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Transition to the New Revenue Standard:
A Study of Firms' Decisions to Adopt ASC 606 Early

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Master of Accountancy, Kansas State University, 2007

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Abstract

The Financial Accounting Standards Board has issued a new revenue standard through a series of updates since May 2014 (collectively, ASC 606). The standard allowed firms to adopt it a year early before the required effective date. This study provides evidence of the adoption effects of ASC 606 on firms' financials and examines the relationship between the likelihood of early adopting ASC 606 and firm-specific characteristics. The results show that early adopters are distributed across 12 industries and 40% of them are concentrated in the computer programming and software industry. Early adopters in the software industry reported the largest cumulative adoption effects in dollars on retained earnings. Overall, the majority of the sample firms (83%) reported positive adoption effects on financial statements and the adoption of ASC 606 increased their retained earnings by 2.95% on average. The results also show that most early adopters chose the full retrospective method while the majority of industry-size-matched non-early adopting peers chose the modified retrospective method. Finally, the multivariate regression analyses suggest that early adopters are associated with decreased earnings in the year before adoption and more favorable adoption effects than non-early adopting peers.

KEYWORDS: Revenue Recognition, ASC 606, Early Adoption, Accounting Choice, Positive Accounting Theory

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Chapter 1: Introduction

Revenue is a key measure of a firm's financial performance and a starting point to analyze a company's value, trends, and prospects. It affects key financial ratios, related metrics (e.g. EBITDA), and contracts that are based on these measures such as incentive compensation plans and debt covenants. As an indicator of a firm's potential value and management's stewardship effectiveness, this top-line number on the income statement is monitored closely by internal and external users of financial statements such as managers, investors, creditors, and market regulators (Papa, 2016; PWC, 2019).

Despite its importance, revenue recognition has always been complex and challenging. Standard-setters in the past followed a rules-based approach to accommodate the complexity by issuing industry- and transaction-specific guidance. These rules developed by various standard-setting bodies were excessive and hard to implement, which resulted in "different accounting for economically similar transactions" (FASB, ASU2014-09: p.1). Given its critical importance and difficulties in applications, it is not surprising that revenue is the most scrutinized number by auditors, investors, and regulators. Studies of the SEC enforcement actions indicate that improper revenue recognition was a major reason for financial restatements and a frequent subject of accounting fraud (Carmichael, 2019; Jones & Pagach, 2013; Sherman & Young, 2016).

Over the years, regulators and stakeholders have raised concerns over revenue guidance's weakness, inconsistency, and non-comparability and requested improvement (SEC, 2003). To address the concerns, the Financial Accounting Standards Board (FASB) has worked collaboratively with the International Accounting Standards Board (IASB) since 2002, and

issued a new universal revenue standard – Accounting Standards Codification (ASC) 606,

Revenue from Contracts with Customers, on May 28, 2014.

ASC 606 replaced the rules-based industry-specific guidance prescribed in ASC 605

Revenue Recognition with a new principles-based five-step model to streamline revenue

reporting. This five-step model is highly conceptual. It starts with identifying a bona fide

contract and distinct performance obligations (what), then determines the amount of revenue to

recognize for each obligation (how much), and ends with determining the timing of revenue

recognition based on the pattern of transfer of *control* of goods/services to customers (when).

The new guidance affects almost all entities (public and non-public) that enter into contracts with

customers to transfer goods or services unless they are subject to other standards (e.g., insurance

contracts, lease contracts, and financial instruments). It represents a significant change in

accounting principles and requires increased discretion and judgment under the new principles-

based framework (Ahn et al., 2021; Peters, 2018; Reddy, 2018; Thorps et al., 2020; Tzuo, 2017).

The new standard allows firms to make two accounting choices in the initial adoption:

adoption timing and *transition method*. In terms of adoption timing, firms have the choice to

voluntarily adopt it as early as one year before the required effective date or defer compliance to

the mandatory effective date, December 15, 2017. The standard also allows firms to choose

either the full retrospective method (FRM) or the modified retrospective method (MRM) to

report the GAAP changes due to the application of the new standard. Under the FRM approach,

ASC 606 is applied retrospectively to each reporting period on the comparative financial

statements, and the cumulative true-ups are made at the earliest reporting period. The FRM

method enables a line-by-line comparison of financial results before and after the adoption, but

this method may require a substantial overhaul of accounting systems to perform dual reporting

using two sets of accounting data, which may not be easily available (Tysiac, 2014). In comparison, the MRM provides a practical expedient approach where the cumulative adjustments are applied at the date of adoption and the comparative years are not restated. This approach could limit the information needed to understand the adoption effect of ASC 606 (Papa, 2016; Peters, 2018). In sum, the adoption timing and transition methods chosen may affect the time and the level of effort to implement the changes. The adoption decisions may also affect the outcome of the financial statements presented. Companies need to evaluate the impact of adoption choices, seek information about how other companies adopt the standard, and determine what meaningful information to disclose before making the adoption decisions.

The implementation of the new standard presents significant challenges for many companies. This is especially true for those that have multiple deliverables such as software and high-tech firms, for aerospace and defense firms that have multi-year contracts with milestone payments, or for firms with innovative business models that involve varying levels of credit risks and fulfillment responsibilities (Deloitte, 2017; Nehoray et al., 2018). For example, Intellectual Property (IP) - related business models are becoming more pervasive in the technology, pharmaceutical, and entertainment industries, but accounting for IP license revenue is difficult due to the complexity involved in determining the nature of licenses[1]. To address stakeholders' concerns about limited implementation guidance in the application of the highly conceptual revenue model, the FASB added additional concepts (functional IP or symbolic IP) in its clarifying guidance to help firms determine whether revenue should be recognized over time or at a point in time (Papa, 2016). As another example, Oracle, a software company that provides an

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[1] Entities must analyze whether a transaction is a sale or licensing of IP, whether the IP is a distinct performance obligation, and the nature of the license to determine the timing of revenue recognition (Bellomy & Driscoll, 2020).

automated revenue management solution for customers, restated its 2018 Q3 earnings in its

initial application of ASC 606 which included a $500 million reduction in revenue. The

reduction was attributed to a misapplication of the new rules, causing confusion and frustration

among analysts and investors. This example is concerning considering that Oracle is the firm that

provides a revenue management system to ensure compliance with ASC 606 (Reddy, 2018). Not

surprisingly, an article in Compliance Week reports that "24 percent of non-reliance notices

(alert investors not to rely on financial statements) are caused by the problems with the ASC 606

adoption in 2018. And 2 percent of late filings in 2018 have cited revenue recognition problems

as the reason for tardy filings."(Whitehouse, 2019).

Besides figuring out the details of the compliance, firms need to dedicate a significant

amount of time, resources, and expertise to review the contract portfolio affected, update or

overhaul the system, seek advice from auditors/lawyers and compensation committees, and

evaluate the impact of the standard on their financial statements. Many firms found that the

implementation process was much more complex and time-consuming than they had expected

(Peters, 2018). According to a survey conducted by Ernst & Young in 2018, the average cost of

transition to the new standard is estimated to be $3.3 million per company, and 88% of

companies said that they found it challenging to compile data needed for the transition and more

than 80% said they may have to rely on manual work to comply with new requirements

(Shumsky, 2019).

In response to the practical difficulties and challenges of transition to the new standard,

the FASB postponed the original effective date for public companies to December 15, 2017, with

one-year early adoption permitted (FASB, ASU2015-14)[2]. In addition, the FASB issued a series

of updates to clarify measurement and presentation issues as well as some practical expedients to

facilitate the transition and implementation of the standard. For example, ASU 2016-08 Revenue

from Contracts with Customers: Principal versus Agent Considerations, provides guidance on

whether revenue should be recognized on a gross or net basis based on the nature of the promise

to provide goods or services to a customer (i.e., a principal or agent destination). ASU 2016-10

Revenue from Contracts with Customers: Identifying Performance Obligations and Licensing,

provides guidance on identifying performance obligations and accounting for licenses of

intellectual property. ASU2014-09 and its amendments (Collectively, ASC 606) are the new

revenue standard in the study.

Despite the complexity and challenges in implementing the changes of the new standard,

a few companies elected to adopt it before the required date (i.e., early adopters). The type of

early adopters varies significantly from large-cap firms such as Microsoft ($857 billion) and

Google ($828 billion) to small companies such as Amerityre ($844,000) (Peters, 2018). It is not

clear if these early adopters exhibit different characteristics from their non-early adopting peers,

what the adoption effects are on financial statements, and how the adoption effects affected their

adoption timing and method decisions. As early adopters, these companies likely had no peer

companies as references regarding the extent and format of new disclosure requirements. This

could have invited additional scrutiny from regulators and market participants, which may have

increased the legal risk of reporting. For example, Peters (2018) indicated that nearly one-third of

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[2] ASU 2014-09 defines that for public companies, "this Update is effective for annual reporting periods beginning after December 15, 2016, including interim periods within that reporting period." Companies faced obstacles in implementing ASU 2014-09 and requested deferral in the adoption. The FASB responded to the requests by issuing ASU 2015-14 and postponed the effective date of ASU 2014-09 to December 15, 2017. Thus, a public company that adopted ASU 2014-09 with an annual reporting period beginning between December 16, 2016 and December 15, 2017, is an early adopter of ASC 606.

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the early adopters received revenue recognition-related comment letters from the SEC, and some

received as many as six rounds of comments from the SEC, questioning their judgments and

analyses used in applying the five steps in revenue recognition and related presentations. Given

the complexity and challenges of adopting ASC 606, it is unclear what the motivations are for

their early adoption decisions.

One potential consideration in firms' choice in adopting ASC606 is the standard's impact

on financial statements[3]. The new revenue model emphasizes the transfer of *control* rather than

the satisfaction of performance obligations prescribed under ASC 605 when determining whether

revenue should be recognized at a point in time or over time. This control-based model may lead

to accelerated or deferred revenue recognition, or revenue reclassification under certain

situations. For example, telecommunication companies often offer bundled products at deep

discounts in exchange for multi-period service contracts (e.g., a free cell phone and monthly

subscription services). In the past, equipment and service revenue were treated as a single

performance obligation with revenue recognized over time as service is provided. ASC 606 is

likely to treat them as a distinct performance obligation, resulting in equipment revenue being

recognized upfront at the point of sale and service revenue being recognized over time. AT&T

disclosed in its 2017 annual report that they expect a positive impact on short-term financial

results, and its significantly affected items are the re-classification of service to equipment

revenues and deferral of commission expenses. In contrast, some construction companies and

consulting companies may have to defer revenue recognition when the percentage of completion

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[3] The SEC's initial review of adoption impacts and disclosures indicated that ASC 606 is more likely to affect the timing of revenue recognition, but has no real effect on cash flows associated with a contract (Peters, 2018)

method is replaced by the control-based model, where the transfer of control occurs upon the final delivery of products or services (Hepp, 2018).

The effects of ASC 606 on financial reporting are likely to vary for firms in different industries due to the fundamental differences in business models and practices, operating environments, prior GAAP rules, and contract designs[4] (Choi, Kim & Wang, 2022). Even within the same industry, the impact of ASC 606 varies because not all contracts in the industry are necessarily economically similar. To the extent that a company chose a different revenue accounting method than its peers under ASC 605, the impacts as a result of the new guidance would be different as well. So far, the nature, extent, and magnitudes of the adoption effects on financial statements are under-examined (Arms & Bercik, 2015; Marco & Ovuka, 2017; McKenna, 2017).

In addition, it is not clear why some firms chose to be early adopters knowing that the FASB had postponed the compliance of ASC 606 due to its complexity and challenges in initial applications, and they could be subject to a heightened risk of errors and increased scrutiny from regulators and investors as first movers. Therefore, it is an empirical question to explore the adoption effects of this standard and examine if there is a systematic difference between early and non-early adopters in firm characteristics and adoption effects to explain their voluntary adoption behaviors. This is also a research area that the FASB called for in the revenue research webinar in March 2021[5].

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[4] The changes in accounting treatment on contract acquisition costs and the new disclosure requirements are expected to affect all industries and entities across the board (Jones & Pagach, 2013; Kral & Levy, 2019).
[5] https://fasb.org/Page/PageContent?PageId=/projects/academics.html#section-2

This study aims to provide evidence on the impact of ASC 606 on firms' financials with a focus on early adopters. Specifically, I examine two research questions: (1) What is the adoption effect of ASC 606 on the financial statements of early adopters versus non-early adopting peers? (2) Is there evidence of systematic differences in the characteristics of firms that were early adopters versus non-early adopting peers?

As discussed earlier, adopting ASC 606 early is a significant accounting choice firms have to make because they had to commit great resources and tackle many challenges. This group of firms is likely to expect more benefits from the changes in accounting by overcoming time and resource constraints. Focusing on this group will provide evidence of the impacts of ASC 606 and complement concurrent studies that have mixed findings regarding the impact of ASC 606 on the stock market. By adopting a new standard early, firms may use the one-time earnings management opportunity to signal their ability and quality of reporting, smooth transitory increase or decrease in earnings, and provide the stock market with information regarding their long-term expectations (Eakin & Gramlich, 2000).

ASC 606 provides an interesting setting for early adoption research in the accounting choice literature. This is because ASC 606 directly affects the top-line number in addition to the bottom-line number on income statements. Prior accounting changes in early adoption studies affected only the bottom-line numbers of the income statement. For example, Ayres (1986) examined the characteristics of firms early adopting SFAS 52 - Accounting for Foreign Currency Translations, where the gains and losses from foreign currency translation are reported under owners' equity rather than the income statement under the previous standard. Sami and Welsh (1992) studied the characteristics of firms early adopting SFAS 87 - Employers' Accounting for Pensions, where the major effect of the new standard is the method used to measure net periodic

pension cost and recognize the minimum liability provision for underfunded plans. Gujarathi and

Hoskin (2003) studied the characteristics of firms early adopting SFAS 96 – Accounting for

Income Taxes, where the new standard changed accounting for income tax recognition and

accrual. Unlike prior accounting changes studied in the prior research, ASC 606 directly affects

the top-line number, which is critical to users in evaluating firms' performance, trends, and

prospects. Given the importance of ASC 606, my study contributes to both ASC 606 literature

and the accounting choice literature that are described below.

ASC 606 literature is new and growing. Extant research on ASC 606 focuses on

examining the market consequences of the standard focusing on materially affected firms, and

their findings are mixed. For example, Lee and Lee (2020) found that ASC 606 decreased

earnings predictability while Chung and Chuwonganant (2019) found that ASC 606 improves the

informativeness of earnings. Complementing the concurrent studies that focus on the market

effects of ASC 606, this study chooses to examine the direct impact of ASC 606 on firms'

financials and examine whether early adopters have certain firm-specific characteristics and

benefits from their voluntary adoption decisions. The analyses will provide insight into the

reporting benefits of the standard and how the benefits vary with the characteristics of firms,

which in turn will further our understanding of the impact of the new standard.

