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LITIGATION RISK AND MARKET REACTION TO RESTATEMENTS

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Abstract

A large negative stock price reaction to a restatement announcement could imply a particularly significant accounting error, or one made by a firm that has a relatively high probability of being sued. This paper investigates the extent to which market reactions to restatement announcements are explained by litigation risk. We model the simultaneous relationship between restatement announcement abnormal returns and litigation risk and find that about half of the -9.2 percent average restatement announcement effect is due to expected litigation costs. We also find that the significance of the accounting error does not directly affect the magnitude of the abnormal return; it only affects abnormal return indirectly because it increases the probability of being sued.

JEL classification: G14, G30

Keywords: Corporate misreporting, financial statement restatements, valuation, dummy endogenous variable model

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1. Introduction

The growing number of financial statement restatements and their associated shareholder losses have motivated new regulations such as Sarbanes-Oxley Act of 2002[2] and the Securities and Exchange Commission's (SEC) earnings management initiative (Berton (2000), Public Accounting Report (1998)). This paper studies the marginal effect of litigation on restatement announcement return; i.e. whether restating firms' stocks suffer such large losses because the market is surprised by particularly egregious accounting mistakes, or because admitting to the mistakes increases the likelihood that firms will face large litigation costs. We show that litigation risk accounts for about half of the average -9.2 percent restatement announcement abnormal return. Our paper contributes to the literature by estimating the marginal effect of litigation using two dummy endogenous variable models. The models can be used to find the embedded marginal effect of litigation risk for other events including seasoned equity offerings, debt issuances, large negative earnings surprises, insider trading, and fraud revelations.

There are several reasons why it is important to isolate the marginal effect of litigation. First, policymakers are interested in the magnitude of the shareholder harm caused by the misinformation, which firms correct in the restatement. Because we find that half of the announcement return is due to a firm's "suability" as opposed to the seriousness of its accounting errors, less stringent regulatory remedies could be appropriate. Similarly, the debate on tort reform could benefit from our evidence that litigation risk accounts for half of shareholder losses at restatement announcement.

[2] Report Pursuant to Section 704 of the Sarbanes-Oxley Act of 2002 specifically says: "The past year has been marked by a series of restatements of financial statements by prominent corporations resulting in billions of dollars lost by investors. To address concerns raised by these restatements, and to restore public trust in the U.S. financial markets, Congress passed the Sarbanes-Oxley Act of 2002 ("the Sarbanes-Oxley Act"), which the President signed into law on July 30, 2002."

Second, the stock loss at restatement announcement is often used to estimate damages in class action lawsuits and in academic literature that tries to establish whether class action lawsuits have merit (Karpoff, Lee, and Martin (2007), Iqbal, Shetty, and Wang (2007)). Our analysis shows that using the full loss overstates shareholder damages due to restatement because it implicitly includes greater litigation costs for firms that are more sueable. Third, financial analysts should be interested in disentangling the effects since litigation costs are one-time costs while the rest of the announcement effects may be related to ongoing operations. Lastly, short-sellers who trade in anticipation of restatements can use our results to gauge when stocks have fallen far enough to warrant covering their short sale.

Several studies find that restating firms suffer an average of up to a ten percent abnormal stock price decline over a two day window surrounding restatement announcements.[3] While these studies seem to imply that large negative restatement announcement returns are mostly due to new negative financial information, they do not account for the substantial litigation costs that often follow.

Other studies contain hints that litigation risk could partly explain restatement announcement returns. Jones and Weingram (1997) search for stocks that fall more than 10 percent in a single day and find that those involved in restatements, insider trading, seasoned equity offerings, SEC enforcement actions, or fall-triggering announcements are more likely to be sued in class actions (Rule 10b-5)[4]. Jones and Weingram (1997) and Bradley, Cline, and Lian (2010) find that restating firms are substantially more likely to

[3] See Palmrose, Richardson and Scholz (2004), Durnev and Mangen (2009), and others.

[4] Securities class action lawsuits filed under Rule 10b-5 allege material flaws pertaining to firms' disclosure. Allegedly, firms' misstatements cause inflation in the stock price during the class action period. Most of these lawsuits are filed on behalf of shareholders who bought the stock during the period of alleged inflated stock prices and believe they are entitled to compensation.

be sued than other firms. Palmrose and Scholz (2004) find that 37.6 percent of restating companies are sued. Lowry and Shu (2002) show that initial public offerings are underpriced, at least partly to reduce litigation risk. But only six percent of the firms in their sample are sued. A much larger proportion of our restating firms are sued, enabling us to produce more precise estimates of the magnitude of expected litigation costs.

Several studies examine the characteristics of firms with high litigation risk, and how investors account for such characteristics at the time of a corrective disclosure that leads to litigation (Jones and Weingram (2005), Francis, Philbrick, and Schipper (1994)). In general, they find that high litigation risk firms are identifiable. Hence, investors should be able to anticipate the cost and the probability of a class action lawsuit at the time of the restatement announcement. In fact, Gande and Lewis (2009) find that the more likely a firm is to be sued, the larger is the anticipation effect by the market and the smaller is the filing date effect. We find a similar effect for restatements. We show that the stock prices of more "sueable" firms start falling a month before their restatement announcements.

Using model specifications that control for the endogeneity of restatement announcement return and litigation risk, we find that litigation risk is an important determinant of market reactions to restatement announcements. This result is robust to various specifications. A ten percent increase in the likelihood of litigation decreases announcement period two-day cumulative abnormal return by approximately 1.42 percent.[5] We estimate that roughly half (-4.8 percent) of the average -9.2 percent announcement abnormal return is due to expected litigation costs. This corresponds to an

[5] This estimate is made by averaging all coefficients on the proxy for litigation risk in all models in Tables 5, 6 and 7.

average loss of $115 million in shareholder wealth at the announcement of a restatement, $60 million of which is lost due to expected litigation costs.

Some firms' stocks suffer particularly large declines because of more serious restatements, such as those due to irregularity or those that affect core accounts. Our method allows us to show that those issues increase the firms' probability of being sued, but provide little new information used by investors to reassess firms' operating cash flows. Apparently, by the time a restatement is announced, investors have already inferred a good deal of the restatement information using other sources, which is consistent with the findings of Bardos, Golec and Harding (2011). We show that a substantial portion of the loss at the restatement announcement is due to details that allow investors to better estimate the probability that a restating firm will be sued.[6]

Intentional mistakes could increase litigation risk more than unintentional mistakes. Indeed, we control for this possibility by distinguishing between restatements with and without irregularities. Prior studies suggest that plaintiff attorneys will pursue the cases with the highest expected payoffs. Therefore, "deep pocket" firms that restate due to a simple computation error can get sued, while empty pocket firms with accounting irregularities might not. Even after controlling for the effect of irregularities, our finding of a negative relation between restatement announcement period return and the likelihood of litigation remains significant.

The rest of the paper proceeds as follows. Section 2 develops hypotheses and empirical methods. Section 3 describes explanatory variables that are included in our

[6] While investors assess the probability of a firm being sued before a restatement is announced, that probability is likely to be small if many firms manipulate earnings but never restate. When the firm admits to the error and restates, the probability of a lawsuit jumps and stock price takes a large hit.

model. The data are described in Section 4. Section 5 presents the results, and Section 6 concludes the paper.

2. The Issue, Hypothesis Development, and Empirical Methods

2.1. The issue illustrated

Figure 1 starkly illustrates the issue of this paper. Using our sample of restating firms, Figure 1.A reproduces the typical pattern of abnormal returns observed in earlier studies around restatement announcements. The average abnormal return on the day of and the day following the restatement announcement is about -9 percent. But this masks significant differences between sued and non-sued firms. Figure 1.B shows that average two-day abnormal return of firms that were sued is much lower (about -20 percent) than that of non-sued firms (about -4 percent). A -4 percent average market reaction to an announcement is substantial, but an average -20 percent reaction for the sued firms suggests that expected litigation costs could be relatively more important than the seriousness of the accounting errors.

<<< Insert Figure 1 here >>>

Figure 1.B shows that the return pattern in Figure 1.A. is largely driven by the restating firms that are sued. Compared to non-sued firms, sued firms' shareholders start to anticipate a costly problem well before the restatement announcement, and after a sharp two day drop at the announcement, the total price decline is maintained or increases somewhat. Non-sued firms' show little pre-announcement effects and they recoup their two day loses shortly after the announcement. The fleeting announcement effect for non-sued firms implies that any firm revaluation due to their restatements is minimal.

