have lower accruals quality only in the year preceding the restatement year, which validates prior evidence suggesting that firms have lower accruals quality immediately before restating (Dechow et al., 2011; Jones et al., 2008; Desai et al., 2006). Panel B presents the development of accruals quality over time. We observe considerable variation across years, reaching the highest values, i.e., lowest quality, in the pre-SOX years and the lowest values, i.e., highest quality, in the years following SOX, with a peak in 2004. Untabulated results reveal that average *LowQuality* is 0.44 before the peak in 2004 and 0.42 after. The difference between the two is statistically significant, and hence there seems to be a switch in accruals quality around this period. We test if our results are sensitive to this switch around the SOX period in Section 4.3.

Descriptive statistics of the variables is presented in Table 4. Summary statistics in Panel A reveals that the propensity score matching seems to be quite successful since the restaters and non-restaters are quite similar. One notable difference is that restating firms are smaller than the control group (*Size* is 5.1271 for restaters and 5.2192 for non-restaters, and *LogMV* is 5.0995 for restaters and 5.2287 for the control group). We do not find a difference in the average accruals quality between the two groups, which we again attribute to the matching procedure. As a result, this table is not consistent with Dechow et al.'s (2011) and Jones et al.'s (2008) evidence suggesting that restating firms have worse accruals quality than other firms. As expected, the restatement announcement is followed by a negative market return (*CAR* of -0.0144), substantially more than the market return of peer firms on the same date (*CAR* of -0.0085). The modest market reaction of -1.44% is consistent with recent evidence, such as Files et al. (2014), and corroborates that market reactions to restatements are declining as described in Section 2. Pearson correlations between the regression variables are displayed in Panel B of Table 4. Multicollinearity does not seem to be a major problem, except for the anticipated exception of a high positive correlation between *Size* and *LogMV*. Both variables add considerable explanatory power in the regression analyses, and the variance inflation factors on these variables do not exceed 2 and therefore we do not consider the correlation to be a

problem. The table is also consistent with prior evidence on the relation between earnings quality and other important firm characteristics. For instance, we observe that accruals quality is increasing in size and performance (*NegEarn*). Finally, the correlation matrix indicates similar characteristics of the restating firms as Panel A, namely that they are smaller and have lower accruals quality.

4 Empirical Results

4.1 Improvement in Accruals Quality After a Restatement

Table 5 presents the results of Equation 2. Recall that H1 predicts that restating firms improve accruals quality relatively more than non-restaters, which corresponds to a negative coefficient on $Restater \times Post$. First, we note that restaters and non-restaters have similar accruals quality during the pre-restatement period in the full model, which reassures us that both groups have the same abilities to improve. Turning to the test variable, $Restater \times Post$ is not related to accruals quality and thus we cannot maintain H1. Hence, restaters do not improve accruals quality significantly more than non-restaters in the three years following the restatement announcement. Recall that our sample is more recent than, for instance, Wiedman and Hendricks (2013) and Chen et al. (2014), and that recent restatements are less material, because they involve fewer accounting issues and periods, and are less likely to reduce net income and involve fraud (Scholz, 2014). Combined with a parallel decline in market reactions to restatements (Burks, 2011), our results suggest that firms perceive restatements as less material now than in the past, and thus they do not trigger altered financial reporting practices. We thus conjecture that the drop in restatement materiality has caused firms to react less to restatements.

We offer three alternative explanations for the lack of improvement. First, our measure of accruals quality may not sufficiently capture the parameters on which the restating firms actually improve. However, we do not believe that this is the case because previous research indicates that accruals quality is associated with restatements (Jones et al., 2008; Dechow et al., 2011).²² In addition, our results remain unchanged even when isolating restatements affecting working capital accruals and when using alternative earnings quality measures. Second, it may be that the three-year period is too short to change accruals quality, because some determinants

²²An untabulated logistic regression including all Compustat firms indicates that firms with poor accruals quality (high *LowQuality*) have significantly (at 1%) higher likelihood of restating, corroborating the descriptive evidence in Table 3.

of earnings quality are slow to change, for instance, those stemming from the business model and operating environment (Francis et al., 2006). However, we include innate factors (such as σCFO , $Size$, and $NegEarn$) in our regressions, and our results hold when allowing the firms five years to improve. Third, it is possible that different restatements provide firms with different incentives to improve, so that only severe restatements are associated with increased accruals quality. We also examine this explanation in the final hypothesis.

4.2 Differences in Severity of Restatements

H2 predicts that restating firms improve accruals quality relatively more than non-restaters if the restatement is severe. Recall that we measure restatement severity in two ways: first, by the characteristics of the restatement and second, by the magnitude of the stock market reaction to the restatement announcement. Therefore, we create sub-samples with the most severe restatements measured along these two dimensions of severity and re-estimate the difference-in-differences regression (Equation 2) in these sub-samples. H2 predicts a negative coefficient on $Restater \times Post$ in all specifications.

Table 6 presents our first set of severity proxies, namely the sub-samples that include restatements involving fraud, SEC investigation, and restatements with net income effects. These regressions must be interpreted with some caution because the sample size decreases quite dramatically, especially in the first column, as only 2.5% of our restatements involve fraud. We observe that firms with fraud related and SEC investigated restatements have worse accruals quality than the control group in the years before the restatement (coefficients of 0.0989 and 0.1681 in the sub-samples including *Fraud* and *SEC Investigated*, respectively) in line with evidence by Ettredge et al. (2010) that the relation between earnings quality and subsequent restatements is more pronounced for restatements involving fraud. However, $Restater \times Post$ is not different from zero in any of the three specifications, and we thus do not find evidence that restatements are associated with higher accruals quality even after the most severe categories of restatements. We therefore cannot maintain the first part of H2.

Table 7 presents our second severity proxy with the sub-sample of firms that experienced the most negative market reaction to the restatement announcement, i.e., CAR below the median. In this sub-sample, we do find a significantly negative coefficient of -0.0691 on $Restater \times Post$, and so we can maintain H2 that severe restatements are associated with subsequent improvements in accruals quality when measuring restatement severity with the market reaction

to the announcement. We also see that restaters have significantly worse accruals quality in the pre-period (coefficient of 0.0525 on *Restater*). The average difference in accruals quality between the post- and pre-periods for the restater group is -0.0491 ($\beta_2 + \beta_3$, statistically different from 0) and 0.0200 for the non-restater group (β_2 , not statistically different from 0). Hence, the coefficient on *Restater* \times *Post* of -0.0691 is caused mainly by a material improvement in quality for the treatment group. Thus, our evidence suggests that restatements per se do not motivate firms to change accruals quality; only restatements deemed severe by financial markets do. Reconciling with the evidence presented by Burks (2011) and Chen et al. (2014), our results indicate that firms are more sensitive to large market reactions in recent times.

