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The effect of effective/ineffective internal controls over financial reporting on customer satisfaction

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BIOGRAPHY

The author received his Bachelor of Science degree in Accounting from Arkansas State University in 1985 and his Master of Business Administration also from Arkansas State University in 1990. After several years in a "big six" accounting firm, he became Chief Financial Officer of a community bank, later becoming Chief Executive Officer. Since selling the bank in 2007, he has served as an accounting instructor at Arkansas State University.

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ABSTRACT

The net benefits of compliance with sections 302 and 404 of the Sarbanes Oxley Act of 2002 (SOX or the Act) have been a point of contention since its enactment. Emerging research suggests a spillover effect from internal controls over financial reporting (ICFR) to operations (Bauer, 2016; Bauer et al., 2018; Caplan et al., 2017; M. Cheng et al., 2013; Q. Cheng et al., 2018; Feng et al., 2015; Su et al., 2014). This study seeks to extend this line of research by investigating the benefits of effective ICFR for customer satisfaction. Satisfying customers is a primary operating objective of most companies (Malhotra & Malhotra, 2011) because high customer satisfaction leads to less customer turnover, lower price elasticity of demand, lower customer acquisition costs, and improved company reputation, improved firm performance, and higher returns for shareholders (Anderson et al., 1994, 2004; Chandrashekaran et al., 2007; Fornell, 1992; Fornell et al., 2006, 2016; Grewal et al., 2010; Hult et al., 2017; Reichheld & Sasser Jr., 1990). Therefore, knowledge of the impact of ICFR on customer satisfaction has value to managers, regulators, and academics. This study estimates the treatment effect of remediating a control deficiency on customer satisfaction using a fixed-effects regression and a dynamic difference-in-difference model (de Chaisemartin & D'Haultfœuille, 2018). No statistically significant treatment effect is identified, although point estimates suggest a *negative* treatment effect which contradicts the study's hypothesis.

INTRODUCTION

Sections 302 and 404 of the Sarbanes-Oxley Act of 2002 (the Act or SOX) require companies to design and implement an effective system of internal controls over financial reporting (ICFR) and disclose whether the system of ICFR is effective or ineffective. In addition, SOX § 404 requires the company's auditor to issue an opinion on the effectiveness of the company's ICFR. Proponents of the Act believe that SOX § 302 and § 404 compliance led to the identification of weaknesses and gaps which resulted in improved disclosure, transparency, and corporate governance (Wagner & Dittmar, 2006), while opponents argue that compliance with SOX costs more than the benefits (Hochberg & Sapienza, 2009). The predominant view of managers seems to be that the costs of complying with SOX outweigh the benefits (Wade, 2008), and only 29% of managers surveyed by Alexander et al. (2013) believe that there are operational or compliance benefits to effective ICFR. This study seeks to provide additional evidence for the discussion of the benefits of ICFR requirements of SOX § 404 by examining the effect of ICFR on customer satisfaction, which is a measure of a firm's operating results.

Satisfying customers is a primary operating objective of most companies (Malhotra & Malhotra, 2011) because high customer satisfaction leads to less customer turnover, lower price elasticity of demand, lower customer acquisition costs, and improved company reputation, improved firm performance, and higher returns for shareholders (Anderson et al., 1994, 2004; Chandrashekaran et al., 2007; Fornell, 1992; Fornell et al., 2006, 2016; Grewal et al., 2010; Hult et al., 2017; Reichheld & Sasser Jr., 1990). Therefore, knowledge of the impact of ICFR on customer satisfaction has value to managers, regulators, and academics.

Academics and practitioners accept that an effective internal control system will help a company achieve its objectives in three areas: operations, compliance, and financial reporting and that the three objectives share underlying components (*COSO*, 2013; Kinney, 2000). For

example, a firm's control environment supports all three objectives, and some business process controls address more than one objective. Following the enactment of SOX, research on ICFR focused on its impact on financial reporting quality, largely ignoring the possibility that ICFR might have a spill-over effect on operations and compliance (Ashbaugh-Skaife et al., 2008, 2009; Chan et al., 2008; Doyle et al., 2007a; Ge et al., 2017; Ge & McVay, 2005; Goh, 2009); however, in recent years a developing stream of research provides evidence of such a spillover effect (Bauer, 2016; Bauer et al., 2018; Caplan et al., 2017; Choi et al., 2019; Feng et al., 2009, 2015; Gallemore & Labro, 2015; Lawrence et al., 2018; Li et al., 2012; Su et al., 2014). This line of research concludes that information from the financial reporting system is used for internal decisions and is used to provide information to non-investor/creditor stakeholders such as suppliers, customers, and employees. Some studies conclude that the impact of ineffective ICFR on operations or compliance is the result of ineffective ICFR leading to lower quality information from the financial reporting system leading to lower quality operating or compliance decisions (Bauer, 2016; Caplan et al., 2017; Feng et al., 2009, 2015; Gallemore & Labro, 2015; Li et al., 2012). Others conclude that ineffective ICFR results in increased information asymmetry, negatively impacting relationships with third parties (e.g., customers and suppliers) relying on information produced by the company (Bauer et al., 2018; Su et al., 2014). A third group did not seek to determine a causal relationship but did find a positive relationship between ICFR and an operating or compliance activity (Choi et al., 2019; Lawrence et al., 2018).

These studies not only provide evidence of a spillover effect from ICFR to operations or compliance but also provide a plausible link from ICFR to customer satisfaction. Based on the evidence that managers use information from the financial reporting system to make operating decisions and that the effectiveness of internal controls affects the quality of the information

produced by the financial reporting system, it is logical to conclude that these operating decisions will impact customers satisfaction (Bauer, 2016; Caplan et al., 2017; Feng et al., 2009, 2015; Gallemore & Labro, 2015; Li et al., 2012). Indeed, Feng et al. (2015) found that ineffective ICFR leads to lower quality inventory management decisions, and poor inventory management decisions likely lead to lower customer satisfaction through stock-outs and purchase of low demand items. Su et al. (2014) found, in a business-to-business (B2B) setting, sales growth decreases in the year following the disclosure of ineffective ICFR. Presumably, lower sales growth reflects, among other things, lower customer satisfaction. In addition, other studies by Feng et al. (2009) and Li et al. (2012) found that ineffective ICFR leads to less precise forecasts and guidance, which likely reflects deficiencies in managements' ability to predict what, why, how, when, and where customers will want to make purchases. The failure to make these predictions accurately can lead to dissatisfied customers.

This study adds to the literature examining the spillover effects of ICFR on operations by evaluating the impact of ICFR on customer satisfaction. While prior research shows that a control deficiency in ICFR can lead to the loss of valuable customers in the context of B2B sales (Bauer et al. 2018), it is not clear whether prior research generalizes to the context of B2C sales. The ACSI measure allows me to test for this non-trivial generalization of prior results and broaden our understanding of the spillover effect of ICFR into operations. Issued by ACSI, LLC, the ACSI score measures the quality of products and services offered in U. S. markets. The ACSI score is issued for approximately 300 of the largest U.S. companies in the consumer market across 45 industries, and the score is constructed by surveying approximately 17,500 U.S. households each quarter (Fornell et al., 2016).

A result indicating that companies with effective ICFR have higher customer satisfaction ratings would weaken the case that SOX was a costly political overreaction to a few high-profile failures of companies such as Enron and WorldCom because at least some of the cost of implementing effective ICFR would be offset by operational benefits that ultimately impact a firm's customers. Regulators and managers should consider these indirect benefits in their cost-benefit calculation concerning the efficiency of SOX. This study does not seek to evaluate all costs and benefits of SOX compliance; instead, it seeks to introduce additional considerations by investigating the benefits of effective ICFR for customer satisfaction. This study seeks to extend this line of research by providing evidence that ICFR affects a firm's relationship with its customers in a B2C setting. Evidence of a relationship between ICFR and customer satisfaction would provide further evidence that effective ICFR has benefits beyond financial reporting, which is something that should be considered when assessing the benefit of compliance with SOX sections 302 and 404. Therefore, the results of this study potentially have implications for managers, auditors, and management advisors by providing evidence that ICFR also affects customer relationships. Managers' decisions about the design, implementation, and evaluation of internal control systems, as well as auditors' evaluation of internal control systems, may need to be reexamined. Regulators will also be interested in a better understanding of the broader costs and benefits of SOX.