The accounting choice literature suggested that voluntary adoption decisions have

important implications for firms and users of financial statements. Prior studies document that

early adopters consist of firms that have unique characteristics and tend to be strategic in making

adoption decisions. They have economic incentives to take advantage of the unique earnings

management opportunity to adopt a new standard early before required (Ali & Kumar, 1994;

Ayres, 1986; Eakin & Gramlich, 2000; Gujarathi & Hoskin, 2003; Langer & Lev, 1993; Sami & Welsh, 1992; Simon & Costigan, 1996; Trombley, 1989; Zmijewski & Hagerman, 1981).

This study will contribute to the literature on ASC 606 and the voluntary adoption literature in the following ways. First, this study will enhance users' understanding of the new revenue standard and its financial reporting impact to make well-informed decisions. Second, this study may be interesting to practitioners in identifying earnings management opportunities for the best interest of stakeholders. Third, the findings may be interesting to standard-setters to understand the implications of accounting choice to determine an optimal level of discretion allowed when issuing new rules (Fields et al., 2001; Watts & Zimmerman, 1990). Lastly, this research may provide useful information for the FASB's post-implementation review of ASC 606 (FASB, 2020-07-29)[6].

The remainder of the paper proceeds as follows. Chapter 2 discusses the background and prior research in revenue standards and voluntary accounting choices followed by hypothesis development. Chapter 3 explains the sample selection process and the research method. Chapter 4 presents the quantitative evidence of summary statistics and logistic regressions with discussions of the results. Chapter 5 discusses the research implications, contributions, and future research opportunities.

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[6] https://www.fasb.org/Page/PageContent?PageId=/pir/pir.html&isstaticpage=true#section-2

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Chapter 2: Literature Review

2.1. History of US Accounting Authorities and Pronouncements

The promulgation of financial accounting standards in the U.S. is a political process influenced by numerous parties, including the Securities Exchange Commission (SEC), standard-setting bodies such as the FASB, the corporate sector, public accountants, and users of financial statements. The SEC was given the authority to prescribe accounting standards in the Securities Act of 1933 but has chosen to delegate this responsibility to the private sector[7].

The earliest accounting standard-setting body delegated by the SEC can be traced back to the predecessor of the American Institute of Certified Public Accountants (AICPA) – the American Institute of Accountants (AIA), which established a subcommittee - Committee on Accounting Procedure (CAP) in 1938 to develop accounting standards. The CAP issued 51 accounting standards known as Accounting Research Bulletins (ARBs) during its twenty-one years of existence. In 1959, The Accounting Principles Board (APB) replaced the CAP and issued 31 APB opinions and four statements during its brief existence. In 1973, the FASB replaced the APB and has been responsible for establishing and interpreting financial accounting and reporting standards for public, private, and not-for-profit organizations since then. The FASB pronouncements are considered as having substantial authoritative support by the SEC in its Accounting Series Release (ASR) 150 - Statement of Policy on Establishment and Improvement of Accounting Principles and Standards, and by the AICPA in its Code of Professional Conduct under Rule 203 – Accounting Principles (Storey and Storey, 1998).

In 1978, the FASB established the Conceptual Framework for Financial Accounting and Reporting which provides the basic objectives and fundamentals underlying financial reporting.

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[7] https://www.sec.gov/news/speech/1989/011089ruder.pdf

The framework is not authoritative but is used as guidance to develop accounting principles and analyze complex or emerging practice issues in the absence of applicable authoritative pronouncements. Over the years, the FASB has issued eight Statements of Financial Accounting Concepts (SFAC) that provide a broad overview of accounting concepts (Drew, 2021), and numerous Statements of Financial Accounting Standards (SFAS) that become the generally accepted accounting principles once published. These generally accepted accounting principles govern the financial reporting of publicly traded companies and are overseen by the SEC. Since 2009, both SFAC and SFAS have been superseded by the FASB Accounting Standards Codification (ASC). The codification is updated via Accounting Standards Updates (ASUs) and the FASB Conceptual Statements.

2.2 Background on Revenue Standard-Setting

Revenue literature in the U.S. includes broad conceptual statements as well as industry-specific rules that were developed over the years by the standard setters that existed at the time. SFAC No. 6 defines revenues as inflows or enhancements of assets or settlements of liabilities from delivering goods or services from an entity's main operations. The SFAC No. 5 includes core concepts of revenue recognition and measurement, where r*ecognition* is defined as a process of formally recording an item into the financial statements, and *measurement* is choosing a reliable method to quantify the item recognized (Storey & Storey, 1998). It specifies that revenue is not recognized until it is "realized or realizable, and earned" (SFAC No.5: page 30). While SFAC No. 5 provides general guidelines for revenue recognition, ASC 605, and numerous industry- or transaction-specific requirements (e.g., SFAS 66 – Accounting for Sales of Real Estate or ASC 985-605 - Software Revenue Recognition) provide detailed authoritative guidance for revenue recording. ASC 605 requires four criteria for revenue recognition: (1) persuasive

evidence of an arrangement exists, (2) delivery of goods or services has occurred, (3) the selling

price is fixed or determinable, and (4) collectability is reasonably assured. In 1999, the SEC

issued the Staff Accounting Bulletin (SAB) No. 101 (amended by SAB 104 in 2003) that

provides interpretive guidance on the four criteria that firms must meet to recognize revenue

(SEC, 1999).

The previous GAAP rules under ASC 605 Revenue Recognition are perceived more as a

rules-based accounting approach that comprises over 200 industry- or transaction-specific rules.

These rules are lengthy, complex, and difficult to implement with numerous restrictions,

exceptions, and bright-line tests (McCarthy & McCarthy, 2014). The advantages of a rules-based

system include increased transparency and verifiability in financial reporting, reduced ambiguity

in compliance, and reduced litigation risks (Benston et al., 2006; Donelson et al., 2012; Lee &

Lee, 2020). However, a rules-based method has been criticized for being *overly prescriptive* and

conflicting in some areas, resulting in a lack of reporting discretion and lack of consistency in

revenue recognition. Schipper (2003) suggested that detailed guidance in GAAP is intended to

increase comparability, but when the guidance is too strict with little room for discretion, the

rules-based reporting system becomes undesirable as it leads to technical compliance and

achieves only surface comparability. Moreover, voluminous guidelines and numerous

restrictions/exceptions can cause unnecessary complications in preparing financial statements

and managers may try to structure transactions to circumvent the true spirit of standards,

resulting in a violation of a critical accounting concept - *substance over form*. This concept is

particularly relevant in revenue recognition for reliable financial reporting (SEC, 2003). The

SEC indicated that a rules-based accounting system induced companies to circumvent

accounting rules to meet the letter but not the intent of standards – "an act of compliance rather

than an act of communication" (SEC, 2003: p. 5). It was given as one of the reasons for a series

of high-profile revenue misreporting scandals in the early 2000s.

The shortcomings of revenue recognition requirements were one of the reasons that high-

tech and software firms regularly use non-GAAP measures and complained that previous

guidance did not fully reflect the value of their new product launches. For example, Twitter

reported a net loss of $521 million under GAAP in 2015, but a net income of $276 million using

non-GAAP measures (Sultanoglu, 2017). The differences are attributed to the stringent vendor-

specific objective evidence (VSOE) requirements under the old subscription accounting rules[8].

Software firms often provide multiple deliverables (e.g., hardware, software, hosting,

maintenance, and support services) that are delivered at varying times but are often offered under

a total fee arrangement. Under the old rules, revenue for an individual service item could be

recognized separately only if a company could establish vendor-specific objective evidence

(VSOE) for the item - the fair market value if the item is sold separately. Otherwise, some or

even all of the multiple arrangements' associated revenue would have to be deferred. However,

VSOE analysis is based on stringent rules and tested by different methods. In practice, it is

extremely challenging for firms to establish VSOE, and it is sometimes impossible to measure

the fair value of an element that is not sold separately (Regan & Regan, 2007). These complex

accounting rules were criticized for causing a significant understatement of revenue, the

inconsistent accounting treatment for economically similar transactions, and the incomparability

of financial results. Unsurprisingly, firms such as Apple, Microsoft, Amazon, Facebook, and

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[8] SOP (Statement of Position) 91-1 specifies that software-license revenue is recognized upon delivery and service revenue is recognized proportionally over time. SOP 97-2 provides further guidance regarding revenue recognition timing and the amount of deferred revenue for delivered and undelivered elements. It requires firms to establish VSOE for each element in multiple deliverables before revenue is individually recognized (Choi, Kim & Wang, 2022).

Twitter lobbied for changes in the revenue rules and the elimination of the VSOE requirements (Leone, 2009).

Despite a large number of rules, there were still transactions that had no direct authoritative guidance under GAAP, and some requirements dated back to various authoritative predecessors of AICPA which resulted in inconsistent accounting treatment for economically similar transactions. Investors had a hard time comparing firms' financial performance across sectors without knowing the nuances of different revenue rules. With the rapid development of innovative business models and more complex transactions, some rules became obsolete and ineffective in reflecting the underlying economic substance of transactions (FASB, ASU 2014-09; SEC, 2003).

Additionally, there were issues and concerns about revenue recognition requirements in IFRS (International Financial Reporting Standards) as well. Previous revenue guidance under IFRS is viewed largely as a principles-based approach that provides general guidelines for a wide range of transactions and diverse business models. It is intended to reduce complexities and potential manipulations of rules in financial reporting (Schipper, 2003). However, the overly-broad standards under the legacy International Accounting Standards (IAS) 18 *Revenue* and IAS 11 *Construction Contracts* and related interpretations have been criticized for providing limited guidance for complex revenue transactions such as multiple-element arrangements, inadequate disclosures, and insufficient structure to frame professional judgments. As a result, some IFRS firms (e.g., software) had to refer to US GAAP rules for reporting revenue. IFRS's rules have been criticized as having caused inconsistent practices for revenue recognition, less trustworthy and auditable procedures, increased likelihood of disagreements on accounting treatments, and a significant loss of comparability among reporting entities (Benston et al, 2006; Bjornsen &

Fornaro, 2019; Guillaume & Pierre, 2016; McCarthy & McCarthy, 2014; Papa, 2016; Peters, 2016). As a result, there was also a call for new revenue standards in the IFRS regime of standards.

Last but not least, disclosure requirements under previous GAAP and IFRS were "limited and lacked cohesion" (FASB, ASU 2014-09, p.8). They were limited to generic boilerplate descriptions of a firm's accounting policies and their effects on revenue, however, investors and users of financial statements indicated that the disclosures were insufficient for analyzing a firm's performance and prospects.

The deficiencies in both US GAAP and IFRS led to the boards' joint decisions to issue the Norwalk agreement in 2002 and the Memorandum of Understanding in 2006 to develop a global revenue standard that can be applied to all contracts with customers regardless of industry- and transaction-specific patterns. The SEC indicated that neither GAAP nor IFRS reached an optimal balance in the various trade-offs inherent in revenue standard setting (e.g., relevance and reliability, or costs and benefits of information production). They suggested a move toward an objectives-oriented approach in developing the new revenue standards based on a high-quality theoretical framework. The new standards should have clearly stated accounting objectives, sufficient and operational rules, minimum exceptions, and minimum bright-line tests that require meeting prescribed thresholds (SEC, 2003).

After working collaboratively for over a decade, the FASB and IASB finally issued a unified revenue standard *Revenue from Contracts with Customer* on May 28, 2014 (i.e., ASC Topic 606 for US firms or IFRS 15 for international firms). The length of time taken to complete the revenue project underscores the complexity of the topic. This revenue standard supersedes all existing revenue rules in GAAP and IFRS and significantly reduces the number of requirements

in recognizing revenue. It aims to remove weaknesses, inconsistencies, and complexities in

previous requirements, streamline and harmonize revenue recognition practices, enhance

disclosures, and provide a more robust framework that allows for better comparability and

decision-usefulness of financial statements (FASB, ASU 2014-09). The boards believe that the

long-term benefits will outweigh the short-term costs of implementation.

This research focuses on U.S. public companies adopting ASC 606, thus the discussion of

IFRS 15 is outside the scope of this study.

2.3. ASC 606 New Revenue Standard

In the U.S., ASC 606 supersedes ASC 605 *Revenue Recognition* and affects almost all

entities (public and non-public) that enter into contracts with customers to transfer goods or

services unless they are subject to other rules (e.g. insurance contracts, lease contracts, and

financial instruments). Given the large percentage of contracts with customers in most

businesses, this new guidance is expected to bring the most influential accounting changes to

corporations since the Sarbanes-Oxley Act of 2002 (Thorps et al., 2020; Tzuo, 2017).

The new revenue standard moves from a rules-based approach to a principles-based

approach and consists of the following five steps:

Table 1. The Five-Step Model of ASC 606

Step 1:	Step 2:	Step 3:	Step 4:	Step 5:
Identify the contract(s) with a customer	Identify performance obligations (POs)	Determine the transaction price	Allocate the transaction price to each PO	Recognize revenue when/as a PO is satisfied

Step 1. ASC 606 defines a *contract* as an agreement between two or more parties that has

enforceable rights and obligations, has commercial substance, and meets a collectability

threshold which is crucial in determining whether a contract exists. It can be written, oral, or implied by business practices. The central requirements for contract existence are intended to prevent fraudulent or abusive contract practices, such as fictitious contracts, side letter agreements (SLA), round-trip transactions, bill-and-hold arrangements, or channel stuffing (Carmichael, 2019; Thorps et al., 2020).

Step 2. *Performance obligations* are enforceable promises to transfer goods or services to a customer, and each good or service that can be separately sold or identified is considered a distinct performance obligation to be recognized separately. If they have substantially the same pattern of transfer, they are accounted for as a series of bundled goods or services (combined output) to transfer to the customer.

Step 3. *Transaction price* refers to the amount of consideration an entity is entitled to receive in exchange for transferring promised goods or services to a customer, excluding the amounts received on behalf of third parties (e.g., sales taxes). The amount of considerations can be fixed or variable. Variable considerations such as discounts, rebates, refunds, performance bonuses/penalties, or incentives are contingent upon the occurrence of uncertain future events and need to be included in the transaction price at contract inception if they can be reasonably estimated (use either the expected value method or the most likely amount method) and are not expected to be reversed. Significant financing components also need to be considered when determining the transaction price.

Step 4. When the total transaction price involves *multiple performance obligations*, the transaction price needs to be *allocated* to each distinct performance obligation identified in step 3 based on its stand-alone selling price directly observable or estimated (e.g., expected cost plus margin).

Step 5. Revenue is *recognized* when a performance obligation is satisfied, i.e. a customer has substantially obtained control of goods or services. Performance obligations can be satisfied at a point in time or over time by measuring the progress of completion.

This 5-step model replaced excessive, disparate, and rigid industry-specific rules with an overarching framework to standardize the revenue reporting process that allows more management discretion and judgment. The core principle underlying ASC 606 is that an entity recognizes revenue to reflect the transfer of promised goods or services to a customer in the amount to which it is entitled. The first four steps help identify a seller's promises to customers and the amount of price associated with each promise, and the last step helps identify the pattern of transfer of promised goods or services to determine whether revenue should be recognized at a point in time or over time.

