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The Effect of SOX 404(b) on Large Non-Accelerated Filers' Earnings Per Share Rounding Behavior

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Accounting Honors Thesis
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Abstract

I examine whether firms with the ability to manipulate earnings per share (EPS) rounding and the incentive to defer the Sarbanes-Oxley Act of 2002 Section 404(b) (SOX 404(b)) compliance round down EPS to understate earnings before a public float evaluation in the second fiscal quarter. I build on existing literature that acknowledges some firms may manipulate the post-decimal (thousandths) digit of EPS and that firms near the SOX 404(b) public float compliance threshold may initiate avoidance techniques to defer the marginal cost of an Internal Controls over Financial Reporting (ICFR) external audit. By comparing the rounding behavior of accelerated filers and non-accelerated filers with public floats between $\pm 20\%$ of \$75 million, I provide evidence that profitable non-accelerated filers faced with the marginal SOX 404(b) compliance costs have a higher likelihood of rounding down their diluted EPS to the nearest cent in the first fiscal quarter compared to accelerated filers in the same quarter. These results are consistent with non-accelerated filers managing reported EPS to avoid costly compliance with SOX 404(b).

Introduction

There is a large literature on the Sarbanes-Oxley Act of 2002 (SOX) in accounting, economics, finance, law, and political science. I draw on this literature to explore how SOX changed business practices in the 21st century. SOX compliance is a challenging undertaking for new accelerated filers, and I hypothesize that earnings management observed by larger firms under the pressure to meet analyst expectations could be adapted by a class of companies with different motivations. Firms near the public float threshold for SOX 404 compliance are under a different type of scrutiny that can cost millions of dollars in increased compliance costs if their public float increases by the end of the second fiscal quarter. If positive stock performance is tied to this outcome, then management is in a position where slight, yet recoverable periods of unattractiveness in the stock market may be advantageous. My hypothesis is that if firms have the incentive to either intentionally round down, or avoid rounding up, their EPS in the quarter preceding their public float evaluation, then non-accelerated filers may be more likely to round down EPS specifically in the first fiscal quarter than accelerated filers. My initial descriptive statistics are promising, and a difference-in-difference regression analysis reveals that non-accelerated filers in the first fiscal quarter may be more likely to round down their diluted EPS than accelerated filers. This observation is consistent exclusively in the first fiscal quarter.

For the purposes of this paper, SOX 404 will always imply the audit component of SOX 404, unless stated otherwise. Part 1 will examine the business and political climate preceding the Sarbanes-Oxley Act of 2002 and its general effects. Part 2 will provide a more detailed review of SOX 404 (one of the costliest sections of SOX), discuss its effects in the market, and review literature supporting the occurrence of SOX 404 avoidance techniques. Part 3 will explore the existing literature on earnings management, providing evidence of firms intentionally

manipulating both earnings and EPS. Part 4 will outline the sampling method, descriptive statistics, and methods used to test the hypothesis. Finally, part 5 will conclude by interpreting the results in Part 4 and identifying areas for additional research.

Part 1: SOX Legislative History

Passed in the wake of several high-profile corporate scandals, SOX became one of the most influential statutes for business governance. Despite its 21st century enactment, its roots can be traced to corporate oversight debates in the 1990's, culminating with the tumultuous scandals of the early 2000's.

In the 1990's, corporate governance practices were changing. One notable point of contention was the proliferation of equity-based compensation, sparking debates over whether the market or regulation should be used to incentivize or enforce honesty. Some argued that stock options were an efficient way to encourage honesty from executives, with all shareholders benefiting from actions taken to raise stock prices. However, others were skeptical that this would lead to earnings manipulation and falsely inflated trading prices (Holmstrom and Kaplan 2003). Ultimately, executives' short-sighted behavior to obscure their losses and bolster stock value resulted in several high-profile scandals, redefining modern business practices and amplifying public divisions about corporate responsibility.

These concerns over incentivized and enforced honesty were validated after Enron was discovered using special purpose entities (SPEs) to conceal their unsustainable debt. Enron's failure was viewed as a market failure since investors were still trading shares for \$30-\$40 immediately before its downfall. Policy makers also viewed this as a failure of the public accounting profession. Arthur Andersen, Enron's auditor at the time, did not insist on Enron disclosing their use of SPEs,

and the audit firm also presided over several high-profile scandals of the early 2000's. As a result, there was growing sentiment that corporations could not be responsible with their shareholders' money (Ribstein 2002). With the attitude towards 'big business' becoming more critical (Romano 2005), corporate reform was considered a viable option.

The haste in which SOX was passed into law has been a topic of debate for almost 20 years. While some saw SOX as a method of restoring investor confidence during a stock market decline (Romano 2005), others used it to appear tough on corruption for the upcoming midterm elections, while a few even considered it an opportunity to revisit previously lost causes. For example, former SEC chair Arthur Levitt spearheaded the segregation of audit and non-audit services for audit clients in 2000 and became a trusted Democratic advisor later in 2002. With the political atmosphere shifting in his favor, the Senate succeeded in adding Section 201 to the bill, accomplishing Levitt's goal (Romano 2005). The act itself took less than a year to pass, leaving little room for researching the economic effects of the activities that SOX aimed to curtail.

There was abundant evidence at the disposal of lawmakers if they were curious about the economic consequences of their actions. Romano (2005) examined 25 studies from before 2002 that appraised the audit quality of companies accepting audit and non-audit services from the same audit firm. 19 concluded that it was a nonproblem, with 15 determining no significant correlation between non-audit engagements and audit quality (Romano 2005). Thus, analysts were concerned that future audits with increased independence could lead to reduced access to information, potentially leading to poorer audit quality and a counterproductive effect of the Act (Ribstein 2002). Despite the available expertise on the subject, only 8 academics and policy analysts combined out of 65 total witnesses were given the floor when SOX was up for debate (Romano

2005). Congress' failure to put such a far-reaching section under any objective level of scrutiny represents a fraction of this law's cost since its enactment.

From its inception, SOX greatly influenced corporate governance practices. The main objectives of this law were to establish further auditor independence, mandate additional disclosures, and make audit firms and executives more responsible for their actions. This was implemented by establishing the Public Company Accounting Oversight Board (PCAOB) to monitor the performance of audit firms. In order to ensure the independence of the PCAOB, its governance board membership was limited to only two former CPA's (Sarbanes-Oxley Act of 2002). In addition, SOX restricted non-audit services for audit clients and mandated the rotation of an audit partner after 5 years. Further limitations were applied on audit clients where senior managers may have had former experience with their audit firms (Ribstein 2002).

In direct response to upper management's actions after the Enron and WorldCom scandals, Section 404(a) required management's personal appraisal of Internal Controls over Financial Reporting (ICFR) (Ashbaugh-Skaife et. al 2008). In addition to management's testing, Section 404(b), arguably the most costly section of SOX, stated that "each registered public accounting firm that prepares or issues the audit report for the issuer shall attest to, and report on, the assessment made by the management of the issuer.... *Any such attestation shall not be the subject of a separate engagement*" (italics and parentheses added) (Sarbanes-Oxley Act of 2002). To augment the actions taken to improve accountability and scope, Section 906(c) imposed a penalty of up to \$5 million or 20 years in prison to anyone who knowingly falsified anything mandated in the Act (Sarbanes-Oxley Act of 2002). This law succeeded in both satisfying representatives concerned about their reputation and stakeholders who felt that legislation was necessary to promote a more trustworthy market for investors.

