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Determinants and economic consequences of cash flow restatements☆

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ABSTRACT

The FASB, PCAOB, SEC, and AICPA have all acknowledged that the accounting field needs to revisit the statement of cash flows (SCF). While the overall number of restatements has held steady over the past five years, the percentage of cash flow restatements (CFRs) has risen from 8.7% of all restatements in 2009 to 20.2% of all restatements in 2014. We examine the determinants of CFRs, investors' differential beliefs about CFRs, and the information content of CFRs by focusing on abnormal trading volume and price reactions to CFRs. We then examine whether the guidance the SEC/AICPA published in early 2006 changed the information content of CFRs. Finally, since the proper classification within the SCF is a current regulatory issue, we examine whether classification shifting within the SCFs impacts the market. The market finds CFRs to be informative with some investor disagreement as shown by higher abnormal trading volume. We also find an incremental volume reaction to changes in operating cash flows after the SEC allowance period. While the market responds negatively to CFRs, we find that the market does not differentiate between whether classification shifting occurs or does not occur with the CFR. This study has implications for policymakers, auditors, and investors since it is one of the first to examine the capital market consequences of CFRs.

1. Introduction

The purpose of this study is to examine the determinants and information content of cash flow restatements (CFRs). This study is the first to examine the abnormal trading volume and market price reactions to CFRs using a comprehensive multivariate analysis. We contribute to the literature by analyzing a dataset of CFRs that has rarely been studied, despite regulators' recent interest in CFRs. We also analyze how investors perceive and react to this type of restatement. We contribute to literature on restatements by showing that the information content of CFRs is incrementally informative for investors and is incremental to the information contained in earnings restatements. While we provide evidence that the abnormal trading volume reaction to changes in operating cash flows increases after the SEC allowance period, we find that when classification shifting occurs within

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[1] Retired.

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the statement of cash flows resulting from a CFR, there is no significant difference with abnormal trading volume or market returns reaction.[2]

The American Institute of Certified Public Accountants (AICPA), Financial Accounting Standards Board (FASB), Public Company Accounting Oversight Board (PCAOB), and the Securities and Exchange Commission (SEC) have all acknowledged that the accounting profession needs to revisit the statement of cash flows (SCF). While the overall number of restatements has held steady over the past five years, the percentage of CFRs has not. The SEC first dealt with the issue of misclassification of items in SCFs in 2005. The result was the SEC gave firms an allowance period to correct misclassified SCFs without penalty in 2006. The Center for Public Company Audit Firms (CPCAF) published Alerts #90 and then #98 to help firms determine whether or not to restate the SCFs. Most restatements at that time were related to the misclassification of items among the operating, investing, and financing categories within the SCFs. Following the SEC allowance period there was a decline in CFRs from 2006 to 2009. However, there has been a resurgence of cash flow restatements; the percentage of SCFs that were restated rose from 8.7% in 2009 to 20.2% in 2014.[3] The reasons for restatements vary, but most do not involve complex determinations of underlying cash flow problems, and many of the issues with the original SCFs have been related to misclassifications.

As a result, in 2014, the FASB acknowledged that the SCFs have been neglected by the standard setting bodies (FASB, 2014). The following year, the FASB asked the Emerging Issues Task Force to consider nine issues related to the SCFs to address this problem. The SEC also noted an increase in the number of restatements related to errors in SCFs (Crews, 2014). They called for companies to tighten accounting procedures and controls pertaining to the SCFs. The PCAOB also noted the same issue and hired inspectors to evaluate auditors' testing of the SCFs (PCAOB, 2015). Consequently, the statement of cash flows continues to be a topic of interest for regulators.

In this study, we first model the economic determinants for firms that overstate operating cash flows and compare them to a control group of non-restaters. Our analysis provides us with a deeper understanding of which factors may cause managers to intentionally (or unintentionally) misstate the statement of cash flows. Next, we examine whether CFRs impact the capital markets. Since financial disclosures result in investor reactions on two dimensions, we examine both returns and trading volume reactions. A growing body of literature asserts that the primary driver of trading volume reactions to public announcements is investor heterogeneity in the form of differential interpretation of the news (e.g., Beaver, 1968; Harris and Raviv, 1993; Kandel and Pearson, 1995; Bamber et al., 1997, 1999, 2011). The lack of research focus on abnormal trading volume is a significant void because trading volume reactions are equally relevant in understanding investors' perceptions of public news (e.g., Ross, 1989). A growing body of literature asserts that the most dominant driver of trading volume reactions to earnings announcements are differences in interpretation of the earnings information (e.g., Hong and Stein, 2007; Bamber et al., 2011). The sources of such differential interpretations are rooted in the presumption that market participants use different priors, likelihood functions, or models to interpret the earnings (i.e., cash flow is a component of earnings) news and determine a firm's value. For example, the cash flow restatement can be thought of as a public signal that reveals the intrinsic value of a firm plus a random error, but investors disagree about the mean of the error. This disagreement causes investors to have different interpretations of the cash flows news: one can interpret the financial disclosure more positively/negatively than the other, or treat the restatement news as a permanent or a temporary signal (Israeli, 2015). Bamber et al. (2011) state in a recent review of research on trading volume responses to earnings announcements and other financial disclosures that little is known about the information content of trading volume reactions to financial disclosures.

Following Kim and Verrecchia (1991), who demonstrate Beaver's (1968) hypothesis that the trading volume reaction reflects differences among individual investors that may be eliminated in the averaging process for determining stock prices, we investigate the effects of potential misperceptions among investors by focusing on disagreements between investors and measuring such disagreements by abnormal trading volume. Kim and Verrecchia (1991) propose that the trading volume reaction to a public announcement is an increasing function of both (1) the magnitude of the associated price reaction and (2) the level of predisclosure information asymmetry among investors. Additionally, Cready and Hurtt (2002) provide simulation-based evidence suggesting that volume reactions are more powerful indicators of a market's response than price reactions. Their results suggest that using measures of volume reactions to complement measures of price reactions is especially important when returns-based analyses yield insignificant results and statistical power is a concern, which is partly the case in our study due to our small sample size.

Next, we investigate whether the market's price reaction differs for CFRs subsequent to the SEC allowance period and/or when classification shifting occurs. The market's reaction to a public announcement of a CFR is important because accounting policymakers such as the FASB and the SEC consider the magnitude of security price and abnormal trading volume reactions to determine whether such disclosure is useful for investors (Atiase and Bamber, 1994; Griffin, 1982; Leisenring, 1983). Consequently, we investigate both the abnormal trading volume and market price reactions to CFRs prior to and subsequent to the SEC published guidance regarding the classification of cash flows in order to examine the informativeness of CFRs resulting from SEC guidance.

Using a sample of 189 restatements (from 124 firms) announced from 2002 to 2014, we use abnormal trading volume reaction to assess how investors interpret CFRs. We first examine the determinants of CFRs and find that firms are more likely to issue a CFR when they have analysts' cash flow forecasts, discontinued operations, dividend issuances, more segments, are growth firms, and are larger in size. We also show that it is less likely that a firm reports a CFR if the firm has higher level of debt or return on assets, or has Big_N auditors. Following prior research (e.g., Chen and Sami, 2008; Bamber et al., 2011), we examine the information content of

[2] A shift is a restatement with no change in total cash flows. When there is no change in total cash flows with a restatement, we assume that the restatement is the result of shifting within the statement of cash flows.

[3] Data from AuditAnalytics.com.

restatements using a mean-adjusted measure of volume reaction over a two-day window. We find a significant trading volume reaction to changes in operating cash flows. We also find that there is an incrementally greater trading volume reaction to changes in operating cash flows in the post-SEC allowance period. Our empirical findings are consistent with disagreement among investors about the implications of CFRs prior to the SEC's guidance and with an increase in disagreement among investors after the SEC's allowance period. We also find that there is a significantly negative abnormal price reaction to changes in cash flows from operations. Our results do not depend on observations with concurrent earnings restatements, which is to be expected since CFRs contain incremental information for investors beyond that contained in earnings restatements. Our results are robust, and our inferences are not affected by firms that restated cash flows during the SEC's allowance period. Our results are not driven by whether classification shifting occurs or does not occur. Just the mere act of a CFR disclosure impacts the trading volume and price reaction.

Our results are relevant to academics, regulators, investors, and auditors. First, this study is important to researchers because it focuses on CFRs, a topic that has received little attention in academic literature. While Lee (2012) finds that firms upwardly manage reported operating cash flows by shifting items within the statement of cash flows, this study finds that the market responds negatively and similarly to CFRs regardless of whether classification shifting occurs within the statement of cash flows or not. Just the mere case of a restatement generates a negative market reaction. Hollie et al. (2011) examine the SEC one-time allowance for firms with erroneous statement of cash flow classifications to correct these misstatements without officially restating their cash flows. They find that these CFRs, in the allowance period, only exerted a marginally negative effect in the capital market. The SEC's intent was to give this allowance period to reduce the negative market effects resulting from CFRs issued during this period. Hollie et al. (2011) provides evidence that the allowance period did mitigate some of the negative market reaction that typically results from restatements.