To identify the hypothesized effect of ICFR weaknesses on customer satisfaction, I rely on firms that discover and remediate ICFR weaknesses. My key assumption is that internal control weaknesses exist prior to their discovery, such that discovering and remediating internal controls can lead to a sustained impact on customer satisfaction. My research design corresponds with a staggered adoption design whereby firms receive the "treatment" of fixing internal control

deficiencies at different times throughout the sample period (de Chaisemartin & D'Haultfœuille, 2018). This design allows me to identify and estimate the treatment effects that I hypothesize.

I use two different methods to estimate the average treatment effect of remediating ICFR weaknesses. First, I use a fixed effects regression with firm and year fixed effects along with an indicator variable that captures firm-years that have remediated ICFR relative to earlier periods (i.e., an indicator set to one for all periods following the disclosure of an ICFR weakness that do not themselves have disclosed ICFR weaknesses). Recent research suggests that estimating treatment effects using this approach may be inappropriate in the presence of heterogeneity in effect sizes across treated firms and across time (see, for example, Goodman-Bacon (2018) or de Chaisemartin and D'Haultfœuille (2018)). To address this concern, I also estimate the hypothesized average treatment effect using a dynamic difference-in-difference model. Perhaps the most critical assumption made by this model is that treated and untreated firms have "common trends" in the dependent variable. Before presenting the results, I test the common trends assumption using the placebo effect estimation procedures in de Chaisemartin and D'Haultfœuille (2018).

The results of my study do not support my hypothesis: I do not find that remediation of an ICFR weakness leads to an increase in customer satisfaction. In fact, all point estimates of the average treatment effect are *negative*, although they do not reach significance at traditional levels (all p-values>0.10). While one must be cautious while interpreting insignificant coefficients, I provide in the penultimate section a discussion of the reasons why remediating ICFR weaknesses may *decrease* customer satisfaction, including bureaucracy associated with customer interactions.

The remaining portion of this dissertation is organized as follows. I begin by discussing the background of customer satisfaction, internal controls, and the costs and benefits of SOX. I then move to a discussion of the development of my hypothesis and research methods. Finally, I discuss the results of my analysis. All figures, tables, and references are included at the end of the paper, along with an appendix that provides variable definitions.

BACKGROUND AND LITERATURE REVIEW

Customer Satisfaction

Customer satisfaction has been studied extensively in the marketing literature. The evidence suggests that high customer satisfaction leads to less customer turnover, lower price elasticity of demand, lower customer acquisition costs, and improved company reputation, improved firm performance, and higher returns for shareholders (Anderson et al., 1994, 2004; Chandrashekaran et al., 2007; Fornell, 1992; Fornell et al., 2006, 2016; Grewal et al., 2010; Hult et al., 2017; Reichheld & Sasser Jr., 1990). According to empirical research, customer satisfaction has three antecedents (Anderson & Fornell, 2000):

1. the customers' perceived quality of the company's product or service,
2. the customers' perceived value of the company's product or service, and
3. the customers' expectations of the company's product or service

These inputs combine to produce customer satisfaction. Perceived value is derived from perceived quality compared to price. Perceived quality is a function of experience with the product or service, price, and expectations. Previous experiences establish expectations about the company's product or service, competitors' product or service, and the anticipated benefits of product or service (Anderson et al., 1994; Zeithaml, 1988). Ultimately, customer satisfaction is seen as a holistic evaluation of the purchase and consumption experience over time (Anderson et al., 1994). Management operating decisions, based on information from the financial reporting

system, likely affect some of the determinants of customer satisfaction, such as price, product or service availability, and forecasting of sales and purchases.

History of Internal Controls over Financial Reporting

The Securities and Exchange Commission (SEC) requires companies to disclose material weaknesses in ICFR.[1] These requirements are the result of congress enacting a series of laws in response to corporate governance failures requiring companies design, implement, and maintain effective ICFR. Beginning with the Foreign Corrupt Practices Act (FCPA) in 1977, Congress has slowly increased companies' ICFR requirements, and as a result, the cost of compliance has increased as well. Before 1977, there were no regulatory requirements that companies design or implement an effective system of ICFR. Furthermore, auditing standards only required auditors to understand (not evaluate) a client's system of ICFR to determine if the client's financial reporting system was capable of producing reliable financial statements. If the auditor did not evaluate the system of ICFR or if the auditor evaluated the system of ICFR and concluded that it was ineffective, the standards required the auditor to reduce reliance on the system of ICFR and increase substantive procedures to reduce audit risk to an acceptable level. However, neither management nor the auditor was required to disclose deficiencies in internal control, and there were no civil or legal penalties to a company, its management, or its auditor if the company failed to design and maintain an effective system of ICFR. The auditor was not required to issue an opinion on the effectiveness of ICFR, and ultimately, management determined the level of

[1] A material weakness in ICFR is defined as: "…a deficiency, or a combination of deficiencies, in internal control over financial reporting, such that there is a reasonable possibility that a material misstatement of the company's annual or interim financial statements will not be prevented or detected on a timely basis (*AS 2201*, 2007 Paragraph A7)."

internal controls to be implemented (Simunic, 1984). I present a brief history of internal control regulation in the United States in the following paragraphs.

Congress enacted the FCPA in the wake of the Watergate political scandal and the discovery that hundreds of US companies had paid bribes to foreign officials and falsified their corporate records to conceal the payments (*A Resource Guide to the U.S. Foreign Corrupt Practices Act*, 2012). The FCPA established the first legal requirement that a company devise and maintain a system of internal accounting controls and established civil and legal penalties for a company that failed to comply with its accounting requirements. It did not, however, require companies or their auditors to identify and report deficiencies in internal control systems (Section 13(b)(2)(A) of the Exchange Act, 15 U.S.C. § 78m(b)(2)).

Following the savings and loan crisis of the 1980s, Congress enacted the FDIC Improvement Act of 1992 (FDICIA). FDICIA applied to all financial institutions with deposits insured by the Federal Deposit Insurance Corporation, requiring management to evaluate the effectiveness of the firms' system of ICFR by comparing it to an established framework, disclose the framework used for the evaluation, and disclose any material weaknesses in internal control (MWIC) identified during the evaluation.[2]

[2] The COSO framework is the most widely used framework for assessing the effectiveness of internal control in the U.S. (Lawrence et al., 2018). In 1985, several key stakeholders in the financial reporting process, including the American Accounting Association, the American Institute of Certified Public Accountants, Financial Executives International, the Institute of Internal Auditors, and the Institute of Management Accountants formed the Committee of Sponsoring Organizations (COSO) to sponsor the National Commission on Fraudulent Financial Reporting (the Treadway Commission). COSO published its initial internal control framework in 1992 and updated the framework in 2013. According to the Public Company Accounting Oversight Board (PCAOB), a company's ICFR is effective if no material weaknesses exist (*AS 2201*, 2007).

SOX was the third law enacted by Congress relating to ICFR and was developed in response to significant corporate failures such as Enron and WorldCom. Sections 302 and 404 of the Act are two of its most contentious provisions because they require management to assess the effectiveness of the firm's ICFR and the auditor to express an opinion on management's assessment (Alexander et al., 2013; Ge et al., 2017). Section 302 requires, among other things, that management disclose in a company's quarterly and annual report an acknowledgment that they are responsible for ICFR and their conclusions about the effectiveness of the company's ICFR (Sarbanes-Oxley Act of 2002 § 302(a)(4)). SOX Section 404 requires that each annual report explicitly state that management is responsible for ICFR and contain an assessment as of the end of the most recent fiscal year of the effectiveness of the internal control structure and procedures (Sarbanes-Oxley Act of 2002 § 404(a)). Therefore, SOX provides the first legal requirement that companies publicly disclose MWIC and that an independent auditor attest to management's assessment of ICFR. Table 1 presents a summary of the internal control requirements of the three laws discussed above.

[Insert Table 1]

Following the enactment of SOX, practitioners, and academics primarily focused on internal controls over financial reporting (Ashbaugh-Skaife et al., 2008, 2009; Chan et al., 2008; Doyle et al., 2007a; Ge et al., 2017; Ge & McVay, 2005; Goh, 2009; Lawrence et al., 2018). However, recent studies have started to examine the spillover effects of ICFR into operations and compliance, with most studies confirming at least some degree of a spillover effect.