The bill's opponents based most of their arguments on the ideology that the market can identify firms that are irresponsible with shareholder wealth (Ribstein 2002). Many of SOX's target behaviors already had preexisting market consequences, suggesting that shareholders already had the power to demand the extent of corporate disclosures. For example, before 2002, stock prices fell for companies that had significant off-balance sheet transactions (Romano 2005). This may be because some corporate governance practices, though permissible, were suggestive enough about fiscal health; thus, corporations with fewer incentives to conceal information would disengage from unhealthy behaviors. The variety of state corporate laws also provided an opportunity for market-based alternatives to regulations. Since each state has different corporate governance laws, firms can deliberately decide where to incorporate. One prominent example is the prevalence of firms incorporating in Delaware. While the so-called "Delaware loophole" has been cited as an inherent flaw in this system, proponents would argue that this is simply a sign of "smart shopping". In fact, both Enron and WorldCom, notorious for their corporate scandals, were both incorporated outside of Delaware where anti-takeover provisions were more stringent (Ribstein 2002). It was argued that firms unconcerned about takeovers would incorporate themselves in another state, both to pursue other opportunities and avoid sending a pessimistic message about their stock outlook.

Those in favor of market-based regulatory solutions argue that if shareholders valued information enough to justify its costs, then disclosing it would have been a natural expectation in the open market. The rational is that by giving firms the choice between disclosure and non-disclosure, their decision would not only suggest the firm's willingness to be transparent, but also take their owners' expectations into consideration. Since none of SOX's mandates were previously

required by any of the 50 states or the District of Columbia, it could be inferred that investors were indifferent about this information and did not find it material in their appraisals (Romano 2005).

As a result, some researchers argued that government interference with disclosure requirements would only create an inconsequential ability to detect fraud. Increasing the scope of an audit that is only meant to provide reasonable assurance, unlike a forensic audit, commands a great cost from stakeholders while potentially doing little to uncover additional risk factors. In addition, with increased disclosure requirements, investors may not know how to use this information because they never demanded it in the first place. An adverse effect might also occur after increasing disclosure mandates; investors might seek false comfort that the government can put companies under greater scrutiny than market-based solutions (Ribstein 2002). Despite investor reactions to SOX disclosure requirements ranging from pessimism to indifference, the returns on the increased regulations are only questionable.

Even at great cost to firms, the effects of several sections of SOX may be ineffectual. For example, complete audit firm independence, while decreasing the chance of collusion with clients, can be a less effective method of gathering information. Without any insider knowledge whatsoever, the cost of obtaining information may increase, the audit team may not be able to identify high-risk components, and an adversarial relationship between the audit firm and the client may arise (Ribstein 2002). In addition, smaller and foreign firms trading in the US have fewer resources to commit to corporate governance practices that were intended for larger firms (Ribstein 2005 and Romano 2005). These implications will be further explored in the next section.

Some benefits did arise from the Act. While it is true that some financial analysts did predict Enron's collapse despite their off-balance sheet SPI's, in a free market scenario, they would have been motivated to protect their own self-interest. When analysts foresaw a failure of a firm

and wanted to warn outsiders, they would need to provide their rationale and risk exposing their modeling techniques, a competitive advantage in their industry (Ribstein 2002). Since SOX enforces greater disclosure for the sake of all stakeholders, more stakeholders have a chance to draw their own conclusions, provided they know how to interpret this new information.

However, increased regulation imposes an additional inefficiency. One of the broader consequences of SOX 404 is the increased price of audits due to a smaller pool of available audit firms registered with the PCAOB. In addition, Section 201 drastically reduced the advisory arms of audit firms, potentially exaggerating the oligopoly of the Big 3 consulting firms by greatly reducing the scope of the audit firms' consulting services (Ribstein 2002).

In response to a pessimistic business environment, SOX was presented to investors as a quick fix to a faltering economy and as a rallying cry for policymakers. SOX compliance has been a significant point of consideration for audit firms and industry alike, despite the lack of research conducted beforehand on its potential consequences. Now that the scope of SOX has been established, it is appropriate to examine its impacts on emerging businesses to understand their desire to avoid mandated compliance.

Part 2: A Detailed Review of SOX 404(b)

Mandated internal control requirements brought on by SOX 404(b) were not without precedent, but SOX was responsible for making it a basic expectation instead of an exception for specific industries. Before SOX, audit firms still required an understanding of ICFR in order to properly plan their audit (Ashbaugh-Skaife et. al 2008), but after the Federal Deposit Insurance Corporation Improvement Act of 1991, financial institutions became subject to internal control assessments. Between 1991 and 2002, non-financial institutions were only required to report ICFR

issues in their 8-K's during an auditor change (McVay 2011). This practice became more popular for regulators when in 1993, guidelines for voluntary ICFR disclosures were released. Despite this, only about 30% of companies volunteered to provide an extended report of their ICFR, and stock prices did not seem to be impacted by the corporations' choice to disclose (Kinney and Shepardson 2011).

SOX cleared the House of Representatives before Section 404 was added by the Senate. At the time, Congressman Christopher Cox stated that "the objective of Section 404 is to provide meaningful disclosure to investors without creating unnecessary compliance burdens or wasting shareholder resources" (Kinney and Shepardson 2011). In May and June 2003, the SEC first announced their intention to defer SOX 404 compliance (Weber and Yang 2018). Compliance was rolled out based on a firm's filing status, which is determined by the aggregate market value of shares held by firm outsiders (public float) at the end of the second fiscal quarter. Nonaccelerated filers are firms that have always had a public float of less than \$75 million on their yearly measurement dates, or any former accelerated filers that have had their public float drop below \$50 million on their measurement dates. Once a firm has a public float of over \$75 million, they become accelerated filers. Accelerated filers, assumed to have more resources, were expected to be compliant with SOX 404 about one year ahead of non-accelerated filers (Gao, Wu, Zimmerman 2009). However, after several subsequent deferrals, the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010 ultimately exempted non-accelerated filers from SOX 404(b) compliance with the addition of SOX 404(c) (Kinney and Shepardson 2011).

Firms have usually taken two general approaches to SOX 404 compliance: they can devote a few resources to compliance or invest more to make a return on it. One example of a return on SOX 404 investment includes finding convergence with SOX and other regulations and creating

seamless processes to fulfill both requirements. This also allows the company to improve their risk mitigation techniques. Regardless of a company's approach to compliance, it became common practice to increase the prevalence of automated controls. Automated controls pose a lower risk and reduce the extent and cost of controls testing. Over time, compliance processes have become more efficient since internal auditors improved at properly identifying high-risk controls to test (Wagner and Dittmar 2006).

SOX 404 compliance cost significantly more in its first year of implementation than in subsequent years. Companies lacked a clear control framework, so many opted to test each control for every process. However, as time went on, more cohesive control structures yielded additional benefits for firms. Since controls ultimately influence the quality of financial information, strong control infrastructure can positively influence mergers and acquisitions, foreign expansion, and long supply chains. SOX 404 has also incentivized firms to run a 'leaner' control environment, reducing maintenance and internal auditing costs (Wagner and Dittmar 2006). Despite these benefits, executive surveys have revealed that while 49% of executives believe their company is benefitting internally, 70% believe the costs outweigh the benefits (Eldridge and Kealey 2005). The repercussions of SOX 404 will be discussed further.