In our study, we find a significant abnormal trading volume market response and a significantly negative market response for abnormal returns. We find that subsequent to the SEC allowance period there is incrementally greater trading volume reaction to restatements of operating cash flows. This suggests that in the post period, investors are more able to revise their expectations of future discounted cash flows and will, in turn, increase the volume of their trading activity surrounding the announcement of a cash flow restatement. However, for the price reaction, while both periods are significant, the negative market response does not statistically differ between the pre- and post-SEC allowance periods.

Second, our findings affect investors and auditors because limited research has examined the capital market's relation to and the consequences of CFRs. Third, our results are particularly important for policymakers since the FASB (along with the Emerging Issues Task Force) may provide additional guidance and/or provide updates to the SCFs, such as resolving certain presentation issues and increasing consistency in the classification of cash flows between the operating, investing, and financing activities within the statement of cash flows.

The remainder of this paper is organized as follows. Section 2 discusses the background and related literature. Section 3 discusses our research methodology and sample selection criteria. Section 4 presents our descriptive statistics and empirical findings, and Section 5 summarizes and concludes the paper.

2. Background, related literature, and hypothesis development

2.1. Background

The statement of Financial Accounting Standard (SFAS) #95, issued in November 1987, establishes standards for cash flow reporting. It supersedes Accounting Principles Board (APB) Opinion #19, Reporting Changes in Financial Position, and it requires the SCFs as part of a full set of financial statements for all businesses in place of the statement of changes in financial position. This standard requires that SCFs classify cash receipts and payments according to whether they stem from operating, investing, or financing activities and provides definitions for each category. While prior research has focused mostly on the "indirect versus direct" method of presenting SCFs, there has been minimal research on the classification within the SCFs. Unfortunately, the regulators have overlooked the SCFs for extended periods.

In December 2005, almost 20 years after the adoption of SFAS No. 95, Joel Levine, an associate chief accountant at the SEC, noted that there was an increase in misclassifications within the SCFs (Levine, 2005).[4] Levine also noted that the presentation formats used by some companies were inconsistent with SFAS No. 95, which refers to the SCF (SFAS No. 95; FASB, 1987). He discusses an example of misclassification that occurs when firms combine operating, investing, and financing cash flows from discontinued operations into a single line item instead of across the applicable line items.

SFAS No. 95 and SFAS No. 144, Accounting for the Impairment or Disposal of Long- Lived Assets (FASB, 2001), may have contributed to misunderstandings about items in the SCF by presenting different interpretations of the requirements and different options for reporting cash flows from discontinued operations. For example, SFAS No. 144 provides "broad criteria" for the classification of discontinued operations, while SFAS No. 95 provides more specific criteria (Whitehouse, 2006). Consequently, disagreements about how an item should be classified sometimes arise. For example, when the FASB was finalizing the reporting requirements for SFAS No. 95, the AICPA recommended reporting interest payments as non-operating cash flow items, while the FASB classified interest-related cash flows as operating cash flow items. Unresolved debates such as these within the accounting profession and among regulators about the format of cash flow statements may have contributed to what are, *ex post*, described as classification errors.

[4] The 33rd AICPA National Conference on Current SEC and PCAOB Developments.

Following Levine's 2005 speech, in February 2006, the SEC's position on SCFs was reflected in AICPA Alerts #90 and #98, which incorporated supplementary guidance from the SEC about how to classify items within the SCF. After February 15, 2006, the SEC allowed companies to correct their classifications during their next quarterly filing without an official restatement. Firms were also advised to revise their SCFs by classifying prior revisions as corrections of errors rather than restatements. This permitted companies to revise or alter their classification of cash flows without filing a full restatement if the issuers disclosed the modification (AICPA Alert #90). We refer to this time as the allowance period. We use the term "restatements" to avoid conveying that firms intended to mislead investors. In the absence of clear guidance and/or conflicting recommendations from the FASB, AICPA, and SEC, different interpretations of SCF items are inevitable.

Hollie et al. (2011) examined the impact of the SEC allowance period by identifying the types of firms affected by the allowance and the types of items that were reclassified in the operating, investing, and financing categories of the SCF. They found, consistent with the SEC's concerns, that firms generally overstated their net operating cash flows and understated their net investing cash flows. The most frequent line item reclassifications echo the SEC's concerns regarding the presentation of discontinued operations and dealer-floor plan financing arrangements. However, insurance claim proceeds and beneficial interests in securitized loans appeared less problematic than the SEC expected. Overall, their findings show that the SEC's plan was relatively successful and that, for firms that took advantage of the allowance period, CFRs had only a marginally negative effect on the capital market.

The SEC's guidance and allowance period appears to have resulted in a decline in CFRs from 2006 to 2009. However, the percentage of restated SCFs has increased from 8.7% in 2009 to 20.2% in 2014. This has given the SEC and FASB recent cause to question the overall quality of the cash flow statement.

Subsequent research by the FASB indicated that the diversity in item classification is due to a lack of specific accounting guidance and inconsistent application of the principles in Topic 230. At its April 28, 2014 meeting, the FASB's board of directors voted to add a project to its agenda. The project, Clarifying Certain Existing Principles on Statement of Cash Flows, was intended to reduce diversity in the practice of financial reporting by clarifying principles in Topic 230. At its April 1, 2015 meeting, the board of directors decided that clarifying these principles would only incrementally reduce diversity. Therefore, they decided to create an Emerging Task Force to consider nine specific cash flow issues in order to reduce diversity in a timely manner. The task force continues to address these issues.

Our study intends to provide insight into the determinants of CFRs as well as examine the market consequences resulting from cash flow restatements. We also examine whether the SEC allowance period had a lasting effect on market responses and investors' differential beliefs (measured by abnormal trading volume) about restatements to the statement of cash flows.

2.2. Related literature and hypothesis development

Although most prior research focuses on earnings (Ali, 1994; Barth et al., 2001; Bowen et al., 1987; Dechow, 1994), cash flows are also an important component of the financial reporting process. Cash flows have value relevance (Ali, 1994; Barth et al., 2001; Bowen et al., 1987; Cohen et al., 2002; Dechow, 1994; FASB, 1978; Hirshleifer et al., 2009; Penman, 2001; Wild et al., 2004) and are a fundamental performance measure for a firm's valuation (Larrain and Yogo, 2008; Penman, 2001). Barth et al. (2001) argue that the market's assessment of firms' cash flows influences the relation between price and earnings. Investors refer to financial metrics, such as cash flows, rather than earnings when earnings become less reliable (Call, 2008; Defond and Hung, 2003; Lee, 2012; Wasley and Wu, 2006). For example, Defond and Hung (2003) find that analysts tend to forecast cash flows when such metrics are useful for interpreting earnings and assessing firms' viability. Defond and Hung's (2007) findings also indicate that there is higher demand for cash flow information if the usefulness of earnings is limited. Johnson and Lee (1994) find that cash flows from operations provide information about future profitability that is incremental to the information provided by a firm's current earnings. Furthermore, recent research shows that certain components of fair value accounting are better able to predict future cash flows than previous methods. For example, Lee (2011) finds that the mapping of goodwill and impairment charges into future cash flows has improved since the pre-SFAS No. 142 period. Overall, a firm with a more reliable cash flow may show greater solvency and may be more attractive to investors (Wild et al., 2004).

In addition, cash flow information is used for purposes other than financial reporting. First, it is important to debt holders. For example, Edmonds et al. (2011) find that cash flow forecasts affect debt financing. Firms meeting or exceeding cash flow forecasts have higher bond ratings and lower bond yields and are more likely to have an improved rating. Second, cash flow can be used to measure a firm's performance. Banker et al. (2009) provide evidence that the incremental value relevance of cash flows explains the variation in their sensitivity to marginal pay. Nwaeze et al. (2006) find that operating cash flows are relevant to contracts when considered in relation to earnings. They also find that operating cash flows are positive and significant in the CEO compensation model in the presence of earnings and stock returns. Third, operating cash flows can be used to predict financial reporting fraud. Lee et al. (1999) find that in most fraud cases, excess earnings over operating cash flow was common before the discovery of fraud.

Several studies focus on inconsistencies that arise when firms report their cash flows in accordance with SFAS No. 95. For example, Nurnberg (1983) and Nurnberg and Largay (1996) provide evidence that disclosing the nature of and reasons for classification policies may enhance cash flow comparability and utility. A few studies have examined the economic implications of cash flow statement components or items (e.g., Klammer and Reed, 1990; Barth et al., 2001; Cheng and Hollie, 2008; Luo, 2008). For example, Luo (2008) links "unusual" operating cash flow items to an incremental ability to predict future cash flows that are not fully reflected in stock prices.