It is helpful to contrast our results with Wiedman and Hendricks (2013), who find that firms improve accruals quality following restatements. We conjecture that this difference stems from our different samples since there are a few material differences between their sample and ours. For instance, our sample period is 2000 to 2014, whereas their sample period is 1997 to 2003. The latter is a very turbulent period in US financial reporting. Two SEC declarations in 1999 are worth mentioning: First, SEC expressed the view that both qualitative and quantitative factors should be taken into account when considering materiality concerns. In particular, it was clarified that "(...) misstatements are not immaterial simply because they fall beneath a numerical threshold," a statement that led to an increase in the number of restatements in the following years.²³ Second, it was clarified that small errors in revenue recognition issues should not lead to restatements.²⁴ A large portion of 40% of the restatements in the sample of Wiedman and Hendricks (2013) are caused by revenue recognition issues (compared to 20% in Scholz (2008), who used a 1997-2006 sample period, and 16% in our sample), and the process around these restatements may be different. In addition, the 2002 enactment of SOX and the prominent restatements by Enron and Worldcom in 2001 and 2002, respectively, sparked an intense focus on financial reporting issues. Recent evidence by He et al. (2019) also corroborates that restatements are not necessarily followed by improved accruals quality. In particular, they find that restatements associated with material weakness disclosures have lower accruals quality afterwards in a sample period from 2003 through 2013, which is consistent with our conjecture that firms' responses to restatements have changed since the sample period used by Wiedman and Hendricks (2013). Another difference is that we use Audit Analytics to identify

²³SEC, Staff Accounting Bulletin: No. 99 - Materiality, available at www.sec.gov/interps/account/sab99.htm.

²⁴SEC, Staff Accounting Bulletin: No. 101 - Revenue Recognition in Financial Statements, available at www.sec.gov/interps/account/sab101.htm.

restatements, whereas Wiedman and Hendricks (2013) use the GAO database. While both databases have pros and cons, we believe that AA is better suited when the research question hinges on accurately identifying the particular restatement year rather than the announcement date.²⁵

4.3 Robustness Tests

Firms subject to restatements do not seem to improve accruals quality relatively more than control firms (H1); only restatements followed by very negative stock returns (H2) seem to affect accruals quality. We next propose alternative explanations for this somewhat surprising result and examine if changes in the research design alter our conclusions.

H1 focused on the motivation of restating firms to improve accruals quality after the restatement is announced, but it is possible that firms do have the motivation, but not the ability, to improve subsequently. As suggested by Valdivia (2008), correcting a restatement is by no means an easy task, and the effort, time, and cost required to correct a restatement are often underestimated by managers. Therefore, firms may not be able to improve accruals quality after a restatement, even if they have the incentives. We test this idea by isolating three different situations where firms have better opportunities to change accounting procedures after a restatement. If we observe improved accruals quality in these situations, it indicates that lack of abilities, rather than lack of incentives to improve, causes the rejection of H1. The first of these three situations is the number of categories causing each restatement. There are considerable variations in the number of categories, ranging from one to 16 (mean 2.14 and median 2), and it is likely that more categories complicate the correction of a restatement (Files et al., 2014; Scholz, 2008). We investigate if restatements with few issues are easier to solve and test H1 separately in a sub-sample of restatements with two or fewer categories, corresponding to the median. Second, the audit quality could influence the ability to improve accruals quality afterwards. A stream of research suggests that Big 4 audit firms (Francis et al., 2013; Hennes et al., 2014; Ying and Scholz, 2012) have fewer restatements, indicating that audit quality plays a role in the restatement process. Similarly, it is possible that firms with Big 4 auditors have better prospects of improving because a high-quality auditor can better aid in the post-restatement

²⁵We use the actual restatement year to match control firms, whereas Wiedman and Hendricks (2013) have to assume the actual restatement year based on the announcement year. They use years -2 and -1 as misstatement periods. In our sample, 34% of the restatement years are outside these two years, 3% when disregarding year 0. The graph in Panel A of Table 3 indicates that accruals quality varies quite a bit around the restatement years, making it crucial to identify the restatement years accurately.

process. We therefore test H1 separately in a sub-sample of firms with Big 4 audit firms. Third, our results are obviously sensitive to our measure of accruals quality, which is based on working capital accruals (Dechow and Dichev, 2002). However, some restatements do not affect working capital accruals, and hence our empirical measure may not detect an improvement among these firms. The final sub-sample thus isolates restatements affecting working capital accruals.²⁶ In all sub-samples, we again include each restating firm's unique match to maintain the difference-in-differences design.

Table 8 presents the results of H1 (Equation 2) for these three sub-samples, namely restatements with two or fewer categories (first column), firms with Big 4 audit firms (second column), and restatements affecting working capital accruals (third column). The results of these sensitivity tests are similar to the main specifications, so that $Restater \times Post$ does not affect accruals quality. Thus, we do not find an improvement in accruals quality even for firms with supposedly better abilities to improve. One additional concern related to the third column is that capital markets may react stronger to restatements affecting working capital accruals, which in turn may affect our conclusion in H2. However, the average CAR for restatements involving working capital is -1.36%, which is not statistically different from the overall average of -1.14% presented in Table 4. Therefore, restatements involving working capital accruals do not seem to be different from the average restatement.

Our sample period is characterized by major economic changes, in particular the enactment of the Sarbanes-Oxley Act in 2002. As described in Section 3.5, the average accruals quality in our sample increases (the decrease in *LowQuality* seen in Panel B of Table 3) after the SOX period, corroborating previous evidence by, e.g., Cohen et al. (2008) and Iliev (2010). We therefore test if our results are different in the post-SOX period by estimating our regressions in a sub-sample including only financial years from 2004 and onwards to allow firms enough time to adopt the changes after SOX became effective in 2002. This robustness test implies that the H2 regressions are estimated in very small samples, and hence these results must be interpreted with some caution. Table 9 presents the results of these robustness tests. Across the first four columns we observe that $Restater \times Post$ is not significantly associated with *LowQuality* and hence we maintain our results that neither restatements per se, nor restatements considered

²⁶Restatement categories affecting working capital accruals (current assets and liabilities, cash, and depreciation) are the following: (1) Depreciation, depletion or amortization errors; (3) PPE intangible or fixed asset issues; (12) Liabilities, payables, reserves and accrual estimate failures; (14) Accounts/loans receivable, investments, and cash issues; (46) PPE issues - Intangible assets, goodwill only (subcategory).

severe impact accruals quality after 2004. The fifth column changes our conclusion, though, since the coefficient on $Restater \times Post$ is not significant at conventional levels (the p-value is 0.12). Hence, a very negative market reaction does not seem to impact accruals quality in the latter part of our sample. Although this result may be caused by reduced statistical power, it also corroborates our conjecture that the responses to restatements have changed in recent times concurrently with the declining materiality of restatements. This result thus emphasizes the need for re-examining the consequences of restatements with a more recent sample than those used by, for instance, Wiedman and Hendricks (2013).