Internal control deficiencies (ICDs) result from negative findings during the SOX 404 attestation. ICDs occur "when the design or operation of a control does not allow management or its employees, in the normal course of performing their assigned functions, to prevent or detect misstatements on a timely basis", as a result of intentional or unintentional causes (Ashbaugh-Skaife et. al 2008). The most common weakness has been a lack of segregation of duties, especially when smaller firms lack the resources for effective staffing (Whalen and Hotham 2018). ICD likelihood decreases with firm size, but increases with complexity, company growth, and

organizational restructuring. As a result, higher-growth companies face issues with updating their ICFR framework in a timely manner (Eldridge and Kealey 2005). Approximately 70% of firms that reported ineffective internal controls reported effective internal controls in the following year (McVay 2011). This may be because before the first year of compliance, new accelerated filers never had an incentive to invest in a sound control structure, only to be prompted to invest more after a critical attestation (McVay 2011). Ultimately, the reduction of ICDs can lead to improved accrual quality, suggesting a reduction in errors or the curtailing of lax management policies (Ashbaugh-Skaife et. al 2008).

The total cost of SOX 404 can be divided into internal and external costs. In general, the total costs can be projected as a function of company size, growth, industry, and effectiveness of internal controls, with the SOX unit cost (cost per dollar of fixed assets) varying inversely with size. Internal costs, usually arising from management's attestation of internal controls and the preparation for the external audit, are harder to determine since many companies have not disclosed it. Most executives reported that these costs included hiring in-house GAAP experts (A.R.C. Morgan 2005), compiling documentation, implementing new processes, training staff, preparing annual reports, and hiring external consultants. However, the opportunity cost associated with staffing individuals on compliance rather than on value-added activities provides an additional obstacle for approximating the total internal cost (McVay 2011). Despite the SEC estimating SOX 404(a) compliance cost at \$91,000 per company in 2003, executive surveys reported that these costs were slightly less than \$500,000 (Eldridge and Kealey 2005). Furthermore, voluntary disclosures and additional surveys from the SEC estimated that internal costs represented approximately 62% of the cost of total SOX 404 compliance (Kinney and Shephardson 2011).

The external cost of SOX 404 is easier to estimate since audit fees are publicly disclosed in SGA expenses and management's discussion in the financial reports (A.R.C. Morgan 2005). In 2004, the first year of mandatory SOX 404 compliance, audit fees were significantly higher than in 2003, taking other macroeconomic variables into consideration. The increase was primarily attributable to the marginal cost of the external attestation of ICFR. This conclusion was validated by a sub sample of 97 firms that disclosed the components of their audit fees, citing SOX 404 compliance as a major contributor. Audit fees were typically higher for firms with ICDs. The SOX audit rate (dollar per thousand dollars of fixed assets) increased by approximately 38% for firms with ICDs. Financial service firms had a lower marginal unit cost than firms in other industries, partly because they were already subject to ICFR audits before SOX (Eldridge and Kealey 2005). In addition, due to the collapse of Arthur Andersen, contracting with large audit firms capable of performing a SOX audit was more imperative and expensive due to increased demand and decreased supply. Ultimately, the nominal increase in audit fees due to SOX was approximately \$1.3 million at the time (Iliev 2010). It is worth noting that this increase would have only been experienced by accelerated filers, since they had to be compliant with SOX 404, unlike non-accelerated filers. This could potentially create an incentive for small firms to avoid equity growth and defer the marginal compliance cost. The PCAOB's enhanced guidance for ICFR audits in Auditing Standard No. 5 may have reduced the marginal cost of a SOX 404 audit, but smaller firms received a lesser benefit compared to larger firms (Krishnan, Krishnan, Song 2011).

Smaller firms, the focus of my study, have been reported to receive a reduced marginal benefit from compliance compared to larger firms. SOX 404 compliance has been described as a somewhat fixed cost, due to the higher unit cost for small firms than for larger firms. This was partly due to economies of scale for larger firms, but also because smaller firms now need to

compete with larger firms for costlier audit firms, since the same audit firm must be responsible for the ICFR opinion and the non-SOX audit work (Sarbanes-Oxley Act of 2002). In the first year of SOX 404 compliance, small accelerated filers have seen their audit fees double and their share values fall. Some research has concluded that because of this, the market favors the deferral of SOX 404 for non-accelerated filers (Gao, Wu, Zimmerman 2009). Previous estimates for initial SOX 404 compliance were approximately \$1 million per \$1 billion in revenue, but smaller firms with less than \$2 billion in revenue experienced an average compliance cost of \$1.8 million per \$1 billion in revenue (A.R.C. Morgan 2005).

The lasting impacts of SOX 404 get more complicated. As with all regulations, compliance will take away time and resources from other functions. However, the additional oversight for ICFR can lead to greater accuracy in financial statements. Overall, compliance has been performed more efficiently over time since audit firms now have a greater understanding of compliance for their clients (Holmstrom and Kaplan 2003). However, small companies may still face pressure to stay small and avoid the audit fees due to the larger unit costs and fewer benefits from compliance. They might be intentionally doing this since they have a greater likelihood of disclosing bad news disclosures and lower earnings in the second quarter (Gao, Wu, Zimmerman 2009) and resorting to debt financing as non-accelerated filers and reverting to equity financing as accelerated filers (Weber and Yang 2018), all in an effort to either alter their share value or the amount of outstanding shares before their public float evaluation. A more extreme option is to 'go dark' and reduce the number of outside shareholders to fewer than 300 people. In 2003, studies showed that approximately 200 firms went dark, and out of the 114 firms that did so in 2004, 44 cited SOX as their primary motivator. However, this course of action is usually reserved for the companies with the weakest growth potential (Ribstein 2005). Now that the motivations and methods of deferral

techniques for SOX 404 have been observed, I will take a closer look at earnings management and apply it to SOX 404 compliance.

Part 3: An Overview of Earnings Management Techniques

Earnings management is any practice that is exercised to obscure a firm's actual financial performance (Malenko and Grundfest 2014). It can be difficult to distinguish intentional earnings management from ineffective accounting practices, but there is some literature that has attempted to distinguish between the two alternatives. Earnings management is usually observed by appraising accrual quality, the degree to which total accruals or working capital accruals map to past, present, and future cash flows. Firms with ICDs are more likely to make errors that add noise to accruals and have larger absolute values of accruals. This is where the distinction between unintentional and intentional actions is drawn: unintentional actions should lead to an equal distribution of abnormal positive and negative accruals, while intentional actions should lead to more abnormally positive accruals and fewer abnormally negative accruals (Ashbaugh-Skaife et. al 2008). There is evidence that actual and discretionary accruals are also managed to control public float (Iliev 2010). When managing earnings to manipulate public float, firms usually use discretion with GAAP, make short term changes in the first quarter to influence their second quarter evaluation, and are less likely to contract with a Big 4 audit firm (Nondorf, Singer, You 2012).

Earnings management has been observed in the rounding behavior of earnings. However, the existing literature documenting earnings management for public float evaluations has only used nominal measurements and has not documented the rounding behavior of earnings or EPS. Nominal earnings have been observed to round favorably when firms are striving to meet analyst

expectations and sustain performance. Profitable firms were more likely to report a round number (\$40 instead of \$39, for example), since it has the psychological effect of appearing to be a significantly greater number. Conversely, firms with losses were less likely to report a round number (-\$39 instead of -\$40, for example) because the loss appears substantially less. High growth firms are more likely to participate in rounding manipulation techniques (Das and Zhang 2003).