Internal Controls Over Financial Reporting and Operations

After SOX was implemented, the discussion of its merits largely ignored the broader COSO definition of internal controls, which encompasses most of management's functions, including the efficiency and effectiveness of operations and compliance with laws and regulations (see Figure 1) (Kinney, 2000).

[Insert Figure 1]

COSO defines internal control as "…a process, effected by an entity's board of directors, management, and other personnel, designed to provide reasonable assurance regarding the achievement of objectives relating to operations, reporting, and compliance" (Landsittel & Committee of Sponsoring Organizations of the Treadway Commission. COSO, 2013). COSO's framework includes three objectives (operations, reporting, and compliance) and six components (environment, risk assessment, control activities, information and communication, and monitoring). The objectives and components relate to all levels of the organization.

COSO's broad definition of internal controls suggests that an effective system of ICFR may have a positive effect on the objectives related to additional stakeholders such as customers, vendors, and employees (Akisik & Gal, 2017). According to Lawrence et al. (2018), there are two reasons to expect a positive relation between ICFR and internal controls over operations, and compliance: (1) a control-overlap exists between financial reporting, operations, and compliance; (2) the effectiveness or ineffectiveness of internal controls over financial reporting may reflect management's commitment to the control environment, which is presumed to impact internal controls overall.

Beyond COSO's broad definition of internal controls suggesting that an effective internal control system reaches beyond financial reporting, more effective ICFR leads to higher quality

information for management decisions which leads to better decisions and better operating results (Feng et al., 2009; Li et al., 2012). While prior research provides evidence that weak operating results are a determinant of ineffective ICFR (Doyle et al., 2007a), it is also possible that weak operating results are an outcome of ineffective ICFR (Feng et al., 2015).

A contemporaneous stream of research has begun to provide evidence of the spillover effect of ICFR into operations and compliance. Researchers have examined the relationship of ICFR and management guidance and forecasts (Feng et al., 2009; Li et al., 2012), sales growth (Su et al., 2014), inventory management (Feng et al., 2015), tax avoidance (Bauer, 2016; Gallemore & Labro, 2015), merger and acquisition decision quality (Caplan et al., 2017), data breaches (Lawrence et al., 2018), duration of customer-supplier relationships (Bauer et al., 2018), and securities regulation violations (Choi et al., 2019). A recent example of ineffective ICFR that affects customers is the material weakness disclosed by Marriott in their 2018 annual report:

> "The combination of the Starwood Preferred Guest and Marriott Rewards programs in August 2018 resulted in delayed, incomplete, and inaccurate reporting of Loyalty Program data such that the financial results of the Loyalty Program could not be properly recorded on a timely basis (*Marriott*, 2019)."

Management Guidance and Forecasts. Feng et al. (2009) were among the first researchers to examine the relationship between the quality of a company's ICFR and operations by examining the relationship between internal control quality and the precision of management guidance. They found that the precision of management guidance was better for companies with effective ICFR than for companies with ineffective ICFR. Based on these findings, they concluded that ICFR quality has broader implications than just financial reporting. Typically, management uses unaudited in-house management reports to produce forecasts and guidance, and management uses these same in-house reports to make other daily operating decisions that

impact stakeholders such as employees, customers, and vendors (Feng et al., 2009). A later study by Li et al. (2012) also found a significant relationship between ineffective internal controls and management forecasts, providing additional evidence of a spillover effect of ICFR to operations. Both Feng et al. (2009) and Li et al. (2012) conclude that the differences in forecast/guidance precision are the result of lower quality information from internal reports used to produce forecasts and guidance. It is reasonable to expect a company's ability to provide precise forecasts to affect customer satisfaction. Inaccurate plans and forecasts may lead to inventory stock-outs, over- or under-commitment of resources in service organizations, and other issues that may affect customer satisfaction.

Sales Growth. Continuing the examination of the spillover effect of ICFR into operations, Su et al. (2014) examined the consequences of ineffective ICFR on customers. They found that sales growth declines significantly following the disclosure of ineffective ICFR. They deduced that disclosure of ineffective ICFR affects customers' willingness to continue to do business with the company. They further surmise that this unwillingness to continue to do business with a company is the result of the customers' doubt about the company's ability to follow through with its commitments to its customers, given the existence of ineffective ICFR (Su et al., 2014). This assumes that customers are aware of and using company ICFR disclosures as they evaluate their relationship with the company. While the study by Su et al. (2014) appears to be in a B2B setting, it is conceivable that lower customer satisfaction could be a factor leading to lower sales growth.

Inventory Management. Feng et al. (2015) explored the effect of ICFR on operations by examining the relationship of ICFR and inventory management. They found that companies

with inventory-related material weaknesses have lower-quality inventory management resulting in lower turnover rates and higher impairments (Feng et al., 2015). They note,

> Many of the same policies, procedures, and controls that lead to effective ICFR related to inventory, however, also affect the proper accounting for inventory acquisition, sale, storage, and returns, leading to more effective inventory management. Thus, we expect there to be mutually beneficial effects on financial reporting quality and firms' inventory management as a result of having effective ICFR (Feng et al., 2015, p. 530).

Feng et al. (2015) extended their study beyond inventory-related material weaknesses and identified a positive relationship between ineffective controls and ROA, providing evidence that designing and maintaining an effective ICFR can be financially beneficial to a company. It is probable that the quality of inventory management decisions has a direct impact on customer satisfaction. For example, stock-outs would seem to have a direct negative relationship with customer satisfaction.

Tax Avoidance. Both Gallemore & Labro (2015) and Bauer (2016) examined the relationship between ICFR and tax avoidance and found that effective ICFR results in higher quality internal information, which in turn leads to better decisions related to income taxes that ultimately lead to lower effective tax rates.

Merger and Acquisition Decision Quality. Caplan et al., (2017) examined the relationship between ICFR and the quality of merger and acquisition decision quality using SOX SOX §404 disclosures as a proxy for the effectiveness of ICFR and goodwill impairment as a proxy for the quality of merger and acquisition decisions. Their study provides evidence that mergers and acquisitions that occur in years that companies disclose ineffective ICFR have a higher rate of goodwill impairment (Caplan et al., 2017). In addition, they note that material weaknesses in ICFR have a negative correlation with managerial performance (Caplan et al., 2017). Presumably, the impairment of goodwill occurs when future cash flows are lower than

initially expected, possibly due to the loss of customers, i.e., ineffective ICFR leads to less accurate prediction of the company's ability to meet the customers' needs.

Data Breaches. Lawrence et al. (2018) examined the relationship between ICFR and "operational control risk indicators", They found that the probability of weaknesses in internal controls over operations is positively associated with the disclosure of ineffective ICFR (Lawrence et al., 2018). While this study does not determine a causal link between data breaches and ICFR, it does identify a correlation between data breaches and ICFR. I expect data breaches will likely lead to lower customer satisfaction.

Duration of Customer-Supplier Relationships. Bauer et al. (2018) hypothesized and found a negative relationship between ICFR weaknesses and the duration of customer-supplier relationships in a business-to-business (B2B) setting. Their theory was that supply chain partners depend on reliable systems to share information and ICFR weaknesses on the suppliers part signal to customers that shared information is unreliable (Bauer et al., 2018). While Bauer et al. (2018) conducted their study in a B2B setting, it reasonable to expect that the duration of the relationships decreased as a result of lower customer satisfaction, and the ineffectiveness or effectiveness of ICFR may have a similar effect on consumers (either directly or indirectly through a deteriorated relationship with distributors).

Securities Regulation Violations. Choi et al. (2019) examined the relationship between ICFR and non-accounting SEC violations, finding a positive relationship between noncompliance with securities regulations and GAAP violations. They anticipate that this correlation exists because of underlying company values and shared facets of the accounting and non-accounting systems (Choi et al., 2019).