For sued firms, investors appear to sense financial weakness up to 30 days prior to their restatements. Sued firms suffer -20 percent abnormal returns on average during the period from day -30 through day -2, and suffer another -20 percent decline at restatement announcement (days zero and plus one). Such a large negative market reaction after an already substantial decline suggests either a surprisingly large accounting problem, or that shareholders anticipate that the restatement itself could bring on large additional costs, e.g., litigation costs. Although we find that sued firms commit somewhat more serious accounting errors than non-sued firms, the magnitude and endurance of restatement day abnormal returns for the sued firms is surprising.

To sort out the differential effect of litigation risk and the magnitude of the accounting error, one must recognize that firms' litigation risks and their restatement-related abnormal returns are interdependent. Lawsuits present a major expense to shareholders, therefore, more "sueable" restating firms should have more negative market reactions to their restatement announcements, all else equal. On the other hand, Jones and Weingram (1997) show that the likelihood of litigation is greater after large one day stock price declines. Therefore, we model the relation between restatement announcement returns and litigation risk as a simultaneous equations system.

2.2. Development of the hypothesis

A significant market reaction to a restatement occurs if it causes the marginal investor to change his estimate of the net present value of future cash flows by either decreasing the cash flows or increasing the cost of capital. This can happen because restatements can reveal that past earnings were overstated and that predicted future earnings need a downward revision, or because of the loss of credibility of financial statements. Indeed, previous studies

show that the majority of restatements correct net income downward (Palmrose, Richardson and Scholz (2004), Bardos, Golec and Harding (2011)). Wilson (2008) finds that information content of earnings declines temporarily after restatements. Hribar and Jenkins (2004) show that analysts revise their estimates of growth rate downward following restatements.[7] Furthermore, prior literature shows that restating firms experience high management turnover subsequent to restatement announcements and worsening of employment prospects of managers (Desai et al. (2006), Srinivasan (2004), Hennes, Miller, and Leone (2008)).[8]

Restatements also increase the likelihood of litigation. They increase the likelihood of litigation more than equity issuance, insider trading, SEC enforcement actions and other announcements that trigger ten percent or more drop in stock prices (Jones and Weingram (1997), Bradley, Cline, and Lian (2010)). Indeed, Palmrose and Scholz (2004) report that 37.6 percent of firms restating financial statements are sued subsequent to restatement announcements.

Litigation is costly to firms. Palmrose and Scholz (2004) document that the mean litigation resolution amount equals $50.3 million for a sample of firms that are sued as a result of restatements during 1995 through 1999.[9] We call these costs *litigation resolution costs*. However, litigation resolution costs are only one portion of the total costs associated with a lawsuit. There are other, potentially more important costs including legal defense costs, lost reputation and the opportunity cost of management time dedicated to lawsuits. Lost reputation is the loss of firm value due to changes of relations

[7] They also find that the cost of capital increases following restatements. However, the validity of this finding was questioned by Kasznik (2004) and others due to methodology concerns.
[8] Similar results are found for a sample of firms subject to SEC and Department of Justice enforcement actions for financial misrepresentation (Karpoff, Lee and Martin (2007), Karpoff, Lee and Martin (2008)).
[9] This number represents strictly settlement costs paid to the litigants either as part of a settlement or as the result of a court order.

with investors, customers and suppliers (see Karpoff and Lott (1993)). We call these costs *indirect costs of litigation*. Karpoff, Lee and Martin (2008) find that firms charged by the SEC with financial misrepresentation face substantial reputation and legal costs, with reputation loss costs exceeding legal costs by over 7.5 times.[10]

We hypothesize that investors at least partly assess expected litigation costs at the time of restatement announcements, and react more negatively to restatement announcements that are expected to result in higher total litigation costs.[11] Therefore we hypothesize that:

Litigation risk hypothesis: Firms with higher expected litigation costs suffer larger stock price declines when they announce restatements.

Prior literature suggests that plaintiff attorneys pursue cases that maximize their profit (Jones and Weingram (2005)). Moreover, Karpoff, Lee and Martin (2007) find that legal penalties imposed by private class actions are positively related to the size and severity of the damage to investors for the sample of firms that are subject to the SEC enforcement actions. A class action lawsuit will be initiated only when expected litigation resolution costs (profit to plaintiff and their attorneys) exceed some threshold. All else equal, that threshold is more likely to be breached when the firm is more "sueable", for example, if the firm has deep pockets. Hence, a significant negative relation between the likelihood of litigation and restatement announcement abnormal returns is consistent with the litigation risk hypothesis.

[10] The authors define reputation costs as "the decrease in present value of the firm's cash flows as investors, customers, and suppliers are expected to change the terms of trade with which they do business with the firm," page 2.

[11] Gande and Lewis (2009) show that partial anticipation of lawsuits does not preempt negative market reaction to the announcement of litigation.

2.3. Description of empirical methods

The test of the litigation risk hypothesis is not trivial because the expected likelihood of litigation is unobservable as are the expected costs associated with litigation. We do, nonetheless, observe whether or not the firm is sued. Let *Litigation*=1 when the firm is sued as a result of a restatement announcement, and *Litigation*=0 otherwise. To measure the expected effect of litigation on announcement period returns, we are interested in the expected difference in *CAR01* with and without litigation. Wooldridge (2002, page 604) calls this expectation the *average treatment effect*.[12] If *Litigation* were statistically independent of the difference between CARs with and without litigation, then the difference in mean estimator for sub-samples with and without litigation would be unbiased, consistent and asymptotically normal (Wooldridge (2002)).

But this condition is not realistic for restatements. The relation between the market reaction to restatement announcements and litigation risk is endogenous. First, investors should react to restatement announcements more negatively when they believe that litigation risk is relatively high. Second, litigation risk has been shown to be higher after large one day stock declines. The relation between *CAR01* and litigation risk can be expressed as the following system of equations.

$$CAR01 = \gamma_1 \text{ Litigation risk} + \beta_1 X_1 + \varepsilon_1 \qquad (1)$$

[12] Wooldridge (2002) defines the partial effect of x_j on the conditional expectation E(y|x) as the partial derivative of E(y|x) with respect to x_j. For example in a simple model where $E(y \mid x_1, x_2) = \beta_0 + \beta_1 x_1 + \beta_2 x_2$, the partial effect of x_1 is β_1. If *y* depends on both observable and unobservable variables and the partial effect of x_j is a function of unobservable variables, then the partial effect of x_j can be averaged across the population of unobservable variables to generate average partial effects. Average treatment effect is the average partial effect for a binary variable.

$$\text{Litigation risk} = \gamma_2 \, CAR01 + \beta_2 X_2 + \varepsilon_2 \qquad (2)$$

The focus of this paper is to estimate equation (1) accounting for the endogeneity of *CAR01* and litigation risk. Because *CAR01* and litigation risk are endogenous, it is not correct to use ordinary least squares (OLS) to regress announcement abnormal returns on explanatory variables and a dummy variable proxy for litigation risk. The ex post occurrence of litigation is not exogenous, hence, the OLS assumption of independence of the error term and explanatory variables is violated.

Because the only endogenous explanatory variable in equation (1) is binary, equation (1) is called a *dummy endogenous variable model* (Heckman (1978)). The estimate of the coefficient γ_1 in equation (1) is called the average treatment effect. It can be estimated using an instrumental variable approach (Wooldridge (2002), Angrist (2001)). This approach requires at least one instrumental variable that we denote by the vector Z. Z is a member of X_2 but not X_1.[13]

Wooldridge (2002) shows that parameters in equation (1) can be consistently estimated by the following procedure (Wooldridge (2002) page 623 procedure 18.1).[14] The first step estimates the probability of litigation using a probit model: Probability(*Litigation* = 1| X). Here, X is the union of X_1 and X_2.[15] The resulting model is used to generate the predicted probability of being sued for each restating firm, denoted $\hat{G}_i$. The next step estimates the system of equations (1) and (2) using two-stage

[13] We discuss our choice of instrumental variable in section 3.
[14] This procedure has been used to study other finance problems. Adams, Almeida and Ferreira (2009) study the effect of performance on founder-CEO status. Zhu (2009) examines the effect of litigation risk on SEO performance.
[15] Recall that Z is a member of X_2.

least squares (2SLS). The first stage is a regression of the litigation dummy variable on $\hat{G}_i$ and X. This generates a second version of the predicted probability of litigation, which we denote as $\hat{P}$*(Litigation)*. The second stage of the 2SLS procedure estimates equation (1) by OLS after substituting $\hat{P}$*(Litigation)* for *Litigation* and obtaining 2SLS standard errors (Wooldridge (2002) and Zhu (2009)).

There are several advantages to using this method (Adams, Almeida and Ferreira (2009)). First, unlike other instrumental variable models such as 2SLS, it takes into consideration the binary nature of the litigation variable. Moreover, the logit model does not have to be correctly specified. Furthermore, there are no special problems (e.g., need to adjust standard errors) in estimating equation (1) in this manner when the endogenous variable is binary (Wooldridge (2002)). The estimated coefficients in equation (1) are consistent and asymptotically normal. We call this approach Method 1.