ASC 606 primarily affects the *timing*, *measurement*, and *disclosures* of revenue, as explained below:

First, ASC 606 changes the timing of revenue recognition. This is because the new revenue model shifts away from the prior risks and rewards model ("earned, realized, or realizable") and focuses on the transfer of *control* as the criteria to determine the *timing* of revenue recognition, where control is defined as "the ability to direct the *use* of and obtain substantially all of the remaining benefits from the asset" (FASB, ASU 2014-09: page 28). The determination of control is evaluated from the customers' perspective based on indicators of transfer of control such as physical possession, legal title, and customer acceptance. In practice, control of an asset may have been passed to a customer while the seller still carries risks related to the asset, thus revenue may be recognized under ASC 606 but not under ASC 605. In other words, the possibility of transferring assets early before the associated risks could lead to

accelerated revenue recognition. For example, large aerospace & defense (A&D) companies

such as Boeing, Lockheed Martin Corp, and Raytheon Corp. make customized goods for

customers. Under ASC 605, revenue was recognized *when* the title of goods was transferred to a

customer upon shipping or delivery. ASC 606 is likely to accelerate revenue reporting because

the seller is creating an asset that has no alternative use, which means that the control of goods

may be transferred to customers at the stage of work in process. For U.S. government contracts,

contractors usually do not have an alternative use for customized goods. The customer has

substantial control of the work-in-process inventory as aerospace & defense contracts allow the

customer to unilaterally terminate the contract for convenience. Therefore, revenue would be

recognized earlier under ASC 606 (McKenna, 2017; Wilks & Ellsworth, 2018).

In addition, the new standard requires firms to capitalize on incremental costs of

obtaining a contract (e.g., sales commissions, contingent legal fees, and travel costs) with a

customer rather than expense them if the costs are expected to be recovered. And ASC 606

breaks down performance obligations into more granular units (Ali & Tseng, 2022), which eases

requirements in software revenue. For example, ASC 605 only allowed the breakdown of the

product and support revenue, but ASC 606 allows the breakdown of the sale of software into

multiple performance obligations[9]. All these changes affect the timing of revenue recognition.

Second, ASC 606 affects the measurement of revenue recognition. When measuring the

amount of revenue, the new standard requires that variable consideration (e.g., performance

bonus, returns, rebates, usage-based charges), significant financing components (payments in

advance more than a year), and non-cash consideration be evaluated and estimated in

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[9] https://www.performio.co/insight/what-is-asc-
606#:~:text=While%20many%20of%20the%20changes,revenue%20to%20be%20broken%20up.

determining the transaction price. Many retailers assume that the new standard probably has little

impact on their revenue recognition practices as revenue is typically recognized at the point of

sale. However, the new standard may significantly affect the accounting treatment for gift cards,

customer incentives, customer loyalty programs, and rights of return (Kishi, 2020).

Measuring variable considerations is challenging in practice as it involves a lot of

uncertainty and contingent events, which requires managers to apply increased judgment on

when control of goods or services transfers to customers. For example, a customer loyalty

program is where a past sales contract gives a customer an option to purchase goods at a lower

price in the future. Under ASC 606, the customer's option to purchase goods or services could

become a separate performance obligation to be recognized as part of the original contract. This

could affect the allocation between current and future revenues, assets, and liabilities (Hepp,

2018). Arora (2019) assessed the impact of ASC606 on eight US airlines and found that the

aggregated income of these airline firms increased by 2% and the frequent flyer program (FFP)

liability increased by 76.93% due to the adoption of new rules. Estimates of the FFP value

represent one of the most uncertain areas in the airline industry as the valuation method changes

from the incremental cost method to the deferred revenue method in ASC 606. The liabilities of

loyalty points recorded under the incremental cost method is likely to be significantly lower than

those recorded under the deferred revenue method which uses the stand-alone redemption prices

rather than the historical costs to estimate the FV of liabilities. As expected, Delta Airlines

increased its FFP liability by 2.2 billion due to the change of valuation method under ASC 606 as

of the date of initial application (2018 Annual Report, Note 1). The highly volatile nature of

airfares indicates that the FV of mileage credits may constantly change. Therefore, variable

consideration represents a major area of uncertainty and requires more judgment under ASC 606 (Gordon et al., 2018).

Third, the new standard significantly increases the amount of information companies are required to disclose regarding the nature, amount, timing, and uncertainty of revenue and cash flows arising from contracts with customers. The new disclosure requirements are more detailed and comprehensive than previous standards. "It is as if your teacher isn't just demanding that you show your work, but also that you write an in-depth essay explaining the approach you chose, why you chose it, what assumptions you made, what tools you used, and what processes you followed to ensure nothing would go wrong." (Knachel, 2017: page 1).

Under ASC 606, firms must disclose revenue policies and explain the analysis and decisions made when applying the 5-step model, including more extensive disclosures on separate revenue streams, deferred customer contract acquisition and fulfillment costs, changes in contract assets and liabilities, descriptions of transaction prices allocated to remaining performance obligations and significant judgments made in the timing and amount of revenue recognition (Olsen & Weirich 2010; Streaser et al., 2014; Yeaton, 2015).

As an example, AT&T disclosed in its 2018 annual report that "As of December 31, 2018, the aggregate amount of the transaction price allocated to remaining performance obligations was $39,871 million of which we expect to recognize approximately 55% next year and 80% cumulatively over the next two years, with the balance recognized thereafter" (AT&T 2018 Annual Report, Note 5). It appears that the length of textual content related to ASC 606 disclosures has increased significantly for many companies, especially those that have a material impact from the adoption in measurement and presentation (Lee & Lee, 2020).

2.4. Transition Requirements and Choices

Initially, ASC 606 was effective for public companies with reporting periods beginning after December 15, 2016, including interim periods within that reporting period. Due to significant concerns about implementation complexities and transition challenges, the FASB postponed the effective date by one year. Thus, ASC 606 is effective for US public firms with reporting periods beginning after December 15, 2017. Most public companies adopted ASC 606 in the year of 2018 (see Table 2). For non-public firms, it was first postponed from December 15, 2017 to December 15, 2018 (FASB, ASU 2015-14). Then, the FASB further extended the effective date for certain non-public firms by another year, noting the practical difficulties and challenges of transition to new standards amplified by the business and market disruptions caused by the coronavirus pandemic (FASB, ASU 2020-05).

To assist with the transition to the new standard, the FASB allows firms to make two choices in the year of transition: *adoption timing* and *transition method*. In terms of adoption timing, firms can elect to adopt it early before the effective date (early adopters) or wait till it becomes mandatory (non-early adopters). In terms of the transition method, firms can choose either the full retrospective method (FRM) or the modified retrospective method (MRM) in the initial adoption. The FRM requires retroactive restatements of all prior reporting periods presented on comparative financial statements as if ASC 606 were effective for those periods; The MRM requires only an adjustment to beginning retained earnings to recognize the cumulative effects of the new standard at the date of initial application, and additional disclosures about amounts and explanations of significant changes made to financial statements in the transition year. Prior periods' amounts are not adjusted and are still reported under historic accounting guidance (see Table 2).

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Table 2: Transition Timing and Method

Transition Method	2016	2017	2018
FRM	Comparative years restated as if ASC 606 was effective and cumulative adjustments made at the earliest reporting period		Required adoption of ASC 606
MRM	ASC 605		Required adoption of ASC 606 and cumulative adjustments made at the adoption year

Originally, the FRM method was the only method proposed in the initial 2010 and 2011 exposure drafts as it allows a comparison of financial results across comparative periods and provides consistent revenue trend data and peer comparisons to investors, but feedback from entities indicated that this method could be too costly and burdensome to implement (Peters, 2016). KPMG's Accounting Change Survey (2016) indicated that most companies were concerned about the data availability, the competing priorities, the resource constraints, and the time needed to have the new systems in place to accommodate the complexities in the FRM transition method. As a compromise, the MRM method is allowed as a practical expedient approach to ease the transition process, which was especially popular for companies that expected a minimal impact on trends. Under the MRM, the comparative years would not be restated, but additional disclosures that explain significant changes in the line items of financial statements, the reasons for these changes, and a numerical reconciliation of key accounts reported under ASC 605 and ASC 606 would be required (Kral & Levy, 2019).

In a report published by Financial Executives International (FEI) in November 2017, 15% of Fortune 500 companies disclosed that they would use the full retrospective method, 71% disclosed that they would use the modified retrospective method, and the rest did not disclose their selections (Macro & Ovuka, 2017).

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Hunsaker (2018) indicated that the accounting choice of adoption timing and transition method may affect the outcome and presentation of financial statements. Under certain circumstances, ASC 606 may cause firms to appear to "lose revenue" if ASC 606 accelerates the timing of revenue recognition for certain contracts that are still outstanding under ASC 605 (see Table 2A), which may have important implications for firms and users of financial statements.

Table 2A: Illustration of Transition Timing and Method*

ASC 605				
	2016	2017	2018	Total
Revenue	$500	$500	$500	$1,500
Beg. Retained Earnings		$500	$1,000	

MRM Adoption of ASC 606: January 1, 2018				
	2016	2017	2018	Total
Revenue	$500	$500	$250	$1,250
Beg. Retained Earnings		$500	$1,250	

FRM Adoption of ASC 606: January 1, 2018				
	2016	2017	2018	Total
Revenue	$1,000	$250	$250	$1,500
Beg. Retained Earnings		$1,000	$1,250	

* A software firm offers a bundled product and service for $1,500 (software: $750; 3 years' service: $750). Under ASC 605, the revenue of $1,500 is recognized pro rata over 3 years (i.e., $500/yr). ASC 606 divides the contract into two performance obligations (software and service) and accelerates software revenue upon delivery (i.e., $750 software revenue + $250 service revenue = $1,000 in year 1) - adapted from Hunsker (2018)

If a firm uses the MRM to adopt ASC 606, the accelerated revenue will bypass the income statement and affect the current-year retained earnings because the MRM does not require a recast of income statements in pre-adoption years. As a result, the revenue in the adoption period will be less under ASC 606 than that reported under ASC 605. If a firm uses the FRM, the cumulative effect of changes would be reflected in the earliest reporting period (i.e., 2016). And any impact on revenue would be spread out over multiple years rather than the

current reporting year only. Gujarathi and Hoskin (2003) indicate that the ability to bypass income statements represents an opportunity for firms to achieve desired financial results in different reporting periods. The transition choices allow firms to choose a method of adoption that suits their preference for the reported numbers on comparative financial statements. Thus, the management decisions of adoption timing and method are relevant factors affecting the financial results in the year of adoption.

2.5. Existing Research on ASC 606

ASC 606 is introducing significant changes to revenue reporting and its impact is likely to go beyond firms' financials to influence other dimensions of businesses, such as customer contracting practices, information technology systems and processes, compensation plans, debt covenants, and tax positions. However, the specific impacts of ASC 606 are not well understood. According to a survey conducted by Deloitte in 2018, only 11% of the participants were familiar with ASC 606 and only 8% assessed the impact of the new guidance on their revenue streams (Nehoray et al., 2018). Market observers predicted that the new guidance may have more impact on the software, aerospace and defense, airline, and telecommunication industries (Arms & Bercik, 2015; Marco & Ovuka, 2017; Mckenna, 2017), but there is a lack of evidence on the nature, extent, and magnitudes of its impacts on firms' financial statements (Ali & Tseng, 2022).

The literature on ASC 606 is new and growing. Concurrent studies that examine the impacts of ASC 606 on the market focus on materially affected firms, and their results are mixed and at times contradictory as to whether ASC 606 has improved the informativeness of earnings. For example, Lee and Lee (2020) examined the effect of ASC 606 on earnings predictability and the debt market using a difference-in-difference design. They collected the sample firms Russell 3000 firms on Audit Analytics and separated the sample into a treatment group (firms reporting a

material impact of ASC 606 based on firms' disclosures) and a control group (the rest). Their

underlying assumption is that companies that have less predictable earnings are likely to have

larger forecast errors and distributions. They found that the new standard is associated with

increased analysts' forecast errors and increased discretionary working capital accruals,

indicating that the new standard is associated with decreased earnings predictability and

increased opportunistic behaviors. The decreased earnings predictability could reduce the

reliability and usefulness of earnings in the debt market as creditors were more willing to use

capital-based covenants rather than earnings-based covenants as observed in the study.

In contrast, Chung and Chuwonganant (2019) evaluated the effect of ASC 606 on market

reactions to earnings announcements. They conjecture that the enhanced disclosure requirements

in ASC 606 improve the quality and quantity of information regarding firms' revenue, thus, they

would increase the informativeness of earnings. Their study found that the new standard is

associated with increased market efficiency, stock liquidity, and decreased information

asymmetry between traders, suggesting that ASC 606 increases the informativeness of earnings,

and the effect is more significant for industries with larger recurring revenues.

Rutledge et al. (2016) indicated that the new standard is expected to produce more

relevant financial information with increased comparability, but at the same time, it also provides

more room for management estimates and judgment which may reduce the informativeness of

earnings, suggesting that the direction of the market effect is not clear.

Glaze et al. (2021) examined whether quarterly reports issued concurrently with earnings

news bring useful information to investors under the ASC 606 setting. They assume that a new

accounting standard is associated with increased uncertainty which may suppress the market

response. McClane (2019) indicates that financial statements may become less useful due to the

heavy volume of mandatory disclosures, causing low understandability of financial statements and potential information overload. Their studies found that the quarterly reports issued concurrently with earnings news are associated with increased trading because these interim reports contain more detailed and value-relevant information about earnings which helps reduce ASC606-related uncertainty and help investors understand and respond to the earnings surprise.

Ahn et al. (2021) examined the disclosure requirements under SAB 74 in the context of ASC 606[10]. ASB 74 requires firms to disclose the potential adoption effects of a new accounting standard in the quarters preceding the implementation. They found that variations exist among firms within the materially impacted group, and the SAB 74 disclosures are associated with reduced information asymmetry and other financial reporting issues, especially for companies with more complex adoptions in ASC 606.

Ferreira (2020) collected data from Compustat and used a difference-in-difference design to examine the market effects of implementing the new revenue standard. Assuming that the converged guidance increases the comparability of financial statements, investors are likely to incur fewer information costs to compare firms' performance across industries or capital markets because they do not have to know the nuances of industry-specific rules under ASC 605. As a result, the number of informed investors would increase and stock prices would become more informative. A more informative stock price leads to higher liquidity. Their results provide evidence that ASC 606 is associated with increased liquidity through an improvement in reporting precision and comparability of financial statements.

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[10] The SEC Staff Accounting Bulletin No. 74 (SAB 74) requires that when a recently issued accounting standard has not yet been adopted, a registrant disclose the potential effects of the future adoption in its interim and annual SEC filings to provide insight into a registrant's preparedness to a new accounting standard (SEC, SAB Topic 11.M)

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Hu (2021) used a difference-in-difference design to examine whether the new standard

has improved comparability between US firms and IFRS firms that report in the US market. The

author noted that comparability only improved in the industries that are more affected by the new

standard, in particular, the effect is more pronounced in the telecommunication and software

industries.