Summary. The developing research stream, summarized above, provides evidence of the spillover effect of ICFR to operations and compliance. Several of these articles conclude that the impact of ineffective ICFR on operations or compliance is the result of ineffective ICFR leading to lower quality information which leads to lower quality decisions (Bauer, 2016; Caplan et al., 2017; Feng et al., 2009, 2015; Gallemore & Labro, 2015; Li et al., 2012). Others concluded that ineffective ICFR resulted in increased information asymmetry and negatively impacted relationships with third parties relying on information produced by the company (Bauer et al., 2018; Su et al., 2014), while a third group provides evidence of a relationship between ICFR and an operating or compliance activity (Choi et al., 2019; Lawrence et al., 2018). Information from the financial reporting system is often used to make pricing decisions. Lower quality information may lead to mispriced products or services, given that price is an antecedent to customer satisfaction; it is logical to expect lower quality pricing decisions to impact customer satisfaction. Companies often use information from the financial reporting system to identify profitable and unprofitable customers. Reicheld (1996) presents the results of a case study involving a bank customer who received a letter stating that they were a preferred customer only to be subsequently turned down for a new credit card. The customer was unhappy and defected to another bank. In this situation, the bank used inaccurate information from the financial reporting system (accounting system) to identify preferred customers, and the error resulted in customer dissatisfaction. The financial reporting system produces billing statements, and their accuracy or inaccuracy of billing statements can sway customer satisfaction.

Hallowell et al. (1996) report that improved internal service quality leads to improved customer satisfaction, and he identified six mechanisms necessary to improve internal service quality: tools, appropriate policies and procedures, teamwork, management support, goal

alignment, and training. Many of these mechanisms are enhanced by an effective system of ICFR, thereby improving customer satisfaction. For example, in regard to appropriate policies and procedures, the principles of the control environment suggest that those responsible for corporate governance should establish an appropriate structure, reporting lines, appropriate authority, and responsibilities (*COSO*, 2013). It can be argued that teamwork will be improved by filling roles with trained, competent individuals aligned with company objectives. The fourth COSO principle suggests that companies should commit to attracting, developing, and retaining competent individuals in alignment with objectives (*COSO*, 2013). Other operating decisions such as purchase decisions, investment decisions, employment decisions, and facilities upgrades use information from the financial reporting system and may have an indirect impact on customer satisfaction.

The concept of high-quality information leading to customer satisfaction is supported by Bauer et al. (2018), who found that ineffective controls impaired suppliers' relationships with customers and that disclosure of an MWIC was positively associated with the likelihood of a relationship being terminated in the following year. Bauer et al. (2018) focused on large companies engaging in business-to-business sales, and it is not clear if their results generalize to consumers.

Impacts of Ineffective Internal Controls Over Financial Reporting

Multiple studies have found that there are negative consequences for companies that disclose ineffective ICFR. Compared to firms that do not disclose ineffective ICFR, firms that do disclose ineffective ICFR have lower accrual quality, higher cost of equity, and higher audit fees (Doyle et al., 2007b; Gordon & Wilford, 2012; Hogan & Wilkins, 2008). In addition, there are negative consequences for individuals responsible for ICFR. CFO and board turnover is

higher for companies disclosing ineffective ICFR (Li et al., 2010). Because of this risk to individuals, it is possible that SOX incentivized managers to overspend on ICFR because non-compliance may result in a substantial personal cost to the manager. In contrast, the cost of compliance is shared by all stakeholders (Coates, IV, 2007).

Costs and Benefits of Sarbanes-Oxley

According to A.R.C. Morgan, as cited in Zhang (2007), compliance with the Act came at an average cost per firm ranging from $1.56 million to $10.0 million depending on a firm's size, complexity, geographical dispersion, and other attributes. Because of these financial costs as well as the burden of compliance, the costs and benefits of the Act have been a topic of debate among managers, investors, and regulators. The predominant view among managers seems to be that the costs of complying with SOX outweigh the benefits (Wade, 2008).

Researchers have attempted to evaluate the costs and benefits of SOX through event studies by examining abnormal stock market returns in the period leading up to the passage of the Act (Jain & Rezaee, 2006; Leuz, 2007; Zhang, 2007). The results of these studies are mixed. Jain and Rezaee (2006) examined abnormal returns around events leading up to the passage of SOX. They found that "…the induced benefits of the Act significantly outweigh its imposed compliance costs as measured by stock prices" (Jain & Rezaee, 2006, p. 652). While Zhang (2007) concluded that SOX imposed net costs on firms, she also suggested that the results from her event studies be interpreted with caution because all relevant factors were not captured. Some events unrelated to SOX but relevant to the value of the firm may have occurred at the same time as the passage of SOX.

Some managers have acknowledged the value of SOX compliance requirements, "[a]s SOX went into effect, more and more executives began to see the need for internal reforms; indeed, many were startled by the weaknesses and gaps that compliance reviews and assessments

had exposed" (Wagner & Dittmar, 2006, p. 134). Supporters of SOX believe that the identification of weaknesses and gaps led to needed changes that resulted in improved disclosure, transparency, and corporate governance, while opponents argue that SOX has been ineffective or that its benefits do not outweigh the associated compliance cost (Hochberg & Sapienza, 2009). Consistent with the latter view, only 19% of managers surveyed by Alexander et al. (2013) believed that the benefits of SOX outweigh the cost, and only 29% believed that there are operational or compliance benefits to effective ICFR. According to Feng et al. (2015), managers acknowledge that effective internal controls over financial reporting result in better quality information; however, they do not believe that this translates into meaningful operational improvements.

HYPOTHESIS DEVELOPMENT

While the purpose of the ACT was to enhance the quality of financial reporting to external users, management uses information from the financial reporting system to make many operating decisions. Empirical research provides evidence that higher-quality ICFR improves the quality of information used to make internal decisions, resulting in better management decisions (Bauer, 2016; Caplan et al., 2017; Feng et al., 2009, 2015; Gallemore & Labro, 2015; Li et al., 2012). Studies provide evidence that management guidance and forecasts are less accurate for firms with ineffective ICFR as a result of lower quality information (Feng et al., 2009; Li et al., 2012). As a result of lower quality information produced by a firm's financial reporting system, operating decision quality is lower when ICFR is ineffective. Researchers provide evidence of this by examining income tax decisions (Bauer, 2016; Gallemore & Labro, 2015); merger and acquisition decisions (Caplan et al., 2017); and inventory management decisions (Feng et al., 2015). In addition, Cheng, Goh, & Kim (2018) found that operational efficiency is lower for firms with MWIC. Redman (1998) states that poor quality information has

negative implications for a firm including customer dissatisfaction, implying that high-quality information leads to customer satisfaction.

Based on this reasoning, I hypothesize that remediating an ICFR weakness will lead to an increase in customer satisfaction. Based on prior research, it is reasonable to assume that ICFR weaknesses exist for multiple reporting periods before they are detected. For example, Rice and Weber (2012) find that 67.6% of companies with restatements between October 2004 and November 2009 failed to identify a material weakness during the period restated, suggesting that material weaknesses are not identified in the period when they first occur. The existence of ICFR weaknesses prior to remediation allows me to identify the hypothesized treatment effects by examining changes in customer satisfaction that occur after an ICFR weakness is remediated. Formally stated, my hypothesis is:

> Hypothesis 1 (H1): Remediating an ICFR weakness will lead to an increase in customer satisfaction

RESEARCH METHOD

To test my hypothesis, I use all U.S. public firms with non-missing data for their ACSI score, various financial statement items used as control variables, and publicly disclosed SOX Section 404 opinions. Since the first full year of material weaknesses in internal control disclosures under SOX were available starting in 2005, the sample stretches from 2005 to 2018, the last full year of material weakness disclosures available. The sample includes accelerated and non-accelerated filers.

Research Design and Identification Strategy

I use a staggered adoption design that allows me to identify the average treatment effect of remediating an ICFR weakness. This design assumes that firms have a latent, unknown ICFR deficiency prior to its discovery, disclosure, and remediation (see Figure 2). I consider the ICFR

weakness to be fully remediated during the first year in which no ICFR weakness is disclosed after one or more years in which a weakness was disclosed. However, I also consider the first year prior to full remediation to have received the treatment (i.e., partial remediation occurs the year prior to full remediation). I have several reasons for making this design choice, the most important being the incentives to correct previously disclosed weaknesses.