We finally test if our results are sensitive to our choice of earnings quality proxy. In particular, it may be that firms change accounting practices in ways that are not captured by accruals quality, such as conducting less real earnings management. We follow Wiedman and Hendricks (2013) and measure real earnings management with three different proxies that capture abnormal production costs (Equation 3a), abnormal operating cash flows (Equation 3b), and abnormal discretionary expenditures (Equation 3c):

$$ProdCost_{i,t} = \beta_0 + \beta_1 \frac{1}{AT_{i,t-1}} + \beta_2 Rev_{i,t} + \beta_3 \Delta Rev_{i,t} + \beta_4 \Delta Rev_{i,t-1} + \mu_{i,t} \quad (3a)$$

$$CFO_{i,t} = \beta_0 + \beta_1 \frac{1}{AT_{i,t-1}} + \beta_2 Rev_{i,t} + \beta_3 \Delta Rev_{i,t} + \mu_{i,t} \quad (3b)$$

$$DiscCost_{i,t} = \beta_0 + \beta_1 \frac{1}{AT_{i,t-1}} + \beta_2 Rev_{i,t} + \mu_{i,t} \quad (3c)$$

where $ProdCost$ is production costs; $DiscCost$ is discretionary expenditures; and remaining variables are as previously defined. All variables are scaled by lagged total assets and defined in Table A1.

Each of these regressions is estimated cross-sectionally each year in each two-digit SIC code for all Compustat firms, requiring a minimum of ten observations per two-digit SIC code. We use the parameter estimates to compute the expected level of production costs, operating cash flows, and expected discretionary expenditures, respectively. Our measure of real earnings management is the absolute difference between the expected and actual levels, capped at 1.0. Table 10 presents the results of H1 when replacing $LowQuality$ with the three measures of real earnings management as the dependent variable. Since high values of these absolute differences

indicate higher occurrences of real earnings management, H1 predicts a negative coefficient on the difference-in-differences estimator ($Restater \times Post$). The table does not find evidence that restating firms perform less real earnings management following a restatement. The only statistically significant effect we observe in these specifications is that the control firms seem to conduct less real earnings management with abnormal production costs in the post-period (negative coefficient on $Post$ in the first column).

5 Conclusion

We explore whether firms that announced a restatement between 2000 and 2014 improve accruals quality subsequently. Using a multivariate difference-in-differences research design of restating firms and a propensity score matched control group, we find that restating firms do not improve accruals quality relatively more than the control group after the restatement announcement. This result holds even when we isolate the most severe restatements, namely those involving fraud, SEC investigations, and earnings restatements. However, firms that experienced the most negative market reactions to the restatement announcements seem to improve relatively more than the control group. Hence, our results indicate that only the restatements considered most severe by the capital market motivate firms to subsequently improve accruals quality.

We draw an opposite conclusion of Wiedman and Hendricks (2013) based on a larger and more recent sample, who find that accruals quality improves after restatements. Our paper hence complements previous research on how the nature of restatements has changed in recent times. Our results validate the evidence that restatements have become less material, which in turn has changed how they are perceived by investors and firms (Scholz, 2014; Burks, 2011; Chen et al., 2014). Our analyses complement previous research on the implications of different restatement characteristics on subsequent financial reporting strategies (Badertscher et al., 2012; Wilson, 2008; Hennes et al., 2008), and on whether firms attempt to restore financial credibility after restatements (Chakravarthy et al., 2014; Karpoff et al., 2008).

The implications of our paper are of particular importance to two groups: First, financial statement users such as investors and regulators should be aware that restating firms do not necessarily improve accruals, which calls for continued caution and scrutiny when evaluating firms with past restatements. Second, accounting academics should be aware that we cannot necessarily generalize the results from early evidence to more recent settings, even within the same region.

The implication for accounting scholars leads us to an important caveat, namely that our results do not necessarily extend to different sample periods or firms. For instance, we do not know if our results generalize to firms restating several times or more than once within the same financial year. Although we expect that especially the former firms are less likely to improve because their financial statements have material weaknesses over several years, it would be interesting to see how their accruals quality changes after each restatement. We leave this question for future research. Caution should also be exercised when interpreting our results, because variations in accruals quality arise from a large number of sources. For instance, it is possible that firms cannot reduce accrual estimation errors after a restatement because of innate factors or that firms improve on other dimensions of earnings quality. These conjectures call for future research on the long-term consequences of restatements.

Appendix A Variables

Table A1: Estimation of Variables

Variable	Definition
<i>AT</i>	is total assets (AT)
<i>BtoM</i>	is the book-to-market value measured as the book value of common equity (CEQ) divided by the market value of common equity (PRCCF*CSHO)
<i>CapitalIntens</i>	is the capital intensity measured as net property, plant, and equipments (PPENT) divided by lagged total assets (AT)
<i>CAR</i>	is the cumulative abnormal return in the three day window (t-1, t, t+1) surrounding the restatement announcement date measured as firm <i>i</i> 's return (RET) less the market's equal weighted return (VWRETD)
<i>CEOTurnover</i>	is an indicator variable equaling 1 if the firm switched CEO two years after the restatement (different EXECID not caused by RETIRED), and 0 otherwise
<i>CFO</i>	is cash flows from operating activities (OANCF) divided by lagged total assets (AT)
<i>DiscCost</i>	is discretionary expenditures measured as the sum of advertising expense (XAD), R&D expense (XRD), and SG&A expense (XSGA) divided by lagged total assets (AT)
<i>Earnings Restatements</i>	are restatements that affected net income (CHANGE_CUM_NET_INCOME)
<i>Emp</i>	is the number of employees (EMP) divided by lagged total assets (AT)
<i>Fraud Restatements</i>	are restatements that identified fraud or misrepresentation (RES_FRAUD_RESTATEMENT_CATEGORY_TITLE_LIST)
<i>Growth</i>	is the percentage change in net turnover (SALE)
<i>Inv</i>	is total inventory (INVT) divided by lagged total assets (AT)
<i>Issue</i>	is an indicator variable equaling 1 if sale of common stock (SSTK) or long-term debt issuance (DLTIS) is greater than 0, and 0 otherwise
<i>Lev</i>	is leverage measured as long-term debt (DLTT) divided by total assets (AT)
<i>Litigation</i>	is an indicator variable equaling 1 in industries with high litigation risk (SIC codes 2833-2836, 3570-3577, 3600-3674, 5200-5961, 7370-7374), and 0 otherwise
<i>LogMV</i>	is the natural logarithm of the market value of common equity (PRCC_F*CSHO)
<i>LowQuality</i>	is accruals quality measured as the absolute difference between expected and actual level of working capital accruals based on residuals from Equation 1
<i>NegEarn</i>	is an indicator variable equaling 1 if net income (NI) is below 0, and 0 otherwise
<i>Post</i>	is an indicator variable equaling 1 if the fiscal year is after the restatement is announced, and 0 otherwise
<i>PPE</i>	is total property, plant, and equipment (PPEGT) divided by lagged total assets (AT)
<i>ProdCost</i>	is production costs measured as the sum of cost of goods sold (COGS) and the change in inventory (INVCH) divided by lagged total assets (AT)
<i>Rec</i>	is total receivables (RECT) divided by lagged total assets (AT)
<i>Restater</i>	is an indicator variable equaling 1 if the firm has restated during the sample period, and 0 otherwise
<i>Restructure</i>	is an indicator variable equaling 1 if restructuring costs (RCP, RCA, RCEPS, or RCD) are above 1, and 0 otherwise
<i>Rev</i>	is net turnover (SALE) divided by lagged total assets (AT)
<i>ROA</i>	is return on assets measured as net turnover (SALE) divided by total assets (AT)
<i>SEC Investigated</i>	are restatements where the registrant was investigated by the SEC (RES_SEC_INVESTIGATION)
<i>Size</i>	is the natural logarithm of total assets (AT)
<i>WC</i>	is working capital measured as the change in total current assets (ACT) less the change in total current liabilities (LCT) less the change in cash and equivalents (CHE) plus the change in debt in current liabilities (DLC) less depreciation and amortization (DP) divided by lagged total assets (AT)