In summary, most of these studies mainly tested the market reactions to ASC 606

focusing on materially affected firms, and their findings are mixed (see Table 3). Although it is

important to study the effects of ASC 606 on market activities, the study of adoption effects on

financial statements and the adoption choices in ASC 606 will complement the market-focused

studies.

Table 3. ASC 606 Literature

	Research Topic - ASC 606	Findings
Lee & Lee (2020)	Earnings quality	Earnings predictability (-)*
Chung et al (2019)	Market efficiency	Informativeness of earnings & liquidity (+)
Glaze et al (2021)	10-Q disclosures	Value relevance of earning & trading (+)
Ahn et al (2021)	Preadoption disclosures (SAB 74)	Information asymmetry (-)
Ferreira (2020)	Liquidity effect	Value relevance & liquidity (+)
Hu (2021)	Comparability (GAAP & IFRS)	Comparability in telecom. & software (+)

* (+) or (-) indicates an increased or decreased effect

2.6 Research Interest

As discussed above, existing studies on ASC 606 focus on the information perspective to

examine the relationship between the new standard and its market effect, using tests of market

efficiency and value relevance for new accounting information. These studies provide evidence

of the market's response to this mandatory accounting change. However, the voluntary aspect of

the adoption choices has not been examined. For example, why did some firms choose to adopt

the standard early? Are firm characteristics and adoption effects associated with early adoption decisions?

The adoption decision for ASC 606 is a significant accounting choice. As discussed earlier, the costs and efforts involved in ASC 606 applications were so significant that not only the original two-year preparation periods (i.e., the time between the issuance date and the original effective date) were deemed insufficient, but also an additional year of an extension was needed (Ernst & Young, 2018; FASB, ASU 2015-04).

As first movers, early adopters of a significant accounting standard could potentially be subject to a higher risk of errors, higher litigation risk, and stricter scrutiny from regulators. For example, nearly one-third of early adopters received revenue recognition-related comment letters from the SEC and were questioned about their judgments, analyses, and disclosure in applying the standard. Thus, early adopters provide an interesting setting to understand the impact of ASC 606 and the potential motivations behind the adoption decisions. Specifically, this study asks and examines the following questions: (1) What is the adoption effect of ASC 606 on the financial statements of early adopters versus non-early adopting peers? (2) Is there evidence of systematic differences in the characteristics of firms that were early adopters versus non-early adopting peers?

Accounting choice literature suggests that managers have economic incentives to make accounting choices to obtain desired financial results. Most of these studies focused on the contracting perspective in positive accounting theory to explain and predict accounting practices. Assuming information asymmetry in an imperfect market, the theory predicts that managers select accounting methods to maximize their utility which is highly associated with explicit and implicit contracting costs. These contracting costs arise in internal transactions as well as

external transactions and consist of transaction costs, agency costs, political costs, bankruptcy costs, etc. It is hypothesized that firms have incentives to minimize transaction costs (e.g., brokerage fees and information production costs), agency costs (e.g. costs of compensation and debt contracts), and political costs (e.g., taxes and regulation costs) to maximize firm value and self-interest (Watts & Zimmerman, 1990).

Fields et al. (2001) reviewed and summarized prior accounting choice studies and defined an accounting choice as "any decision whose primary purpose is to influence the output of the accounting system." (Fields et al., 2001: page 256). This broad definition includes accounting choices that have real effects on cash flows such as production or investment decisions (e.g., reducing R&D expenditures), structuring transactions in certain ways (e.g., operating vs capital lease), or choices of accounting methods (e.g., FIFO vs. LIFO). It also includes accounting choices in the timing of adoption of a new standard that does not affect cash flows but has effects on reported income presented on the comparative financial statements. Research shows that managing the timing of the adoption of a new accounting standard is a strategy to manage earnings to obtain desired results. To the extent that reported income affects a firm's economic value through its implications for future performance, firms have incentives to use income-increasing or income-decreasing strategies to influence reported income (Fields, 2001; Han & Hsiao, 2017; Zmijewski & Hagerman, 1981).

Most accounting choice studies assume that accounting numbers matter because they play an important role in contractual relations (relations among management, shareholders, and creditors), information dissemination (relations between informed managers and less-informed investors), and public policy implications. For example, Fields et al. (2001) summarized the importance of reported numbers in three areas: *agency costs* - managers choose accounting

methods to maximize managerial compensation and avoid debt covenant violations, *information asymmetries* – managers communicate private information through accounting choice to influence stock prices, and *political costs* - managers select accounting methods to avoid potential regulations or reduce/defer taxes. In general, managers make accounting choices to influence the output of the accounting system that is beneficial to themselves and their firms. However, there has not been a consensus on what motivates managers to choose one accounting alternative over another, and what the determinants and economic implications of these accounting choices are to users of financial statements. This is because managerial motivations, determinants, and implications of different accounting choices vary by the specific context.

The implication of making accounting choices to influence users of financial statements is consistent with accounting research on earnings management (Fields et al., 2001; Watts & Zimmerman; 1990). Revenue/earnings, the most scrutinized numbers in a company's financial statements, provide a very informative signal to stakeholders that facilitate resource allocation and wealth redistribution in capital markets. It is not surprising that financial managers have a keen interest in how they are presented in financial statements and will exercise discretion to obtain desired financial results.

Healy & Wahlen (1999) suggested that earnings management is a pervasive phenomenon under the accrual basis accounting framework in GAAP, which allows management discretion in the choice and application of accounting methods, estimates, and disclosures that influence external reporting. They identified three major motivations managers have to manage reported earnings: capital market motivations, contracting motivations, and regulatory motivations. (1) Under *capital market* motivation, public companies feel pressure to report earnings that meet or exceed analysts' expectations. (2) Under the *contracting* motivation, accounting-based

compensation and lending contracts induce managers to report higher earnings to increase

compensation and job security and mitigate potential violations of debt covenants by maintaining

some accounting ratios. (3) Under the *regulatory* motivation, managers have incentives to report

lower earnings to reduce or defer tax and avoid being a target of an anti-trust investigation. In

practice, whether managers exercise discretion to report higher or lower income depends on the

dominant factors underlying multiple motivations and goals.

In summary, the accounting choice literature and earnings management literature

identified common factors that drive managers' accounting decisions to maximize firm value and

self-interest. Researchers also indicated that not all accounting choices involve opportunistic

earnings management (Fields et al., 2001; Healy & Wahlen, 1999; Watts & Zimmerman; 1990).

This study aims to identify the characteristics and motivations of early adopters in the

context of ASC 606 to complement existing ASC 606 studies and offer additional insights to

further our understanding of the new guidance. ASC 606 provides an interesting setting for early

adoption research in the accounting choice literature. This is because most previous studies

assumed that the new accounting standards had a positive effect on income or only selected firms

that had a positive adoption effect on the reported income in the sample (Gujarathi & Hoskin,

2003; Simon & Costigan, 1996). ASC 606 presents a more comprehensive setting to re-examine

the positive adoption choices literature as ASC 606 is likely to have a varying degree of effect on

firms' financials. Unlike prior accounting changes, ASC 606 directly affects the top-line number

on the income statement. The informative nature and implications of revenue numbers to

investors make ASC 606 a unique standard to examine.

Prior literature on adoption timing choice in new accounting regulations documents that

early adopters consist of firms that have unique characteristics and tend to be strategic in making

adoption decisions. The reporting flexibility allowed in transition choices provides firms

opportunities to communicate firm performance to investors in certain ways and influence

contractual outcomes predicted by positive accounting theory (Ali & Kumar, 1994; Ayres, 1986;

Gujarathi & Hoskin, 2003; Langer & Lev, 1993; Sami & Welsh, 1992; Simon & Costigan, 1996;

Trombley, 1989; Zmijewski & Hagerman, 1981).

However, the evidence on firm characteristics of early adopters is mixed in the extant

literature. For example, Zmijewski & Hagerman (1981) found that firms' income strategies are

associated with factors including firm size, industry concentration, capital structure, systematic

risk, and debt constraints. Ayres (1986) found that early adopters of SFAS 52 – Accounting for

Foreign Currency Translation were smaller firms with lower earnings before adoption, more

constraints on dividend payouts, and less insider ownership. Trombley (1989) found that early

adopters of SFAS 86 – Accounting for Costs of Computer Software adoption decisions were

associated with auditors' preference for the treatment of software development costs. Sami and

Welsh (1992) found that early adopters of SFAS 87 – Accounting for Pensions were large firms

with more fully funded pension obligations. Simon and Costigan (1996) found that early

adopters of SFAS 96 – Accounting for Income Taxes were associated with declining earnings

and larger deferred tax liabilities before the adoption.

ASC 606, provides a potential opportunity for earnings management in the year of

transition as it is likely to affect the timing and measurement of revenue recognition, but the

directions and magnitude of changes are not clear. Accordingly, this study examines the adoption

effects of this standard and tests if there is a systematic difference between early and non-early

adopters in firm characteristics to explain their voluntary adoption behaviors.

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2.7. Hypotheses Development

Managers evaluate their choices in debt management to maximize the value of their stakeholders. Creditors are concerned about firms' abilities to repay the loans when they come due and usually seek the protection of their interest by requiring certain restrictive rules in debt agreements to limit wealth transfer between debt and equity stakeholders. For example, they may require borrowers to maintain certain financial leverage ratios or generate sufficient non-restrictive earnings before distributing dividends. If these restrictive covenants are not met, firms face negative consequences of technical default. The creditors may request immediate repayment or firms may incur additional costs to renegotiate agreements with lenders. In addition, lenders may increase interest rates on loans and notes following a violation or impose additional control of firms' assets or activities by adding new covenant restrictions. Researchers documented that the average costs of a technical violation of accounting-based debt covenants range between 1.2 percent and 2 percent of stockholders' equity (Beneish & Eric, 1993). Thus, managers could have incentives to increase reported earnings to ease constraints on debt covenants. Managers could also have incentives to maintain an optimal level of debt to take advantage of positive financial leverage (i.e., return on assets exceeds after-tax interest costs) to increase the rate of return on equity for the benefit of stockholders (Garrison et al., 2021).

Positive accounting theory predicts that managers are more likely to increase reported earnings when a firm approaches its debt covenant limits to reduce the likelihood of technical violation and its associated costs. If a firm is far away from its covenant limits, the incentive to adopt an income-increasing method would be less than a firm that is closer to the limit. In other words, the probability of choosing an income-increasing accounting strategy is positively related

to firms' closeness to debt covenant constraints, and the effect is more pronounced when the effects on earnings and equity are high (Ali & Kumar, 1994).

As discussed in Chapter 2, the new standard affects the timing and measurement of revenue recognition. The changes due to the adoption of the new standard may affect covenant slack – the difference between the required threshold value and the actual value of the covenant measure. If these covenant slacks are one of the factors managers consider in their decision to adopt ASC 606 early, then the closer firms are to the covenant threshold, the more likely firms would take advantage of the opportunities to reduce the pressures imposed by debt covenants. Research also suggests that firms are more likely to choose income-increasing strategies rather than reduce dividend payments when they are closer to dividend restrictions. This is because a missed dividend may send a warning signal to investors who expect to receive dividend payments periodically.

Therefore, firms that are close to violating debt covenants are more likely to adopt ASC 606 early, if the adoption effects on reported financials are positive and the magnitude of the adoption effects helps firms reduce the likelihood of debt covenant violations. If the adoption effect is negative, firms are less likely to adopt it early if they approach the covenant threshold because the adverse adoption effect would increase their chance of covenant violations. Rather than adopting the standard early, they would wait for the mandatory adoption to have more time to renegotiate contracts with third parties. This suggests that the likelihood of adopting the standard early is decreasing in the magnitude of a negative adoption effect. Taken together, the likelihood of adopting ASC 606 early increases with the adoption effects of ASC 606 as firms are getting closer to their covenant threshold. This gives rise to my first hypothesis:

H1: There is a positive relationship between the adoption effect of ASC 606 and the propensity of firms that approach their debt constraints to adopt the standard early.

Prior research has identified that the consideration of stock prices may influence managers' accounting choices. A consistent trend of revenue growth is usually associated with higher stock prices (Healy & Wahlen, 1999). The former chairman of the SEC, Arthur Levitt said that in a market where missing an earnings projection by a penny could cause firms to lose millions of dollars in their market value, it is not surprising that managers are motivated to game the system to project a smooth earnings path and avoid negative stock price reactions. The former chairman also criticized firms for using opportunistic revenue practices to influence contractual outcomes that erode the quality of financial reporting, such as premature revenue recognition, "cookie jar reserves" (banking income for the future in good years), "big bath" charges (flushing more costs in bad years so that earnings can be inflated in the future), or abusive practices of materiality (intentionally misstate earnings within a self-defined materiality threshold) (Levitt, 1998). Healy (1985) suggested that managers are more likely to inflate earnings when earnings are close to market expectations and deflate earnings when earnings are way above or below market expectations.

Positive accounting theory predicts that self-interested managers have incentives to exercise their discretion over accounting numbers to maximize firm value and compensation (Watts & Zimmerman, 1990). Management compensation plans usually include base salaries, performance-based bonuses, stock options, and deferred compensations that are tied closely to firms' stock performance in the market. These accounting-based and stock market-based incentive plans are structured as a part of solutions for agency problems to align the interests of principals (shareholders) with agents (managers). Managers of firms with incentive

compensation plans are more likely to use accounting alternatives to increase reported earnings

to present a better picture of their financials if the pre-adoption financial performance is below

the market expectations. Studies also have suggested that managers may seek a consistent trend

of revenue growth and avoid reporting income below the previous year's level even absent an

income-based incentive compensation plan (Trombley, 1989). This is because the trend of

revenue directly affects stock prices and the perception of management performance.

The adoption of ASC 606 could affect firms' reported revenue and thus earnings,

although the effect is likely to vary across firms and industries. The adoption timing choice

provides firms with a one-time earnings management opportunity to influence reported revenue

numbers and earnings. If a firm has a declining financial performance before adoption and the

adoption results in a positive effect on revenue and earnings, it is more likely for the firm to

adopt the standard early if the favorable impact helps the firm get closer to or exceed the targeted

return. Firms with a declining pre-adoption performance are less likely to adopt the standard

early if the adoption results in a negative impact on earnings because the unfavorable adoption

effect would make their financials appear even worse, holding everything else constant. In

contrast, firms with improving pre-adoption performance are less likely to adopt the standard

because a favorable adoption effect is less needed to help them meet the earnings target while an

unfavorable adoption effect may make them miss the earnings target if the size of changes is

large enough. In sum, firms with improving pre-adoption performance are less likely to adopt the

standard early considering the benefit of having more time to comply with such a complex and

comprehensive standard and increased attention and scrutiny from the public and regulators.

Therefore, the likelihood of adopting ASC 606 early increases with the adoption effects as firms'

pre-adoption financial performance deteriorates. This discussion leads to my second hypothesis:

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H2: There is a negative relationship between the adoption effect of ASC 606 and the propensity of firms with an increasing pre-adoption financial performance to adopt the standard early.