[INSERT FIGURE 2]

Once auditors or the company identify and disclose a material weakness, management has significant incentives to remediate the material weakness to avoid the negative consequences of disclosed ineffective controls. Empirical studies provide extensive evidence that ineffective ICFR has negative consequences for management and the firm. Such consequences include a higher cost of equity with the penalty for ICFR weaknesses increasing each year in which the firm fails to remediate the issue (Gordon & Wilford, 2012). Also, ICFR weaknesses result in higher audit fees (Hogan & Wilkins, 2008) and a higher turnover of individuals in critical positions (Johnstone et al., 2011). Due to the negative consequences for a company and its management, I expect remediation to begin immediately after discovery. However, full remediation is likely to take more than one reporting period, and therefore the impact on information quality, and consequently, improvement in customer satisfaction is likely to be gradual. I explicitly model this heterogeneity using a dynamic difference-in-difference model (de Chaisemartin & D'Haultfœuille, 2018).

As several recent studies suggest, there are challenges with using a staggered adoption design (see, for example, Goodman-Bacon (2018) or de Chaisemartin and D'Haultfœuille (2018)). In particular, heterogeneity in the treatment effect across firms and time can lead to unexpected results when a regression with firm and year fixed effects is used to estimate the

average treatment effect. While a fixed effects regression estimates a weighted average of the firm-level treatment effects, some weights can be negative. With negative weights, it is possible that a fixed effects regression estimates the average treatment effect to have the opposite sign of the true average treatment effect (de Chaisemartin & D'Haultfœuille, 2018; Goodman-Bacon, 2018). This can happen when there is heterogeneity in the size and timing of the firm-level treatment effects. *A priori*, it seems likely that each remediation will have a unique effect size as each remediation addresses issues unique to the ICFR weakness that was discovered. Heterogenous effect sizes are especially concerning when the effect size is correlated with the timing of the treatment (de Chaisemartin & D'Haultfœuille, 2018). It seems plausible that the most significant deficiencies are either the easiest or perhaps the hardest to discover. In either case, the size of the treatment effect would be correlated with the timing of the treatment as the more significant weaknesses would either be discovered earlier or later in the sample period.

To address these concerns, I use the methods of de Chaisemartin and D'Haultfœuille (2018) to estimate the need to allow for heterogeneous effects and to provide a better estimate of the average treatment effect. De Chaisemartin and D'Haultfœuille (2018) also provide a method for estimating dynamic treatment effects that vary across time, which helps alleviate concerns that my effect size estimates are biased downward because little remediation occurs during the year prior to no disclosure of an ICFR weakness.

Dependent Variable

The dependent variable of interest is customer satisfaction, as measured by the American Customer Satisfaction Index (ACSI). To develop an objective understanding of customer satisfaction, researchers have developed customer satisfaction indexes such as the American Customer Satisfaction Index (ACSI) (Fornell et al., 1996). Such indexes can be used to evaluate

a company's customer satisfaction performance against its prior period performance and its industry (Angelova & Zekiri, 2011). According to Fornell et al. (2016), the ACSI score measures the quality of products and services offered in U. S. markets from a latent variable structural equation model (see Figure 3). They assert that the ACSI index provides a customer satisfaction score for approximately 300 of the largest U.S. companies in the consumer market across 45 industries by surveying approximately 17,500 U.S. households each quarter resulting in over 3,200 firm-year observations with an average score of 76.44 and an annual standard deviation of 2.43. According to Fornell et al. (2006), a 1% change in ACSI equates to approximately 5% change in market value.

[Insert Figure 3]

Proprietary software determines the weighting of questions (*American Customer Satisfaction Index*, n.d.). The ACSI reports 90% confidence intervals of approximately +/- 0.2 points on the national scale, and the average R^2 is .75 (Anderson & Fornell, 2000). To construct the measure, ACSI distributes surveys to consumers throughout the year for various companies.

The ACSI measures are dated according to when they are issued, not when they are collected. Collection typically occurs several months prior to the issuance date, but the ACSI database does not report exact collection dates for the majority of firm-years. To ensure that the measurement date of the ACSI matches the timing of the identification and remediation of ICFR weaknesses, I subtract one year from the date reported in the ACSI database before combining the measure with the other databases that I use.[3]

[3] I repeated all analyses with alternative matching procedures and found no qualitative differences in the effect sizes or statistical significance of the results. For example, subtracting two years from the ACSI score's date for firms with a fiscal year end during or prior to June yields the same results.

Control Variables

Based on prior research by Ivanov et al. (2013), I have included variables to control for other factors that could impact customer satisfaction. Ivanov identified research and development (RD) and advertising expenses (Advert) as measures of a company's investment in customers and as determinants of customer satisfaction. Both expenditures on research and development and advertising are viewed as prior investments in customers; by investing in research and development, firms provide greater product diversity and by investing in advertising companies increase the mean of customer utility and decrease the variance of customer utility (Chauvin & Hirschey, 1993; Erdem & Baohong Sun, 2002; Ivanov et al., 2013). Based on the results of their research, I included *RD* (research and development expenditures) and *Advert* (advertising expenditures) as control variables.

Several other variables have been determined to be associated with both a firm's ACSI score and its ICFR effectiveness. These variables include firm complexity (as measured by the number of segments), return on assets, and firm size (Ivanov et al., 2013; Doyle et al., (2007b). Firms with more than one segment are more likely to invest in customer satisfaction because they will be able to realize the benefit of the investment across the various segments (Ivanov et al., 2013). This added complexity is likely to create additional challenges in maintaining an effective ICFR system (Doyle et al., 2007a). Firms with higher ROA are more efficient and have more resources available to invest in customers and internal control systems (Doyle et al., 2007a; Ivanov et al., 2013). Larger firms are expected to have more resources available to invest in customers and internal control systems (Doyle et al., 2007a; Ivanov et al., 2013). I, therefore, include the number of segments (n_segs), return on assets (ROA), and the logarithm of total assets (SIZE) as control variables.

Regression with Fixed Effects

I first estimated the average treatment effect of remediating an ICFR weakness using several fixed effects regressions:

$$ACSI_{it} = \beta_0 + \alpha_i + \lambda_t + \beta_1 Trt\_Rem_{it} + \varepsilon_{it} \quad (1)$$

$$ACSI_{it} = \beta_0 + \alpha_i + \lambda_t + \beta_1 Trt\_Rem_{it} + \beta_2 RD_{it} + \varepsilon_{it} \quad (2)$$

$$ACSI_{it} = \beta_0 + \alpha_i + \lambda_t + \beta_1 Trt\_Rem_{it} + \beta_2 RD_{it} + \beta_3 n\_segs_{it} + \varepsilon_{it} \quad (3)$$

$$ACSI_{it} = \beta_0 + \alpha_i + \lambda_t + \beta_1 Tret\_Rem_{it} + \beta_2 RD_{it} + \beta_3 n\_segs_{it} + \beta_4 Size_{it} + \varepsilon_{it} \quad (4)$$

$$ACSI_{it} = \beta_0 + \alpha_i + \lambda_t + \beta_1 Tret\_Rem_{it} + \beta_2 RD_{it} + \beta_3 Advert_{it} + \beta_4 ROA_{it} + \varepsilon_{it} \quad (5)$$

The α_i and λ_t terms capture firm and year fixed effects, respectively. While estimating the fixed effects regressions, I cluster the standard errors by firm and year. This ensures that the estimated standard errors are not biased due to a violation in the assumption that the error terms in the regression are independent across firm-years.

Dynamic Difference-in-Difference Model

After using fixed-effects regressions, I estimate the average treatment effect using a dynamic difference-in-difference model (de Chaisemartin & D'Haultfœuille, 2018). As previously discussed, this model explicitly accounts for heterogeneity in effect size of the treatment across firms and time. In addition, it allows me to separately estimate the treatment effect in each year following the treatment. I use the twowayfeweights and did_multipleGT Stata packages to test for effect heterogeneity and to estimate the dynamic effects models (de Chaisemartin & D'Haultfœuille, 2018).

Sample Selection

I obtained firm-years with the ACSI measure from the ACSI website. To facilitate joining the ACSI database with Compustat and Audit Analytics, I manually populated the values for

each firm's Central Index Key (CIK) by searching for the company's name in either the Compustat or Audit Analytics database. When a potential match was identified, I conducted a web query using the company's name and CIK to verify that the match was accurate.

After populating the table with each firm's CIK, I calculated the average ACSI score for firms that have multiple segments included in the ACSI database—ensuring that I had only one ACSI measure for each firm-year.

Next, I used the Compustat segments file to count the number of segments for each firm. I then combined this information with each firm's financial statement information that appears in the Compustat database before joining the resulting table with the ACSI table.