Chuck Mulford, director of the Financial Analysis Lab at the Georgia Institute of Technology, noted in 2004 and 2005 that companies pay less attention to how they classify cash flows. Mulford and Martins' (2004, 2005a, 2005b) studies pre-date the SEC's

actions related to restatements. Their efforts prompted the SEC to announce a one-time allowance period in 2006 for firms to correct misclassifications without officially restating their cash flows. They have been credited with helping the SEC focus on the issues outlined in Hollie et al. (2011). Hollie et al. (2011) assesses the impact of this one-time allowance. Using a sample of firms that restated their cash flows during the allowance period, they find that firms overstated operating cash flows, understated investing cash flows, and, in some instances, restated total cash flows. These findings were consistent with the SEC's concerns.

Lee (2012) examines restatements that inflate operating cash flows and the mechanisms used by firms to manage operating cash flows. She finds that, even after controlling for a firm's earnings, firms overstate operating cash flows when there is significant incentive to do so. Specifically, she finds that firms manage operating cash flows by shifting items between operating cash flow categories both within and outside the boundaries of generally accepted accounting principles (GAAP) and by controlling the timing of certain transactions, such as delaying payments to suppliers or accelerating payments from customers.

Since cash flow restatements correctly classify the different operating, investing, and financing sections of the statement of cash flows, this helps investors to improve their estimations of firm valuation. Thus, investors are able to revise their expectations of future discounted cash flows and will, in turn, increase the volume of their trading activity surrounding the announcement of the restatement. Therefore, our *first prediction* is that the change in operating cash flows from the restatement will be positively associated with abnormal trading volume. In this study, we focus on firms who restated operating cash flows downward (that is, restated operating cash flows are lower than originally reported operating cash flows). The prior literature shows that firms who restate operating cash flows downward have economic incentives to opportunistically inflate cash flows from operations (Lee, 2012). If investors perceive these managers as engaging in intentional cash flow management behavior, there will likely be a negative market reaction surrounding the announcement of the restatement. Therefore, our *second prediction* is that, on average, the change in operating cash flows from the restatement is negatively associated with the market price reaction.

Our study differs from prior studies and contributes to the literature in several ways. First, we look at the characteristics of firms that issue a cash flow restatement. Next, we evaluate the market's response to the disclosure of cash flow restatements using abnormal trading volume and returns reactions. This helps us determine whether investors have different beliefs about firms that report restatements. Third, we investigate the abnormal trading volume and returns reaction to restatements prior to and subsequent to the SEC's guidance and restatement allowance period, as well as when firms may have engaged in classification shifting.

3. Research design and sample selection criteria

3.1. Research design

3.1.1. Characteristics of firms with cash flow restatements

To better understand the underlying factors associated with CFRs, we first examine a set of determinant variables that may affect the likelihood of a firm filing a CFR by exploring the literature on determinants of earnings restatement (Kinney and McDaniel, 1989). We then propose a set of variables that may be associated with overstated cash flows on the original SCFs as proxies for the likelihood that a firm will file an overstated CFR.[5] Specifically, we compare firms who filed an overstated cash flow CFR to all other firms listed in Compustat that did not file a CFR in the same year. We use the following probit model to examine the determinants of CFR:

$$CFR = \alpha_0 + \alpha_1 POST + \alpha_2 CFOFC + \alpha_3 CHGEC + \alpha_4 DO + \alpha_5 CR + \alpha_6 ACC + \alpha_7 DEBT + \alpha_8 ROA + \alpha_9 DIV + \alpha_{10} BIGN + \alpha_{11} NUMSEG + \alpha_{12} SIZE + \alpha_{13} MB + \alpha_{14} LOSS + \varepsilon \quad (1)$$

where

CFR = 1 if the firm disclosed a negative CFR during the current fiscal year, and 0 otherwise;
POST = 1 if after the SEC's allowance period, and 0 otherwise;
CFO_FC = 1 if at least one cash flow forecast was issued for the firm during the current year, and 0 otherwise;
CHG_E_C = the absolute value of the change in earnings divided by the change in operating cash flows;
DO = 1 if the firm reports discontinued operations, and 0 otherwise;
CR = current assets divided by current liabilities;
ACC = operating accruals calculated as income before extraordinary items minus operating cash flows divided by total assets;
DEBT = total long-term debt divided by total assets;
ROA = net income divided by total assets;
DIV = 1 if the firm paid cash dividends in the current year, and 0 otherwise;
BIG_N = 1 if the firm is audited by a Big N firm, and 0 otherwise;
NUMSEG = number of business segments of the firm;
SIZE = the log of total assets;
MB = the market value of equity divided by the book value of equity; and
LOSS = 1 if the firm reports negative income before extraordinary items or negative operating cash flow, and 0 otherwise.

In model (1), we include an indicator variable, POST, since the likelihood of a CFR may have changed due to the SEC's guidance

[5] In this study, we focus only on firms that have overstated operating cash flows in some capacity.

and allowance period. Although Givoly et al. (2009) indicate that analysts' cash flow forecasts are less accurate than analysts' earnings forecasts, we examine the association between the probability of a firm filing a CFR with the existence of cash flow forecasts (CFO_FC), since firms may have incentives to opportunistically inflate operating cash flows to meet analysts' cash flow forecasts. However, it is also possible that firms with analysts issuing cash flow forecasts are managed more carefully and are less likely to file a CFR.

We include the absolute value of the change in earnings relative to the change in operating cash flows (CHG_E_C). Nwaeze et al. (2006) find that cash flows from operations are used to determine CEOs' cash compensation when a firm's earnings are relatively low. Therefore, CEOs might have incentives to inflate their compensation by intentionally shifting the categories of cash flows to inflate operating cash flows.

Kinney and McDaniel (1989) find that firms with quarterly earnings restatements are smaller in size, less profitable, have higher debt, and have lower growth rates, relative to the industry. Thus, we also control for the firm size by the log of total assets (SIZE), and the level of debt of the firm (DEBT), since SFAS No. 95 has led to various classifications of interest payments, as it pertains to bonded debt, debt issuance costs, and capitalized interest. We control for growth firms (MB) since these types of firms can have different types of incentives regarding their demand for cash, which may provide incentives to misclassify cash flows. We also include an indicator variable for firms' losses (LOSS) since cash flow problems can lead to bankruptcy, which affects a firm's incentive to misclassify cash flow. That is, lower profitability may indicate operation problems and potentially weak accounting controls, which leads to the fact that less profitable firms are more likely to file a CFR because managers have significant incentive to manage cash flows through classification shifting.

We control for discontinued operations (DO) since SFAS No. 95 and 144 contributed to misunderstandings concerning cash flow classifications by presenting different interpretations of cash flows from discontinued operations. We include current ratio (CR) since managers of firms who are close to violating debt covenants might misclassify cash flows to alter the firm's cash level. This can influence a firm's current ratio, which indicates a firm's liquidity. We include an indicator variable for issued dividends (DIV) since SFAS No. 150 led to classification issues regarding dividends, as it pertains to mandatorily redeemable preferred stock (FASB, 2003). Romanus et al. (2008) find that auditor industry specialization and the auditor changing from specialist to non-specialist both reduce the likelihood of accounting restatements. Thus, we include the variable BIG_N in the model to proxy for auditor specialist as the big N auditors are more likely to be a specialist and have industry specialization. We expect that the coefficient on BIG_N would be negative in the determinant model, indicating the likelihood of a CFR restatement is lower given a Big N auditor.

We hypothesize that a firm's complexity, debt leverage, size, growth, high accruals, cash flow forecasts, discontinued operations, and losses are all positively associated with the likelihood that a firm will file a cash flow restatement. We conjecture that a firm's auditor type (i.e., Big N versus non-Big N), current ratio, and profitability affect its likelihood to file a CFR, and that firms after the SEC's guidance was published and firms that issue dividends are less likely to file CFRs.