Chapter 3: Research Method

3.1 Sample Selection

In May 2014, the FASB issued ASU 2014-09, "*Revenue from Contracts with Customers*", which supersedes the revenue recognition requirements in Revenue Recognition under ASC 605. The FASB subsequently issued several amendments to the initial guidance (collectively, ASC 606) in response to shareholders' concerns about the practical difficulties and challenges of transition to the new standard. Among these amendments, ASU2015-14 defers the mandatory effective date of the new standard for public entities from annual reporting periods beginning after December 15, 2016, to annual reporting periods beginning after December 15, 2017, but allows companies to adopt it a year early. This means that a firm is an early adopter of ASC 606 if it adopted the standard with annual reporting periods beginning between December 16, 2016, and December 15, 2017. Otherwise, a non-early adopter if it adopted the standard outside this window frame.

Table 4 summarizes the sample collection process of early adopters and non-early adopting peers of ASC 606 in this study. I began the sample selection by choosing the Data Year – Fiscal variable with a date range from 01/2014 to 12/2020 and searching the entire Compustate North America Fundamental Annual database and all variable types. Then, I required the data with the Foreign Incorporate Code (FIC) variable - USA and Currency Code variable – USD. This resulted in a total of 55,824 firm years. The item "FIC" identifies the country in which the company is incorporated or legally registered. This study is interested in US firms that adopted ASC606, thus all foreign-incorporated firms were removed from the sample even though some of them adopted ASC 606 or IFRS 15 and trade stocks in the US market.

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Table 4. Sample Selection

Data Selection Process	Data Output
(1) In Compustat, select *Data Year - Fiscal*: 01/2014-12/2020, and require *FIC* = 'USA' and Currency = "USD"	55,824 firm-years
(2) Remove firms with SIC codes between 6000 and 6999 (Division H: Finance, Insurance, and Real Estate)	30,248 firm-years
(3) Filter data and identify firms reported as materially affected by ASC606 by requiring *ACCTCHG* = 'ASU14-09'	1,807 firms
(4) Identify firms that adopted ASC606 with accounting periods beginning between 12/16/2016 and 12/15/2017 (i.e., ending between 12/15/2017 and 12/14/2018 in Compustat)	50 early adopters and 1,757 non-early adopters
(5) Identify *early adopters* that have required data available and disclosed the cumulative adoption effects in footnotes	20 firms
(6) Select the *non-early* adopting peers that have required data available by matching the four-digit SIC code and closest total assets with early adopters identified in step (5)	20 firms

Next, I removed firms with the SIC codes between 6000 and 6999 (Division H: Finance, Insurance, and Real Estate) using the Standard Industrial Classification (SIC) Manual provided by the Department of Labor – Occupational Safety and Health Administration[11]. Firms in this regulated industry were excluded because they have unique industry characteristics and their incentives to adopt early may be different from other industries. This step resulted in 30,248 firm years.

I then followed the prior literature on adoption timing choices to focus on early adoption samples that were materially affected by the new standard (Ali & Kumar, 1994; Simon & Costigan, 1996). To identify materially affected firms, I relied on the accounting change variable

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[11] https://www.osha.gov/data/sic-manual

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(ACCTCHG) *equal to* "ASU2014-09" in Compustat. According to Compustat's variable

explanations, the item "ACCTCHG" captures the effective date of accounting changes that "have

a substantive impact on the *measuremen*t and *presentation* of financial data, or which require

significant new *disclosures*". To understand how the "substantive impact" is captured in this

variable, I communicated with the S&P Global Client Support team and they confirmed that the

variable ACCTCHG was set to "ASU2014-09" in the adoption year based on firms' disclosures

of quantitative adoption effects and the corresponding accounting change footnotes. In other

words, if the adoption of ASC 606 had no or immaterial effect on a firm's financial statements

including its presentation, or a firm did not disclose the adoption effects in footnotes, this

accounting change variable in Compustat was not set to "ASU2014-09". For example, Apple,

Inc. disclosed that it adopted ASC 606 in the first quarter of 2019 using the FRM method and the

adoption did not have a material impact on its financial statements (2019 Annual Report, Note

1), the variable ACCTCHG was not set to "ASU2014-09" in the adoption year or any other firm-

years for Apple Inc. in Compustat. Thus, I identified firms that were materially affected by

ASU2014-09 based on the ACCTCHG variable in Compustat. This step resulted in a sample of

1,807 US firms.

I further separated the sample into two groups: early adopters and non-early adopters.

Specifically, I sorted the 1,807 firms by FY end date ("datadate" in Compustat) and identified an

initial sample of 50 firms that met the early adoption requirements - firms that adopted ASC 606

with a fiscal year beginning between December 16, 2016, and December 15, 2017[12]. In this

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[12] Compustat provides fiscal year ending data instead of the fiscal year beginning data, thus the criteria for identifying early or non-early adopters are based on firms' fiscal year ending dates (i.e., ending between December 15, 2017, and December 14, 2018) in the sample selection process.

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sample of 1,807 materially affected firms, 50 firms are early adopters and the rest of the 1,757

firms are non-early adopters.

Table 5A below provides the industry distribution of the 1,807 firms identified above

based on the two-digit SIC codes.

Table 5A. Industry Distribution of Early Adopters vs Non-Early Adopters

SIC*	Industry	Early Adopters**	Freq.	Non-Early Adopters**	Freq.	Total
13	Oil and Gas Extraction	2	4%	64	4%	66
20	Food and Kindred Products	1	2%	28	2%	29
28	Chemicals and Allied Products	8	16%	240	14%	248
35	Industrial and Commercial Mach. and Computer Equip	2	4%	85	5%	87
36	Electronic and Other Electrical Equipment	4	8%	127	7%	131
37	Transportation Equipment	2	4%	48	3%	50
38	Measuring, Analyzing, and Controlling Instruments	6	12%	102	6%	108
49	Sanitary Services	1	2%	112	6%	113
50	Wholesale Trade - Durable Goods	2	4%	30	2%	32
56	Apparel and Accessory Stores	1	2%	24	1%	25
59	Miscellaneous Retail	1	2%	39	2%	40
73	Computer Programming, Data Processing, Prepackaged Software	20	40%	343	20%	363
	Other Group***	--	--	515	29%	515
Total		**50**	100%	**1757**	100%	**1807**

Standard Industry Classification (SIC): https://www.osha.gov/data/sic-manual

*** Identified by "ASU2014-09" in Compustat*

**** The rest of the 515 non-early adopters are combined into the "other group" (see appendix A for details)*

The results indicate that the 50 early adopters are distributed across 12 industries and

40% of them are concentrated in the software industry, followed by the chemicals and allied

products industry (16%), then the measuring, analyzing, and controlling instruments industry

(12%). As a comparison, these 12 industries represent about 71% of the industry membership in

non-early adopters. The rest of the 29% of the industry membership in the non-early adopters'

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group was combined and reported in the "other group"[13]. The industry distribution of the non-early adopters shows that 20% of them are in the software industry, 14% in the chemicals and allied products industry, 7% in the electronic and other electrical equipment, and 6% in the measuring, analyzing, and controlling instruments industry. Overall, the industry membership of early adopters is similar to that of non-early adopters except for the software industry (SIC: 73), which has a relatively higher percentage of firms choosing to be early adopters (40% of early adopters vs 20% of non-early adopters).

Table 5B presents the mean values of key variables of interest comparing early adopters with non-early adopters of ASC 606 in the year of adoption (year t in this study)[14].

Table 5B. Preliminary Statistics of Early vs Non-early Adopters of ASC 606

	# of Firms	LEV	ROE	ROA	Total Assets	Total Liab.	Net Sales	EBIT	NI
Early	50	1.012	(2.450)	(0.315)	16,206	10,116	9,060	1,563	804
Non-Early	1752	0.726	(0.840)	(0.212)	7,278	4,949	4,575	535	285
All Adopters	1802	0.734	(0.885)	(0.215)	7,526	5,092	4,699	563	299

Note: All numbers are in millions, except N, LEV, ROE, and ROA

ASC606 adopters are identified by Compustat Variable Descriptor: ASU2014-09

LEV = Total Liabilities/Total Assets

ROE = Pretax Income/Absolute Value of Total Equity

ROA= Pretax Income/Total Assets

After removing five non-early adopters that have missing values in total assets and total liabilities in Compustat, the number of non-early adopters dropped from 1,757 firms in Table 5A to 1,752 firms in Table 5B. The results indicate that the average size of early adopters (50 firms) is larger than that of non-early adopters (1,752 firms) in terms of total assets, total net sales,

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[13] In the other group, no single industry's membership frequency exceeds 2.7% based on the first two digits of the SIC code.
[14] Year t instead of year t-1 statistics are provided due to data limitation of early adopters in year t-1.

earnings before interests and taxes (EBIT), and net income (NI). The average leverage ratio of

early adopters is higher than that of non-early adopters, while the profitability ratios (ROA and

ROE) of early adopters are lower than those of non-early adopters. These preliminary descriptive

statistics are consistent with the expectations that early adopters are more likely to have higher

debt constraints and lower financial performance before adoption.

To collect all the variables for my empirical model, I checked the data availability of the

50 early adopters in the adoption year (year t), and the preadoption years (t-1 and t-2). I found that

13 firms missed financial information in preadoption years t-1 and t-2, and 8 firms missed financial

information in year t-2. This is mainly because these firms issued and completed initial public

offers (IPOs) after adopting ASC606, therefore their preadoption years' financial statements are

not available to the public. This also means that their preadoption cumulative RE effects are not

available for the empirical model. In addition, one of the early adopters had a fresh-start accounting

upon emergence from bankruptcy in the adoption year and eight firms did not provide adequate

information to determine the cumulative adoption effects which is a variable of interest in the

empirical model[15]. Thus, these 30 firms were removed from the initial 50 early adopters, and the

final sample consists of 20 early adopters that present all the data required for the empirical model.

After identifying the sample of early adopters, I selected a control sample of 20 non-early

adopting peers matched by industry and size with early adopters in year t-1. Specifically, I first

removed firms that have missing values under the required variables (total assets, total liabilities,

retained earnings, and pre-tax income) from the 1,757 non-early adopters. I then sorted the data

by the four-digit Standard Industry Classification Code (SIC) and the closet total assets to select

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[15] Five firms incurred significant operating losses since inception.

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the control group of 20 non-early adopting peers. The purpose of matching is to control for

industry and size differences between early adopters and non-early adopters.

Finally, I manually collected the cumulative adoption effects of sample firms from Item 8

Financial Statements and Supplementary Data on Form 10-K from the SEC's Edgar Database.

3.2 Empirical Model and Measurement

I tested H1 and H2 by estimating the following binary logistic regression model:

$$(EarlyAdopt_t=1) = \alpha + \beta_1\ SIZE_{t-1} + \beta_2\ LEV_{t-1} + \beta_3\ GROWTH_{t-1} + \beta_4\ ROE_{t-1} + \beta_5\ \Delta RE_{t-1} +$$

$$\beta_6\ LEV_{t-1} * \Delta RE_{t-1} + \beta_7\ Growth_{t-1} * \Delta RE_{t-1} + \varepsilon$$

Table 6. Variable Definitions

Variable	Variable Definitions	Compustat	Sources
$EarlyAdopt_t=1$	An indicator variable that equals one if a firm is an early adopter of ASC 606 in year t and zero otherwise.	ACCTCHG: ASU2014-09	A&K (1994); G&H (2003)
$SIZE_{t-1}$	A predictor variable that measures firms' size by total sales (= natural log of Total Sales $_{t-1}$)	Ln (SALE $_{t-1}$)	Z&H (1981); S&W (1992)
LEV_{t-1}	A predictor variable that measures firms' constraints on debt covenants (= Total Debt$_{t-1}$ / Total Assets$_{t-1}$)	LT_{t-1} /AT_{t-1}	Z&H (1981); B&P (1993); G&H (2003)
$GROWTH_{t-1}$	A predictor variable that measures the rate of growth of pretax earnings (= Pretax Income $_{t-1}$ - Pretax Income $_{t-2}$) /Absolute value of Pretax Income $_{t-2}$)	$(PI_{t-1} - PI_{t-2})$ /$|PI_{t-2}|$	G&H (2003); S&W (1992)
ROE_{t-1}	A predictor variable that measures firms' profitability in year t-1 (= Pretax Income $_{t-1}$ / Absolute Value of Total Equity$_{t-1}$)	PI_{t-1} /$|TEQ_{t-1}|$	A&K(1994); G&H (2003); S&W (1992)
ΔRE_{t-1}[16]	A predictor variable that measures firms' cumulative adoption effect [(= RE Effect$_{t-1}$ / Total Assets$_{t-1}$) *100]	Hand-collected from 10Ks / AT_{t-1}	G&H (2003)

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[16] All independent variables are specified in year t-1 because the adoption decision is made in year t-1.

H1 states that there is a positive relationship between the adoption effect of ASC 606 and the propensity of firms approaching debt constraints in adopting the standard early. Specifically, I expect the probability of firms being early adopters to be increasing with the interactive effect of leverage (LEV_{t-1}) and the adoption effects (ΔRE_{t-1}). Leverage (LEV_{t-1}) is measured as Total Debt$_{t-1}$ divided by Total Assets$_{t-1}$, which captures firms' closeness to debt covenant constraints (i.e., LEV_{t-1} increases as firms approach their debt constraints). The adoption effect of ASC 606 (ΔRE_{t-1}) is measured as the cumulative adoption effects on opening retained earnings divided by the beginning total assets in percentage in the year of adoption. A larger ΔRE_{t-1} indicates a greater adoption effect of ASC 606 on firms' financial statements. Thus, a finding of a positive β_6 on $LEV_{t-1} * \Delta RE_{t-1}$ provides support for H1.

In prior literature, the most frequently used measures of debt constraints when modeling early adoption decisions of a new accounting standard are debt-to-equity or debt-to-assets ratios and dividend payout ratios. However, dividend payout ratios have limited data availability in the sample. The majority of the sample firms did not pay out dividends and only 14 firms (35% of 40 firms) paid cash dividends in year t-1. More specifically, only 5 early adopters and 9 non-early adopters paid cash dividends. The 14 dividend-paying firms tend to be larger and more profitable than those that did not pay cash dividends[17]. This is consistent with the findings from Fama and French (2001), who showed that publicly traded firms have become less likely to pay dividends as the perceived benefits of dividends have declined over time, and firms are more inclined to reinvest in themselves with increased growth opportunities or prefer stock

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[17] The 14 firms that paid cash dividends have average total assets of $74,489 million, average net income of $2,967 million, and average retained earnings of $11,301 million, while those that did not pay dividends have average total assets of $7,597 million, average net income of $693 million, and average retained earnings of $3,900 million.

repurchases which may result in high returns through increases in stock prices. This phenomenon

raises the concern of whether dividend-paying ratios capture the underlying concept of debt

constraints in the sample. Considering both the data limitation in the sample and the documented

reduction in dividend-paying firms in the literature, I chose to use the debt-to-assets ratio (i.e.,

LEV_{t-1}) as the proxy for debt constraints in the empirical model.