Compustat - Capital IQ items in parentheses. All variables except CAR winsorized at the 1st and 99nd percentile.

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Table 1: Sample Selection Process

	Firms	Restatements
Number of restatements in Audit Analytics 2000-2014	9,093	15,148
Less 485 firms with immaterial restatements ¹	8,608	14,291
Less 3,376 firms with more than one restatement	5,232	5,232
Less 1,045 firms in SIC codes 6000-6999	4,187	4,187
Less 1,627 firms not matched with Compustat/Capital IQ ²	2,560	2,560
Less 256 firms not matched with CRSP	2,304	2,304
Less 624 firms not matched based on PSM	1,680	1,680
Less 146 firms without information to calculate accruals quality ³	1,534	1,534
Final sample: 1,534 treatment firms matched with 1,286 control firms ⁴	2,820	1,534

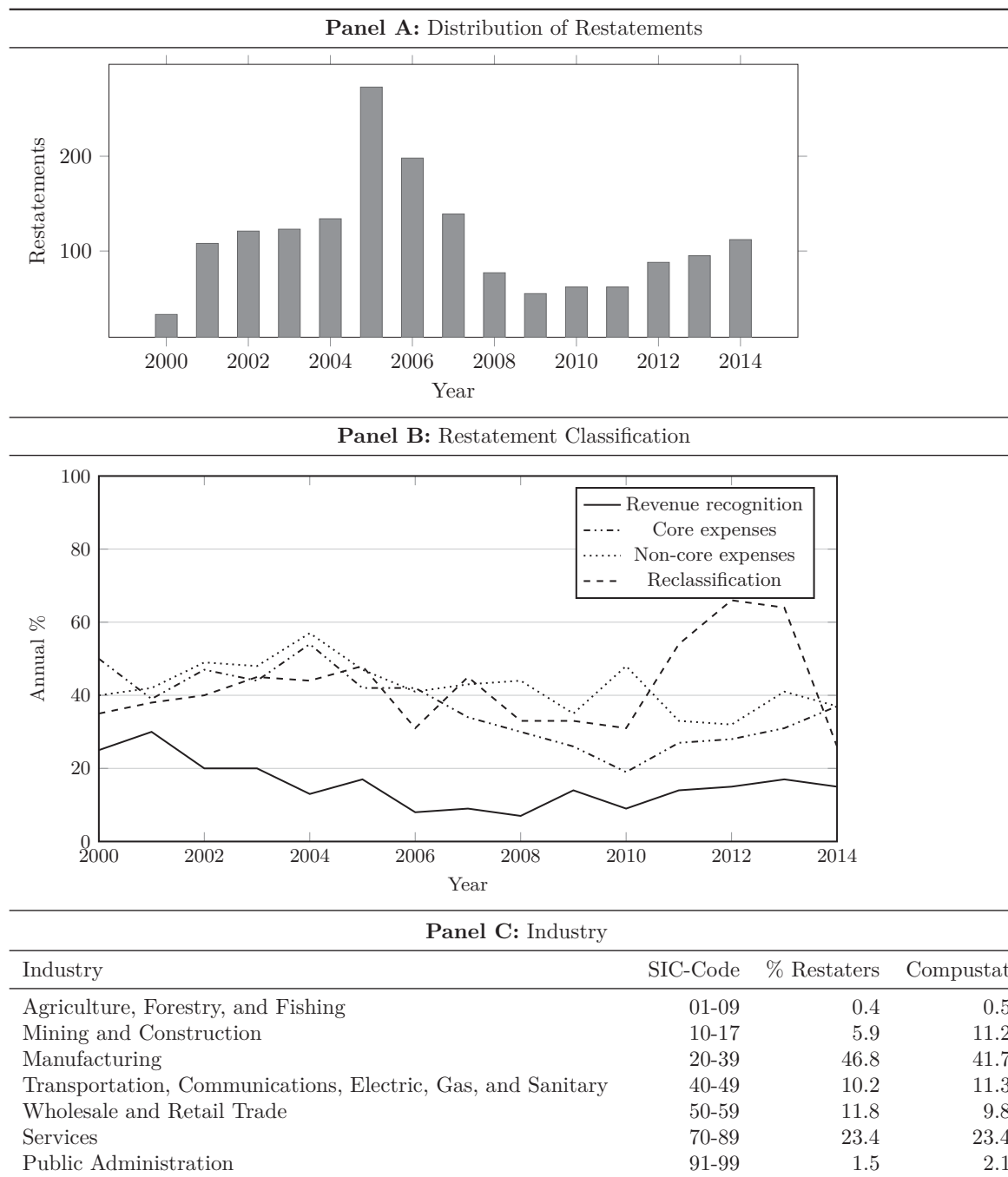
The table presents the sample selection procedure.

¹ Immaterial restatements defined by Hennes et al. (2014) and refer to inflation or currency adjustments by foreign registrants (category 37), errors in GAAP conversion (category 38), retrospective revisions (category 40), SAB 108 changes (categories 49-52), and FIN 48 changes (categories 53-70).

² We match based on COMPANY_FKEY in AA and CIK in Compustat - Capital IQ. Of the 9,093 firms found in the initial search, about 2,000 are located outside the United States. The vast majority of firms not linked in Compustat/Capital IQ are thus foreign.