EPS has also been observed to round more favorably for firms with high analyst coverage. The term “quadrophobia” was dubbed to identify the chronic pervasiveness of firms to underrepresent the number 4 in the post-decimal digit of EPS. The frequency of post-decimal 4 for target firms was only 7.9% with an expected frequency of 10%, and companies with a history of quadrophobia were more likely to underrepresent a post-decimal 4 in the future. Additional analysis has suggested that higher EPS leads to fewer incentives to round up since the rounding effect produces less of a relative improvement. In addition, the closer EPS is to analysts’ expectations, the more likely it is to round up (Das and Zhang 2003). Firms with pervasive quadrophobia were more likely to restate financial statements and be defendants in SEC lawsuits (Malenko and Grundfest 2014). For example, in 2018, the SEC requested documentation of accounting practices for EPS calculation from companies that have reported a suspiciously unrepresentative amount of post-decimal 4’s in prior financial statements (Usvyatsky and Coleman 2019).

Firms with analyst expectations were the main sample for EPS rounding analyses. In the following section, the procedure for analyzing EPS rounding behavior for firms near the public float threshold for SOX 404 will be outlined.

Part 4: Sample Selection and Descriptive Statistics

Before discussing my findings, it is important to acknowledge some concerns raised by prior studies investigating small firms near the SOX 404 threshold. Previous studies have limited their samples to firms that report public float at the end of the second fiscal quarter. Since I am analyzing behavior from one quarter to the next, I adopt this practice to ensure that all firms in my sample view their first fiscal quarter as the quarter preceding their public float evaluation. In addition, I also eliminate financial services previously subject to ICFR disclosures (financial services firms with standard industry classifications (SICs) from 6000 to 6799) (Iliev 2010), newly public firms that did not have a second quarter public float evaluation (Nondorf, Singer, You 2012), and firms with ordinary losses in order to control the sample for firms that had positive earnings as an influencer for their stock prices. I also followed existing literature that has restricted observations to firms with public float ranging from $\pm 20\%$ of \$75 million (\$60 million to \$90 million) (Nondorf, Singer, You 2012). My sample covers fiscal years from 2011 to 2013, just after the Dodd-Frank Wall Street Reform Act of 2010. At that time, non-accelerated filers and smaller reporting companies were permanently exempted from SOX 404 (Kinney and Shepardson 2011).

I retrieve EPS data from Compustat's fundamental quarterly database. I obtain net income before extraordinary items, extraordinary items and income from discontinued operations, common shares used to calculate basic earnings per share, common shares used to calculate diluted earnings per share, fiscal year, and fiscal quarter (Compustat items `ibadjq`, `xidoq`, `cshprq`, `cshfdq`, `fyearq`, and `fqtr`, respectively). Firms' public float, evaluation quarter, and filing status were hand-collected from the SEC's EDGAR database and joined to the Compustat dataset. Observations with ordinary net losses, SICs between 6000 and 6799, and missing values for shares and filing status are eliminated from the sample. Observations with total net losses are removed from

analyses of EPS including extraordinary items. In addition, there were some instances of non-accelerated filers having a public float over \$75 million and accelerated filers having a public float below \$75 million; I remove both from the sample. The post-decimal digit was collected from the thousandths digit of $(\text{ibadjq} / \text{cshprq})$ for basic ordinary EPS, $(\text{ibadjq} + \text{xidoq}) / \text{cshprq})$ for basic EPS with extraordinary items, $(\text{ibadjq} / \text{cshfdq})$ for diluted ordinary EPS, and $(\text{ibadjq} + \text{xidoq}) / \text{cshfdq})$ for diluted EPS with extraordinary items.

My initial observations aggregate the rounding behavior of non-accelerated filers and accelerated filers by year, and then by quarter (Figure 1) before conducting a one-tailed two variable z test for differences in proportions. Initial results show that the proportion of non-accelerated filers' EPS rounding down is significantly greater at the 5% level for Q1 2011 for each type of EPS except diluted EPS with extraordinary items. In addition, the proportion of Q1 2012 EPS rounding down for non-accelerated filers was significantly greater for both types of diluted EPS, with ordinary diluted EPS significant at the 5% level and diluted EPS with extraordinary items significant at the 1% level.

To compensate for the limited observations when aggregating by year and then by quarter, I next compare rounding differences aggregating solely by quarter (Figure 2) and follow up with a one-tailed two variable z test for differences in proportions. In this analysis, the proportion of diluted EPS rounding down for non-accelerated filers was significantly greater in just the first fiscal quarter at the 5% level. Since both types of diluted EPS show a significant difference in only the first fiscal quarter, I believe these results are the most compelling evidence of targeted earnings management.

I follow up by aggregating my observations by fiscal quarter and then by post-decimal digit (Figures 3 and 4). My null hypothesis is that the proportion of each digit occurrence should be

approximately 10% of the total sample size for a given fiscal quarter. While there are a few differences in post-decimal digits exhibited by different types of filers across quarters, I do not conclude that any specific digit is responsible for the significant difference in rounding behavior for each type of filer. Instead, it appears that the difference in rounding behavior is consistent across most digits in the first fiscal quarter; only one digit between 0 and 4 has a smaller proportion of non-accelerated filers exhibiting it compared to accelerated filers, and only one digit between 5 and 9 has a greater proportion of non-accelerated filers exhibiting it compared to accelerated filers. Instead of a decreased likelihood to exhibit a specific digit, such as the phenomena referred to as quadrophobia (Malenko and Grundfest 2014), my digit-by-digit analysis suggests that overall rounding behavior is not being influenced by the avoidance or preference of any specific post-decimal digit.

My last analysis of the data is a difference-in-difference regression model for each type of EPS, aggregated by quarter. My model is as follows:

$$\text{ROUNDDOWN} = \alpha + \beta_1\text{Q1} + \beta_2\text{NAF} + \beta_3\text{Q1NAF} + \varepsilon$$

The variable ROUNDDOWN is the probability of EPS rounding down and having a post-decimal digit range from 0-4, Q1 is 1 if the observation was from the first quarter of the fiscal year and 0 if otherwise, NAF is 1 if the firm was a non-accelerated filer at the time and 0 if an accelerated filer, and Q1NAF is 1 if the data was from a non-accelerated filer in the first fiscal quarter and 0 for any other observation. Figure 5 outlines the coefficient values for each type of EPS. If my hypothesis is supported by my data, I would expect to see a significant positive coefficient for Q1NAF. As the results show, Q1NAF for ordinary diluted EPS and diluted EPS with extraordinary items was positive and statistically significant with t-values of 1.53 and 1.77, respectively. These results are statistically significant with a one-tailed t test at the 10% and 5% level, respectively.

These results are consistent with Malenko and Grundfest (2014) because these rounding anomalies are most prevalent in diluted EPS including extraordinary items. Their study observed greater rounding abnormalities in diluted EPS since outside decision makers place a greater emphasis on it over basic EPS (Malenko and Grundfest 2014), and my finding is also consistent with their conclusion that diluted EPS would be more susceptible to rounding abnormalities. If these rounding abnormalities are created with the intention of inducing a psychological effect on an investor and influencing their stock's attractiveness in the market, it would make the most sense that diluted EPS is the EPS type that exhibits a suggestive and statically significant coefficient for Q1NAF.