When the purpose is to estimate only equation (1), Heckman (1978) recommends a simpler method for the estimation of dummy endogenous variable models. One can estimate a linear probability model with *Litigation* as a dependent variable. The independent variables should include all of the variables in X_1 and X_2. As long as X_2 contains at least one variable not included in X_1, the model is identified and the predicted values of *Litigation* can be used as regressors in the second stage estimation of equation (1) because the regression residuals from the prediction of *Litigation* are constructed to be orthogonal to X_1. Standard instrumental variables results apply because it is not necessary to obtain consistent estimators of the parameters of reduced form equations in

order to consistently estimate structural equations (Heckman (1978)). We call this approach Method 2.[16]

Although Wooldridge (2002) suggests that his method produces estimates that are consistent under less restrictive conditions than Heckman's (1978) method, we find similar results for both. Therefore, we present the full results for Method 1, and simply discuss the results for Method 2 in section 5. The next section describes the explanatory variables and their measurements.

3. Description of explanatory variables

To identify which variables affect the market reaction to restatement announcements, we consider the impact of restatements on changes in future company prospects, as well as the uncertainty of achieving them. This approach relies on discounted cash flow valuation in which stock price is determined as the present value of expected future cash flows. To identify which variables affect the likelihood of class action lawsuits, we assume that plaintiffs consider both the size of the damage and the likelihood of collection, as has been argued by Jones and Weingram (2005).

To identify the system of equations, we need one or more variables that influence the probability of litigation but does not directly affect the announcement abnormal return. We use share turnover prior to the restatement announcements to play this role. Share turnover prior to restatement is a good candidate for litigation instrument because it

[16] The system of equations (1) and (2) also can be estimated using the method discussed in Maddala (1983, page 244).[16] We employ Wooldridge's approach because it has two advantages over Maddala's. First, it allows recovering of coefficients in equations (1) and (2), while Maddala's approach does not (Maddala (1983), Lowry and Shu (2002), Zhu (2009)). Since the main focus of our paper is to estimate the marginal effect of expected litigation costs on restatement announcement returns, it is important for us to be able to recover the coefficients. Second, it offers estimators that are more efficient (Zhu (2009), Wooldridge (2002)).

serves as a direct input in trading models that estimate damages in class action lawsuits (Gande and Lewis (2009)). Since the specific harmed trades made during class action periods are not observed, plaintiffs estimate the number of shares harmed by alleged misinformation as a function of total share turnover using various methods known as trading models (Barclay and Torchio (2001)).[17]

To establish damages, a shareholder must have bought shares at a price that reflects misstated earnings and sold after price adjusts following the restatement. Higher share turnover could, therefore, increase the probability that some shareholders bought shares based on misleading information and sold later after the restatement. At the same time, higher share turnover can indicate lower probability that shares bought after misleading information was releases were held until the announcement of a restatement. This would suggest a negative association of share turnover and shareholder damages. In theory, therefore, turnover and the probability of a lawsuit could be negatively or positively related. However, earlier studies by Francis, Philbrick, and Schipper (1994), Gande and Lewis (2009), Field, Lowry, and Shu (2005), Files, Swanson and Tse (2009) and Dyl (1999) have found that the net effect of turnover on litigation probability is positive and significant. For our goal of identifying a valid instrument, we only require that turnover and the probability of litigation are significantly related.

Ignoring the lawsuit effect, the announcement of a restatement should change price only if the marginal investor changes her expectation of the present value of the firm's future cash flows. Assuming no lawsuit, share turnover prior to restatement

[17] In results not reported we also use stock price volatility as an instrument since it is also used as an input in some models. However, this variable is not significant in explaining the likelihood of litigation and therefore is not a good instrument. Including stock price volatility in the first stage model in either method does not affect the rest of the results.

announcement should not influence announcement period returns. While it is always difficult to find an instrumental variable that is orthogonal to the dependent variable in the second equation, we feel that share turnover is a particularly strong candidate because it is used by law firms as a direct input in damage calculations. Share turnover has been used in Lowry and Shu (2002) as an instrument for litigation risk in a system of equations where the second endogenous variable is the initial return following an IPO.

Share turnover can be viewed as a proxy for the probability that a share was traded within a given time period. Following prior literature, share turnover is calculated as: $[1- \Pi_t (1- \textit{volume traded}_t / \textit{total shares}_t)]$ accumulated over the one-year period ending on the second day prior to the restatement announcement date (Π_t denotes product over period t).[18]

There are several variables that are common to both equations (1) and (2) (i.e., that belong to both X_1 and X_2). The seriousness of the restatement should affect both the likelihood of litigation and the announcement period returns. Holding other factors constant, restatements of core accounts, such as revenue and cost, are considered more serious than non-core account restatements. We use an indicator variable, *Core,* which equals one if the restatement involves revenue, cost of sales or operating expense accounts for on-going operations to control for the seriousness of the restatement. Restating firms in our sample also restate non-core accounts such as securities-related items (e.g., accounting for derivatives, warrants, stock options and convertible securities),

[18] We reestimate our model using alternative estimation windows for share turnover. The results of the first stage models appear to be sensitive to those changes but not the second stage model, which is our focus. We chose to use (-252; -2) estimation window relative to restatement because it is consistent with both practice in estimating losses and previous literature. Please refer to Table 1 for precise definition of all variables.

in-process research and development (IPR&D), reclassifications, and related party transactions. For restatements of non-core accounts, we set *Core* equal to zero.

We expect restatements of core accounts to be positively associated with the likelihood of litigation and negatively associated with *CAR01*. This is consistent with previous research which finds that more persistent operating income is associated with stronger market reactions (Kormendi and Lipe (1987)). Several studies have also shown that the market reacts more strongly to surprises in on-going operating income than to one-time special items (Elliott and Hanna (1996), Strong and Meyer (1987)). Palmrose and Scholz (2004) find that firms that restate core or revenue accounts have a higher likelihood of litigation.

Some events leading to restatements could make it easier for the plaintiffs to win the lawsuit, increasing their propensity to bring a lawsuit. It is easier for lawyers to argue the intent to mislead if a third party initiates a restatement. To capture this effect, we include indicator variables for the party attributed with identifying the misstatement (*Auditor, SEC, or Company*). Managements' integrity and competence are called into question if a restatement is initiated by a third party. As a result, the *Auditor* and *SEC* dummies should be negatively related to *CAR01*, while the *Company* dummy should be positively related to *CAR01*. Palmrose, Richardson and Scholz's (2004) results support our expectations for the effects of *Auditor*.

Restatements that have more substantial impacts on previously reported financial statements should result in a higher likelihood of litigation and more negative *CAR01*. We measure the magnitude of the impact of restatements using variables suggested by prior studies (Palmrose, Richardson and Scholz (2004), Palmrose and Scholz (2004) and

Files, Swanson and Tse (2009)). *Change in NI/Total_assets* is the difference between average annual restated Net Income and average annual originally reported Net Income divided by total assets reported for the fiscal year preceding the restatement announcement.[19] We also include an indicator variable *NI crosses loss threshold*, which takes a value of one if the restatement changes reported income into a loss and zero otherwise. Another variable that measures the significance of a restatement is the *Number of periods restated*, which equals the sum of periods restated, where a fiscal year=1 and each additional quarter=0.25. *Change in NI/Total_assets* should be positively related to *CAR01* and negatively related to the likelihood of litigation. *Number of periods restated* and *NI crosses loss threshold* should be negatively related to *CAR01* and positively related to the likelihood of litigation.

We include the indicator variable *No_details* in both X_1 and X_2. *No_details* is an indicator variable that equals one if full details about a restatement were not released in the initial announcement. If the firm does not disclose all of the details of its restatement, uncertainty regarding firm prospects increases more at the restatement announcement. Moreover, it is likely that full details about more serious restatements will not be released at the initial announcement of a restatement (Palmrose, Richardson and Scholz (2004)). Therefore, this variable can proxy for seriousness of the restatement and should be positively related to the likelihood of litigation and negatively related to restatement announcement period returns.