³ We cannot estimate *LowQuality* for these firms because we require a minimum of ten annual observations within each two-digit SIC code.

⁴ We use replacement when matching firms with propensity scores, therefore the final sample consists of 1,534 restating firms and 1,286 non-restating firms, a total of 2,820.

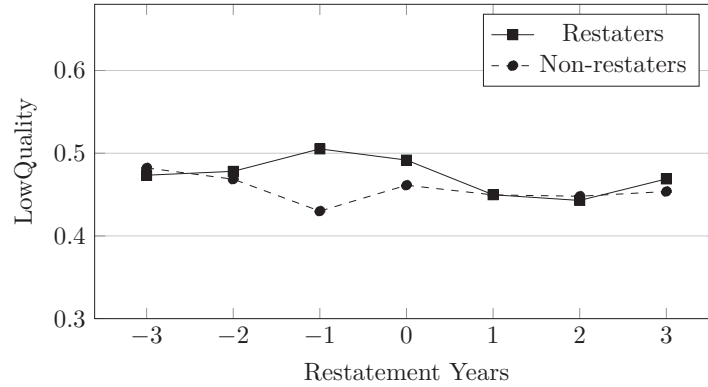
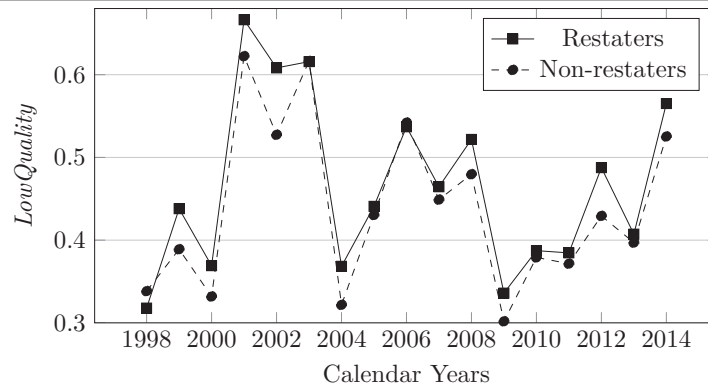
Table 2: Description of Restatements and Restating Firms

The table presents the description of the restating firms in our sample.

Panel A presents the frequency of the restatements in the final sample. Panel B presents the restatement categories classified according to Scholz (2008), one restatement typically has several different reasons, therefore the classifications add up to more than 100 percent. *Revenue recognition* covers all issues related to understanding or calculating the recognition of revenue; *Core expenses* cover corrections of ongoing operating expenses, such as expense recording issues, liabilities and accrual estimation failures, capitalization of expenditures, as well as lease and depreciation issues; *Non-core expenses* cover correction of income statement items arising from non-operating or non-recurring activities, such as errors in recording of debt or equity accounts, derivative instruments and hedging accounting issues, and impairment issues; *Reclassification* cover all issues related to reclassification, disclosure, and underlying events, such as calculation of loans receivables and allowance for uncollectibles, mergers, acquisitions, disposals, and reorganization accounting issues, as well as foreign, related party, affiliated, or subsidiary issues. Panel C compares the restating firms in the final sample with all firms except SIC 6000-6999 from Compustat - Capital IQ.

Table 3: Descriptive Statistics of Accruals Quality

Panel A: <i>LowQuality</i> across Restatement Years					
t	Restaters	N	Non-restaters	N	Difference
t-3	0.4734	1,226	0.4822	1,102	0.0088
t-2	0.4781	1,346	0.4686	1,187	0.0096
t-1	0.5052	1,423	0.4300	1,218	0.0752*
t=0	0.4917	1,419	0.4613	1,234	0.0303
t+1	0.4498	1,376	0.4496	1,178	0.0003
t+2	0.4429	1,351	0.4480	1,195	0.0051
t+3	0.4689	1,361	0.4537	1,212	0.0152

**Panel B:** *LowQuality* across Calendar Years

The table presents descriptive statistics of accruals quality for the firms in our sample. *LowQuality* is the absolute difference between expected and actual level of working capital accruals based on residuals from Equation 1, high values of *LowQuality* indicate low accruals quality.

Panel A presents the development of *LowQuality* for restaters and non-restaters, respectively, in the three years before (pre-period) and after (post-period) the restatement is announced. We do not require full time series of the firms in our sample, and hence some firms enter late or leave early, caused by, e.g., IPOs, M&As, bankruptcies, or insufficient information to estimate *LowQuality* at the firm- or industry-level. Therefore, the number of observations deviates from Table 1.

Panel B presents the annual averages of *LowQuality* for the firms in the sample, five years before and after the restatement.

*, **, *** denote significant differences from 0 at the 10%, 5%, and 1% levels, respectively, with two-sample t-test.

Table 4: Descriptive Statistics of Regression Variables

Variable	Panel A: Summary Statistics						Difference	
	Restaters			Non-Restaters			Mean	Mean
	N	Mean	Median	N	Mean	Median		
LowQuality	7,430	0.4741	0.1538	6,464	0.4615	0.1551	0.0126	
Size	7,430	5.1271	5.2515	6,464	5.2192	5.3502	-0.0924**	
LogMV	7,430	5.0995	5.2098	6,464	5.2287	5.3493	-0.1292***	
Restructure	7,430	0.2176	0.0000	6,464	0.2192	0.0000	-0.0016	
σ CFO	7,430	71.5004	14.2947	6,464	65.9314	15.6532	5.5690	
BtoM	7,430	0.6684	0.4589	6,464	0.5261	0.4476	-0.1424	
NegEarn	7,430	0.4240	0.0000	6,464	0.4072	0.0000	0.0168	
CapitalIntens	7,430	0.2574	0.1698	6,464	0.2504	0.1646	0.0070	
CAR	1,524	-0.0144	-0.0060	1,283	-0.0085	-0.0041	-0.0058**	

Panel B: Correlations										
Variables	Restater	LowQuality	Size	LogMV	Restructure	σ CFO	BtoM	NegEarn	CapitalIntens	CAR
Restater	1.0000									
LowQuality	0.0131**	1.0000								
Size	-0.0206***	-0.1968***	1.0000							
LogMV	-0.0193***	-0.1260***	0.8857***	1.0000						
Restructure	-0.0010	-0.0386***	0.2767***	0.2106***	1.0000					
σ CFO	0.0126**	-0.0089*	0.5199***	0.5071***	0.1160***	1.0000				
BtoM	-0.0004	-0.0028	-0.0088*	0.0358***	-0.0243***	-0.0037	1.0000			
NegEarn	0.0166***	0.1571***	-0.4068***	-0.4281***	0.0466***	-0.1669***	-0.0199***	1.0000		
CapitalIntens	0.0055	-0.0728***	0.2957***	0.1891***	-0.0842***	0.1793***	0.0018	-0.1276***	1.0000	
CAR	-0.0351*	-0.0237	0.0295	0.0366*	0.0039	0.0125	0.0089	-0.0329*	0.0099	1.0000

Panel A presents descriptive statistics of the regression variables for restaters and non-restaters, respectively. Panel B presents Pearson correlations between regression variables.