Part 5: Discussion and Conclusion

My results from part 4 are suggestive of an overall difference between non-accelerated and accelerated filers, but the significant coefficient of Q1NAF for diluted EPS with extraordinary items suggests that this difference may be unique to non-accelerated filers for just the first fiscal quarter. There are several reasons why this may be the case. Non-accelerated filers may have greater incentives to round down diluted EPS with extraordinary items, or accelerated filers are placed under more pressure to round up their EPS. If non-accelerated filers' management is placed under pressure to manage their public float leading up to a public float evaluation at the end of the second fiscal quarter, they must choose between either influencing the quantity of shares held by outsiders or the value of their stock. Both strategies are viable options, but slightly altering EPS has the benefit of not impacting a firm's financing structure in the long term. Regardless, it may be inferred that the cost associated with managing EPS are exceeded by the potential cost of SOX 404 compliance in as early as the next fiscal year.

Since the non-accelerated filers and accelerated filers in my samples are still roughly of equal size, using public float as a measurement of size, financial analyst coverage should be about the same, with the exception of the additional scrutiny faced by non-accelerated filers in a public float evaluation at the end of the second fiscal quarter. If investors are aware of the potential redirection of shareholder wealth towards SOX 404 compliance, then more attention may be placed on EPS in the months leading up to the evaluation, creating an opportunity for EPS rounding to have a psychological effect on investor's decision making. I find it especially compelling that my findings along with Malenko and Grundfest's both observe these significant EPS rounding differences in diluted EPS, arguably the most significant EPS type analysts use to assess firm performance (Malenko and Grundfest 2014).

I find it reasonable that the digit-by-digit analyses did not reveal a pervasive attractiveness or avoidance to any particular post-decimal digit in any quarter; most of the significant differences in the occurrence of specific digits appeared with digits that do not straddle the border between rounding up and rounding down (digits 4 or 5). I would be less convinced of any sort of fundamental EPS rounding differences if they manifested themselves exclusively in digits that did not straddle the rounding border, since this may suggest nothing more than noise. Since there is an overall lower likelihood of non-accelerated filers representing any of the digits that would cause EPS to round down, then this observation may be more suggestive than a statistical anomaly.

I am surprised to see these results almost a decade after the issuance of SOX. Despite the efforts by the PCAOB and Congress to make the ICFR audit of SOX 404 more manageable for small companies, SOX 404 still seems to be a hurdle for them. Perhaps this is a natural response for any firm placed in a position where they must choose between compliance expenses or dedicating those resources to value-added activities. Ironically, the SOX 404 compliance threshold

between non-accelerated and accelerated filers may be the reason why these rounding abnormalities exist, thus creating a situation where a law intended to increase transparency instead incentivizes obfuscating information.

Additional research should be directed towards scaling SOX 404's compliance requirement. Public float is representative of the public's stake in a company, and more research should be conducted on the market effects of companies straddling the compliance threshold with materially misstated financial statements. By determining the cost imposed when SOX 404 fails or when it is not present, more insight can be made on whether the compliance costs to avert this damage are worth it. The existing line between non-accelerated and accelerated filers was the arbitrary border set for SOX 404 compliance. Now, almost 20 years later, a more defined threshold should be set in order to protect small companies' resources and prioritize growth potential over compliance.

Figure 1

**Distribution of Rounding Down EPS
Aggregated by Year, Quarter**

Fiscal Year	Quarter	Basic EPS: Ordinary						Basic EPS: Including Extraordinary Items					
		N_NAF	P_NAF	N_AF	P_AF	z-value	p-value	N_NAF	P_NAF	N_AF	P_AF	z-value	p-value
2011	1	27	0.74	27	0.44	2.22	0.013	27	0.70	26	0.46	1.79	0.037
2011	2	29	0.41	26	0.35	0.52	0.303	28	0.39	25	0.36	0.25	0.403
2011	3	29	0.34	26	0.23	0.93	0.176	29	0.34	26	0.23	0.93	0.176
2011	4	28	0.46	30	0.43	0.24	0.406	27	0.48	28	0.46	0.13	0.449
2012	1	24	0.54	22	0.55	-0.03	0.490	22	0.59	21	0.48	0.75	0.225
2012	2	23	0.35	27	0.41	-0.43	0.333	22	0.32	27	0.44	-0.90	0.183
2012	3	25	0.40	23	0.61	-1.44	0.074	24	0.46	23	0.61	-1.03	0.151
2012	4	25	0.56	25	0.44	0.85	0.198	25	0.52	24	0.46	0.43	0.333
2013	1	15	0.33	25	0.56	-1.39	0.082	15	0.40	25	0.64	-1.48	0.070
2013	2	13	0.77	30	0.53	1.45	0.073	13	0.77	30	0.60	1.07	0.142
2013	3	11	0.45	29	0.52	-0.35	0.362	11	0.45	28	0.54	-0.46	0.324
2013	4	14	0.43	27	0.44	-0.10	0.461	14	0.43	27	0.44	-0.10	0.461

Fiscal Year	Quarter	Diluted EPS: Ordinary						Diluted EPS: Including Extraordinary Items					
		N_NAF	P_NAF	N_AF	P_AF	z-value	p-value	N_NAF	P_NAF	N_AF	P_AF	z-value	p-value
2011	1	27	0.63	27	0.37	1.91	0.028	27	0.59	26	0.42	1.23	0.109
2011	2	29	0.52	26	0.42	0.70	0.242	28	0.50	25	0.48	0.15	0.442
2011	3	29	0.31	26	0.31	0.02	0.492	29	0.28	26	0.31	-0.26	0.398
2011	4	28	0.36	30	0.40	-0.34	0.368	27	0.37	28	0.43	-0.44	0.330
2012	1	24	0.58	22	0.32	1.80	0.036	22	0.68	21	0.24	2.92	0.002
2012	2	23	0.30	27	0.37	-0.49	0.312	22	0.32	27	0.44	-0.90	0.183
2012	3	25	0.56	23	0.48	0.57	0.286	24	0.58	23	0.52	0.42	0.336
2012	4	25	0.52	25	0.60	-0.57	0.284	25	0.56	24	0.50	0.42	0.337
2013	1	15	0.33	25	0.44	-0.67	0.252	15	0.40	25	0.52	-0.74	0.231
2013	2	13	0.77	30	0.43	2.03	0.021	13	0.69	30	0.50	1.17	0.122
2013	3	11	0.36	29	0.52	-0.87	0.193	11	0.36	28	0.50	-0.77	0.221
2013	4	14	0.43	27	0.52	-0.55	0.292	14	0.43	27	0.52	-0.55	0.292

Figure 2

**Distribution of Rounding Down EPS
Aggregated by Quarter**

Fiscal Quarter	Basic EPS: Ordinary						Basic EPS: Including Extraordinary Items					
	N_NAF	P_NAF	N_AF	P_AF	z-value	p-value	N_NAF	P_NAF	N_AF	P_AF	z-value	p-value
1	66	0.58	74	0.51	0.74	0.230	64	0.59	72	0.53	0.77	0.220
2	65	0.46	83	0.43	0.34	0.368	63	0.44	82	0.48	-0.37	0.355
3	65	0.38	78	0.45	-0.77	0.220	64	0.41	77	0.45	-0.58	0.282
4	67	0.49	82	0.44	0.65	0.257	66	0.48	79	0.46	0.35	0.363