The inclusion of the interaction term ($LEV_{t-1} * \Delta RE_{t-1}$) in the empirical model also

followed the research design discussion in the accounting choice literature. Prior studies usually

included firm characteristics as baseline variables for inferences of economic differences in

contracting costs and political costs that influence firms' accounting choices. However, Ali and

Kumar (1994) argued that many of these studies either left out the variables that capture the

economic consequence of financial statement effects in accounting decisions or only included

them as separate independent variables along with measures of firm-specific variables. They

recommended the inclusion of the interactive effects of firm characteristics and financial

statement effects of the accounting choice in the model to enhance the power of explanations and

mitigate concerns about omitted variables. Gujarathi and Hoskin (2003) modeled the early

adoption decision in SFAS 96 – Accounting for Income Taxes and showed that the interactive

effects model has higher explanatory power in terms of adjusted R^2 when comparing models

with and without interactive terms.

The adoption effect of ASC 606 (ΔRE_{t-1}) is regarded as a balance sheet effect in the

accounting choice literature. Gujarathi and Hoskin (2003) suggested that the balance sheet effect

is more important than the income effect in accounting changes as the balance sheet effect

captures the overall change to equity due to the adoption of a new standard, while the income

effect only captures the current year adoption effect on the income statement. In addition, the

focus on the balance sheet effect is because the adoption year income effect is not available for firms that used the full retrospective method. Under the FRM method, revenues on comparative financial statements were restated or reported under ASC 606, but the revenue under ASC 605 in the adoption year is not available, which makes it infeasible to calculate the adoption year income effect (i.e., the difference between ASC 606 revenue and ASC 605 revenue). Regardless of the transition method, firms disclosed cumulative adoption effects that affected the opening retained earnings in the year of transition (i.e., adoption year balance sheet effect). Therefore, I used the cumulative adoption effects on retained earnings to capture the adoption effect (ΔRE_{t-1}) in this study.

H2 states that there is a negative relationship between the adoption effect of ASC 606 and the propensity of firms with an increasing pre-adoption financial performance to adopt the standard early. Firms' preadoption financial performance is captured by the variable $Growth_{t-1}$ which is the change of pretax income from year t-2 to year t-1 divided by the absolute value of pretax income in year t-2. To test H2, my interest lies in the sign of the coefficient of β_7 on the interactive term $Growth_{t-1} * \Delta RE_{t-1}$. I expect the probability of firms being early adopters to be decreasing with the interactive effect of firms' adoption effect and increasing preadoption performance. Thus, a finding of a negative β_7 on $Growth_{t-1} * \Delta RE_{t-1}$ provides support for H2.

I followed the prior literature that used the rate of growth ($Growth_{t-1}$) and profitability (ROE_{t-1}) to capture the management compensation and stock market incentives (Gujarathi & Hoskin, 2003; Sami & Welsh, 1992). The two variables ($Growth_{t-1}$ and ROE_{t-1}) provide different measures of financial performance. Specifically, ROE is a measure of a firm's profitability and efficiency of operations in a specific period. It is calculated using pre-tax income at year t-1 divided by the absolute value of total equity at year t-1. Pretax income rather than net income is

used in the calculation of ROE to avoid potential tax effects on earnings from the 2017 Tax Cuts

and Jobs Act. In practice, ROE is often considered an important metric for analyzing stocks.

Whether a firm's ROE is high or low depends on what is normal in the industry and what it is

relative to its competitors. In comparison, growth rates capture a trend and measure the

percentage change in income over multiple periods. Two firms with the same ROE may have

very different growth rates. Studies show that earnings growth is considered one of the most

important elements in stock selections. A stable and consistent trend of earnings growth is

usually associated with higher stock prices (Gujarathi & Hoskin, 2003)

In addition, firm size is included as a control variable in the model, and no predictions are

made regarding the direction of the association between the firm size characteristics and early

adoption. Positive accounting theory suggests that the effect of firm size on accounting choices is

often associated with political costs. Large firms have higher political costs than small firms

because they receive more public attention and are more likely to be the target of potential anti-

trust lawsuits as the public tends to associate high income with monopoly rents (Watts &

Zimmerman, 1990). Small firms have lower political costs because they are followed by fewer

investors and analysts and tend to have more private debt with banks (e.g., notes payable) than

public debt with investors (e.g., bonds payable). Thus, large firms have incentives to defer

compliance with a mandatory accounting standard that has a favorable and larger effect on their

earnings if they are meeting analysts' expectations. However, the new standard imposes new

information production costs on firms such as system upgrading costs, bookkeeping costs,

training costs, and consulting costs. Ceteris paribus, large firms are *more* likely to be early

adopters because they have more human and economic resources and abilities to implement the

changes, and the information costs related to adoption would be much lower for large firms than

small firms relative to their sizes. Therefore, political cost theory and information production

cost theory give an opposite prediction regarding the direction of the association between the

firm size characteristics and early adoption. Most prior research documented that firm size is an

important factor in adoption decisions but provided mixed findings (Simon & Costigan, 1996).

Some researchers suggested that firm size can be a proxy variable for factors other than political

costs and information production costs (Sami & Welsh, 1992). Thus, size is included in the

model as a control variable. In the literature, the firm size is usually measured by total assets or

total sales. I chose to use total sales to reduce correlations among independent variables because

both LEV_{t-1} and ΔRE_{t-1} variables are scaled by total assets in the model.

Prior literature documented that LEV_{t-1}, $Growth_{t-1}$, and ROE_{t-1}, are important factors that

are associated with firms' adoption decisions, therefore, they are included as control variables in

the model. I expect that early adopters of ASC 606 have higher preadoption financial leverage

and lower preadoption profitability and growth rates than non-early adopting peers. ΔRE_{t-1} is

also included as a control variable in the model and I expect that early adopters of ASC 606 are

more likely to have larger and more favorable adoption effects than non-early adopting peers.

Since the dependent variable of my model is a dichotomous categorical variable that has

two possible outcomes (1= early adopter and 0 = non-early adopter) and independent variables

are measured at scale or ratio level, I used binary logistic regression to predict the probability of

the target group (early adopters) relative to the control group (non-early adopters) based on the

value of the predictors. Least Square regression is not appropriate in this study because it

assumes a constant relationship between independent variables (X) and dependent variables (Y)

where X and Y would extend infinitely to both directions (linear function). However, since the

dependent variable in my model (the probabilities of events occurring) is bound by 0 or 1, the

logistic regression model (non-linear function) provides a better line of fit as it recognizes a

different predicting power over the entire range of predictors (S-shaped curve). According to

Meyers, Gamst & Guarino (2017), logistic regression uses maximum likelihood estimation to

obtain predicted probabilities and makes fewer assumptions than linear regression. It does not

require normal distribution of predictor variables and homoscedasticity of variances as linear

regression does when making inferences about the coefficients. Thus, a binary logistic regression

was employed for the empirical model in this study.

Chapter 4: Results

This study investigated the motivations behind firms' early adoption decisions of ASC 606 and addressed two research questions: (1) What is the adoption effect of ASC 606 on the financial statements of early adopters versus non-early adopting peers? (2) Is there evidence of systematic differences in the characteristics of firms that were early adopters versus non-early adopting peers?

4.1 Descriptive Statistics

I first examined the industry pattern of early adopters using the two-digit SIC codes and presented the results in Table 7A.

Table 7A. Industry Distribution of Early Adopters (n = 20)[18]

SIC[19]	Industry	# of Firms	Frequencies
28	Chemicals and Allied Products	1	5%
35	Industrial and Commercial Machinery and Computer Equipment	2	10%
36	Electronic and Other Electrical Equipment and Components	4	20%
37	Transportation Equipment	2	10%
38	Measuring, Analyzing, and Controlling Instruments	3	15%
49	Sanitary Services	1	5%
50	Wholesale Trade - Durable Goods	1	5%
73	Computer Programming, Data Processing, and Prepackaged Software	6	30%
	Total	20	100%

The results show that the early adopters in the final sample are distributed across eight industries and about 30% of them are in the computer programing and software industry (SIC: 73), followed by 20% in the electronic and other electrical equipment industry (SIC: 36), and 15% in the measuring, analyzing, and controlling instruments industry (SIC: 38). This industry

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[18] Due to inadequate data in Compustat and the 10-Ks, the final sample includes 20 early adopters and 20 non-early adopting peers matched by industry and size. Thus, non-early adopters have the same industry pattern as the early adopters in the final sample.

[19] Standard Industry Classification (SIC): https://www.osha.gov/data/sic-manual

distribution is similar to the industry distribution in the initial 50 early adopters (see Table 5A).

More specifically, the 30% early adopters in the final sample are consistent with the 40% early

adopters in the initial sample of 50 early adopters (see Table 5A). This higher proportion of early

adopters in the software industry may be related to their specific industry characteristics and

business models. As discussed earlier, software firms often have multiple deliverables and ASC

606 breaks down performance obligations into more granular units, resulting in certain types of

income being shifted to earlier periods. For example, Microsoft (SIC: 7372) disclosed in its

annual report (6/30/2018) that it elected to early adopt the standard effective July 1, 2017, using

the full retrospective method. The new revenue standard affects the company's accounting for

software license revenue (e.g., Windows 10 and certain multi-year commercial software

subscriptions). Under ASC 606, they recognize license revenue at the time of delivery rather than

ratably over the subscription period under ASC 605. This finding is consistent with the

expectation of industry experts that the software firms are probably more affected by the new

standard than other industries and consistent with their lobbying efforts for the change of revenue

standards.

The results also show that 20% of early adopters are in the electronic and other electrical

equipment industry (SIC: 36). This phenomenon may be related to the accounting changes for

their distributor revenue in this industry. For instance, Power Integrations Inc. (SIC: 3674)

disclosed in its annual report (12/31/2017) that it elected to early adopt ASC 606 effective

January 1, 2017, using the full retrospective method. ASC 606 changes its accounting for

distributor and reseller revenue, where the firm recognizes revenue upon shipment and transfer

of control to distributors ("sell-in" model) in ASC 606, rather than deferring revenue recognition

until goods are sold to end customers ("sell-through" model) in ASC 605.

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Then, I examined the average adoption effects of ASC 606 by industry and presented the cumulative adoption effects in dollars (REEFFECT) and percentage changes (ΔRE) in Table 7B[20].

Table 7B. Average Adoption Effects of ASC 606 by Industry (n = 40)

SIC	Industry	# of Firms	REEFFECT (in millions)*	ΔRE (in %)**
28	Chemicals and Allied Products	2	$21.76	2.58
35	Industrial and Commercial Machinery and Computer Equipment	4	$6.23	26.67
36	Electronic and Other Electrical Equipment and Components	8	$10.26	2.44
37	Transportation Equipment	4	-$170.75	-0.32
38	Measuring, Analyzing, and Controlling Instruments	6	$32.40	-3.23
49	Sanitary Services	2	$0.35	0.72
50	Wholesale Trade - Durable Goods	2	$4.06	0.48
73	Computer Programming, Data Processing, and Prepackaged Software	12	$1,346.30	0.42
	Total	40	$395.66	2.95

*REEFFECT = Cumulative Adoption Effect of ASC 606 as of the Date of Adoption (in millions)

** ΔRE = (Cumulative RE effect $_{t-1}$ / Total Assets$_{t-1}$) *100

The results indicate that the new standard affected industries differently in both magnitude and direction. For example, the computer programming and software firms (SIC: 73) reported an average increase of retained earnings by $1,346.30 million (0.42% increase of RE), while the transportation equipment firms (SIC: 37) reported an average decrease of retained earnings by $170.75 million (0.32% decrease in RE) due to the adoption of ASC606 in the year of transition. Although the average dollar amount adoption effect for the industrial and

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[20] The non-early adopting peers are selected based on the closest size in the same industry to early adopters.

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commercial machinery firms (SIC: 35) is only $6.23 million, they reported the highest adoption

impact in terms of a percentage change in RE (26.67%). This is mainly because these firms are

relatively small (average total assets: $260.36 million) compared with the entire sample firms

(average total assets: $31,009.64 million). Of the sample firms, 33 out of 40 firms (83%)

experienced a positive change to stockholders' equity due to the application of ASC 606 in the

year of transition.

Next, I examined the descriptive statistics of the variables of interest in the study and

presented the results in Table 8A.

Table 8A. Descriptive Statistics (n = 40)

Variable [a]	Mean	Std Dev	25%Q	Med.	75%Q
REEFFECT $_{t-1}$	395.66	2411.68	0.66	5.59	34.31
SIZE $_{t-1}$	6.68	3.24	4.86	6.58	8.84
LEV $_{t-1}$	0.60	0.41	0.26	0.61	0.80
GROWTH $_{t-1}$	- 0.16	1.15	-0.61	-0.05	.21
ROE $_{t-1}$	-0.39	6.80	-0.14	0.17	0.27
ΔRE $_{t-1}$	2.95	17.62	0.08	0.72	3.00

[a]Variable Definitions:

REEFFECT$_{t-1}$ = Cumulative Adoption Effect of ASC 606 as of the Date of Adoption (in million dollars)

SIZE $_{t-1}$ = Natural log of Total Sales $_{t-1}$ (t = Adoption Year)

LEV $_{t-1}$ = Total Debt$_{t-1}$/Total Assets$_{t-1}$

GROWTH $_{t-1}$ = (Pretax Income $_{t-1}$ - Pretax Income $_{t-2}$) /Absolute value of Pretax Income $_{t-2}$

ROE $_{t-1}$ = Pretax Income $_{t-1}$ / Absolute value of Total Equity$_{t-1}$

ΔRE $_{t-1}$ = (Cumulative RE effect $_{t-1}$ / Total Assets$_{t-1}$) *100

The results show that the average dollar amount adoption effect (REEFFECT $_{t-1}$) of ASC

606 on firms' financials is $395.66 million and the median value is $5.59 million. The range of

the adoption effects is widely spread in the sample. This is because Microsoft (early-adopter)

reported a $15,121 million increase in retained earnings and General Motors (non-early adopter)

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reported a $1,336 million decrease in retained earnings as of the date of transition due to the

adoption of the new standard[21].

  To adjust for the effect of firm size on the adoption effects, I scaled the cumulative

adoption effects (REEFFECT $_{t-1}$) by total assets to obtain the variable ΔRE_{t-1}. The results in

Table 8A show that sample firms on average experienced a 2.95% increase in retained earnings

due to the adoption of the new standard in the year of transition.

  After that, I compared the adoption effects of ASC 606 between early and non-early

adopters and reported the summary statistics by group (early vs non-early group) in Table 8B.