Restater is an indicator variable equaling 1 if the firm has restated in the sample period, and 0 otherwise; *LowQuality* is the absolute difference between expected and actual level of working capital accruals based on residuals from Equation 1, high values of *LowQuality* indicate low accruals quality; *Size* is the natural logarithm of total assets; *LogMV* is the natural logarithm of the market value of equity; *Restructure* is restructuring costs scaled by total assets; σ CFO is the five-year rolling standard deviation of operating cash flows; *BtoM* is the book value of equity divided by the market value of equity. Δ Rec is the annual change in receivables scaled by total assets; *NegEarn* is an indicator equaling 1 if net income is negative, and 0 otherwise; *CapitalIntens* is net property, plant, and equipment scaled by total assets; *CAR* is the three-day cumulative abnormal return surrounding the restatement announcement. Table A1 provides additional details on variable definitions. *, **, *** denote significant differences from 0 at the 10%, 5%, and 1% levels, respectively, with two-sample t-tests in Panel A.

Table 5: H1: Improvement in Accruals Quality After a Restatement

Dependent Variable: LowQuality		
Restater	0.0311*	0.0133
	(1.79)	(0.81)
Post	-0.0108	-0.0192
	(-0.40)	(-0.72)
Restater*Post	-0.0144	-0.0143
	(-0.68)	(-0.58)
Size		-0.1987***
		(-8.59)
LogMV		0.1027***
		(5.51)
Restructure		0.0485*
		(2.00)
σ CFO		0.0004***
		(4.12)
BtoM		-0.0007***
		(-6.36)
NegEarn		0.1067***
		(3.54)
Litigation		-0.1122**
		(-2.29)
CapitalIntens		0.0541
		(0.79)
Intercept	-0.0100	0.3737**
	(-0.23)	(2.42)
Year controls	Yes	Yes
Industry controls	Yes	Yes
N	15,062	13,894
R ²	0.1581	0.2091
VIF	2.31	2.18

The table presents the results of Equation 2, answering H1 that restating firms improve accruals quality relatively more than the matched control group in the three years following the restatement announcement.

LowQuality is the absolute difference between expected and actual level of working capital accruals based on residuals from Equation 1, high values of *LowQuality* indicate low accruals quality; *Restater* is an indicator variable equaling 1 if the firm has restated in the sample period, and 0 otherwise; *Post* is an indicator variable equaling 1 if the fiscal year is after the restatement is announced, and 0 otherwise; *Size* is the natural logarithm of total assets; *LogMV* is the natural logarithm of the market value of equity; *Restructure* is restructuring costs scaled by total assets; σ *CFO* is the five-year rolling standard deviation of operating cash flows; *BtoM* is the book value of equity divided by the market value of equity; *NegEarn* is an indicator equaling 1 if net income is negative, and 0 otherwise; *Litigation* is an indicator variable equaling 1 in industries with high litigation risk, and 0 otherwise; *CapitalIntens* is net property, plant, and equipment scaled by total assets; Table A1 provides additional details on variable definitions.

Weights corresponding to $1/k$ are included to account for fewer control firms than treatment firms caused by propensity score matching with replacement. Robust standard errors clustered by firm and year in accordance with Petersen (2009). t-statistics in parentheses. *, **, *** denote significant differences from 0 at the 10%, 5%, and 1% levels, respectively.

Table 6: H2: Differences in Severity of Restatements: Restatement Characteristics

Dependent Variable: LowQuality						
	(1) Fraud Restatements		(2) SEC Investigated		(3) Earnings Restatements	
Restater	0.1224** (2.53)	0.0989*** (3.69)	0.1013 (1.15)	0.1681** (2.09)	-0.1001 (-0.71)	0.0095 (0.07)
Post	-0.1128*** (-3.23)	-0.1334 (-1.20)	-0.1260 (-1.23)	-0.0205 (-0.24)	-0.3964** (-2.23)	-0.2467 (-1.52)
Restater × Post	-0.1014** (-2.16)	-0.0159 (-0.79)	0.1575 (1.35)	0.0216 (0.27)	0.0943 (0.51)	-0.0560 (-0.34)
Size		-0.1670*** (-3.91)		-0.3036*** (-3.55)		-0.1403** (-1.97)
LogMV		0.1047*** (3.18)		0.1664*** (2.59)		0.0590 (1.32)
Restructure			0.0629 (1.06)		0.0370 (0.45)	0.2632* (1.70)
σ CFO		0.0005* (1.75)		0.0008** (2.51)		0.0003 (1.34)
BtoM		0.0014 (0.17)		-0.0145*** (-2.97)		-0.0009*** (-2.85)
NegEarn		0.0448 (0.61)		-0.0361 (-0.60)		-0.0243 (-0.21)
Litigation		-0.0393 (-0.42)		-0.3284** (-2.01)		-0.0561 (-0.36)
CapitalIntens		0.3204 (0.82)		-0.3213 (-1.43)		0.0215 (0.21)
Intercept		0.3428 (0.84)		-0.3582 (-1.55)		0.3995 (0.92)
Year controls	Yes	Yes	Yes	Yes	Yes	Yes
Industry controls	Yes	Yes	Yes	Yes	Yes	Yes
N	459	395	1,133	1,050	655	597
R ²	0.2314	0.3289	0.1829	0.2666	0.3517	0.3559
VIF	2.44	2.39	2.59	2.22	2.73	2.48

The table presents the results of Equation 2, answering H2 that restating firms improve accruals quality relatively more than the matched control group in the three years following the restatement announcement if the restatement is severe. The table includes three sub-samples: Column (1) features restating firms where the restatement identified fraud, along with their unique matches; Column (2) features restating firms where the restatement was investigated by the SEC, along with their unique matches; Column (3) features restating firms where the restatement affected earnings, along with their unique matches.