Finally, I used a join to include in the final dataset the necessary information about ICFR weaknesses and remediation from the Audit Analytics database. For each firm-year, I combined both management and the auditor's opinion concerning the presence of an ICFR weakness. Only one of the two parties was required to believe that an ICFR weakness was present in order for the firm-year to be designated as having a disclosed ICFR weakness. Using this information, I constructed the Trt_Rem measure that captures the timing of the treatment of remediating an ICFR weakness.

Table 2 presents the derivation of my sample. The sample started with 5,980 firm-years that had an ACSI score. After eliminating firm-years with missing data from either the Compstat of Audit Analytics, the sample contained 1,669 firm-years for which all the necessary information was available.

[Insert Table 2]

RESULTS

Descriptive Statistics and Correlations

Table 3 presents the frequency distribution of firms by industry. Trade, including both wholesale and retail, is the largest industry represented by 66 firms, followed closely by transportation, communications, electric, gas, and sanitary with 63 firms. Table 4 presents the descriptive statistics for the variables in the sample used to estimate the various models. Firms in the sample had an average ACSI score of 75.83 with a standard deviation of 6.22; scores ranged from 54 to 88. Table 5 presents the pairwise correlations for all regression variables used in the analyses; Pearson correlations are presented below the diagonal, and Spearman correlations are presented above the diagonal.

[Insert Table 3]

[Insert Table 4]

[Insert Table 5]

Regression Results

Table 6 presents the results of the regression analysis for Models 1 - 5 with firm and year fixed effects as well as clustered standard errors. In all models, the coefficients between internal control effectiveness and customer satisfaction are negative and are not statistically significant. In Model (1), the regression coefficient that summarizes the relationship between customer satisfaction and internal control effectiveness is negative ($B = -0.35$, $t = -0.62$, $p>0.05$); overall the model is statistically significant ($F(235, 1{,}433) = 34.79$, $p < 0.01$), with an adjusted R^2 of 0.83. In Model (2), the regression coefficient that summarizes the relationship between customer satisfaction and internal control effectiveness is negative ($B = -0.31$, $t = -0.56$, $p > 0.05$); overall the model is statistically significant ($F(237, 1{,}431) = 34.66$, $p< 0.01$), with an adjusted R^2 of

0.83. In Model (3), the regression coefficient that summarizes the relationship between customer satisfaction and internal control effectiveness is negative (B = -0.35, t = -0.64, p > 0.05); overall the model is statistically significant (F(238, 1,430) = 34.75, p < 0.01), with an adjusted R^2 of 0.83. In Model (4), the regression coefficient that summarizes the relationship between customer satisfaction and internal control effectiveness is negative (B = -0.66, t = -0.60, p > 0.05); overall the model is statistically significant (F(240, 1428) = 34.79, p < 0.01), with an adjusted R^2 of 0.83. In Model (5), the regression coefficient that summarizes the relationship between customer satisfaction and internal control effectiveness is negative (B = -0.51, t = -0.94, p > 0.05); overall the model is statistically significant (F(239, 1429) = 34.70, p < 0.01), with an adjusted R^2 of 0.83. These findings do not support H1, which predicted that the treatment effect of remediating an ICFR weakness on customer satisfaction would be positive.

[Insert Table 6]

While informative, the results of my fixed effects regression to estimate the treatment effect of remediating an ICFR weakness may be inappropriate in the presence of significant heterogeneity in the size of the treatment effect for various firms. To investigate this concern, I used the twowayfeweights Stata package created by de Chaisemartin and D'Haultfœuille (2018) to see how much heterogeneity would be necessary to lead to concerns that the sign on the fixed effects regression reported in Table 7 is incorrect.

[Insert Table 7]

The analysis revealed that a fairly small degree of treatment heterogeneity could result in a fixed-effects coefficient with the opposite sign of the true average treatment effect. About 16% of the estimated treatment effects received a negative weight. More importantly, the $\underline{\sigma}_{fe}$ parameter was about 0.29, indicating that firm-level treatment effects that have a standard

deviation greater than 0.29 can give a fixed-effects coefficient with the incorrect sign. It is not unreasonable to believe that the standard deviation of the treatment effects will exceed this amount as each control deficiency is of a unique nature and severity and, therefore, the procedures installed to remediate the problem could vary considerably in their impact on customer satisfaction. Heterogeneity in treatment effect size is especially concerning when the effect size is correlated with the timing of remediation (de Chaisemartin and D'Haultfœuille, 2018). In my sample, this type of correlation is plausible; more severe control deficiencies were likely more quickly discovered post-SOX, or possibly took longer to discover. This could mean that treatment effects are larger or smaller in earlier periods than later periods, which would bias the fixed-effects coefficient.

In addition to verifying the accuracy of the results from the fixed-effects regression, I am also interested in checking for time-series variation in the treatment effect that may be of interest in its own right. For example, it might be the case that remedying a control deficiency leads to an immediate increase (or decrease) in customer satisfaction, but this effect changes over time. For example, it is plausible that customers are initially unsatisfied with a change in the company's policies and procedures due to increased bureaucracy, but, over time, they become accustomed to the changes, and the effect deteriorates or even reverses.

To verify robustness and investigate the presence of dynamic effects, I use the did_multipleGT Stata package created by de Chaisemartin and D'Haultfœuille (2018). This package allows me to estimate the average treatment effect of remediating a control deficiency on customer satisfaction for each year following the discovery of the control deficiency. In addition to explicitly modeling and accounting for heterogeneity in the effect size of remediating an ICFR weakness, a dynamic effects model also alleviates concerns about the timing of

remediation. The fixed effects regression assumed that the remediation process at least started during the year in which the control deficiency was discovered. To the extent that remediation does not begin immediately after the discovery of a weakness, the fixed effects design might result in attenuated estimates of the average treatment effect.

I started my analysis of dynamic treatment effects by first verifying the common trends assumption that is necessary to estimate treatment effects using a difference-in-differences approach. In the context of my study, the common trends assumption would be violated if firms that remediate a control weakness had trends in their customer satisfaction ratings that differed from firms that do not remediate a control weakness. De Chaisemartin and D'Haultfœuille (2018) provide a test for the common trends assumption that involves estimating placebo effects during the period prior to treatment. If the common trends assumption is correct, there should be no identifiable differences-in-differences for the periods prior to treatment. Table 8 presents the results of the placebo test for the five periods prior to treatment. The analysis suggests no detectable difference in trends across groups. First, most point estimates are reasonably close to zero, with the possible exception of the year just prior to treatment. Second, none of the point estimates are statistically distinguishable from zero. Third, the placebo effects switch sign from one period to the next, which is inconsistent with any linear or monotonic trends (although a more complex trend is still possible).

Given the results of the placebo test, I now move to estimating dynamic treatment effects that allow for heterogeneity in effect size across time. I estimate the treatment effects for the year of remediation and for five years thereafter.

Table 8 shows the results of my difference-in-differences model. Column 1 is the year of a disclosure of an ICFR weakness. Columns 2 -7 show the estimated average treatment effect for

the six years after the remediation of an ICFR weakness. The results indicate a negative treatment effect for most years, although none of the effects are statistically significant at the traditional level (all p-values>0.10). The results are presented graphically in Figure 4, which makes clear the uncertainty in the estimated treatment effect and the fact that the results are not significant at the traditional level (i.e., the confidence intervals include zero). These results do not support my hypothesis that effective ICFR increases customer satisfaction.

[Insert Table 8]

[Insert Figure 4]

DISCUSSION

My hypothesis is not supported by the results of this study. The results are somewhat surprising given prior research (Bauer et al., 2018; Feng et al., 2015; Gallemore & Labro, 2015); however, it should be noted that prior studies examined business-to-business relationships rather than the business-to-consumer relationships explored in this study. The marketing literature has established that industrial customers and consumers are different (Industrial Marketing Review Board, 1954). The Industrial Marketing Review Board (1954) suggests that industrial customers' purchases are based on formulated policy, while consumer purchases are less structured. Su et al., (2014) states, "[i]ndustrial customers, compared to their consumer counterparts, are more dependent on firms' implicit claims," suggesting that it is possible disclosure of ICFR weaknesses may have a more significant impact on companies with industrial customers rather than companies dedicated to the consumer market. Consistent with this hypothesis, they found that the sales growth of consumer-oriented companies decreased less following the disclosure of a material weakness in ICFR than did sales for industrial oriented

companies (Su et al., 2014). Companies included in my study were primarily consumer-oriented companies.