3.1.2. Abnormal trading volume reaction to cash flow restatements

In order to examine whether CFRs influence the market, we perform two market reaction analyses following prior literature (Courtenay et al., 1989; Burks, 2011). We first examine the abnormal trading volume reaction to CFR announcements by firms in our sample. We consider only restatements that overstate operating cash flow (i.e., the restated operating cash flow is lower than the original operating cash flow) in line with Lee (2012). We do so because overstatements of CFRs are more likely to reflect managerial opportunism than understatements and hence provide investors with dissimilar information. Overstatements are also less likely to be the result of unintentional classification errors since managers have more incentives to inflate operating cash flow (e.g., to meet or beat analysts' forecasts of a firm's cash flow from operations). Consistent with prior research (Jang and Lin, 1993; Chen and Sami, 2008; Cready and Hurtt, 2002), we analyze the effect of restatements on abnormal trading volume by calculating the cumulative abnormal relative volume (CARV). Following Kim and Verrecchia (1997), we expect that lack of consensus or disagreements across investors cause higher levels of trading volume for a given level of contemporaneous returns. Burks (2011) shows that there was no significant increased trading volume toward earnings restatements after SOX. Similar to the trading volume model in Burks (2011), we use the following multivariate regression model for our primary abnormal trading volume reaction analysis:

$$CARV = \beta_0 + \beta_1 CFO\_CHG + \beta_2 POST + \beta_3 SHIFT + \beta_4 NUM\_YRS + \beta_5 CAR + \beta_6 SEC + \beta_7 MBE + \beta_8 SIZE + \beta_9 DEBT + \beta_{10} ER + \varepsilon \quad (2)$$

where

CARV = the mean-adjusted daily percentage of outstanding shares traded, accumulated over a two day period from day −1 to day 0, where day 0 is the day the restatement was announced;
CFO_CHG = the original operating cash flows minus the restated operating cash flows deflated by restated total assets;
POST = 1 if after the SEC allowance period, and 0 otherwise;
SHIFT = 1 if the original total cash flows equal the restated total cash flows, and 0 otherwise;
NUM_YRS = the number of years that are restated in the CFR;
CAR = the absolute value of the cumulative market-adjusted return from day −1 to day +1, where day 0 is the day the restatement was announced;
SEC = 1 if there was an SEC investigation in the same year as the restatement, and 0 otherwise;
MBE = 1 if the firm meet or exceeds the consensus operating cash flow forecast for the fiscal year, and 0 otherwise;
SIZE = the log of total assets;

DEBT = total long-term debt divided by total assets; and
ER = amount of the earnings restatement divided by total restated assets.

We use CARV to control for market-wide activities, such as liquidity trading, tax considerations, interest rate changes, and portfolio rebalancing that occurred on the same day as the restatement announcement. The announcement period ranges from day −1 to day 0, where day 0 is the day the restatement was announced. Similar to Bamber et al. (1997), the non-announcement period ranges from 249 to 2 trading days before the restatement announcement. We divide the volume of shares traded by the total number of shares outstanding to control for firms' size and increases in the number of shares traded over time (Bamber, 1987).

Our primary variable of interest is the change in operating cash flow as a result of a cash flow restatement (CFO_CHG). Files et al. (2009) use restatement magnitude in their model to examine the association between earnings restatement and disclosure prominence as a control variable. Files et al. (2009) define the earnings restatement magnitude as the cumulative earnings effect of the restatement scaled by total assets and found that the negative restatement magnitude to correct an originally overstated earnings lead to incremental negative market returns. Badertscher et al. (2011) use a similar variable to be one of the proxies to measure the severity of the earnings restatement, the difference between the originally reported and the restated earnings. Similar to Files et al. (2009), we develop the measure of restatement of cash flow from operations (CFO_CHG) as the difference between originally reported CFO and the restated CFO divided by total restated assets. If the coefficient of CFO_CHG is positive, it indicates that the CFR restatement magnitude causes higher trading volume which may indicate that investors get confused. The indicator variable POST will show whether there are different trading volume reactions to CFRs between the pre- and post-SEC allowance period.

We also test whether there is a stronger trading reaction when certain types of CFRs suggest that firms may have opportunistically engaged in classification shifting of cash flows in order to inflate operating cash flows (SHIFT) rather than manipulate the total cash flows. Sophisticated investors would be able to recast SCFs only if managers provide precise definitions of all cash flow line items. However, if managers combine certain types of cash flows or intentionally obscure classification shifting in order to inflate operating cash flows, investors do not have transparent information necessary to recast SCFs.

Since some firms may restate cash flows from multiple years, an interdependence problem may arise in our observations. Palmrose et al. (2004) used the number of years that earnings were restated as one of the proxies to indicate the materiality of an earnings restatement (along with the number of accounts affected by the restatement, and net income change over assets) as they examine the market return reaction to the earnings restatement. Therefore, we include the variable NUM_YRS to control for the number of years for which a firm restates cash flows. As the number of years that CFOs are restated increases, and the more material the CFR is, we predict that it is easier for investors to have higher levels of disagreement, that is, the coefficient of NUM_YRS is predicted to be positive to the market volume reaction.

We control for the effects of potential returns with CAR, which is the absolute value of the cumulative market-adjusted return from day −1 to day +1. We also control for whether restatements are indicative of intentional misstatements with an indicator variable (SEC) that represents whether there was an SEC investigation in the same year as the restatement, which indicates a higher probability of being sued. As shown in Bardos et al. (2013), a big portion of the negative stock price reaction to financial statement restatements are explained by litigation risk.

We also control for firms that meet or beat the analysts' consensus cash flow forecast (MBE) since the market's reaction might be different if investors perceive that these firms have stronger incentives to overstate operating cash flows. We include a SIZE variable since larger firms are more likely to issue analyst cash flow forecasts. We control for long-term debt (DEBT) since firms that file CFRs have historically used different classifications for certain interest payments pertaining to debt. Last, we include restatements with concurrent earnings restatements in our primary analysis to maximize our sample size, but we include a variable to capture the magnitude of any earnings restatement (ER) that was filed at the same time as the CFR to investigate the effect of concurrent earnings restatements.

3.1.3. Market price reaction to cash flow restatements

As the trading volume indicates disagreement among investors, prices are efficient and indicate the aggregated beliefs of rational investors with positive or negative perceptions (Kim and Verrecchia, 1997; Burks, 2011). We analyze the abnormal price reaction to CFRs during a short-window surrounding the announcement of the CFRs. We use the following multiple regression to examine investors' find the aggregated perception of CFRs using price reactions to the disclosure of cash flow restatements:

$$CAR3 = \gamma_0 + \gamma_1 CFO.CHG + \gamma_2 POST + \gamma_3 SHIFT + \gamma_4 NUM.YEARS + \gamma_5 SEC + \gamma_6 MBE + \gamma_7 SIZE + \gamma_8 DEBT + \gamma_9 ER + \varepsilon \quad (3)$$

where

CAR3 = the 3-day market adjusted abnormal return surrounding the restatement disclosure date.

Similar to Files et al. (2009), we include the measure of the restatement of cash flow from operations (CFO_CHG) in the model, defined as the difference between originally reported CFO and the restated CFO divided by total restated assets. We expect a negative coefficient on CFO_CHG, which indicates that the CFR restatement magnitude causes negative return reactions.

Badertscher et al. (2011) measure the severity of earnings restatement by the core of the restatement (whether revenue and/or expense was impacted by the earnings restatement), the total amount of the restatement, the total number of years between the restatement announcement date and the beginning of the misstatement period. The variable, CFO_CHG, in our model incorporates whether CFO is restated and the magnitude of CFRs. We also include other control variables from model 2 for similar reasons.

3.2. Sample selection criteria

The initial data for this study comes from the Audit Analytics database. Audit Analytics' restatement data set includes SEC registrants that disclosed a restatement in electronic filings since January 2002. Additional financial data were obtained from the Morningstar Document Research database and from SEC filings in the Edgar database. We use the date the firm disclosed actual (or estimated) restatement figures to the market. This date may differ slightly from the disclosure date listed in the Audit Analytics database. If the restatement is listed as disclosed in an 8-K form in the database and the restatement is only qualitative, we search for the closest disclosure form (e.g., 10-K, 10-Q, etc.) to 8-K containing the actual (or estimated) restatement figures. In this case, we use the later disclosure date for our volume reaction tests since it is when the market received quantitative information.

The initial sample was comprised of 654 firm-year observations (363 firms) from 2002 to 2014. If a firm disclosed restatements for multiple years, we recorded each year as "restated." We eliminated 204 firm-year observations that were not listed in the Compustat and/or CRSP databases or did not have sufficient data to meet our data requirements. We also removed 261 firm-year observations for firms that issued CFRs that understated operating cash flow (i.e., the restated operating cash flow is greater than original operating cash flow). This resulted in 189 firm-year observations (124 firms) for firms with CFRs (CFR firms) that overstated operating cash flow (i.e., the restated operating cash flow is less than the original operating cash flow) for our multivariate analyses. For our control sample, we used all Compustat firms that did not file a CFR during the same time period. This control sample consists of 78,352 firm-year observations. Therefore, our full sample is comprised of 78,541 firm-year observations.