Other variables unrelated to the seriousness of the accounting mistake could be important. Palmrose, Richardson and Scholz (2004) suggest that markets should react

[19] Our results remain robust to using the difference between total restated net income and total originally reported net income scaled by absolute value of total originally reported net income.

less negatively to negative announcements made by poor performing firms. Therefore, we include the firm's pre-restatement stock performance, measured over 250 trading days preceding the announcement (*Return (-252, -2))*. We expect a negative coefficient on *Return (-252, -2)* in equation (1). We also include *Return (-252, -2)* in equation (2) because it has been shown that similar measures of prior performance are negatively associated with the likelihood of litigation (Jones and Weighram (2005), Gande and Lewis (2009), Files, Swanson and Tse (2009)).[20]

The positive relation between a firm's size and its legal exposure has been well documented in the legal literature, and is referred to as the "deep pocket" theory (Francis, Philbrick, and Schipper (1994), Jones and Weingram (1996), and Skinner (1997)). Because of the fixed costs associated with filing a lawsuit, plaintiffs initiate lawsuits only if they perceive the recoverable damages to be sufficiently large. Large firms may be better able to pay damages than a small firm. As a result, firm size measures the capacity to pay damages. Therefore, we include the variable *Size*, measured as the logarithm of market capitalization of the restating firm one year prior to restatement, as a determinant of the likelihood of litigation. Firm size is also likely to influence market reaction to restatements because prior studies find that for a given percent change in income, small companies' stocks change more than large companies' stocks (O'Brien and Bhushan (1990), El-Gazzar (1998)). This is because large firms are followed by more analysts and investors and consequently earnings surprises are typically small. Therefore, we include the variable *Size* in both X_1 and X_2.

<<<Insert Table 1 here>>>

[20] Return (-252, -2) can also capture the size of the potential damages.

4. Data

Restatement dates and characteristics were hand collected from the Lexis-Nexis and Factiva databases. The Lexis-Nexis and Factiva databases were researched using key words "restatement," "restat," "revis," "adjust," "error" and "responding to guidance from the SEC" in the period January 1, 1997 through June 30, 2002. We selected this period for two reasons. First, the Government Accountability Office (GAO) made a sample of restatements announced in this period publicly available. Second, by using June 30, 2002 as a cut off date, all restatements precede the Sarbanes-Oxley Act and were therefore made in the same regulatory environment. After identifying the sample of companies announcing restatements, we collect data describing the restatements from amended SEC reports (Form 10-K/A and Form 10-Q/A). We collected the following data from these sources: date of the restatement announcement, years and quarters restated, and original and restated net income in each period. We obtain accounting and market variables from COMPUSTAT and return data from CRSP.

We cross-checked our sample with the sample released by the GAO and included restatements from the GAO sample that were not picked up by the Lexis-Nexis and Factiva searches.[21] In total, we identified 923 restatements or restatement announcements between 1997 and 2002. Because we are interested in restatements that are attributable to mistakes or improper interpretation of Generally Accepted Accounting Principles (GAAP), we excluded 130 restatements that were caused by the adoption of new accounting rules or changes in accounting method. We also excluded restatements if the required information needed to define the variables in Table 1 was not available. Within this category, 187 observations were deleted because data was not available on either

[21] The Lexis-Nexis and Factiva searches identified five restatements that were not in the GAO sample.

CRSP or COMPUSTAT. Other observations were excluded because of missing information about the restatement itself. The final sample includes 536 restatements and 496 firms. Table 2, Panels A and B present the reasons for excluding restatements from our sample. Panel C of Table 2 provides information about the number of firms restating and the distribution of restatement announcements by year. Most of the firms (93%) restate their financial statements only once in our sample period.

<<<Insert Table 2 here>>>

5. Results

5.1. Sample description and univariate analysis

Table 3, Panel A shows that 180 restating firms (33.58%) were sued as a result of a restatement. To identify which firms have been sued due to restatements, we searched for announcements of lawsuits by restating firms in Stanford Securities Class Action Clearinghouse, Lexis-Nexis and Factiva databases, and checked whether a class period corresponds to a restatement announcement window. Most lawsuits mention restatement or accounting problems as a reason for the lawsuit. Class action lawsuits are filed by plaintiff attorneys on behalf of shareholders. Our rate of litigation is similar to the 37.6% rate reported by Palmrose and Scholz (2004).[22]

Palmrose, Richardson and Scholz (2004) and Hennes, Miller, and Leone (2008) point out that the market reaction to restatements might differ depending on whether a restatement is due to a simple error or an irregularity.[23] We define restatements due to irregularity using an approach common to these two papers: as restatements subject to

[22] Only 19% of restating firms analyzed by Files, Swanson and Tse (2009) were sued.
[23] Note that we exclude restatements due to changes in accounting rules from our sample and therefore our study is not subject to the criticism by Hennes, Miller, and Leone (2008) of studies that wholly adopt the GAO sample for restatement studies.

SEC enforcement actions (AAER) or those that disclose an accounting irregularity or fraud as the reason for restatement. In our sample, 25.75% of restating firms have been subject to AAER and 11% report irregularity or fraud as the reason for restatement. In total, 30% of restating firms in our sample involve irregularity.

Table 3, Panel B, illustrates how litigation and irregularities samples only partially overlap. Of firms subject to class action lawsuits, 42.22% do not involve irregularity. Moreover, 36.20% of restatements due to irregularity are not subject to class action lawsuits. As pointed out by Hennes, Miller, and Leone (2008), lawyers might not find it beneficial to sue all firms committing an irregularity that results in a restatement (e.g. smaller firms and limited damages). A chi-square test of the association suggests that restatements involving an irregularity are more likely to get sued. Therefore, we control for the effects of irregularities in our analysis.

The majority of restatements are initiated by management (59.33%), with 19.03% initiated by the SEC and 8.96% by an auditor (Table 3, Panel C). However, these proportions vary by the sub-sample. The proportion of restatements that are initiated by an auditor is larger in the sub-sample of firms that are sued. The majority of restatements involve restatement of at least one annual report (61.57%) as opposed to just quarterly financial statements. This proportion is higher for the sample of sued firms (66.67%) compared with the sample of non-sued firms (58.99%) (Table 3, Panel C).

The content of a restatement announcement is very heterogeneous. Some firms file revised financial statements at the announcement of a restatement. Others mention only the possibility of a restatement in their initial announcement. In our sample, 40.30% of the firms did not disclose the full impact of the restatement on financial statements in

the initial announcement (Table 3, Panel C) and such firms are more likely to be sued. Eleven percent of the restatements change positive net income to a loss. Approximately half of all restatements involve core accounts. The percentage of core restatements is higher in the sued sample than in the non-sued sample (68.89% compared with 41.57%) (Table 3, Panel C). Table 3, Panel D shows that 77% of lawsuits are filed within one month of the restatement announcement.

<<<Insert Table 3 here>>>

Table 4, Panel A shows statistics for continuous variables used in the analysis for the entire sample and Panel B compares sued and non-sued sub-samples. Results in Table 4 are presented for descriptive purposes only. Our main inference is drawn from simultaneous equation estimation, the results of which are presented in Tables 6-9.

<<<Insert Table 4 here>>>

Table 4, Panel A and B, and Figure 1 show that on average, restating firms have a negative market reaction of -9.22 percent during a two day window around a restatement announcement (days zero and plus one), which corresponds to an average loss of $115 million in shareholder wealth.[24] This result is consistent with the findings of other researchers (Palmrose, Richardson and Scholz (2004), GAO (2002)).[25] Firms that are sued have an average *CAR01* of -20.58 percent, which represents a loss of $308 million, compared with an average *CAR01* of only -3.67 percent for the non-sued sub-sample,

[24] Following Gande and Lewis (2009) we calculate the daily economic dollar effect for firm j on date *t* as market capitalization of firm j's equity on date *t-1* times day *t* abnormal return.

[25] Palmrose, Richardson and Scholz (2004) find a 9 percent negative cumulative average abnormal return around a two-day restatement announcement period in a sample of 403 restatements between 1995 and 1999. GAO, 2002 find a 10 percent negative reaction for a sample of 689 public companies announcing restatements from 1997 to March 2002.

which represents a loss of only $21 million.[26] The difference in *CAR01*s for the two sub-samples is statistically significant at the 1% level using a Wilcoxon test. The mean *CAR01s* for the full sample and both sub-samples are statistically different from zero at the 1% level.[27]

Sued firms made more material mistakes and restated more periods than non-sued firms. Sued firms performed worse than non-sued firms in the year preceding their restatement announcements. Buy and hold returns calculated over one year prior to the restatement announcement equals -12.81% for sued firms compared to 1.89% for non-sued firms. The difference is statistically significant. Consistent with the "deep pocket theory", we find that sued firms are larger than non-sued firms. The mean market capitalization is $3,652.44 million for sued firms and $1,451.86 million for non-sued firms. As expected, sued firms have much higher share turnover one year prior to restatement. This result is consistent with the findings of Lowry and Shu (2002) and others. We also find that sued firms have higher cash flow using a one-sided test.[28]

5.2. Testing the relation between restatement abnormal returns and litigation risk using Method 1

In this section we describe our main results obtained from estimating equation (1) using Method 1. Equation (1) is a dummy endogenous variable model and can be

[26] These numbers are reported for descriptive purposes only. Because of endogeneity of litigation risk and restatement announcement returns one cannot use the difference in returns or dollar effects of the sued and non-sued subsamples to make inference regarding the effect of the expected litigation costs. After controlling for endogeneity, we estimate that $56 million of shareholder losses can be attributed to expected litigation costs (See section 5.2 and 5.3).
[27] Patell Z test was used to make statistical inference.
[28] Results using cash flow variable are discussed in section 5.4.

estimated using the generated instrumental variable approach described in Wooldridge (2002, p. 621).