The present study is the first to attempt to establish a relationship between effective internal controls over financial reporting and consumer customer satisfaction. While it is not possible to draw conclusions from statistically insignificant results, the following considerations may contribute to the current study's failure to support its hypothesis:

1. As some managers have suggested, there are no substantial operating benefits to having effective ICFR (Alexander et al., 2013).
2. The bureaucracy of an effective internal control system may impair the ability of the company to meet customers' expectations. This is especially likely for controls that directly impact the customer, such as approvals and authorizations. Often such controls add barriers to the business transaction, and the customer may see little benefit. This is unlikely to be true of control activities that occur "behind the scenes" such as reconciliations and reviews.
3. Disclosed weaknesses in the effectiveness of a company's internal control system may not be an adequate proxy for the quality of a company's internal control system. For example, Rice and Weber (2012) found that only 32.4% of firms reported a material weakness in internal control during the period of a material misstatement of the financial statements. The material weakness was only disclosed once the financial statements were restated. It is possible that firms with ineffective internal controls do not disclose material weaknesses in internal controls.

4. It is possible that the ineffective internal controls are the result of ineffective management in a broader sense. It is plausible that ineffective management may make decisions that benefit the customer at the expense of financial reporting quality.
5. As is the case with any observational study, an unidentified variable may be effecting both internal controls and customer satisfaction.

Future research can investigate these possibilities with either archival or experimental methods.

This study has a number of limitations, including its observational nature, its small sample size, and the fact that most of the instances of ineffective controls occurred early in the implementation of SOX. The small sample size implies that the statistical tests used are of low power. This increases the chances of a Type II error: it might be that my tests failed to reject the null hypothesis because of a small sample (and, therefore, low power) and not because there is no treatment effect of remediating ICFR weaknesses. Identifying alternative measures of customer satisfaction that are available for more firms would provide a more robust test of the treatment effect of remediating ICFR weaknesses on customer satisfaction.

CONCLUSION

The purpose of this study was to extend emerging research that suggests a spillover effect from ICFR to operations by investigating the benefit of effective ICFR to customer satisfaction. This study did not provide evidence to support a spillover of ICFR to customer satisfaction. On the contrary, the point estimates of the treatment effect of remediating an ICFR weakness were consistently negative, although they did not reach statistical significance at traditional levels. The lack of statistical significance may be due to a small sample size; however, the direction of the estimates indicates that it is unlikely that remediating control weaknesses will increase customer satisfaction. The small sample size was largely due to the ACSI score being measured

for only a small number of firms. Other methods of measuring customer satisfaction might yield different results.

While caution is necessary when interpreting statistically insignificant point estimates, my results may have implications for companies as they make choices regarding the design and implementation of internal controls over financial reporting. It may be to companies' advantage to select and implement control activities that are less visible to customers but are effective at mitigating the identified risk. The study has implications for auditors as well. Auditors, especially those serving the internal audit function, should be mindful of the relationship between internal controls and customer satisfaction. Some internal controls might come at the cost of customer satisfaction. Auditors should keep this potential tradeoff in mind when implementing or recommending internal controls over financial reporting.

TABLES

Table 1
Comparison of Internal Control Requirements of FCPA, FDICIA, and SOX

	FCPA	FDICIA	SOX
Applies to:	Public companies.	Applicable to institutions with assets over $1 billion.	Public companies with market capitalization over $75 million.
Management Responsibility	Yes	Yes	Yes
Report on the effectiveness of ICFR	No	Yes	Yes
Auditor attestation of management report	No	Yes	Yes
Auditor attestation of the effectiveness of ICFR	No	No	Yes

Table 2

Sample Selection

	# of Observations
Firm-years with ACSI scores from 1992 to 2018	5,980
Missing Compustat data	-2,592
Firm-years with ACSI scores and Compustat data	3,388
Missing Audit Analytics data	-1,719
Final Sample	1,669

Table 3

Frequency Distribution of Firms by Industry

	N	%
Mining and Construction	1	0.00
Manufacturing	38	17.27
Transportation, Communications, Electric, Gas, and Sanitary Service	63	28.64
Trade	66	30.00
Finance, Insurance, and Real Estate	36	16.36
Services	15	6.82
Public Administration	1	0.00
Total	220	100.00

Table 4

Descriptive Statistics—All Observations

	n	Mean	SD	Min	25%	Median	75%	Max
Dependent Variable								
$ACSI_t$	1,669	75.83	6.22	54	72.00	77.00	80.00	88.00
Independent Variables								
Trt_Rem_t	1,669	0.16	0.36	0.00	0.00	0.00	0.00	1.00
RD_t	1,669	0.01	0.02	0.00	0.00	0.00	0.00	0.19
$Advert_t$	1,669	0.03	0.05	0.00	0.00	0.00	0.03	0.43
$Complexity_t$	1,669	0.92	0.62	0.00	0.00	1.00	1.39	2.30
$Size_t$	1,669	10.17	1.71	5.15	9.18	10.07	11.06	14.76
ROA_t	1,669	0.05	0.09	-1.09	0.01	0.04	0.07	0.90

Table 5
Variable Correlations

Measure	1	2	3	4	5	6	7
1. $ACSI_{i,t}$	1.00	0.11**	0.32**	0.28**	-0.07**	-0.14**	0.23**
2. $Trt\_Rem_{i,t}$	0.09**	1.00**	0.05*	0.20**	-0.09**	-0.19**	-0.06*
3. $RD_{i,t}$	0.19**	0.01	1.00	0.36**	0.00	0.03	0.22**
4. $Advert_{i,t}$	0.23**	0.12**	0.15**	1.00	-0.26**	-0.37**	0.32**
5. $Complexity_{i,t}$	0.02	-0.10**	-0.08**	-0.15**	1.00	0.32**	-0.10**
6. $Size_{i,t}$	-0.09**	-0.18**	0.01	-0.49**	0.32**	1.00	-0.30**
7. $ROA_{i,t}$	0.20**	-0.01	0.09**	0.22**	-0.06**	-0.18**	1.00

* Coefficients with a one-tailed p-value of < 0.05.
** Coefficients with a one-tailed p-value of < 0.01.

Pearson pairwise correlations presented along the bottom diagonal.

Spearman pairwise correlations presented along the top diagonal.

Table 6

Model 1 – Regression Results with Firm Fixed Effects, Year Fixed Effects, and Clustered Standard Errors

Dependent variable – $ACSI_{i,t}$					
	1	2	3	4	5
Independent Variables					
$Trt\_Rem_{i,t}$	-0.35	-0.31	-0.35	-0.51	-0.66
	(0.56)	(0.57)	(0.54)	(0.54)	(0.60)
$RD_{i,t}$		-12.03	-10.10	-9.92	-9.37
		(15.31)	(14.19)	(12.02)	(11.79)
$Advert_{i,t}$		11.37	10.48	8.71	8.23
		(8.42)	(7.75)	(7.11)	(6.97)
$n\_segs_{i,t}$			-0.88	-0.79	-0.80
			(0.50)	(0.51)	(0.50)
$Size_{i,t}$				-0.44	-0.41
				(0.36)	(0.35)
$ROA_{i,t}$					2.88
					(1.24)
Degrees of Freedom	1,433	1,431	1,430	1,429	1,428
R^2	0.85	0.85	0.85	0.85	0.84
Adjusted R^2	0.83	0.83	0.83	0.83	0.82

***, **, * Denote significant two-tailed p-values at $p < 0.01$, $p < 0.05$, and $p < 0.10$, respectively.

Standard errors are in parentheses.

See Appendix A for variable definitions.

Table 7

Placebo Test for the Five Periods Prior to Treatment

	DV=ACSI					
IV=Trt_Rem	*t-5*	*t-4*	*t-3*	*t-2*	*t-1*	*t=0*
No Control Variables	0.88 (0.76)	-0.86 (0.71)	0.20 (0.63)	-0.39 (0.55)	0.81 (0.60)	0.15 (0.47)
Degrees of Freedom	352	425	535	655	792	910

***, **, * Denote significant p-values at $p < 0.01$, $p < 0.05$, and $p < 0.10$ levels (one-tailed), respectively.

See Appendix A for variable definitions.