4. Descriptive statistics and empirical findings

4.1. Descriptive statistics

Panel A of Table 1 reports our descriptive statistics for the full sample of overstated CFR and control firms. Relative to control firms, CFR firms issue significantly more restatements in the pre–SEC allowance period, have more analysts' cash flow forecasts (CFO_FC), report discontinued operations more often (DO), have less negative accruals (ACC), higher levels of debt (DEBT), higher returns on assets (ROA), issue dividends more often (DIV), have more segments (NUMSEG), and are significantly larger in size (SIZE). At the same time, CFR firms have Big-N auditors less frequently and lower absolute value of the change in earnings divided by the change in operating cash flows (CHG_E_C), lower current ratios (CR), lower market to book ratio (MB), and a lower probability of experiencing a loss (LOSS), relative to the control firms. These significant differences between CFR firms and the control firms indicate these are potential determinant variables to predict the likelihood of firms that will issue a CFR.

In Panel B of Table 1, we report descriptive statistics for the cross-sectional variables of firms with overstated CFRs (i.e., the restated operating cash flows are less than the original operating cash flows). We also examine the difference in the cross-sectional variables of overstated CFRs before and after the SEC allowance period. The mean abnormal volume reaction to restatement announcements over a three-day period is 0.058 and is significant at the 1% level. Similarly, the mean abnormal price reaction to restatement announcements over a three-day period is 0.015 and is significant at the 5% level. The volume reaction to CFR in the post-SEC allowance period is less significant than that in the pre-SEC allowance period (CARV = 0.036). Additionally, the price reaction to CFRs in the pre-SEC allowance period is significantly more negative than that in the post-SEC allowance period. These significant volume and price reactions suggest that announcements of overstated CFRs are informative for investors and the information content of CFRs may be affected by the SEC guidance in the post-SEC allowance period. In later analyses, we test whether these reactions are maintained in a multivariate setting.

There are other significant differences in the pre- and post-SEC Allowance period regarding firms with overstated CFRs as reported in Panel B of Table 1. First, CFR firms restated more years of cash flows in the pre-SEC allowance period than they restated in the post-SEC allowance period (NUM_YRS = 0.475). CFR firms that restated cash flows in the pre-SEC allowance period were significantly larger in size and higher levels of debt than those that restated in the post-SEC allowance period (SIZE = 0.604, DEBT = 0.052), which suggests the characteristics of a CFR firm may have changed in the post-SEC allowance period.

As reported in Panel B of Table 1, the mean change in operating cash flows (CFO_CHG) after a CFR is 0.047 and approximately 36% of firms with overstated CFRs report no changes in total cash flows, which suggests that classification shifting may have occurred for 64% of the CFR firms. This result suggests that these firms inflate operating cash flows by shifting amounts within the three categories of cash flows on the statement of cash flows. It is interesting to note that the SEC initiated investigations into approximately 7% of these firms in both the pre- and post-SEC allowance period.

Panel A of Table 2 presents the Pearson correlation coefficients for our full sample of CFR and control firms. The correlation between CFRs and the post-SEC allowance period is negative and significant at the 1% level (-0.025), which indicates that firms issued more restatements in the pre-SEC allowance period. There is a positive and significant correlation between CFR and CFO_FC (0.207), which suggests that analysts issue more forecasts of operating cash flows for CFR firms than for control firms. This is consistent with managerial opportunism incentives to meet or beat the analysts' forecasts. Furthermore, there is a positive and significant correlation between CFR firms and discontinued operations (DO), accruals (ACC), debt (DEBT), return on assets (ROA), issuance of dividends (DIV), the number of segments (NUMSEG) and the size of the firm (SIZE). There is a significantly negative correlation between CFR firms and the absolute value of the change in earnings divided by the change in operating cash flows (CHG_E_C), current ratio (CR), a Big_N auditor, market to book ratio (MB), and the probability of experiencing a loss (LOSS). The results of the Pearson correlation tests in Panel A of Table 2 are consistent with the results of univariate tests reported in Panel A of Table 1.

Table 1
Descriptive statistics.

Variable	Full sample			CFR = 1			CFR = 0			Difference
	Mean	Std Dev	Median	Mean	Std Dev	Median	Mean	Std Dev	Median	
Panel A: Determinants of cash flow restatements										
POST	0.455***	0.157	0.000	0.423***	0.169	0.000	0.487***	0.146	0.000	−0.063***
CFO_FC	0.612***	0.359	0.000	0.922***	0.268	1.000	0.302***	0.450	0.000	0.620***
CHG_E_C	3.293***	7.650	0.893	2.970***	7.036	0.872	3.616***	8.264	0.913	−0.646***
DO	0.234***	0.392	0.000	0.323***	0.468	0.000	0.146***	0.317	0.000	0.177***
CR	2.374***	3.240	1.510	1.882***	2.311	1.386	2.866***	4.170	1.635	−0.983***
ACC	−0.376***	2.082	−0.072	−0.137***	0.750	−0.066	−0.615***	3.414	−0.078	0.478***
DEBT	0.214***	0.204	0.169	0.243***	0.177	0.229	0.185***	0.231	0.109	0.058***
ROA	−0.143***	0.817	0.027	0.027*	0.137	0.038	−0.313***	1.497	0.016	0.340***
DIV	0.494***	0.459	0.000	0.686***	0.464	1.000	0.302***	0.453	0.000	0.384***
BIG_N	0.783***	0.377	1.000	0.769***	0.261	1.000	0.797***	0.493	1.000	−0.027***
NUMSEG	2.177***	2.085	1.000	2.888***	2.458	3.000	1.465***	1.713	1.000	1.423***
SIZE	7.311***	2.404	7.731	8.889***	1.945	9.115	5.732***	2.863	6.346	3.157***
MB	0.076***	0.244	0.016	0.034***	0.143	0.010	0.119***	0.346	0.022	−0.085***
LOSS	0.338***	0.442	0.000	0.182***	0.386	0.000	0.493***	0.497	0.000	−0.311***
n	78,541			189			78,352			

Variable	CFR = 1			Pre-SEC Allowance Period			Post-SEC Allowance Period			Difference
	Mean	Std Dev	Median	Mean	Std Dev	Median	Mean	Std Dev	Median	
Panel B: Cross-sectional determinant variables of overstated CFR's										
CARV	0.058***	0.248	0.010	0.075***	0.283	0.011	0.040***	0.037	0.018	0.036**
CAR3	0.015**	0.102	−0.001	−0.019*	0.116	0.001	0.050*	0.101	0.004	−0.069**
CFO_CHG	0.047***	0.026	0.007	0.045***	0.066	0.017	0.050***	0.078	0.008	−0.005
SHIFT	0.360***	0.487	0.000	0.376***	0.487	0.000	0.345***	0.478	0.000	0.031
NUM_YRS	1.735***	0.765	1.000	1.972***	0.726	2.000	1.498***	0.532	1.000	0.475***
CAR	0.072***	0.088	0.032	0.057***	0.102	0.019	0.087**	0.237	0.029	−0.030
SEC	0.071***	0.223	0.000	0.073***	0.262	0.000	0.069*	0.255	0.000	0.004
MBE	0.356***	3.154	0.000	0.138***	0.346	0.000	0.575***	2.341	0.000	−0.437*
SIZE	6.934***	2.646	5.695	7.236***	2.523	7.010	6.632***	1.896	6.500	0.604***
DEBT	0.211***	0.205	0.026	0.237***	0.199	0.196	0.185***	0.195	0.121	0.052**
ER	−0.016***	0.782	0.000	−0.015**	0.063	0.000	−0.016***	0.024	0.000	0.002
n		189			109			80		

***, **, * are significant at the 1%, 5%, and 10% levels. POST equals 1 if after the SEC Allowance Period, and 0 otherwise. CFO_FC equals 1 if at least one cash flow forecast was issued for the firm during the current year, and 0 otherwise. CHG_E_C equals the absolute value of the change in earnings divided by the change in operating cash flows. DO equals 1 if the firm reports discontinued operations, and 0 otherwise. CR equals the current assets divided current liabilities. ACC is the firm's operating accruals calculated as income before extraordinary items less operating cash flows. DEBT is the total long-term debt divided by total assets. ROA is net income divided by total assets. DIV equals 1 if the firm paid cash dividends in the current year, and 0 otherwise. BIG_N equals 1 if the firm is audited by a Big N firm, and 0 otherwise. NUMSEG is the number of business segments for the firm. SIZE is the log of total assets. MB is the market value of equity divided by the book value of equity. LOSS equals 1 if the firm reports negative income before extraordinary items or negative operating cash flow, and 0 otherwise. CARV the mean adjusted daily percentage of outstanding shares traded, accumulated over a two day period from day −1 to day 0, where day 0 is the day the restatement was announced. CAR3 is the 3-day market adjusted abnormal return surrounding the restatement disclosure date. CFO_CHG is the difference between restated CFO and the original CFO divided by total restated assets. SHIFT equals 1 if original total cash flows equals restated total cash flows, and 0 otherwise. NUM_YRS is the number of years that are restated in the CFR. CAR is the absolute value of the cumulative market-adjusted return from day −1 to day 0. SEC equals 1 if there was an SEC investigation in the year of the restatement, and 0 otherwise. MBE equals 1 if the firm met or beat the consensus CFO forecast for the fiscal year, and 0 otherwise. ER is the amount of the earnings restatement divided by total restated assets. All continuous variables are winsorized at the 1st and 99th percentiles.