Table 5 shows the results of all steps of the estimation. The first two columns of Table 5, Model 1, show parameter estimates and Chi Square statistics for the single-equation probit model with the dependent variable *Litigation.* The model includes all exogenous variables in the system of equations (1) and (2). The third column shows the first stage of the 2SLS with *Litigation* as a dependent variable. The estimated probability of litigation is included as a regressor, along with all variables in X_1 and X_2. The last step estimates a model explaining the *CAR01* using the first stage prediction for the litigation probability and the exogenous variables from X_1 (shown in the last column).

We first consider the second stage model of *CAR01*. As predicted, we find a negative and significant coefficient estimate on *predicted probability of litigation.* This supports the litigation risk hypothesis and suggests that investors expect high litigation risk firms to bear larger costs due to restatements. A ten percent increase in the likelihood of litigation decreases announcement period cumulative abnormal return by approximately 1.47 percent.

Firms that restate net income to a loss have more negative market reactions. The coefficient estimate on *NI crosses loss threshold* is -0.049 and is significant at the 10% level, consistent with Palmrose, Richardson and Sholz (2004). We also find that firms that do not disclose the full impact of a restatement at the time of the initial announcement have more negative market reactions to restatements. Firms that restate more periods have higher *CAR01* as suggested by positive coefficient on *Number of periods restated*. A potential reason for this result is that more serious errors get caught

sooner. The estimated coefficient on *No_Details* is -0.043 and is significant at the 5% level, consistent with our prediction that more uncertainty about a firm's prospects reduces abnormal returns around restatements.

We also find that the market reaction differs between strong and weak performers: *Return (-252, -2)* and abnormal returns are negatively related. As predicted, weak performers experience less negative returns after accounting for litigation risk. This result is robust to estimating return over the (-252, -45) window, which excludes the period during which investors apparently start to anticipate a restatement and a lawsuit (Gande and Lewis (2009), Bardos, Golec and Harding (2011)).

<<<Insert Table 5 here>>>

Now we turn our attention to the probit estimation of Litigation probability (first two columns of the table). The most important result is that the majority of the measures of the seriousness of the accounting error affect the litigation probability but not the abnormal return directly. The coefficient estimates on *Core*, *Irregularity*, and *Number of periods restated* are all positive and statistically significant in the probit model, meaning that they increase the probability that a firm will be sued. From that group, only *Number of periods restated* is significant in the 2nd stage model of *CAR01*. Therefore, *Core* and *Irregularity* only affect restatement announcement returns indirectly by increasing the likelihood of litigation. Although we saw earlier that firms that cross the net loss threshold experience more negative returns at a restatement announcement, this variable is not significant in the model for the likelihood of litigation.

No_Details enters the probit model with a significant positive coefficient estimate. Firms that do not provide full information about the restatement (*No_Details* =

1) are significantly more likely to be sued. Because the variable *No_Details* is significant in both equations (1) and (2), it affects the abnormal return through two channels. Investors apparently use *No_Details* to estimate the probability that a firm will be sued and to revise their estimates of future earnings and operating performance.

Stock return performance prior to restatement has different, and partially offsetting impacts on the likelihood of litigation and *CAR01*. The results show that weak performance increases the likelihood of litigation (thereby indirectly lowering the abnormal return), but also directly increases abnormal returns. The increase in litigation probability is consistent with Gande and Lewis (2009) and Jones and Weingram (1996), who show that lawyers target poor performers.

Finally, the probit shows that larger firms are more likely to be sued, consistent with the notion that deep pockets attract more lawsuits. Greater share turnover significantly increases the likelihood of litigation. Note that the coefficient on share turnover is highly significant in the probit model, suggesting that it is a strong instrument.

5.3. Re-estimating the relations using Method 2

To check the robustness of our results, we estimate the system of equations (1) and (2) using the method described in Heckman (1978). The results are very similar to those obtained using Method 1 and are not shown for brevity. The only difference is that the estimates using Method 2 provide weak evidence that firms whose restatements are initiated by the SEC are less likely to be sued. One possible explanation for this result is that restatements initiated by the SEC are more technical in nature and are more likely to

result from misinterpretation of GAAP rather than serious mistakes (Palmrose, Richardson and Scholz (2004)).

5.4. Sensitivity analysis

To further test the robustness of our results, we perform a number of sensitivity tests. First, we use cash flow instead of firm size to proxy for the capacity to pay damages. Following Almeida, Campello and Weisbach (2004), we define cash flow as operating income before extraordinary items and deprecation, less dividends.[29] An advantage to using the cash flow measure is that it has statistically insignificant correlation of less than 1% with share turnover, while firm size has a small positive correlation of 0.28.[30]

Table 6 shows our main model, replacing firm size with cash flow. The results are largely unchanged. We continue to find a positive and highly significant association between share turnover and the likelihood of litigation. The insignificant estimate on cash flow is not surprising because cash flow is much noisier over time than size. The coefficient estimate on our main variable of interest, predicted probability of litigation, remains negative and significant and is similar in magnitude to that found in Table 5.

<<<Insert Table 6 here>>>

[29] Our results are robust to using two other definitions of cash flows. Our second definition follows Dechow (1994), Gatchev, Pulvino and Tarhan (2010) among others, and calculates cash flow as operating income before depreciation less net interest expense less cash taxes less the change in net working capital. Net working capital is defined as ((total current assets – cash and equivalents) – (total current liabilities – debt in current liabilities)). Lastly, we define cash flow as income before extraordinary items plus depreciation and amortization and plus deferred taxes, as in Moyen (2004). In the paper, we report the results using cash flow measure that has the least number of missing observations.

[30] The coefficient on share turnover and the rest of the results are not affected by elimination of firm size suggesting little effect from multicollinierity.

Second, because *Change in NI/Total_assets* is not available for firms that did not disclose full details about their restatements, we repeat the analysis including the interaction of *No_Details* with *Change in NI/Total_assets.* We report the results in Table 7. Our results are basically unchanged.

<<<Insert Table 7 here>>>

We also explored other model specifications which we discuss here but for space reasons do not provide full model details. We distinguish between restatements of annual reports and restatements of only quarterly reports by including a dummy variable *Annual*. *Annual* equals one if a restatement includes a revision of at least one annual report; and zero otherwise. Since annual financial statements are audited by a third party, their restatements are inherently different. We exclude *Number of periods restated* from this specification because it is highly correlated with *Annual.* We find that abnormal returns do not differ between restatements of annual and quarterly reports, and the predictive power of other variables is unchanged.

We also replicate our results using a more robust measure of firm performance prior to restatement announcement. We replace *Return (-252, -2)* with buy-and-hold abnormal returns of restating firms relative to a sample of control firms for the fourth quarter of the error period.[31] The control firms were selected to match the restating firms in terms of size and book-to-market ratio one year before the first mistake is made. The sample size drops to 380 restatements because of the missing data necessary for matching, but the results remain robust to using this measure of prior firm performance.

[31] The error period is defined as the period between the start of the first year or quarter restated and the restatement announcement date. The total error period is then divided into fourths. Thus the term quarter as used here does not refer to a calendar quarter, but a time period equal to 1/4th of the error period. For example, if the company made a mistake in 1997 and announced a restatement of its 1997 annual report on March 15, 1998, the error period would span January 1, 1997 – March 15, 1998 and equal 1.20 years.

Prior literature suggested that volatility of returns prior to disclosure of irregularity can also determine litigation. We find that sued and non-sued firms do not differ with respect to volatility of stock return calculated over the year prior to restatement announcement.[32] Gande and Lewis (2009) and Bradley, Cline and Lian (2010) also find that volatility is not a significant predictor of litigation. We rerun our models including volatility and find that consistent with univariate analysis the coefficient estimate on volatility is not significant in determining the likelihood of litigation and the on other estimates are not affected.

Next, we re-estimate the models excluding second and third restatements by the same firm. Announcement of the first restatement by the firm is likely to have a much larger impact on its stock price. In fact, several firms, such as Rite Aid, that announced several restatements in our sample period restate the same 10-Ks and 10-Qs several times. The first restatement announcement is likely to undermine the confidence of investors in the quality of firm's financial statements and management's competence more than the second and third restatements. Again, results for this slightly smaller sample are little changed.