Table 8B. Descriptive Statistics (20 Early Adopters vs 20 Non-Early Adopting Peers)

Variable[a]	Sample	Mean	Std Dev	25%Q	Med.	75%Q
REEFFECT$_{t-1}$	Early	746.89	3387.38	0.45	15.94	41.55
	Non-Early	44.42	452.18	0.89	4.29	28.60
SIZE$_{t-1}$	Early	6.28	3.86	4.00	6.56	9.56
	Non-Early	7.08	2.50	5.51	6.58	8.84
LEV$_{t-1}$	Early	0.65	0.52	0.25	0.64	0.85
	Non-Early	0.56	0.28	0.28	0.54	0.80
GROWTH$_{t-1}$	Early	-0.49	0.99	-1.08	-0.35	0.21
	Non-Early	0.17	1.23	-0.47	0.04	0.29
ROE$_{t-1}$	Early	-2.23	7.63	-0.56	-0.02	0.22
	Non-Early	1.45	5.43	-0.09	0.12	0.41
ΔRE_{t-1}	Early	4.90	25.06	0.03	1.76	3.84
	Non-Early	1.00	1.23	0.13	0.57	1.49

 [a]*Variable Definitions:*

 REEFFECT$_{t-1}$ = Cumulative Adoption Effect of ASC 606 as of the Date of Adoption (in million dollars)

 SIZE $_{t-1}$ = Natural log of Total Sales $_{t-1}$ (t = Adoption Year)

 LEV $_{t-1}$ = Total Debt$_{t-1}$/Total Assets$_{t-1}$

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[21] Per Microsoft (Annual Report, 6/30/2018), the adoption of the new standard resulted in an increase in revenue, income taxes, accounts receivable, and other long-term assets and a decrease in unearned revenue due to the upfront recognition of license revenue. For some complex commercial license contracts, the revenue recognition treatment depends on the contract-specific terms. General Motors disclosed in its annual report (12/31/2018) that the new standard affected their accounting for sales incentives and certain transfers to daily rental companies. Sales incentives are recorded at the time of sale rather than at the later of sale or announcement, resulting in the shifting of incentive spending to earlier periods. In addition, some transfers were previously accounted for as operating leases under ASC 605 but are accounted for as sales under ASC 606 if ownership of vehicles is not expected to be transferred back.

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$GROWTH_{t-1}$ = (Pretax Income $_{t-1}$ - Pretax Income $_{t-2}$) /Absolute value of Pretax Income $_{t-2}$

ROE_{t-1} = Pretax Income $_{t-1}$ / Absolute value of Total Equity$_{t-1}$

ΔRE_{t-1} = (Cumulative RE effect $_{t-1}$ / Total Assets$_{t-1}$) *100

The results show that the average dollar amount adoption effects of early adopters ($746.89 million) are much larger than those of non-early adopting peers ($44.42 million). The median value of adoption effects for early adopters ($15.94 million) is also larger than that of non-early adopters ($4.29 million). This suggests that the adoption of ASC 606 produced a more favorable financial effect on early adopters than on non-early adopting peers. The scaled adoption effects (ΔRE_{t-1}) indicate that early adopters reported an average of 4.90% increase in retained earnings while non-early adopters reported an average of 1.00% increase in retained earnings. The median value of the ΔRE_{t-1} effect is consistent with the results of the mean values. That is, a 1.76% increase of ΔRE_{t-1} for early adopters is higher than a 0.57% increase of ΔRE_{t-1} for non-early adopters.

In addition, early adopters appear to be more leveraged and have lower pre-adoption performance than non-early adopting peers. As shown in Table 8B, the average debt-to-assets ratio (LEV_{t-1}) is 65% for early adopters and 56% for non-early adopters; the pre-adoption profitability (ROE_{t-1}) is -2.23 for early adopters and 1.45 for non-early adopters; and the pre-adoption rate of growth is -49% for early adopters and 17% for non-early adopters. Furthermore, 60% of early adopters experienced a loss in pretax income ($PI_{t-1} < 0$), while 35% of non-early adopters had a loss in pretax income. These results are consistent with the expectation that firms with higher debt constraints, lower preadoption financial performance, and larger adoption effects are more likely to be early adopters as predicted in the hypotheses. This evidence suggests that managers potentially made their adoption timing choices based on firm characteristics and adoption effects on firms' financials.

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        Finally, I examined the percentage of sample firms in the choices of transition methods

and presented the results in Table 9.

Table 9. Frequencies of Transition Method Choice in Sample Firms (n=40)

	Early Adopters		Non-Early Adopters		Overall	
Transition Method	# of Firms	%	# of Firms	%	# of Firms	%
Full Retrospective	13	65%	3	15%	16	40%
Modified Retrospective	7	35%	17	85%	24	60%
Total	20	100%	20	100%	40	100%

        The results show that 65% of early adopters chose the full retrospective method while

85% of non-early adopters chose the modified retrospective method. This is interesting

considering that the full retrospective method is far more challenging and resource intensive to

implement. It might indicate that these early adopters have relatively lower information

production costs and value the benefit of the availability of historical trend information via

restated comparative financial statements. Another reason that might contribute to this finding is

that some early adopters were planning to issue IPOs. If they use the modified respective

method, revenue reported would appear to be lower in the transition period if ASC 606

accelerates the timing of revenue recognition as the accelerated revenue would bypass the

income statement and be recorded as a cumulative adjustment to retained earnings at the date of

adoption (see Table 2A). This issue of accelerated revenue not being shown on the income

statement may be a consideration for firms that were planning to go public since investors use

revenue, net income, and revenue growth rate when analyzing firms' profitability and prospects.

The full retrospective method may help mitigate the perception that a firm's revenue growth is

decreasing, depending on various factors such as the date to issue IPOs, the number of

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outstanding contracts (contracts that started before adoption), or new contacts (contracts that started during the adoption year), etc.

In summary, descriptive statistics suggest that most early adopters chose the full retrospective method while the majority of non-early adopters chose the modified retrospective method, and on average, the cumulative adoption effects of early adopters are higher than those of the non-early adopting peers in both dollar amounts and percentage changes. In the next section, I tested the two hypotheses by estimating the empirical model as proposed earlier.

4.2 Tests of Hypotheses

To answer the second research question whether there is evidence of systematic differences in the characteristics of firms that were early adopters versus non-early adopting peers, I first examined the statistical significance between the group means of the variables of interest using the independent samples t-test, and the results were presented in Table 10 below.

Table 10. Independent Samples T-Test: Comparing Group Mean Differences

Variable[a]	Early Adopters (N=20)	Non-Early Adopters (N=20)	Group Means*	T-statistics	One-tailed P-value	Effect Sizes**	Levene's Test (Sig.)
$SIZE_{t-1}$	6.284	7.083	-0.799	-0.777	0.221	0.246	0.145
LEV_{t-1}	0.648	0.555	0.093	0.707	0.242	0.224	0.255
$GROWTH_{t-1}$	-0.489	0.170	-0.659	-1.865	0.035	-0.590	0.992
ROE_{t-1}	-2.229	1.445	-3.674	-1.755	0.044	-0.555	0.426
ΔRE_{t-1}	4.899	1.003	3.896	0.695	0.248	0.220	0.031

[a]*Variable Definitions:*

$REEFFECT_{t-1}$ = Cumulative Adoption Effect of ASC 606 as of the Date of Adoption (in million dollars)

$SIZE_{t-1}$ = Natural log of Total Sales $_{t-1}$ (t = Adoption Year)

LEV_{t-1} = Total Debt$_{t-1}$/Total Assets$_{t-1}$

$GROWTH_{t-1}$ = (Pretax Income $_{t-1}$ - Pretax Income $_{t-2}$) /Absolute value of Pretax Income $_{t-2}$

ROE_{t-1} = Pretax Income $_{t-1}$ / Absolute value of Total Equity$_{t-1}$

*ΔRE_{t-1} = (Cumulative RE effect $_{t-1}$ / Total Assets$_{t-1}$) *100*

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The results show that the mean differences between early adopters and non-early adopters in $Growth_{t-1}$ (t = -1.865, p = 0.035) and ROE_{t-1} (t = -1.755, p =0.044) are statistically significant at the 5% level, and both are consistent with the expectations that less profitable firms or firms with deteriorating preadoption performance are more likely to be motivated to adopt ASC 606 early. Although the mean differences in other indicator variables ($SIZE_{t-1}$, LEV_{t-1}, ΔRE_{t-1}) are not statistically significant, the direction of the differences in LEV_{t-1} and ΔRE_{t-1} follows the conjecture that early adopters were subjected to tighter contractual constraints and experienced a larger impact of adoption.

To further understand the magnitude of the mean difference, I used Cohen's d as a reference which provides point estimates for effect sizes in standard deviation (SD) units. The guidelines of Cohen's d suggest that the effect size is small if Cohen's d is less than 0.2 and large if it is over 0.8. The results indicate that the effect size of the group mean differences among the variables is between 0.2 and 0.6. In particular, the two preadoption performance indicator variables $Growth_{t-1}$ and ROE_{t-1} exhibit relatively larger effect sizes with Cohen's d at -0.590 and 0.555, respectively. The results suggest that preadoption financial performance may be an important factor in managers' consideration of the adoption timing decisions of ASC 606.

One concern with using the independent samples t-test is that it assumes homogeneous variances in the population. Levene's test for equality of variances addresses whether this assumption is violated by comparing the variability of the group means in the sample. If it is significant, then this assumption is violated. The results indicate that this assumption is not violated for all the variables except for ΔRE_{t-1} with Levene's test significant at the 5% level. Since the mean difference in ΔRE_{t-1} is not statistically significant based on the t-test (p = 0.248),

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the comparison between the early adopters and non-early adopters suggests that these two groups

differ in their preadoption performance as shown by Growth $_{t-1}$ and ROE$_{t-1}$ in Table 10.

Compared with the independent samples t-test, logistic regression makes fewer

assumptions. It does not require normal distribution of predictor variables, or homoscedasticity

of variances when making inferences about the coefficients. Logistic regression requires an

absence of multicollinearity, independence of errors (each observation is independent of other

observations), and a categorical binary dependent variable (two possible outcomes) where the

focus category/target group is coded as 1 to be consistent with the odds statement in SPSS.

According to Meyers, Gamst, and Guarino (2017), collinearity or multicollinearity exists when

two or more predictors are strongly correlated. The general rule of thumb of 0.7 or more is used

to determine if a collinearity or multicollinearity problem exists.

Table 11A reports the Pearson correlations between the independent variables.

Table 11A. Pearson Correlations

Variable[a]		SIZE $_{t-1}$	LEV $_{t-1}$	GROWTH $_{t-1}$	ROE $_{t-1}$	ΔRE $_{t-1}$
SIZE $_{t-1}$	Pearson Correlation	-				
	N	40				
LEV $_{t-1}$	Pearson Correlation	-0.23				
	Sig. (2-tailed)	0.889				
	N	40	40			
GROWTH $_{t-1}$	Pearson Correlation	0.235	-0.242			
	Sig. (2-tailed)	0.144	0.132			
	N	40	40	40		
ROE $_{t-1}$	Pearson Correlation	0.481**	-0.062	0.254		
	Sig. (2-tailed)	0.002	0.702	0.113		
	N	40	40	40	40	
ΔRE $_{t-1}$	Pearson Correlation	-0.186	.505**	-0.402*	0.135	
	Sig. (2-tailed)	0.249	0.001	0.010	0.408	
	N	40	40	40	40	40

[a]*Variable Definitions:*

REEFFECT$_{t-1}$ = Cumulative Adoption Effect of ASC 606 as of the Date of Adoption (in million dollars)

SIZE $_{t-1}$ = Natural log of Total Sales $_{t-1}$ (t = Adoption Year)

LEV $_{t-1}$ = Total Debt$_{t-1}$/Total Assets$_{t-1}$

GROWTH $_{t-1}$ = (Pretax Income $_{t-1}$ - Pretax Income $_{t-2}$) /Absolute value of Pretax Income $_{t-2}$

ROE $_{t-1}$ = Pretax Income $_{t-1}$ / Absolute value of Total Equity$_{t-1}$

ΔRE $_{t-1}$ = (Cumulative RE effect $_{t-1}$ / Total Assets$_{t-1}$) *100

The results show that the correlation between LEV$_{t-1}$ and ΔRE $_{t-1}$ is the highest among the variables. They are positively and significantly correlated (r = .505, *p* = .01). A potential reason for the relatively strong correlation between LEV $_{t-1}$ and ΔRE $_{t-1}$ might be that both variables are scaled by total assets[22]. An alternative option is to use market value as the scaler, but a preliminary examination of the logistic regression reveals that scaling adoption effects by total assets is a better modeling choice than by market value because the Nagelkerke pseudo-R^2 value and the predictive accuracy in the classification table are both higher when total assets are used as scalers. The correlation matrix also indicates that Size $_{t-1}$ is positively and significantly corrected with ROE $_{t-1}$ (r = .481, *p* = .01), and Growth $_{t-1}$ is negatively and significantly correlated with ΔRE $_{t-1}$ (r = -.402, *p* = .05). They are all in the expected direction.

In summary, the correlations among independent variables in the empirical model are less than 0.7, thus, collinearity problems are not a serious concern. Pearson correlations also reveal that total assets and total sales are strongly and significantly related (r = 0.935, *p* = 0.01). Because both LEV$_{t-1}$ and ΔRE $_{t-1}$ are scaled by total assets, I chose to use total sales as a proxy variable for firm size to keep the correlations among independent variables as low as possible.

Although multicollinearity is not concerning based on correlation statistics, I chose to conduct formal testing on multicollinearity to provide additional assurance. Specifically, I tested

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[22] One potential option to reduce the correlation is to scale the cumulative adoption effects by the beginning market value in the transition year to reduce the influence of total assets, however, the market value of two early adopters in year t-1 is not available in Compustat. If I eliminated them, I had to remove their matched non-early adopters, which would further reduce the sample size and thus the staitiscal power of the empirical tests.

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multicollinearity by regressing each independent variable on all other independent variables

using the ordinary least square (OLS) method, and present the results in Table 11B.