Panel B of Table 2 reports the Pearson correlations for the cross-sectional variables of overstated CFRs. There is a positive and significant relation between the abnormal volume reaction (CARV) and changes in operating cash flows (CFO_CHG). There is also a positive relation between the volume reaction (CARV) and the probability of a firm that meets or beats the consensus CFO forecast for the fiscal year (MBE). In addition, there is a significantly negative relation between the three-day price reaction (CAR3) and the change in operating cash flows (CFO_CHG). Since the majority of the determinant variables are significantly correlated, we control for these variables in our multiple regression.

4.2. Determinants of CFRs

In Table 3, we report the results of the determinants for CFRs. We show that the probability of a firm issuing a CFR restatement is significantly less in the post-SEC allowance period relative to the pre-SEC allowance period (POST = −0.0021), which suggests that firms are reluctant to issue a CFR in the post-SEC allowance period as the market may perceive this restatement negatively, or the reporting quality of cash flows is significantly enhanced in the post-SEC allowance period resulting in fewer CFRs.

Table 2
Pearson correlation coefficients.

Panel A: Correlations for determinants of cash flow restatements

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
(1) CFR														
(2) POST	*−0.025*													
(3) CFO_FC	*0.207*	*0.211*												
(4) CHG_E_C	*−0.013*	*0.022*	*−0.045*											
(5) DO	*0.091*	*0.006*	*0.161*	*0.007*										
(6) CR	*−0.042*	*0.014*	*−0.105*	*0.011*	*−0.074*									
(7) ACC	*0.027*	*0.015*	*0.101*	*−0.091*	*0.031*	*−0.048*								
(8) DEBT	*0.035*	*0.018*	*0.135*	*0.022*	*0.126*	*−0.215*	*0.004#*							
(9) ROA	*0.038*	*0.019*	*0.162*	*−0.123*	*0.035*	*0.082*	*0.464*	*−0.025*						
(10) DIV	*0.123*	*0.045*	*0.261*	*−0.090*	*0.138*	*−0.136*	*0.118*	*0.081*	*0.178*					
(11) BIG_N	*−0.106*	*−0.024*	*0.416*	*0.006&*	*0.156*	*−0.076*	*0.138*	*0.134*	*0.249*	*0.306*				
(12) NUMSEG	*0.141*	*−0.021^*	*0.270*	*−0.036*	*0.199*	*−0.123*	*0.073*	*0.001#*	*0.085*	*0.217*	*0.312*			
(13) SIZE	*0.174*	*0.139*	*0.496*	*−0.100*	*0.161*	*−0.160*	*0.256*	*0.174*	*0.468*	*0.501*	*0.528*	*0.275*		
(14) MB	*−0.037*	*−0.095*	*−0.133*	*0.007&*	*−0.058*	*0.084*	*0.014*	*−0.115*	*0.103*	*−0.006^*	*−0.129*	*−0.059*	*−0.155*	
(15) LOSS	*−0.090*	*0.026*	*−0.324*	*0.159*	*−0.091*	*0.111*	*−0.231*	*0.008*	*−0.314*	*−0.480*	*−0.381*	*−0.255*	*−0.478*	*−0.030*

Panel B: Correlations for cross-sectional determinant variables of overstated CFR's

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(1) CARV											
(2) CAR3	−0.178^										
(3) CFO_CHG	*0.473*	*−0.259*									
(4) POST	0.128&	0.175&	−0.074#								
(5) SHIFT	0.057#	−0.136&	0.061#	0.016#							
(6) NUM_YRS	*0.287*	−0.081#	0.017#	*−0.436*	−0.057#						
(7) CAR	0.169&	*0.586*	0.028#	0.068#	0.038#	−0.084#					
(8) SEC	−0.017#	0.029#	0.178^	−0.085#	0.157^	−0.061#	*0.235*				
(9) MBE	*0.234*	−0.081#	−0.048#	0.131#	0.018#	−0.015#	−0.051#	−0.017#			
(10) SIZE	0.265&	−0.157^	−0.087#	−0.142&	0.067#	0.198^	0.005#	−0.057#	*0.389*		
(11) DEBT	*0.213*	−0.128&	−0.069#	−0.192^	0.169^	0.174^	0.009#	−0.148#	−0.074#	0.076#	
(12) ER	*−0.368*	−0.012#	0.005#	0.051#	0.141&	0.147&	0.004#	0.041#	0.032#	0.082#	−0.139#

Correlations in italics, with a "^", and with a "&" are significant at the 1%, 5%, and 10% level, respectively. Correlations with a "#" are not significant. CFR equals 1 if the firm has a negative cash flow restatement in the current year, and 0 otherwise. POST equals 1 if after the SEC Allowance Period, and 0 otherwise. CFO_FC equals 1 if at least one cash flow forecast was issued for the firm during the current year, and 0 otherwise. CHG_E_C equals the absolute value of the change in earnings divided by the change in operating cash flows. DO equals 1 if the firm reports discontinued operations, and 0 otherwise. CR equals the current assets divided current liabilities. ACC is the firm's operating accruals calculated as income before extraordinary items less operating cash flows divided by total assets. DEBT is the total long-term debt divided by total assets. ROA is net income divided by total assets. DIV equals 1 if the firm paid cash dividends in the current year, and 0 otherwise. BIG_N equals 1 if the firm is audited by a Big N firm, and 0 otherwise. NUMSEG is the number of business segments for the firm. SIZE is the log of total assets. MB is the market value of equity divided by the book value of equity. LOSS equals 1 if the firm reports negative income before extraordinary items or negative operating cash flow, and 0 otherwise. All continuous variables are winsorized at the 1st and 99th percentiles. CARV is the mean adjusted daily percentage of outstanding shares traded, accumulated over a two day period from day −1 to day 0, where day 0 is the day the restatement was announced. CAR3 is the 3-day market adjusted abnormal return surrounding the restatement disclosure date. CFO_CHG is the difference between restated CFO and the original CFO divided by total restated assets. POST equals 1 if after the SEC Allowance Period, and 0 otherwise. SHIFT equals 1 if original total cash flows equals restated total cash flows, and 0 otherwise. NUM_YRS is the number of years that are restated in the CFR. CAR is the absolute value of the cumulative market-adjusted return from day −1 to day 0. SEC equals 1 if there was an SEC investigation in the year of the restatement, and 0 otherwise. MBE equals 1 if the firm met or beat the consensus CFO forecast for the fiscal year, and 0 otherwise. ER is the amount of the earnings restatement divided by total restated assets. All continuous variables are winsorized at the 1st and 99th percentiles.

We find that firms are more likely to issue a CFR when they have analysts' cash flow forecasts, discontinued operations, dividend issuances, more segments, are growth firms and are larger in size. These results are consistent with the results reported in Table 1. Also, firms are more likely to issue a CFR when they report a loss (LOSS = 0.0011). Interestingly, as reported in Panel A of Table 1, the probability of a CFR firm experiencing a loss is 18.2% relative to the probability of control firms of 49.3%. These results indicate that LOSS is a critical determinant of a CFR. That is, although it is less likely that a CFR firm reports a loss, it is more likely a firm reports a CFR if there is a loss. Similarly, in Panel A of Table 1, we find that CFR firms report higher levels of debt and returns on assets, and have Big_N auditors more frequently relatively to control firms. However, as reported in Table 3, after controlling for other variables, it is less likely that a firm reports a CFR if the firm has higher level of debt or return on assets, or has Big_N auditors. The results are consistent with the facts that (1) firms with Big_N auditors issue higher quality financial statements and are less likely to issue a restatement, and (2) firms with higher return on assets have less incentives to manage financial statements which may result in future restatements.

Table 3
Determinants of cash flow restatements.