We also control for restatements that affect only the timing of income recognition by including a dummy variable to identify *Timing* restatements. Such restatements do not impact the value of past cash flows or earnings and therefore should have less negative announcement period abnormal returns. We find that the coefficient estimates on *Timing* are statistically insignificant.

[32] Volatility is calculated as the daily standard deviation of the rate of return over the one year prior to the restatement announcement.

Most litigation studies find that firms in financial, technology, retail and highly regulated industries are more likely to be sued. When we include dummy variables for these industries in the models for litigation risk none are significant predictors of litigation and the rest of the results are unaffected.

6. Conclusion

Litigation imposes substantial costs on firms. Attorney fees, the costs of management time allocated to the lawsuit, reputation costs, and settlement costs represent a large potential liability for restating firms. When firms announce restatements, it is likely that investors simultaneously assess the implication of restatements for firm operations as well as potential litigation costs. This paper focuses on the litigation risk effect using a simultaneous equations model to account for endogeneity.

Results show that firms with higher litigation risk have much larger negative market reactions to restatement announcements, controlling for other determinants of market reaction. A ten percent increase in the likelihood of litigation decreases announcement period cumulative abnormal return by approximately 1.43 percent. We also find that most measures of the seriousness of the accounting errors directly affect only the probability of being sued, not the magnitude of the restatement announcement abnormal return. The seriousness of the restatement only affects the restatement announcement abnormal return indirectly by increasing the probability of litigation.

We show in Figure 1.B that sued restating firms experience negative abnormal returns over the 30 trading days prior to the announcement. Investors apparently start learning that the firm has serious undisclosed problems well before the restatement. A

restatement announcement can produce additional large negative abnormal returns if it provides information that investors interpret as raising the likelihood of costly litigation. The restatement announcement is a large negative surprise, not because it informs investors much about the true (weaker) financial state of the firm, but because it sheds new light on the likelihood that the firm will be sued and will have to bear significant litigation costs.

Our results have implications for prior studies of restatement announcements that do not account for litigation risk. For example, the large negative abnormal returns reported in earlier studies do not necessarily imply that most restating firms committed egregious accounting errors, and that disclosure regulations should therefore be tightened.

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Figure 1: Cumulative abnormal returns around restatement announcement
Figures show market model cumulative average abnormal return for 60 days surrounding restatement announcements. Market model parameters are estimated over a 250 day period starting on day -46 relative to restatement.

Figure 1.A. Full sample

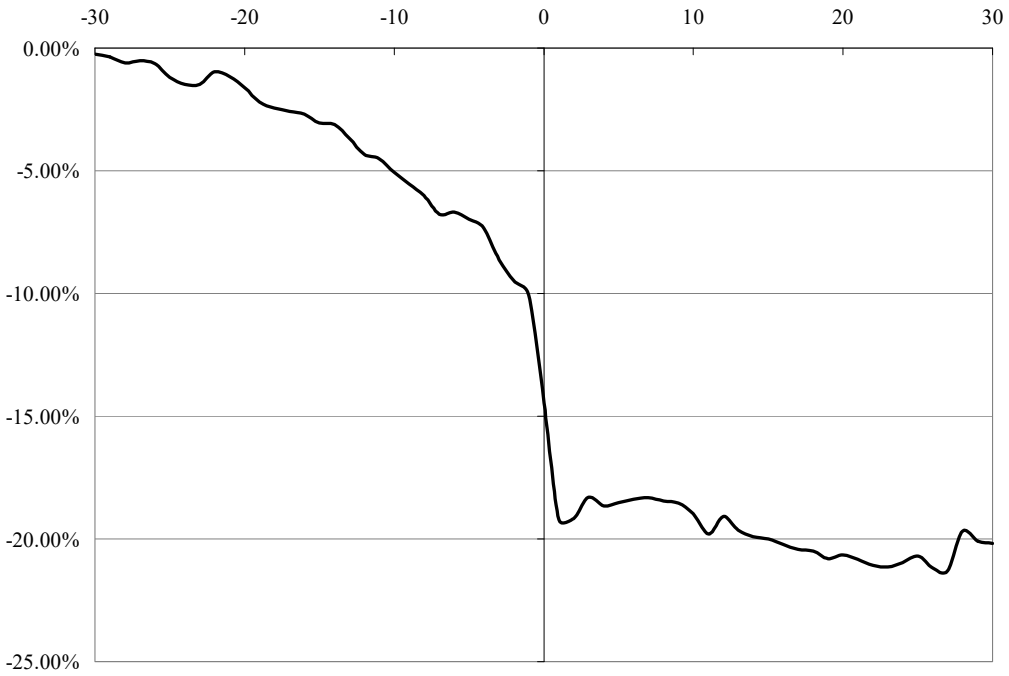

Figure 1.B. Sub-samples of sued and non-sued restating firms

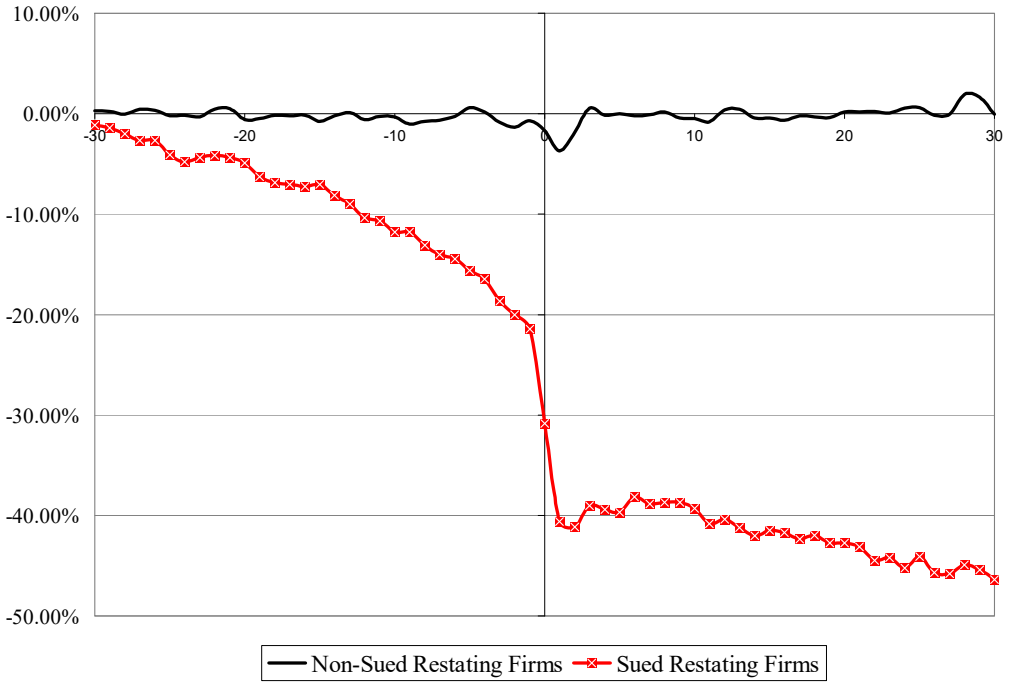

Table 1: Definition of variables

This table defines variables that are used to identify equations (1) and (2). Z is a vector of instrumental variables for predicting the likelihood of litigation and is part of X_2 but not X_1. Variables are listed in alphabetical order.

$$CAR01 = \gamma_1 \text{ Litigation risk} + \beta_1 X_1 + \varepsilon_1 \qquad (1)$$

$$\text{Litigation risk} = \gamma_2 CAR01 + \beta_2 X_2 + \varepsilon_2 \qquad (2)$$