Table 8

Average Treatment Effects Estimates From Dynamic Difference-in-Difference Model

	DV=ACSI						
IV=Trt_Rem	*t=0*	*t=1*	*t=2*	*t=3*	*t=4*	*t=5*	*t=6*
No Control Variables	-0.15	-0.30	-0.72	-1.43	-1.55	-0.79	-0.03
	(0.47)	(0.57)	(0.81)	(1.01)	(1.22)	(1.53)	(1.30)
Control for RD, and Advert	0.17	-0.30	-0.70	-1.43	-1.58	-0.84	-0.72
	(0.47)	(0.55)	(0.76)	(0.99)	(1.11)	(1.46)	(1.32)
Control for RD, Advert, and Complexity	0.17	-0.30	-0.70	-1.43	-1.58	-0.84	-0.07
	(0.49)	(0.58)	(0.69)	(0.96)	(1.12)	(1.49)	(1.29)
Control for RD, Advert, Complexity, and SIZE	0.27	-0.30	-0.70	-1.43	-1.58	-0.84	-0.07
	(0.48)	(0.58)	(0.75)	(0.93)	(1.10)	(1.50)	(1.31)
Control for RD, Advert, Complexity, Size, and ROA	0.08	-0.30	-0.70	-1.43	-1.58	-0.84	-0.07
	(0.52)	(0.57)	(0.74)	(0.96)	(1.11)	(1.48)	(1.25)
N	910	762	633	521	431	285	272

***, **, * Denote significant p-values at $p < 0.01$, $p < 0.05$, and $p < 0.10$ levels (one-tailed), respectively.

See Appendix A for variable definitions.

FIGURES

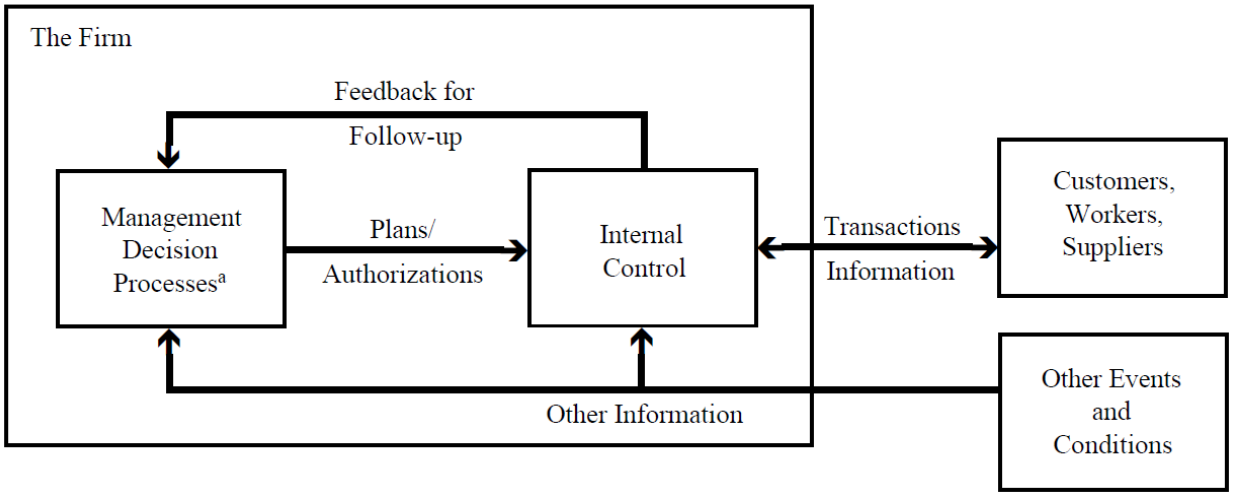

Figure 1 – Management Decision Processes and Internal Control (Kinney, 2000)

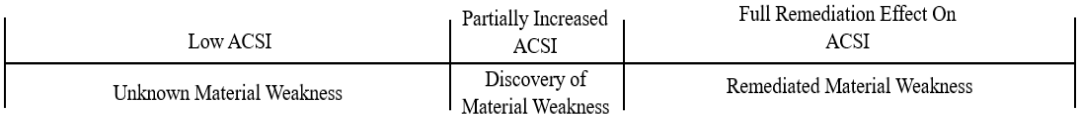

Figure 2 -Timeline of the Effect of Material Weakness Disclosure

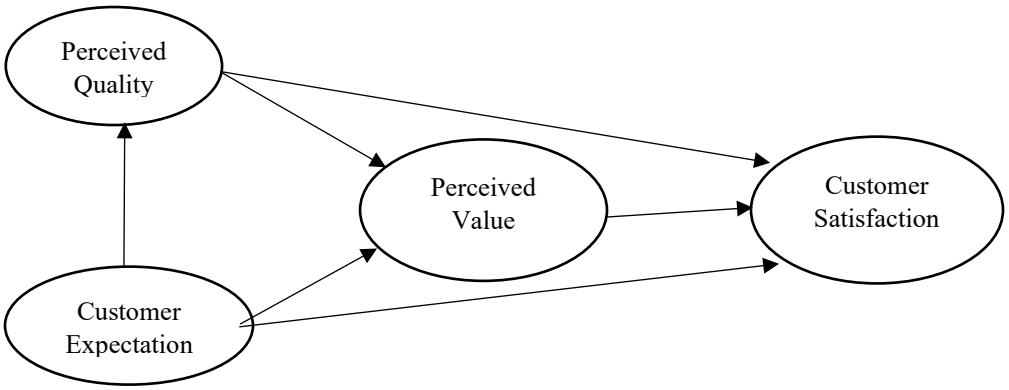

Figure 3 – ACSI Model (Antecedents Excluded)
(Hult et al., 2017)

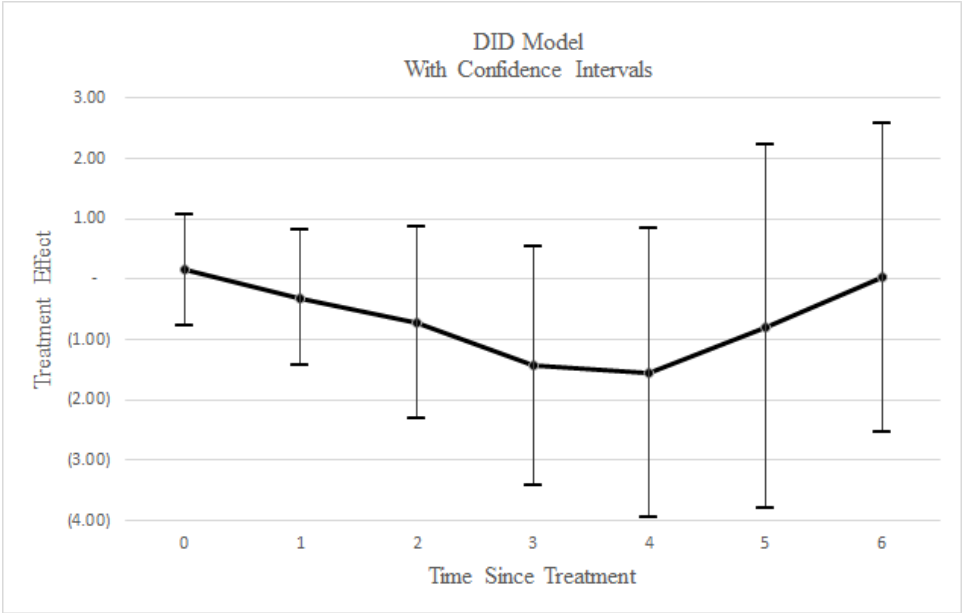

Figure 4 – Graph of Effects of DID Model

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Appendix
Variable Definitions

Variable	Definition
ACSI	Customer satisfaction measured by the American Customer Satisfaction Index (ACSI).
Trt_Rem	An indicator variable set to 1 if a firm began remediating an ICFR weakness in year t, and otherwise 0. ICFR weaknesses were obtain from audit analytics database.
RD	Firm research and development expense scaled by total assets.
Advert	Advertising expense; ratio of advertising expenses to revenues; advertising expense in year t divided by revenue in year t.
n_segs	The logarithm of the number of operating segments for a firm-year reported in the Compustat segments file.
Size	Natural log of the total assets of the firm.
ROA	Return on assets, net income/net loss divided by total assets.