LowQuality is the absolute difference between expected and actual level of working capital accruals based on residuals from Equation 1, high values of *LowQuality* indicate low accruals quality; *Fraud Restatements* include restatements that identified fraud; *SEC Investigated* include restatements where the registrant was investigated by the SEC; *Earnings Restatements* are restatements that affected net income; *Restater* is an indicator variable equaling 1 if the firm has restated in the sample period, and 0 otherwise; *Post* is an indicator variable equaling 1 if the fiscal year is after the restatement is announced, and 0 otherwise; *Size* is the natural logarithm of total assets; *LogMV* is the natural logarithm of the market value of equity; *Restructure* is restructuring costs scaled by total assets; σ CFO is the five-year rolling standard deviation of operating cash flows; *BtoM* is the book value of equity divided by the market value of equity; *NegEarn* is an indicator equaling 1 if net income is negative, and 0 otherwise; *Litigation* is an indicator variable equaling 1 in industries with high litigation risk, and 0 otherwise; *CapitalIntens* is net property, plant, and equipment scaled by total assets; Table A1 provides additional details on variable definitions.

Weights corresponding to $1/k$ are included to account for fewer control firms than treatment firms caused by propensity score matching with replacement. Robust standard errors clustered by firm and year in accordance with Petersen (2009). t-statistics in parentheses. *, **, *** denote significant differences from 0 at the 10%, 5%, and 1% levels, respectively.

Table 7: H2: Differences in Severity of Restatements: Market Reaction

Dependent Variable: LowQuality		
	CAR below median	
Restater	0.0635*** (3.23)	0.0525** (2.42)
Post	0.0333 (0.83)	0.0200 (0.50)
Restater × Post	-0.0620* (-1.77)	-0.0691* (-1.79)
Size		-0.1817*** (-6.31)
LogMV		0.0950*** (3.90)
Restructure		0.0548* (1.81)
σ CFO		0.0003* (1.74)
BtoM		-0.0006*** (-4.73)
NegEarn		0.1021*** (2.66)
Litigation		-0.1034* (-1.95)
CapitalIntens		0.0774 (0.94)
CEOTurnover		0.0342 (1.06)
Intercept	0.0365 (1.12)	0.3692*** (2.91)
Year controls	Yes	Yes
Industry controls	Yes	Yes
N	10,698	9,840
R ²	0.1555	0.1982
VIF	2.28	2.18

The table presents the results of Equation 2, answering H2 that restating firms improve accruals quality relatively more than the matched control group in the three years following the restatement announcement if the restatement is severe. The table includes one sub-sample featuring firms where CAR on the restatement announcement date is below the median, along with their unique match.

LowQuality is the absolute difference between expected and actual level of working capital accruals based on residuals from Equation 1, high values of *LowQuality* indicate low accruals quality; *CAR* is the three-day cumulative abnormal return surrounding the restatement announcement; *Restater* is an indicator variable equaling 1 if the firm has restated in the sample period, and 0 otherwise; *Post* is an indicator variable equaling 1 if the fiscal year is after the restatement is announced, and 0 otherwise; *Size* is the natural logarithm of total assets; *LogMV* is the natural logarithm of the market value of equity; *Restructure* is restructuring costs scaled by total assets; σ *CFO* is the five-year rolling standard deviation of operating cash flows; *BtoM* is the book value of equity divided by the market value of equity; *NegEarn* is an indicator equaling 1 if net income is negative, and 0 otherwise; *Litigation* is an indicator variable equaling 1 in industries with high litigation risk, and 0 otherwise; *CapitalIntens* is net property, plant, and equipment scaled by total assets; *CEOTurnover* is an indicator variable equaling 1 if the firm switched CEO two years after the restatement, and 0 otherwise; Table A1 provides additional details on variable definitions.

Weights corresponding to $1/k$ are included to account for fewer control firms than treatment firms caused by propensity score matching with replacement. Robust standard errors clustered by firm and year in accordance with Petersen (2009). t-statistics in parentheses. *, **, *** denote significant difference from 0 at the 10%, 5%, and 1% levels, respectively.

Table 8: Robustness: Ability to Improve

Dependent Variable: LowQuality			
	(1) Two or less categories	(2) Big 4 auditor	(3) Restatement affecting WC
Restater	0.0090 (0.38)	0.0003 (0.02)	0.0089 (0.28)
Post	-0.0032 (-0.10)	-0.0410* (-1.65)	0.0148 (0.18)
Restater × Post	-0.0180 (-0.52)	-0.0030 (-0.11)	-0.0175 (-0.25)
Size	-0.2295*** (-8.18)	-0.0917*** (-4.56)	-0.1288*** (-3.20)
LogMV	0.1158*** (5.07)	0.0520*** (2.72)	0.0598** (2.38)
Restructure	0.0644*** (2.71)	0.0302 (1.15)	0.0728 (1.49)
σ CFO	0.0005*** (4.68)	0.0001* (1.79)	0.0002 (1.17)
BtoM	-0.0008*** (-7.23)	-0.0000 (-0.41)	-0.0008*** (-2.60)
NegEarn	0.0937*** (3.04)	0.1145*** (2.73)	0.0445 (0.96)
Litigation	-0.1292** (-2.09)	-0.0604 (-1.06)	-0.0203 (-0.30)
CapitalIntens	0.0841 (0.87)	0.0746 (1.00)	-0.0099 (-0.09)
Intercept	0.4519*** (2.64)	0.1875 (1.56)	0.5545*** (2.67)
Year controls	Yes	Yes	Yes
Industry controls	Yes	Yes	Yes
N	9,732	6,602	3,924
R ²	0.2115	0.1724	0.2271
VIF	2.25	2.27	2.30

The table presents robustness tests of H1 in three sub-samples: Column (1) features restating firms with two or fewer restatement categories, along with their unique matches, Column (2) features restating firms with Big 4 auditors, along with their unique matches, while Column (3) features restating firms where the restatement affected working capital (see Footnote 26).

LowQuality is the absolute difference between expected and actual level of working capital accruals based on residuals from Equation 1, high values of *LowQuality* indicate low accruals quality; *Restater* is an indicator variable equaling 1 if the firm has restated in the sample period, and 0 otherwise; *Post* is an indicator variable equaling 1 if the fiscal year is after the restatement is announced, and 0 otherwise; *Size* is the natural logarithm of total assets; *LogMV* is the natural logarithm of the market value of equity; *Restructure* is restructuring costs scaled by total assets; σ CFO is the five-year rolling standard deviation of operating cash flows; *BtoM* is the book value of equity divided by the market value of equity; *NegEarn* is an indicator equaling 1 if net income is negative, and 0 otherwise; *Litigation* is an indicator variable equaling 1 in industries with high litigation risk, and 0 otherwise; *CapitalIntens* is net property, plant, and equipment scaled by total assets; Table A1 provides additional details on variable definitions.

Weights corresponding to 1/k are included to account for fewer control firms than treatment firms caused by propensity score matching with replacement. Robust standard errors clustered by firm and year in accordance with Petersen (2009). t-statistics in parentheses. *, **, *** denote significant differences from 0 at the 10%, 5%, and 1% levels, respectively.