Variable name	Variable definition	Matrix
Annual	A dummy variable that equals one if restatement includes a revision of at least one annual report; and equals zero if only quarterly financial statements were restated.	X_1 and X_2
Auditor	A dummy that equals one if auditor initiated restatement.	X_1 and X_2
CAR01	Market model cumulative abnormal return for days zero and plus one relative to restatement. Market model is estimated over a 250 day period starting on day -46 relative to restatement using value-weighted CRSP index of NYSE, AMEX, and NASDAQ companies.	X_1 and X_2
Cash Flow	Operating income before extraordinary items and deprecation less dividends. This variable is winzorized at 5% due to high skewness.	X_1 and X_2
Change in NI/Total_assets	The difference between average annual restated Net Income and average annual originally reported Net Income divided by total assets reported for the fiscal year preceding the restatement announcement. Average annual restated (originally reported) Net Income is calculated as total restated (originally reported) Net Income divided by Number of Periods Restated and multiplied by 4.	X_1 and X_2
Company	A dummy that equals one if company's management initiated restatement.	X_1 and X_2
Core	A dummy that equals one if a restatement involved revenue, cost of sales or operating expense accounts for on-going operations, and zero otherwise.	X_1 and X_2
Irregularity	A dummy that equals one if the company announced fraud or an irregularity as a reason for restatement or if restating firm was subject to AAER as a result of a restatement.	X_1 and X_2
Litigation	Dummy that equals one if the firm was sued because of restatement in class action lawsuit.	
No_Details	A dummy that equals one if full details about a restatement were not released in the initial announcement.	X_1 and X_2
NI crosses loss threshold	Takes a value of one if restatement changes reported income into loss and zero otherwise.	X_1 and X_2
Number of periods restated	The number of periods restated in years. If the firm restated one annual report, this variable will equal 1. If the firm restated one annual report and one quarterly report, this variable will equal 1.25.	X_1 and X_2
SEC	A dummy that equals one if SEC initiated restatement.	X_1 and X_2
Return (-252, -2)	Buy and hold stock return, measured over one year estimation period preceding restatement announcement date.	X_1 and X_2
Share turnover	Probability that a share was traded within a given time period. It is calculated as: $[1-\Pi_t (1- \textit{volume traded}_t / \textit{total shares}_t)]$ accumulated over the one-year period ending on the second day prior to the restatement announcement date.	Z
Size	Logarithm of the market capitalization of restating firm one year prior to restatement.	X_1 and X_2

Table 2. Restatement sample description

Restatement dates and characteristics were hand collected from the Lexis-Nexis and Factiva databases. The Lexis-Nexis and Factiva databases were searched using key words "restatement" "restat" "revis" "adjust" "error" and "responding to guidance from the SEC" during the period January 1, 1997 - June 30, 2002. We cross checked our sample with the sample released by the GAO. Unlike the GAO sample, we excluded restatements that were caused by an adoption of new accounting rules, and retained only restatements due to a mistake or an improper interpretation of GAAP rules. After identifying the sample of companies announcing restatements, we find further data on restatements in amended statements (Form 10-K/A(s) and Form 10-Q/A(s)).

Panel A: Sample selection

Source	Number of restatements
GAO sample	918
Less deleted restatements	387
	531
Additional restatements	5
Total sample	**536**

Panel B: Reasons for deleting GAO restatements

Reason for deleting	Number of restatements
Data not available on either CRSP or Compustat	187
New rule adoption	114
In the sample period, companies adopted the following rules FASB 101, FASB 133, EIC-113, EITF 00-10, EITF 00-14, FASB 142, etc. Approximately 50% of new rule adoption restatements are due to adoption of FASB 101 revenue recognition rule.	
Change in method of accounting	16
No restatement was made despite the announcement of a possibility of restatement	20
No information found regarding restatement	25
Other*	25
	387

Panel C: Number of restatements and restating firms

Number of restatements by same firm in the sample period	Number of restating firms	Number of restatements
1	461	461
2	30	60
3	5	15
	496	**536**

Panel D: Restatements by year

Year	Number of restatements
1997	64
1998	70
1999	120
2000	125
2001	82
2002 (through June 30, 2002)	75
	536

*16 of the restatement announcements in GAO sample were not announcements of new restatements, but rather releases of new information regarding already announced restatement. We deleted such announcements. This category also includes restatements that were not a result of a mistake or a misinterpretation of accounting rules (for example restatements due to changes in the number of shares).

Table 3: Restatement sample summary statistics of binary variables

This table shows summary statistics for binary variables for a sample of firms restating financial statements during the period of January 1, 1997 - June 30, 2002. *Litigation* is a dummy that equals one if the firm was sued because of a restatement. We search for the announcement of a class action lawsuit in Lexis-Nexis and Factiva and check whether the announcement specially mentions restatement as a reason for the lawsuit. *Irregularity* is a dummy that equals one if the company announced fraud or an irregularity as a reason for restatement or if restating firm was subject to AAER as a result of a restatement. *Auditor, SEC and Management* are dummy variables that equal one if restatements were initiated by auditor, SEC and management, respectively. *Annual* is a dummy variable that equals one if restatement includes a revision of at least one annual report; and equals zero if only quarterly financial statements were restated. *Quarterly* is a dummy that equals one when *Annual=0*. *No_Details* is a dummy that equals one if full details about a restatement were not released in the initial announcement. *NI crosses loss threshold* equals one if a restatement changes reported income into a loss and equals zero otherwise. *Core* is a dummy that equals one if a restatement involved revenue, cost of sales or operating expense accounts for on-going operations, and equals zero otherwise. The difference in sub-samples in Panel B is tested using a chi-square test of association *, **, and *** indicate significance at 10%, 5% and 1% respectively.

Panel A: Litigation and irregularity

Characteristic	Yes	as a %	No	as a %
Litigation	180	33.58%	356	66.42%
Irregularity	163	30.04%	373	69.59%
AAER	138	25.75%	398	74.25%
Firm discloses irregularity or fraud	59	11.01%	477	88.99%

Panel B: Litigation and irregularity cross frequency

Litigation	Irregularity	Number of restatements	As a percent of total (536)	As a percent of Litigation=Yes (180)	As a percent of Irregularity=Yes (163)
Yes	Yes	104	19.40%	57.78%	63.80%
Yes	No	76	14.18%	42.22%	N/A
No	Yes	59	11.01%	N/A	36.20%
No	No	297	55.41%	N/A	N/A

Chi-square test of association = 95.91 (p-value<0.01)

Panel C: Description of dummy variables for restatements with and without litigation

	Full sample (N=536)		With litigation (N=180)		No litigation (N=356)		
Binary variables	Number of restatements	as a % of 536	Number of restatements	as a % of 180	Number of restatements	as a % of 356	Chi-square test of association
Auditor	48	8.96%	43	23.89%	24	6.74%	2.73*
SEC	102	19.03%	24	13.33%	69	19.38%	
Company	318	59.33%	33	18.33%	196	55.06%	
Annual	330	61.57%	120	66.67%	210	58.99%	2.98*
Quarterly	206	38.43%	60	33.33%	146	41.01%	
No_Details	216	40.30%	108	60.00%	108	30.34%	30.18***
NI crosses loss threshold	60	11.19%	25	13.89%	35	9.83%	1.98
Core	272	50.75%	124	68.89%	148	41.57%	20.35***

Table 3 (continued): Restatement sample summary statistics of binary variables

Panel D: Number of days between restatement and litigation announcements

Number of Calendar Days between Restatement and Litigation Announcements	Number of restatements	As a %
0	18	10%
1	28	16%
2	13	7%
3	10	6%
4	7	4%
less than 30	139	77%
less than 60	151	84%
less than 90	160	89%

Table 4: Restatement sample summary statistics of continuous variables

This table describes the continuous variables for a sample of firms restating financial statements during the period of January 1, 1997 - June 30, 2002. *CAR01* is a market model cumulative abnormal return for days zero and plus one relative to a restatement announcement. Market model parameters are estimated over a 250 day period starting on day -46 relative to restatement using value weighted market index. *Change in NI/Total_assets* is the difference between restated Net Income and originally reported Net Income divided by total assets reported in the year preceding restatement announcement. If more than one period is restated, Net Income for all restated periods is added up. *Number of periods restated* is the number of periods restated in years. If the firm restated one annual report, this variable will equal 1. If the firm restated one annual report and one quarterly report, this variable will equal 1.25. *Return (-252, -2)* is the buy and hold stock return, measured over the one year period preceding the restatement announcement date. *Size* is the market capitalization reported at the year end prior to the restatement announcement. *Share turnover* is the probability that a share was traded within a given time period. It is calculated as: $[1- \Pi_t (1- \textit{volume traded}_t / \textit{total shares}_t)]$ accumulated over the one-year period ending on the second day prior to the restatement announcement date. *Cash flow* equals operating income before extraordinary items and deprecation less dividends, and is winzorized at 5%. The Wilcoxon Test tests for significant differences between sued and non-sued restating firms. *, **, and *** indicate significance at 10%, 5% and 1% respectively.