Dependent variable = CFR

Variable	Parameter	Standard Error	*p* -value	Marginal Effect
Intercept	−0.0364***	0.0005	< 0.0001	
POST	−0.0021***	0.0002	< 0.0001	−0.0417
CFO_FC	0.0092***	0.0002	< 0.0001	0.0329
CHG_E_C	0.0000	0.0000	0.9043	0.0015
DO	0.0018***	0.0002	< 0.0001	0.0297
CR	0.0000	0.0000	0.5951	−0.0035
ACC	0.0002*	0.0001	0.0695	−0.0001
DEBT	−0.0016***	0.0004	0.0002	−0.0332
ROA	−0.0008***	0.0002	0.0006	−0.0197
DIV	0.0016***	0.0002	< 0.0001	0.0358
BIG_N	−0.0025***	0.0003	< 0.0001	−0.0369
NUMSEG	0.0006***	0.0000	< 0.0001	0.0267
SIZE	0.0017***	0.0001	< 0.0001	0.0278
MB	0.0010**	0.0005	0.0406	0.0014
LOSS	0.0011***	0.0002	< 0.0001	0.0349
Log Likelihood	39635.34			
Chi-Square	7958.84			
Pseudo R^2	6.21%			
n	78,541			

CFR equals 1 if the firm disclosed a negative cash flow restatement during the fiscal year, and 0 otherwise. POST equals 1 if after the SEC Allowance Period, and 0 otherwise. CFO_FC equals 1 if at least one cash flow forecast was issued for the firm during the current year, and 0 otherwise. CHG_E_C equals the absolute value of the change in earnings divided by the change in operating cash flows. DO equals 1 if the firm reports discontinued operations, and 0 otherwise. CR equals the current assets divided current liabilities. ACC is the firm's operating accruals calculated as income before extraordinary items less operating cash flows. DEBT is the total long-term debt divided by total assets. ROA is net income divided by total assets. DIV equals 1 if the firm paid cash dividends in the current year, and 0 otherwise. BIG_N equals 1 if the firm is audited by a Big N firm, and 0 otherwise. NUMSEG is the number of business segments for the firm. SIZE is the log of total assets. MB is the market value of equity divided by the book value of equity. LOSS equals 1 if the firm reports negative income before extraordinary items or negative operating cash flow, and 0 otherwise. All continuous variables are winsorized at the 1st and 99th percentiles.

4.3. Market volume reaction to cash flow restatements

Table 4 presents the results of the multivariate analyses of abnormal market reactions to announcements of CFRs. In Panel A of Table 4, we find that there is a significant abnormal volume reaction to restatements that reported downward changes to cash flows from operations (CFO_CHG = 0.058). That is, in general, the market finds CFRs to be informative, and investors engage in higher abnormal trading volume.

In Panel B of Table 4, we examine whether the volume reaction to changes in operating cash flows differs in the pre- and post-SEC allowance period. We find a significant trading volume reaction to changes in operating cash flows (CFO_CHG = 0.054). The coefficient of CFO_CHG × POST is 0.005 and is significant at the 5% level. This suggests that in the post period, investors are more able to revise their expectations of future discounted cash flows and interpret the restatement with higher degree of disagreement, which will, in turn, increase the volume of their trading activity surrounding the announcement of a restatement. In addition, the sum of the coefficients on (CFO_CHG + CFO_CHG × POST) is 0.059 and is significant at a 1% level. This indicates that the information effect remains significant in the post period.

In Panel C of Table 4, we investigate the effect of classification shifting on the volume reaction to changes in operating cash flows. We define classification shifting (SHIFT) as the misclassification of cash flows within the SCF, where the original total cash flows is equal to the restated total cash flows. In these cases, firms inflate operating cash flows by merely shifting amounts across the three categories within the statement of cash flows. We do not find a significant association between volume reaction to changes in operating cash flows when firms are suspected of classification shifting (CFO_CHG × SHIFT = 0.000). However, the absence of a classification shifting effect may not be reliably detected due to a lower power for our test given the sample size.

In Panels A, B, and C of Table 4, the coefficients of POST variable are positive but insignificant in these multivariate models. However, as reported in Panel B of Table 1, results of the univariate analysis, the mean value of trading volume reaction to CFRs is significantly positive in both the pre- and post-SEC allowance period, but less positive in the post-SEC allowance period relative to that in the pre-SEC allowance period. This result suggests that the trading volume reactions are associated with the changes in the cash flow from operations (CFO_CHG), and incrementally associated with the changes in the cash flow from operations in the post-SEC allowance period (CFO_CHG × POST). That is, the investors react to the changes in the cash flows from operations as CFRs are informative in the pre-SEC allowance period, and react incrementally as CFRs are more informative in the post-SEC allowance period.

In Panels A, B, and C of Table 4, we report that the trading volume increases as the number of years restated increases, as shown by a significantly positive coefficient on NUM_YRS. These results indicate that the levels of investors' disagreement about CFRs increase as the CFRs are restated for more periods. The coefficient of MBE is significantly positive, which suggests that the trading volume or the investors' level of disagreement about CFRs increases as the CFR firms meet or beat analyst's cash flow forecasts. The

Table 4
Multivariate analysis of abnormal volume re actions to cash flow restatements.

Variable	Parameter	S.E.	*t* Value	Pr > |t|
Panel A: Abnormal volume reaction to cash flow restatements				
Dependent variable = CARV				
Intercept	0.113***	0.003	3.85	< 0.0001
CFO_CHG	0.058***	0.019	2.97	0.0033
POST	0.046	0.036	1.28	0.2025
SHIFT	−0.025	0.033	−0.77	0.4445
NUM_YRS	0.012***	0.002	4.88	< 0.0001
CAR	0.132	0.192	0.69	0.4938
SEC	0.072	0.070	1.04	0.3020
MBE	0.016***	0.006	2.77	0.0062
SIZE	0.013	0.015	0.86	0.3934
DEBT	0.002**	0.001	2.22	0.0274
ER	−0.048***	0.017	−2.82	0.0054
n	189			
Adj. R^2	30.8%			
Panel B: The effect of the post-SEC allowance period on volume reaction				
Dependent variable = CARV				
Intercept	0.113***	0.003	3.71	< 0.0001
CFO_CHG	0.054***	0.019	2.79	0.0059
POST	0.029	0.046	0.64	0.5224
CFO_CHG × POST	0.005**	0.000	2.37	0.0189
SHIFT	−0.029	0.039	−0.75	0.4573
SHIFT × POST	−0.005	0.071	−0.08	0.9396
NUM_YRS	0.012***	0.002	4.94	< 0.0001
CAR	−0.004	0.201	−0.02	0.9822
SEC	0.073	0.069	1.06	0.2916
MBE	0.015***	0.006	2.65	0.0088
SIZE	0.015	0.015	1.00	0.3198
DEBT	0.002**	0.001	2.30	0.0225
ER	−0.050***	0.017	−2.96	0.0034
n	189			
Adj. R^2	32.1%			
	Mean	*F − value*	*Pr > F*	
CFO_CHG + CFO_CHG × POST	0.059	7.920	0.006	
Panel C: The effect of classification shifting on volume reaction				
Dependent variable = CARV				
Intercept	0.113***	0.003	3.70	< 0.0001
CFO_CHG	0.054***	0.019	2.78	0.0060
POST	0.029	0.046	0.64	0.5240
CFO_CHG × POST	0.005**	0.000	2.36	0.0190
SHIFT	−0.030	0.040	−0.76	0.4480
CFO_CHG × SHIFT	0.000	0.000	0.19	0.8530
NUM_YRS	0.012***	0.002	4.93	< 0.0001
CAR	−0.005	0.201	−0.02	0.9820
SEC	0.074	0.070	1.06	0.2900
MBE	0.015***	0.006	2.64	0.0090
SIZE	0.015	0.015	0.99	0.3220
DEBT	0.002**	0.001	2.29	0.0230
ER	−0.050***	0.017	−2.96	0.0040
n	189			
Adj. R^2	31.8%			
	Mean	*F − value*	*Pr > F*	
CFO_CHG + CFO_CHG × POST	0.059	0.720	0.3969	
CFO_CHG + CFO_CHG × SHIFT	0.054	0.160	0.6870	

CARV is the mean adjusted daily percentage of outstanding shares traded, accumulated over a two day period from day −1 to day 0, where day 0 is the day the restatement was announced. CFO_CHG is the difference between restated CFO and the original CFO divided by total restated assets. POST equals 1 if after the SEC Allowance Period, and 0 otherwise. SHIFT equals 1 if original total cash flows equals restated total cash flows, and 0 otherwise. NUM_YRS is the number of years that are restated in the CFR. CAR is the absolute value of the cumulative market-adjusted return from day −1 to day 0. SEC equals 1 if there was an SEC investigation in the year of the restatement, and 0 otherwise. MBE equals 1 if the firm met or beat the consensus CFO forecast for the fiscal year, and 0 otherwise. SIZE is the log of total assets. DEBT is the total long-term debt divided by total assets. ER is the amount of the earnings restatement divided by total restated assets. All continuous variables are winsorized at the 1st and 99th percentiles.

Table 5
Multivariate analysis of abnormal price re actions to cash flow restatements.