Table 9: Robustness: Only post-SOX Years

	Dependent Variable: LowQuality				
	(1) H1	(2) H2: Fraud	(3) H2: SEC	(4) H2: Earnings	(5) H2: CAR
Restater	0.0261 (0.87)	-0.0163 (-0.21)	0.3508*** (2.97)	0.0446 (0.70)	0.0466 (1.47)
Post	-0.0044 (-0.15)	-0.0184 (-0.19)	0.0802 (0.99)	-0.0930 (-1.15)	0.0046 (0.16)
Restater × Post	-0.0420 (-1.10)	-0.0096 (-0.09)	-0.1199 (-0.84)	-0.0468 (-0.40)	-0.0637 (-1.54)
Size	-0.2354*** (-11.73)	-0.0866 (-1.62)	-0.3277*** (-3.83)	-0.2335** (-2.11)	-0.2281*** (-8.65)
LogMV	0.1287*** (7.73)	0.0163 (0.41)	0.2023*** (3.03)	0.0627 (1.34)	0.1268*** (6.05)
Restructure	0.0546*** (2.72)	-0.0323 (-0.49)	0.1388* (1.86)	0.1011 (1.04)	0.0738*** (3.13)
σ CFO	0.0004*** (7.53)	0.0003 (1.22)	0.0005** (2.48)	0.0004 (1.12)	0.0003*** (4.92)
BtoM	-0.0005** (-2.07)	0.0194 (1.60)	-0.0012 (-0.28)	0.0055 (0.19)	-0.0004* (-1.75)
NegEarn	0.0710*** (2.98)	-0.0172 (-0.24)	-0.0592 (-0.90)	0.1251 (1.17)	0.0676** (2.54)
Litigation	-0.1612*** (-3.76)	-0.1325 (-1.24)	-0.2473 (-1.38)	-0.5847** (-2.36)	-0.1253*** (-2.61)
CapitalIntens	0.1140 (1.58)	0.0010 (0.00)	-0.3019 (-0.83)	0.4653 (0.76)	0.0837 (0.92)
Intercept	0.8536*** (6.78)	0.9483*** (3.31)	1.1751*** (3.62)	1.5332** (2.59)	0.9340*** (7.68)
Year controls	Yes	Yes	Yes	Yes	Yes
Industry controls	Yes	Yes	Yes	Yes	Yes
N	8,569	178	680	265	6,068
R ²	0.2401	0.5050	0.2896	0.3544	0.2410
VIF	2.46	2.97	2.41	3.27	2.43

The table presents robustness tests of H1 and H2 in a sub-sample with only the years following SOX, i.e., financial years from 2004 to 2014.

LowQuality is the absolute difference between expected and actual level of working capital accruals based on residuals from Equation 1, high values of *LowQuality* indicate low accruals quality; *Restater* is an indicator variable equaling 1 if the firm has restated in the sample period, and 0 otherwise; *Post* is an indicator variable equaling 1 if the fiscal year is after the restatement is announced, and 0 otherwise; *Size* is the natural logarithm of total assets; *LogMV* is the natural logarithm of the market value of equity; *Restructure* is restructuring costs scaled by total assets; σ *CFO* is the five-year rolling standard deviation of operating cash flows; *BtoM* is the book value of equity divided by the market value of equity; *NegEarn* is an indicator equaling 1 if net income is negative, and 0 otherwise; *Litigation* is an indicator variable equaling 1 in industries with high litigation risk, and 0 otherwise; *CapitalIntens* is net property, plant, and equipment scaled by total assets; Table A1 provides additional details on variable definitions.

Weights corresponding to $1/k$ are included to account for fewer control firms than treatment firms caused by propensity score matching with replacement. Robust standard errors clustered by firm and year in accordance with Petersen (2009). t-statistics in parentheses. *, **, *** denote significant differences from 0 at the 10%, 5%, and 1% levels, respectively.

Table 10: Robustness: Real Earnings Management

	(1)	(2)	(3)
	Abnormal Production	Abnormal CFO	Abnormal Expenditures
Restater	0.0040 (0.43)	0.0079 (1.07)	0.0133 (1.23)
Post	-0.0292*** (-3.00)	-0.0117 (-1.64)	-0.0011 (-0.09)
Restater × Post	0.0062 (0.59)	-0.0046 (-0.51)	-0.0108 (-1.06)
Size	-0.0481*** (-8.98)	-0.0827*** (-24.05)	-0.0128*** (-3.39)
LogMV	0.0169*** (3.97)	0.0350*** (11.39)	-0.0019 (-0.50)
Restructure	-0.0226*** (-2.64)	-0.0043 (-0.63)	-0.0261** (-2.40)
σ CFO	0.0002*** (4.58)	0.0002*** (9.64)	0.0000 (1.00)
BtoM	-0.0003*** (-5.02)	-0.0002*** (-4.39)	-0.0001* (-1.90)
NegEarn	0.0194** (2.02)	0.0187** (2.28)	0.0064 (0.74)
Litigation	-0.0613*** (-3.58)	-0.0162* (-1.68)	-0.1206*** (-5.86)
Capitalintens	-0.0158 (-0.61)	-0.0270 (-1.59)	0.0696*** (2.70)
Intercept	0.8151*** (8.98)	0.8899*** (8.05)	1.1232*** (40.67)
Year controls	Yes	Yes	Yes
Industry controls	Yes	Yes	Yes
N	15,178	15,178	15,178
R ²	0.2888	0.4253	0.1975
VIF	2.16	2.16	2.16

The table presents robustness tests of H1 with three different dependent variables: Column (1) features abnormal production costs measured as the difference between actual and expected production costs (Equation 3a); Column (2) features abnormal operating cash flows as the difference between actual and expected operating cash flows (Equation 3b); Column (3) features abnormal expenditures as the difference between actual and expected expenditures (Equation 3c).

Restater is an indicator variable equaling 1 if the firm has restated in the sample period, and 0 otherwise; *Post* is an indicator variable equaling 1 if the fiscal year is after the restatement is announced, and 0 otherwise; *Size* is the natural logarithm of total assets; *LogMV* is the natural logarithm of the market value of equity; *Restructure* is restructuring costs scaled by total assets; σ *CFO* is the five-year rolling standard deviation of operating cash flows; *BtoM* is the book value of equity divided by the market value of equity; *NegEarn* is an indicator equaling 1 if net income is negative, and 0 otherwise; *Litigation* is an indicator variable equaling 1 in industries with high litigation risk, and 0 otherwise; *CapitalIntens* is net property, plant, and equipment scaled by total assets; Table A1 provides additional details on variable definitions.

Weights corresponding to $1/k$ are included to account for fewer control firms than treatment firms caused by propensity score matching with replacement. Robust standard errors clustered by firm and year in accordance with Petersen (2009). t-statistics in parentheses. *, **, *** denote significant differences from 0 at the 10%, 5%, and 1% levels, respectively.