Panel A: Full sample

Variables	Mean	Median	Std Dev	N
CAR01	-9.22%	-3.93%	18.05%	506
Change in NI/Total_assets	-5.06	-0.04	75.05	494
Number of periods restated	1.37	1.00	1.05	536
Return (-252, -2)	-2.99%	-23.47%	143.25%	524
Size (in millions)	2,173.65	182.87	8,906.85	500
Share turnover	0.679	0.733	0.270	524
Cash flow (in millions)	106.28	9.53	235.07	492

Panel B: Comparison of sued and non-sued sub-samples

	Sued restating firms				Non-sued restating firms				
Variables	Mean	Median	Std Dev	N	Mean	Median	Std Dev	N	Wilcoxon test
CAR01	-20.58%	-16.17%	22.74%	166	-3.67%	-2.02%	11.81%	340	-9.28***
Change in NI/Total_assets	-0.442	-0.070	2.006	162	-7.314	-0.024	91.495	332	-4.92***
Number of periods restated	1.622	1.250	1.136	180	1.242	1.000	0.983	356	3.88***
Return (-252, -2)	-12.81%	-41.47%	202.60%	174	1.89%	-17.78%	101.66%	350	-4.31***
Size (in millions)	3,652.44	288.54	12,935.32	164	1,451.86	132.52	5,929.78	336	4.38***
Share turnover	0.818	0.903	0.203	174	0.611	0.630	0.273	350	8.55***
Cash flow (in millions)	133.93	13.13	258.64	161	92.83	7.60	221.87	331	1.53*

Table 5: Determinants of market reaction to restatements using method 1 (Model 1)

This table examines the determinants of market reaction to restatements controlling for litigation risk using a simultaneous-equation approach, where announcement period cumulative abnormal return (CAR01) and litigation probability are treated as endogenous variables (see Wooldridge, 2002). The first step estimates the probability of litigation using a maximum likelihood probit model: Probability(*Litigation* = 1| X_1 , X_2). The model is used to generate a first step predicted probability of being sued for each restating firm, $\hat{G}_i$. The next step estimates the system of equations, (1) and (2), using two-stage least squares (2SLS). The first stage of the 2SLS estimation is a regression of the dummy variable *Litigation* on $\hat{G}_i$, X_1 , and X_2, which is used to generate a second version of the predicted probability of litigation, denoted $\hat{P}$ *(Litigation).* The second stage of the 2SLS procedure estimates equation (1) by OLS after substituting $\hat{P}$ *(Litigation)* for *Litigation,* and produces 2SLS standard errors. Please refer to Table 1 for variable definitions. *, **, and *** indicate significance at 10%, 5% and 1% respectively.

	Probit ML		2SLS		2SLS		
	Dependent variable=**Litigation**		1st Stage Dependent variable=**Litigation**		2nd Stage Dependent variable=**CAR01**		
Explanatory variables	Estimated coefficient	Chi Square	Estimated coefficient	T values	Predicted sign	Estimated coefficient	T values
$\hat{P}$ ***(Litigation)***					**-**	**-0.147**	**-2.78*****
Predicted probability of litigation $\hat{G}_i$			0.993	3.74***			
Restatement and firm characteristics:							
Change in NI/Total_assets	0.001	0.02	0.000	-0.01	**+**	0.000	-1.30
NI crosses loss threshold	0.346	2.34	0.000	0.00	**-**	-0.049	-1.88*
Number of periods restated	0.163	4.90**	-0.001	-0.03	**-**	0.014	1.82*
Irregularity	1.094	50.96***	0.003	0.06	**-**	-0.007	-0.42
Core	0.377	6.26***	0.005	0.05	**-**	-0.010	-0.40
Auditor	0.283	0.68	-0.009	-0.11	**-**	-0.034	-0.96
SEC	-0.370	1.58	-0.007	-0.09	**-**	-0.008	-0.30
Company	0.227	0.79	-0.001	-0.02	**+**	-0.023	-0.92
No_Details	0.343	5.18**	0.007	0.15	**-**	-0.043	-2.38**
Return (-252, -2)	-0.098	5.11**	0.002	0.12	Control	-0.018	-3.43***
Size	0.094	5.91**	-0.001	-0.12	Control	0.007	1.58
Intercept	-3.603	77.45***	0.002	0.01		-0.016	-0.66
Instrument for Probability of Litigation:							
Share turnover	2.124	43.45***	0.013	0.08			
Number of Observations	483		483			464	
Adjusted R squared			35.03%			11.38%	
F statistic [Log Likelihood]	[-207.92]		20.99***			6.40***	

Table 6: Determinants of market reaction to restatements using method 1 (Model 2)

Model 2 replaces firm *size* with *cash flow*.

This table uses Method 1 described in the legend to Table 5 and differs from Table 5 in that it replaces *Size* with *Cash flow*. See Table 1 for variable definitions and the legend in Table 5 for the description of the simultaneous-equation approach used in the estimation. *, **, and *** indicate significance at 10%, 5% and 1% respectively.

	Probit ML		2SLS		2SLS		
	Dependent variable=**Litigation**		1st Stage Dependent variable=**Litigation**		2nd Stage Dependent variable=**CAR01**		
Explanatory variables	Estimated coefficient	Chi Square	Estimated coefficient	T values	Predicted sign	Estimated coefficient	T values
$\hat{P}$ ***(Litigation)***					**-**	**-0.131**	**-2.71*** **
Predicted probability of litigation $\hat{G}_i$			1.065	3.79***			
Restatement and firm characteristics:							
Change in NI/Total_assets	0.001	0.02	0.000	0.00	+	0.000	-1.29
NI crosses loss threshold	0.269	1.46	-0.005	-0.08	-	-0.046	-1.84*
Number of periods restated	0.156	4.25**	-0.004	-0.17	-	0.013	1.62
Irregularity	1.108	51.11***	-0.003	-0.06	-	-0.005	-0.3
Core	0.345	5.34**	-0.021	-0.20	-	-0.016	-0.62
Auditor	0.292	0.72	-0.011	-0.12	-	-0.023	-0.62
SEC	-0.336	1.33	0.001	0.01	-	-0.009	-0.31
Company	0.161	0.42	-0.001	-0.02	+	-0.025	-1.02
No_Details	0.325	4.64**	0.000	0.00	-	-0.040	-2.24**
Return (-252, -2)	-0.085	3.85**	0.003	0.24	Control	-0.017	-3.37***
Cash flow	0.0003	0.73	0.000	-0.04	Control	0.0001	1.58
Intercept	-3.173	78.96***	0.017	0.16		-0.025	-1.01
Instrument for Probability of Litigation:							
Share turnover	2.311	53.55***	-0.031	-0.18			
Number of Observations	476		476			457	
Adjusted R squared			33.75%			11.06%	
F statistic [Log Likelihood]	[-208.72]		19.62***			5.73***	

Table 7: Determinants of the market reaction to restatements using method 1 (Model 3)

Model 3 includes interaction of *No_Details* and *Change in NI/Total_assets*

This table uses Method 1 described in the legend to Table 5 and differs from Table 5 in that it adds the interaction of the variables *No_Details* and *Change in NI/Total_assets*. See Table 1 for variable definitions and the legend in Table 5 for the description of the simultaneous-equation approach used in the estimation. *, **, and *** indicate significance at 10%, 5% and 1% respectively.

	Probit ML		2SLS		2SLS		
	Dependent variable=**Litigation**		1st Stage Dependent variable=**Litigation**		2nd Stage Dependent variable=**CAR01**		
Explanatory variables	Estimated coefficient	Chi Square	Estimated coefficient	T values	Predicted sign	Estimated coefficient	T values
$\hat{P}$ ***(Litigation)***					**-**	**-0.147**	**-2.77*** **
Predicted probability of litigation $\hat{G}_i$			0.984	3.70***			
Restatement and firm characteristics:							
Change in NI/Total_assets	0.000	0.01	0.017	0.11	**+**	0.000	-1.31
NI crosses loss threshold	0.347	2.35	0.000	-0.02	**-**	-0.049	-1.88*
Number of periods restated	0.166	5.04**	0.001	0.01	**-**	0.015	1.83*
Irregularity	1.090	50.44***	0.000	-0.02	**-**	-0.008	-0.43
Core	0.375	6.17***	0.003	0.08	**-**	-0.010	-0.41
Auditor	0.300	0.76	0.007	0.08	**-**	-0.033	-0.92
SEC	-0.373	1.61	-0.009	-0.1	**-**	-0.009	-0.3
Company	0.228	0.80	-0.007	-0.1	**+**	-0.023	-0.92
No_Details	0.346	5.26**	-0.001	-0.01	**-**	-0.042	-2.36**
No_Details*(Change in NI/Total_assets)	0.026	0.16	0.007	0.16	**-**	0.001	0.24
Return (-252, -2)	-0.099	5.14**	0.000	-0.03	Control	-0.018	-3.43***
Size	0.094	5.99***	0.001	0.11	Control	0.007	1.58
Intercept	-3.607	77.62***	-0.001	-0.11		-0.052	-1.55
Instrument for Probability of Litigation:							
Share turnover	2.121	43.38***	0.017	0.11			
Number of Observations	483		483			463	
Adjusted R squared			34.91%			11.47%	
F statistic [Log Likelihood]	[-207.78]		19.46***			5.61***	