Fiscal Quarter	Diluted EPS: Ordinary						Diluted EPS: Including Extraordinary Items					
	N_NAF	P_NAF	N_AF	P_AF	z-value	p-value	N_NAF	P_NAF	N_AF	P_AF	z-value	p-value
1	66	0.55	74	0.38	1.98	0.024	64	0.58	72	0.40	2.04	0.021
2	65	0.49	83	0.41	1.00	0.158	63	0.48	82	0.48	0.01	0.497
3	65	0.42	78	0.44	-0.25	0.402	64	0.41	77	0.44	-0.42	0.336
4	67	0.43	82	0.50	-0.82	0.207	66	0.45	79	0.48	-0.32	0.375

Figure 3

**Distribution of Post-Decimal Digits: Basic EPS
Aggregated by Quarter**

Fiscal Quarter	pd	Basic EPS: Ordinary						Basic EPS: Including Extraordinary Items					
		N_NAF	P_NAF	N_AF	P_AF	z-value	p-value	N_NAF	P_NAF	N_AF	P_AF	z-value	p-value
1	0	66	0.11	74	0.15	-0.75	0.226	64	0.08	72	0.15	-1.35	0.089
1	1	66	0.09	74	0.08	0.21	0.418	64	0.09	72	0.10	-0.07	0.473
1	2	66	0.11	74	0.08	0.51	0.306	64	0.14	72	0.10	0.78	0.216
1	3	66	0.18	74	0.11	1.24	0.107	64	0.19	72	0.11	1.26	0.105
1	4	66	0.09	74	0.09	-0.08	0.470	64	0.09	72	0.07	0.52	0.302
1	5	66	0.11	74	0.12	-0.29	0.386	64	0.09	72	0.14	-0.82	0.207
1	6	66	0.12	74	0.05	1.42	0.078	64	0.09	72	0.07	0.52	0.302
1	7	66	0.02	74	0.08	-1.79	0.037	64	0.03	72	0.06	-0.69	0.245
1	8	66	0.09	74	0.12	-0.59	0.279	64	0.08	72	0.08	-0.11	0.456
1	9	66	0.09	74	0.11	-0.34	0.367	64	0.11	72	0.13	-0.28	0.389
2	0	65	0.08	83	0.13	-1.08	0.140	63	0.08	82	0.15	-1.24	0.107
2	1	65	0.11	83	0.05	1.37	0.085	63	0.10	82	0.07	0.48	0.316
2	2	65	0.05	83	0.10	-1.16	0.124	63	0.05	82	0.10	-1.13	0.130
2	3	65	0.14	83	0.10	0.80	0.213	63	0.16	82	0.10	1.11	0.134
2	4	65	0.09	83	0.06	0.74	0.230	63	0.06	82	0.06	0.06	0.475
2	5	65	0.11	83	0.11	-0.01	0.494	63	0.10	82	0.13	-0.72	0.235
2	6	65	0.06	83	0.10	-0.77	0.220	63	0.08	82	0.06	0.43	0.332
2	7	65	0.12	83	0.08	0.78	0.219	63	0.13	82	0.07	1.09	0.138
2	8	65	0.08	83	0.18	-1.83	0.033	63	0.10	82	0.16	-1.12	0.131
2	9	65	0.17	83	0.10	1.31	0.094	63	0.16	82	0.10	1.11	0.134
3	0	65	0.11	78	0.17	-1.01	0.156	64	0.11	77	0.14	-0.59	0.277
3	1	65	0.14	78	0.04	2.15	0.016	64	0.14	77	0.05	1.81	0.035
3	2	65	0.02	78	0.06	-1.45	0.074	64	0.03	77	0.09	-1.44	0.075
3	3	65	0.09	78	0.10	-0.21	0.419	64	0.09	77	0.10	-0.20	0.421
3	4	65	0.03	78	0.08	-1.20	0.116	64	0.03	77	0.06	-0.92	0.180
3	5	65	0.15	78	0.12	0.67	0.250	64	0.14	77	0.10	0.67	0.252
3	6	65	0.12	78	0.12	0.14	0.444	64	0.14	77	0.10	0.67	0.252
3	7	65	0.11	78	0.14	-0.60	0.275	64	0.11	77	0.13	-0.37	0.355
3	8	65	0.18	78	0.08	1.93	0.027	64	0.16	77	0.09	1.19	0.118
3	9	65	0.05	78	0.10	-1.26	0.104	64	0.05	77	0.12	-1.48	0.069
4	0	67	0.06	82	0.12	-1.30	0.098	66	0.05	79	0.16	-2.28	0.011
4	1	67	0.06	82	0.06	-0.03	0.487	66	0.08	79	0.06	0.30	0.384
4	2	67	0.18	82	0.11	1.21	0.113	66	0.15	79	0.10	0.91	0.180
4	3	67	0.09	82	0.11	-0.41	0.342	66	0.11	79	0.10	0.09	0.462
4	4	67	0.10	82	0.04	1.65	0.050	66	0.11	79	0.03	2.01	0.022
4	5	67	0.06	82	0.16	-1.89	0.030	66	0.06	79	0.15	-1.75	0.040
4	6	67	0.10	82	0.12	-0.33	0.369	66	0.11	79	0.11	-0.15	0.440
4	7	67	0.09	82	0.12	-0.64	0.263	66	0.09	79	0.11	-0.45	0.325
4	8	67	0.18	82	0.06	2.26	0.012	66	0.20	79	0.06	2.43	0.008
4	9	67	0.07	82	0.10	-0.49	0.311	66	0.06	79	0.10	-0.88	0.188