Variable	Parameter	S.E.	*t* Value	Pr > |t|
Panel A: Abnormal price reaction to cash flow restatements dependent variable = CAR3				
Intercept	−0.004	0.032	−0.12	0.9010
CFO_CHG	−0.017***	0.003	−5.00	< 0.0001
POST	−0.012	0.018	−0.69	0.4920
SHIFT	0.011	0.019	0.56	0.5750
NUM_YRS	0.025	0.160	0.15	0.8780
SEC	0.018	0.038	0.48	0.6290
MBE	0.004	0.003	1.47	0.1440
SIZE	0.065	0.484	0.13	0.8940
DEBT	0.014	0.043	0.32	0.7500
ER	−0.005	0.011	−0.40	0.6870
n	189			
Adj. R^2	14.9%			
Panel B: The effect of the post-SEC allowance period on price reaction dependent variable = CAR3				
Intercept	0.001	0.015	0.09	0.9290
CFO_CHG	−0.021***	0.006	−3.65	0.0000
POST	−0.023	0.022	−1.03	0.3060
CFO_CHG × POST	0.007	0.007	1.06	0.2900
SHIFT	0.003	0.023	0.15	0.8840
SHIFT × POST	0.019	0.036	0.51	0.6120
NUM_YRS	0.028	0.138	0.20	0.8400
SEC	0.029	0.037	0.76	0.4460
MBE	0.004	0.003	1.46	0.1480
SIZE	0.015**	0.007	2.08	0.0400
DEBT	0.021	0.043	0.48	0.6300
ER	−0.004	0.011	−0.34	0.7360
N	189			
Adj. R^2	17.8%			
	Mean	*F-value*	*Pr > F*	
CFO_CHG + CFO_CHG × POST	−0.013	11.420	0.0010	
Panel C: The effect of classification shifting on price reaction dependent variable = CAR3				
Intercept	−0.002	0.014	−0.14	0.8880
CFO_CHG	−0.021***	0.006	−3.77	0.0000
POST	−0.017	0.018	−0.96	0.3390
CFO_CHG × POST	0.008	0.007	1.25	0.2150
SHIFT	0.011	0.019	0.59	0.5570
CFO_CHG × SHIFT	−0.001	0.001	−0.84	0.4010
NUM_YRS	0.036	0.137	0.26	0.7920
SEC	0.029	0.037	0.78	0.4380
MBE	0.004	0.003	1.42	0.1580
SIZE	0.014*	0.007	1.91	0.0580
DEBT	0.030	0.044	0.67	0.5020
ER	−0.004	0.011	−0.35	0.7260
N	189			
Adj. R^2	18.1%			
	Mean	*F−value*	*Pr > F*	
CFO_CHG + CFO_CHG × POST	−0.013	10.700	0.0014	
CFO_CHG + CFO_CHG × SHIFT	−0.022	14.850	0.0002	

CAR3 is the 3-day market adjusted abnormal return surrounding the restatement disclosure date. CFO_CHG is the difference between restated CFO and the original CFO divided by total restated assets. POST equals 1 if after the SEC Allowance Period, and 0 otherwise. SHIFT equals 1 if original total cash flows equals restated total cash flows, and 0 otherwise. NUM_YRS is the number of years that are restated in the CFR. SEC equals 1 if there was an SEC investigation in the year of the restatement, and 0 otherwise. MBE equals 1 if the firm met or beat the consensus CFO forecast for the fiscal year, and 0 otherwise. SIZE is the log of total assets. DEBT is the total long-term debt divided by total assets. ER is the amount of the earnings restatement divided by total restated assets. All continuous variables are winsorized at the 1st and 99th percentiles.

coefficient on ER is significantly negative, which indicates that the trading volume or investors' level of disagreement about CFRs increases as earnings are restated downward.

4.4. Market price reaction to cash flows restatements

In Table 5, we report the results for our multivariate analyses of abnormal price reactions to CFR announcements. In Panel A of

Table 5, we find that there is a significantly negative abnormal price reaction to changes in cash flows from operations (CFO_CHG = −0.017). This suggests that investors may perceive downward restatements of operating cash flows as indicative of opportunistic managerial conduct.

In Panel B of Table 5, we examine whether the impact of the price reaction to changes in operating cash flows differs in the pre- and post-SEC allowance period. We find a significantly negative price reaction to changes in operating cash flows in the pre-SEC allowance period (CFO_CHG = −0.021). However, we find that there is no incremental price reaction to operating cash flows in the post-SEC allowance (CFO_CHG × POST = 0.007). It appears as though the negative price reaction to changes in operating cash flows is similar in the pre- and post-SEC allowance period. However, the sum of the coefficients for the post-SEC allowance period (CFO_CHG + CFO_CHG × POST) is significantly negative at the 1% level. This result indicates that even though the market reaction is not significantly different between the pre- and post-SEC allowance period, the overall reaction is still negative in the post period. This finding is consistent with our volume reaction results. In general, it appears that investors perceive downward restatements of operating cash flow in the pre-SEC allowance period as an indication of intentional, or even fraudulent, managerial actions to increase operating cash flows as shown by the positive (negative) association of market volume (price) reactions and the changes in the operating cash flows reported in overstated CFRs.

In Panel C of Table 5, we investigate the effect of classification shifting on the price reaction to changes in operating cash flows. We do not find any evidence that investors respond differently to changes in operating cash flows when firms are suspected of classification shifting. Investors respond negatively to the mere act of a cash flow restatement regardless of whether classification shifting occurs or does not occur.

5. Summary and conclusions

We examine the economic determinants and market consequences of cash flow restatements that firms issued from 2002 to 2014. We analyze the information content of CFRs and explore whether the informativeness of CFRs changed subsequent to the SEC's allowance period, which instructed firms on the proper classification and categorization of different types of cash flows within the statement of cash flows. Overall, we find that firms are more likely to issue a CFR when analysts' issue cash flow forecasts, report discontinued operations, issue dividends, have more segments, are growth firms, are larger in size, or have a loss. However, it is less likely that a firm reports a CFR if the firm has a higher level of debt, higher return on assets, or has a Big_N auditor.

We also find that CFRs are informative for investors. Specifically, we show that there is a significant abnormal trading volume reaction to overstated operating cash flows. This indicates that, on average, the market finds CFRs to be informative with some investor disagreement, and investors engage in higher abnormal trading volume in the two days surrounding the announcement of the restatement. We find there is an incremental increase in the sensitivity of trading to CFR magnitudes in the post-SEC period. We also find that there is a significantly negative abnormal price reaction to negative changes in operating cash flows. This suggests that investors may perceive downward restatements of operating cash flows as an indication of opportunistic managerial conduct.

When firms may be classification shifting, we find no significantly different association between trading volume or market return reactions to CFRs. This is consistent with the market not differentiating between whether classification shifting occurs or does not occur. The market seems to recognize CFRs similarly with negative market consequences.

In summary, we find that cash flow restatements are important economic events and contain information for the capital market. Also, greater abnormal trading volume reaction signifies a greater degree of difference among individual investors' beliefs about CFRs subsequent to the SEC allowance period. Our results do not depend on observations with concurrent earnings restatements, are robust, and our inferences are not affected by firms that restated cash flows during the SEC's allowance period. Exploring the relation between the change in operating cash flows and earnings restatements could be an interesting avenue for future research.

The evidence is consistent with disagreement among investors about the implications of CFRs prior to the SEC's guidance and with an increase in disagreements among investors after the SEC's allowance period. Also, classification shifting does not appear to influence the trading volume or market reaction any differently from just the act of a mere cash flow restatement. Our findings have important implications for standard setters and investors seeking to determine economic determinants and consequences of cash flow restatements, as well as the current state of market perceptions of cash flow restatements compared to those prior to the SEC allowance period.

Appendix A. Examples of cash flow restatements

Panel A: Downward cash flow restatement with a change in total cash flows

Greenshift Corporation
Consolidated statements of cash flows
For the year ended December 31, 2008

	Restated 2008	Original 2008
Net cash provided by (used in) operating activities	1,096,811	3,419,511

Net cash provided by (used in) investing activities	(9,877,219)	(10,910,629)
Net cash provided by (used in) financing activities	8,732,837	7,292,620
Net increase (decrease) in cash	(47,571)	(198,498)
Cash at beginning of period	55,491	486,993
Cash at end of period	7920	288,495

Panel B: Cash flow restatement with no change in total cash flows

Clarcor Inc.
Consolidated statements of cash flows
For the year ended December 31, 2012

	Restated 2012	Original 2012
Net cash provided by (used in) operating activities	135,849	135,849
Net cash provided by (used in) investing activities	(42,128)	(51,210)
Net cash provided by (used in) financing activities	(64,873)	(55,791)
Net increase (decrease) in cash	28,848	28,848
Net effect of exchange rate changes on cash	649	649
At beginning of period	155,999	155,999
Cash at end of period	185,496	185,496

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