Figure 4

**Distribution of Post-Decimal Digits: Diluted EPS
Aggregated by Quarter**

Fiscal Quarter	pd	Diluted EPS: Ordinary						Diluted EPS: Including Extraordinary Items					
		N_NAF	P_NAF	N_AF	P_AF	z-value	p-value	N_NAF	P_NAF	N_AF	P_AF	z-value	p-value
1	0	66	0.11	74	0.05	1.14	0.127	64	0.14	72	0.07	1.36	0.086
1	1	66	0.12	74	0.11	0.24	0.404	64	0.11	72	0.15	-0.75	0.228
1	2	66	0.17	74	0.08	1.55	0.061	64	0.19	72	0.08	1.79	0.037
1	3	66	0.09	74	0.09	-0.08	0.470	64	0.08	72	0.06	0.53	0.299
1	4	66	0.06	74	0.04	0.54	0.293	64	0.06	72	0.04	0.55	0.292
1	5	66	0.14	74	0.14	0.02	0.492	64	0.13	72	0.15	-0.47	0.320
1	6	66	0.08	74	0.19	-1.96	0.025	64	0.08	72	0.17	-1.56	0.060
1	7	66	0.08	74	0.09	-0.40	0.346	64	0.06	72	0.07	-0.16	0.435
1	8	66	0.15	74	0.09	1.03	0.152	64	0.14	72	0.10	0.78	0.216
1	9	66	0.02	74	0.11	-2.24	0.013	64	0.02	72	0.11	-2.24	0.013
2	0	65	0.08	83	0.14	-1.28	0.100	63	0.08	82	0.16	-1.43	0.076
2	1	65	0.08	83	0.06	0.40	0.344	63	0.10	82	0.10	-0.05	0.481
2	2	65	0.12	83	0.07	1.05	0.147	63	0.10	82	0.09	0.21	0.418
2	3	65	0.14	83	0.07	1.32	0.093	63	0.14	82	0.06	1.65	0.049
2	4	65	0.08	83	0.06	0.40	0.344	63	0.06	82	0.07	-0.23	0.410
2	5	65	0.09	83	0.11	-0.32	0.373	63	0.10	82	0.10	-0.05	0.481
2	6	65	0.08	83	0.12	-0.87	0.192	63	0.10	82	0.11	-0.28	0.388
2	7	65	0.15	83	0.10	1.06	0.144	63	0.16	82	0.07	1.63	0.052
2	8	65	0.09	83	0.16	-1.16	0.123	63	0.08	82	0.15	-1.24	0.107
2	9	65	0.09	83	0.11	-0.32	0.373	63	0.10	82	0.10	-0.05	0.481
3	0	65	0.08	78	0.09	-0.28	0.392	64	0.09	77	0.09	0.06	0.477
3	1	65	0.09	78	0.10	-0.21	0.419	64	0.08	77	0.10	-0.53	0.299
3	2	65	0.05	78	0.08	-0.75	0.225	64	0.05	77	0.08	-0.75	0.226
3	3	65	0.15	78	0.09	1.18	0.119	64	0.14	77	0.10	0.67	0.252
3	4	65	0.05	78	0.08	-0.75	0.225	64	0.05	77	0.06	-0.46	0.322
3	5	65	0.17	78	0.15	0.25	0.402	64	0.16	77	0.13	0.45	0.327
3	6	65	0.12	78	0.12	0.14	0.444	64	0.13	77	0.13	-0.09	0.466
3	7	65	0.14	78	0.09	0.92	0.179	64	0.16	77	0.06	1.75	0.040
3	8	65	0.02	78	0.08	-1.70	0.045	64	0.03	77	0.13	-2.09	0.018
3	9	65	0.14	78	0.13	0.18	0.429	64	0.13	77	0.10	0.39	0.347
4	0	67	0.15	82	0.15	0.05	0.480	66	0.14	79	0.15	-0.26	0.396
4	1	67	0.06	82	0.06	-0.03	0.487	66	0.08	79	0.08	0.00	0.498
4	2	67	0.07	82	0.10	-0.49	0.311	66	0.09	79	0.06	0.63	0.266
4	3	67	0.07	82	0.11	-0.73	0.232	66	0.08	79	0.10	-0.54	0.296
4	4	67	0.07	82	0.09	-0.24	0.405	66	0.08	79	0.09	-0.28	0.390
4	5	67	0.07	82	0.12	-0.96	0.170	66	0.08	79	0.11	-0.77	0.219
4	6	67	0.13	82	0.10	0.70	0.241	66	0.09	79	0.13	-0.68	0.247
4	7	67	0.15	82	0.13	0.26	0.396	66	0.18	79	0.11	1.16	0.124
4	8	67	0.07	82	0.09	-0.24	0.405	66	0.08	79	0.09	-0.28	0.390
4	9	67	0.13	82	0.06	1.53	0.063	66	0.12	79	0.08	0.92	0.179

Figure 5

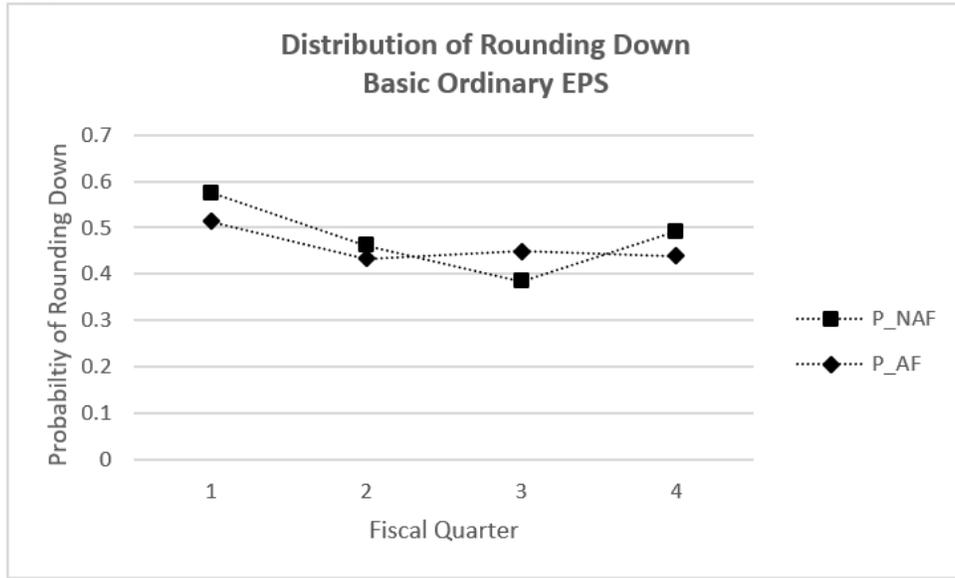
Difference-in-Difference Analysis

Variable	Basic EPS: Ordinary			Basic EPS: Including Extraordinary Items		
	Coefficient	Standard Error	t Value	Coefficient	Standard Error	t Value
Intercept	0.44	0.03	14	0.46	0.03	14.51
Q1	0.09	0.07	1.34	0.08	0.07	1.22
NAF	0.01	0.05	0.17	-0.01	0.05	-0.29
Q1NAF	0.04	0.10	0.43	0.07	0.10	0.69

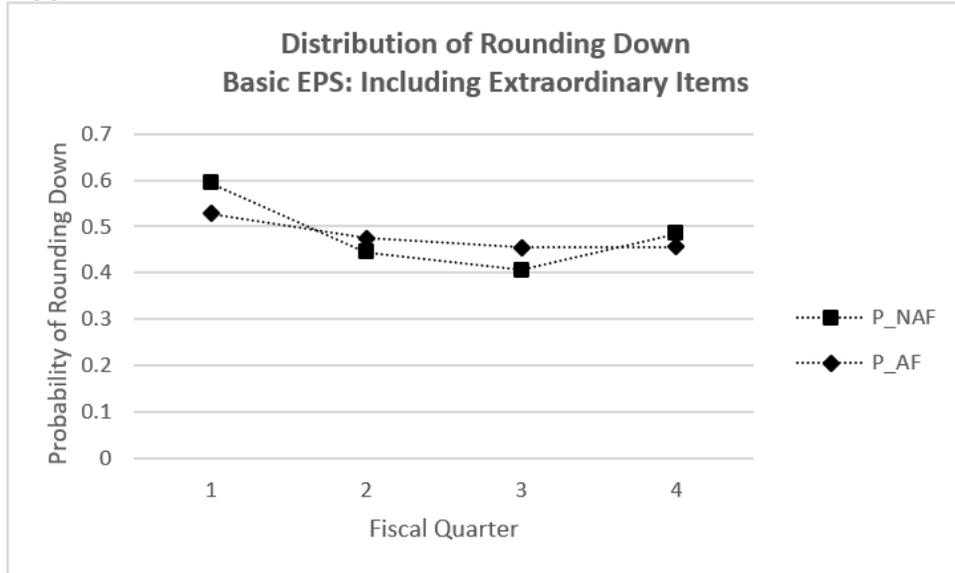
Variable	Diluted EPS: Ordinary			Diluted EPS: Including Extraordinary Items		
	Coefficient	Standard Error	t Value	Coefficient	Standard Error	t Value
Intercept	0.44	0.03	14.15	0.46	0.03	14.52
Q1	-0.05	0.07	-0.74	-0.04	0.07	-0.62
NAF	0.00	0.05	0.08	-0.01	0.05	-0.29
Q1NAF	0.15	0.10	1.53	0.17	0.10	1.77*

Bold t values signify coefficients significant at the 10% level with a one-tailed test. Bold t values with an asterisk represent coefficients significant at the 5% level with a one-tailed test.

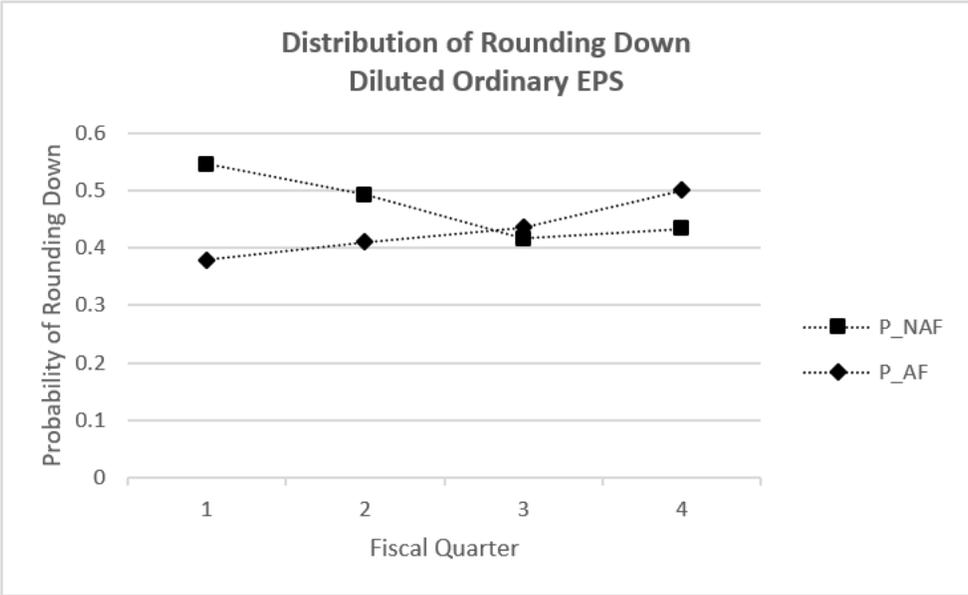
Appendix A



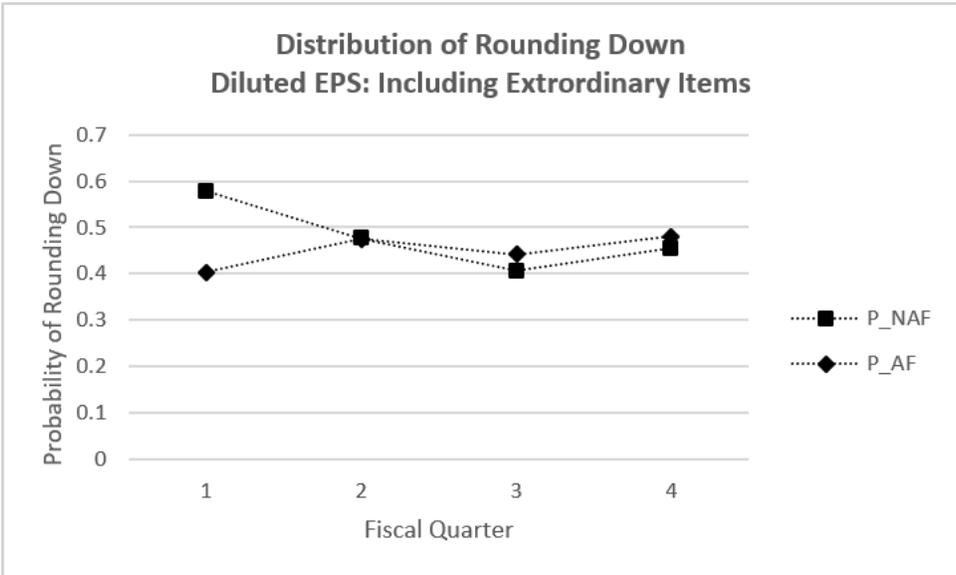
Appendix B



Appendix C



Appendix D



References

- 107th Congress. 2002. *Sarbanes-Oxley act of 2002*. Vol. 745.
- A.R.C Morgan. 2005. Sarbanes-Oxley implementation costs: What companies are reporting in their SEC filings.
- Ashbaugh-Skaife, Hollis, Daniel W. Collins, William R. Kinney Jr., and Ryan LaFond. 2008. The effect of SOX internal control deficiencies and their remediation on accrual quality. *The Accounting Review* 83, (1): 217-250.
- Das, Somnath, and Huai Zhang. 2003. Rounding-up in reported EPS, behavioral thresholds, and earnings management. *Journal of Accounting and Economics* 35, : 31-50.
- Eldridge, Susan W., and Burch T. Kealey. 2005. SOX costs: Auditor attestation under section 404. *University of Nebraska*.
- Gao, Feng, Joanna Shuang Wu, and Jerold Zimmerman. 2009. Unintended consequences of granting small firms exemptions from securities regulation: Evidence from the Sarbanes-Oxley act. *Journal of Accounting Research* 47, (2): 459-506.
- Holmstrom, Bengt, and Steven N. Kaplan. 2003. The state of U.S. corporate governance: What's right and what's wrong? *National Bureau of Economic Research, Working Paper*(9613).
- Iliev, Peter. 2010. The effect of SOX section 404: Costs, earnings, quality, and stock prices. *The Journal of Finance* 65, (3): 1163-1196.
- Kinney Jr., William R., and Marcy L. Shepardson. 2011. Do control effectiveness disclosures require SOX 404(b) internal control audits? A natural experiment with small U.S. public companies. *Journal of Accounting Research* 49, (2): 413-448.
- Krishnan, Jagan, Jayanthi Krishnan, and Hakjoo Song. 2011. The effect of auditing standard no. 5 on audit fees. *Auditing: A Journal of Practice and Theory* 30, (4): 1-27.
- Malenko, Nadya, and Joseph A. Grundfest. 2014. Quadrophobia: Strategic rounding of EPS data. *Rock Center for Corporate Governance*(65).
- McVay, Sarah E. 2011. Discussion of do control effectiveness disclosures require SOX 404(b) internal control audits? A natural experiment with small U.S. public companies. *Journal of Accounting Research* 49, (2): 449-456.
- Nondorf, Maria E., Zvi Singer, and Haifeng You. 2012. A study of firms surrounding the threshold of Sarbanes-Oxley section 404 compliance. *Advances in Accounting*: 96-110.
- Ribstein, Larry. 2005. Sarbanes-Oxley after three years. *Illinois Law and Economics Working Papers Series*(LE05-016).

Ribstein, Larry E. 2002. Market vs. regulatory responses to corporate fraud: A critique of the Sarbanes-Oxley act of 2002. *Illinois Law and Economics Working Papers Series*(LE02-008).

Romano, Roberta. 2005. The Sarbanes-Oxley act and the making of quack corporate governance. *The Yale Law Journal* 114, (1521): 1521-1611.

Usvyatsky, Olga, and Derryck Coleman. 2019. What caused SEC investigation for healthcare services group, inc.? *Audit Analytics*.

Wagner, Stephen, and Lee Dittmar. 2006. The unexpected benefits of Sarbanes-Oxley. *Deloitte & Touche, LLP*.

Weber, David P., and Yanhua Sunny Yang. 2018. The debt-equity choice when regulatory thresholds are based on equity values: Evidence from SOX 404. *The Accounting Review*, forthcoming.

Whalen, Don, and Jessica Hotham. 2018. SOX 404 disclosures: A fourteen year review. *Audit Analytics*.