Table 11B. Tests of Multicollinearity (OLS Regression: N=40)

Model 1	Tolerance	VIF
LEV $_{t-1}$	0.728	1.374
GROWTH $_{t-1}$	0.742	1.349
ROE $_{t-1}$	0.850	1.176
ΔRE $_{t-1}$	0.602	1.662

DV: SIZE $_{t-1}$ (adjusted R^2 = 0.245, F = 0.007)

Model 3	Tolerance	VIF
SIZE $_{t-1}$	0.678	1.476
LEV $_{t-1}$	0.700	1.428
ROE $_{t-1}$	0.678	1.475
ΔRE $_{t-1}$	0.633	1.581

DV: Growth $_{t-1}$ (adjusted R^2 = 0.174, F = 0.029)

Model 2	Tolerance	VIF
SIZE $_{t-1}$	0.704	1.420
GROWTH $_{t-1}$	0.742	1.349
ROE $_{t-1}$	0.654	1.529
ΔRE $_{t-1}$	0.726	1.377

DV: LEV $_{t-1}$ (adjusted R^2 = 0.220, F = 0.012)

Model 4	Tolerance	VIF
SIZE $_{t-1}$	0.926	1.080
LEV $_{t-1}$	0.736	1.358
GROWTH $_{t-1}$	0.808	1.237
ΔRE $_{t-1}$	0.650	1.539

DV: ROE $_{t-1}$ (adjusted R^2 = 0.307, F = 0.002)

Model 5	Tolerance	VIF
SIZE $_{t-1}$	0.753	1.327
LEV $_{t-1}$	0.940	1.064
GROWTH $_{t-1}$	0.867	1.153
ROE $_{t-1}$	0.747	1.339

DV: RE $_{t-1}$ (adjusted R^2 = 0.397, F = 0.001)

[a]Variable Definitions:

SIZE $_{t-1}$ = Natural log of Total Sales $_{t-1}$ (t = Adoption Year)

LEV $_{t-1}$ = Total Debt$_{t-1}$/Total Assets$_{t-1}$

GROWTH $_{t-1}$ = (Pretax Income $_{t-1}$ - Pretax Income $_{t-2}$) /Absolute value of Pretax Income $_{t-2}$

ROE $_{t-1}$ = Pretax Income $_{t-1}$ / Absolute value of Total Equity$_{t-1}$

ΔRE $_{t-1}$ = (Cumulative RE effect $_{t-1}$ / Total Assets$_{t-1}$) *100

Meyers, Gamst, and Guarino (2017) suggest that multicollinearity exists if multiple

correlations are high, that is, the adjusted R^2 is over 0.6. None of the adjusted R^2 in the models

above exceeds 0.4 (see Table 11B), suggesting that multicollinearity is less of a concern. In

addition, SPSS provides some indices that help identify multicollinearity problems. For example,

tolerance (1- R^2) is the amount of variance in a predictor not explained by the other predictors.

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Or a related statistic, variance inflation factors (VIF = 1/tolerance), also helps identify

multicollinearity problems. According to Meyers, Gamst, and Guarino (2017), tolerances less

than 0.4 (or VIF > 2.5) indicate that variables may be problematic and tolerances less than 0.1 (or

VIF > 10) suggest a severe multicollinearity problem. Based on the tolerance or the VIF values

in Table 11B, multicollinearity is not a concern.

The results indicate that a multivariate test is an appropriate approach to estimate the

simultaneous effect of independent variables on the early adoption decision of ASC 606, after

taking both the correlations between independent variables (as shown in Table 10A) and the

analysis of multicollinearity (as shown in Table 11B) into consideration.

I first ran the univariate logistic regression using the 20 early adopters and 20 industry-

size-matched non-early adopters and presented the results in Table 12A.

Table 12A. Univariate Logistic Regression Analysis (N=40)

Variable*	Expected Sign	Coefficients	*P* *Value*	Exp (B)	Chi-Square Sig[a]	N. Pseudo-R2[b]	H&L Test Sig[c]	Predictive Accuracy[d]
$SIZE_{t-1}$	?	-0.080	0.432	0.924	0.427	0.021	0.182	50.0%
LEV_{t-1}	(+)	0.581	0.479	1.788	0.467	0.018	0.614	55.0%
$GROWTH_{t-1}$	(-)	-0.676	0.101	0.509	0.050	0.122	0.650	60.0%
ROE_{t-1}	(-)	-1.760	0.092	0.172	0.003	0.260	0.532	60.0%
ΔRE_{t-1}	(+)	0.014	0.503	1.014	0.467	0.018	0.201	62.5%

a Null hypothesis of the omnibus tests of model coefficients: the coefficients are zero

b.Nagelkerke pseudo-R2 explains the percentage change of DV explained by IV in the model

c. Null hypothesis of Hosmer and Lemeshow Test: the predictions match the observed values

d. The probability of a correct prediction (percentage correctness)

Variable Definitions:

$SIZE_{t-1}$ *= Natural log of Total Sales $_{t-1}$ (t = Adoption Year)*

LEV_{t-1} *= Total Debt$_{t-1}$/Total Assets$_{t-1}$*

$GROWTH_{t-1}$ *= (Pretax Income $_{t-1}$ - Pretax Income $_{t-2}$) /Absolute value of Pretax Income $_{t-2}$*

ROE_{t-1} *= Pretax Income $_{t-1}$ / Absolute value of Total Equity$_{t-1}$*

ΔRE_{t-1} *= (Cumulative RE effect $_{t-1}$ / Total Assets$_{t-1}$) *100*

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The results show that the coefficients on all the variables of interest have the predicted signs, but only Growth $_{t-1}$ ($\chi2[1]$ =3.851, p =0.050) and ROE $_{t-1}$ ($\chi2[1]$ =8.687, p = 0.003) are negatively and statistically significantly related to early adoption decision at a 10% level. The odds ratio, a robust measure of effect-size statistics, calculates the odds of an event happening to one group relative to another. An odds ratio higher than 1 indicates that the treatment group is more likely to experience an event than the control group. However, an odds ratio below 1 is not directly interpretable (McHugh, 2009). In practice, researchers suggest that we calculate its reciprocal if the odds ratio is below 1 to make the interpretation more intuitive[23].

The odds ratio for Growth $_{t-1}$ (b = -0.676, p = .101; Exp(B) = 0.509, 1/Exp(B) = 1.96) indicates that firms with low preadoption growth rates are 1.96 times more likely to be early adopters than firms with high preadoption growth rates. The Nagelkerke pseudo-R^2 in the Growth $_{t-1}$ only model is 0.122, indicating that Growth $_{t-1}$ alone explains approximately 12.2% of the variance in adoption timing decisions. The classification accuracy based on Growth $_{t-1}$ alone is 60%, which is slightly higher than the model without any predictors in it (50% accuracy).

Similarly, the odds ratio for ROE $_{t-1}$ (b = - 1.760, p = .092; Exp(B) = 0.172, 1/Exp(B) = 5.81) indicates that firms with a lower rate of return are 5.81 times more likely to be early adopters than firms with a higher rate of return. Its Nagelkerke pseudo-R^2 is 0.260, indicating that the ROE $_{t-1}$ alone explains approximately 26% of the variance in adoption timing decisions. The classification accuracy based on ROE $_{t-1}$ is 60%, slightly higher than the model with constant only (50% accuracy).

In addition, Size $_{t-1}$ (*b* =-0.080, *p* = .432; *Exp(B)* = 0.924; *R^2* =0.021), LEV $_{t-1}$ (*b* = .581, *p* = .479; *Exp(B)* = 1.788; *R^2* =0.018), and ΔRE $_{t-1}$ (*b* =0.014, *p* = .503; *Exp(B)* = 1.014; *R^2*

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[23] http://onbiostatistics.blogspot.com/2012/02/how-to-interpret-odds-ratios-that-are.html#:~:text=%E2%80%9CAn%20OR%20of%20less%20than,is%20not%20the%20OR%20result.

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$=0.018$) are not statistically significant in the univariate tests. $Size_{t-1}$ and LEV_{t-1} appear to make

no significant contribution to the prediction of outcome based on their respectively low

Nagelkerke pseudo-R^2. However, the classification accuracy based on ΔRE_{t-1} alone is 62.5%,

suggesting that the adoption effects are an important factor in predicting the adoption timing

decisions (i.e., early vs non-early adopters).

In addition, the Hosmer and Lemeshow Tests assess whether the predicted probabilities

are statistically different from the observed probabilities and its null hypothesis is that there is no

difference between the predictions and observed values. The results show that none of them are

statistically significant, indicating that there is an acceptable match between the predicted and

observed probabilities.

Next, I ran the multivariate logistic regression modeling the binary variable of the early

adoption decision of ASC 606 and presented the results in Table 12B.

Table 12B. Multivariate Logistic Regression Analysis

Variable*	Expected Sign	Model 1 (Baseline)			Model 2 (Interaction)		
		Coefficients	*P Value*	Exp (B)	Coefficients	*P Value*	Exp (B)
$SIZE_{t-1}$	?	0.197	0.292	1.218	0.309	0.123	1.362
LEV_{t-1}	(+)	-0.902	0.589	0.406	-0.568	0.759	0.566
$GROWTH_{t-1}$	(-)	-0.146	0.775	0.864	-0.248	0.687	0.780
ROE_{t-1}	(-)	-2.603	0.099	0.074	-1.931	0.223	0.145
ΔRE_{t-1}	(+)	0.047	0.414	1.048	0.856	0.091	2.353
$LEV_{t-1}*\Delta RE_{t-1}$	(+)				-0.741	0.101	0.476
$GROWTH_{t-1}*\Delta RE_{t-1}$	(-)				-0.276	0.106	0.759
Chi-Square Sig[a]			0.059			0.055	
Nagelkerke R2[b]			0.311			0.389	
H&L Test Sig[c]			0.576			0.102	
Predictive Accuracy[d]			60%			75%	

a Null hypothesis of the omnibus tests of model coefficients: the coefficients are zero

b.Nagelkerke pseudo-R2 explains the percentage change of DV explained by IV in the model

c. Null hypothesis of Hosmer and Lemeshow Test: the predictions match the observed values

d. The probability of a correct prediction (percentage correctness)

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Variable Definitions:

$SIZE_{t-1}$ = *Natural log of Total Sales $_{t-1}$ (t = Adoption Year)*

LEV_{t-1} = *Total Debt$_{t-1}$/Total Assets$_{t-1}$*

$GROWTH_{t-1}$ = *(Pretax Income $_{t-1}$ - Pretax Income $_{t-2}$) /Absolute value of Pretax Income $_{t-2}$*

ROE_{t-1} = *Pretax Income $_{t-1}$ / Absolute value of Total Equity$_{t-1}$*

ΔRE_{t-1} = *(Cumulative RE effect $_{t-1}$ / Total Assets$_{t-1}$) *100*

The early adopters as the target group was coded as 1 and non-early adopters as the reference group was coded as 0. Two models were used to test the predictive power of the independent variables. The predictor variables in Model 1 (baseline model) include firm characteristics ($SIZE_{t-1}$, LEV_{t-1}, $Growth_{t-1}$, ROE_{t-1}) and adoption effects of ASC 606 (ΔRE_{t-1}). In addition to all the variables in Model 1, Model 2 (interaction model) adds two additional terms ($LEV_{t-1}*\Delta RE_{t-1}$ and $GROWTH_{t-1}*\Delta RE_{t-1}$) to capture the interactive effects of firm characteristics and magnitude of adoption effects on firms' adoption timing decisions.

The results in Model 1 show that coefficients on $Growth_{t-1}$, ROE_{t-1}, and ΔRE_{t-1} are consistent with the predicted signs, but ROE_{t-1} is the only variable that is statistically significantly associated with early adoption decisions at a 10% level (*b = -2.603, p = .099*). The odds ratio for ROE_{t-1} (*Exp(B) = 0.074; 1/Exp(B) = 13.51*) indicates that firms with a lower rate of return in year t-1 are 13.51 times more likely to be early adopters than firms with a higher rate of return. This result is consistent with the findings in the univariate test for ROE_{t-1} (see Table 12A) The Nagelkerke pseudo-R2 indicates that the baseline model accounts for approximately 31.1% of the total variance in the dependent variable, which is higher than all the univariate models (the highest Nagelkerke pseudo-R^2 is 26% for the ROE_{t-1} model).

The Hosmer and Lemshow test is 0.576, indicating that the predicted frequencies are not statistically different from the observed frequencies. Based on a classification threshold predicted probability of the target group of 0.5 in the constant-only model, results of the logistic analysis

indicate that the baseline model provides a statistically significant prediction of early adopters

($\chi 2[5] = 10.619$, $p = 0.059$). However, the overall correct prediction rate is 60% (i.e., a correct

prediction rate of 60% for early adopters and 60% for non-early adopters), indicating no big

improvement from the predictive accuracy of univariate models (see Table 12A). Taken together,

there is some evidence from the baseline model suggesting that the preadoption financial

performance is associated with firms' early adoption decisions.

The interaction model (model 2) expands the baseline model by including two additional

terms (LEV$_{t-1}$*ΔRE$_{t-1}$ and GROWTH$_{t-1}$*ΔRE$_{t-1}$), which provides formal testing of H1 and H2.

The impacts of the inclusion of the two interactive terms in model 2 on model statistics are

noticeable. As seen in Table 12B, there is a significant increase in the prediction accuracy based

on a cutoff value of 0.5 for the constant-only model. The overall correct prediction rate increases

from 60% in Model 1 (baseline model) to 75% in Model 2 (interaction model). More

specifically, the correct prediction rate for early adopters increases from 60% in the baseline

model to 85% in the interaction model. The correct prediction rate for non-early adopters

increases from 60% in the baseline model to 65% for non-early adopters.

The test of the null hypothesis that each of the coefficients in the model is equal to zero

yields a chi-square value ($\chi 2[7] = 13.803$, $p = 0.055$), indicating that the interaction model

provides a statistically significant prediction of early adopters at a 10% level. The Nagelkerke

pseudo-R^2 indicates that the interaction model accounts for approximately 38.9% of the total

variance in the dependent variable, which is higher than the baseline model (the Nagelkerke

pseudo-R^2 = 31.1%) and the univariate model (the Nagelkerke pseudo-R^2 = 26%, the highest

among all the univariate models), indicating that the interaction model has higher predictive

power for early adopters.

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Moreover, the coefficients on Growth$_{t-1}$ ($b = -.248, p = .687; Exp(B) = 0.780$) and ROE$_{t-1}$

($b = -1.931, p = .223; Exp(B) = 0.145$) have the predicted signs but are not statistically

significant. ΔRE $_{t-1}$ is statistically significant at a 10% level ($b = 0.856, p = .091; Exp(B) =$

2.353) and its positive coefficient is in the direction predicted. The multivariate results provide

evidence consistent with the prediction that firms are more likely to adopt ASC 606 early if this

standard has produced more favorable effects on firms' financials.

H1 predicts a positive relationship between the adoption effect of ASC 606 and the

propensity of firms approaching debt constraints in adopting the standard early. This hypothesis

would be supported by a positive coefficient β_6 on the first interactive term LEV$_{t-1}$*ΔRE $_{t-1}$.

Although the coefficient is not positive, it is not statistically significant ($b = -.741, p = .101;$

$Exp(B) = 0.476$). Thus, the result does not provide support for the hypothesis of debt constraint

considerations (H1) in early adoption decisions. This result is different from the findings in the

independent samples test (see Table 10) and the univariate test on leverage (see Table 12A)

which provides preliminary evidence that early adopters are more leveraged than non-early

adopters.

A potential reason for the insignificant coefficient of β_6 could be attributed to the

unusually high leverage ratio in a few of the sample firms. For example, LEV $_{t-1}$ is 85% for early

adopters and 80% for non-early adopters at the 75% percentile as shown in Table 8B. I checked

the sample and found that a few firms' debt-to-asset ratios are close to or even over 1, indicating

that these firms were mostly funded by debt, thus putting them at an extremely high risk of

defaulting on debt. These companies are more likely to have a lower degree of flexibility in

managing their legal obligations as they are very closely monitored by their creditors, which

could influence their reporting choices. To get an idea of the influence of the extremely

leveraged firms, I excluded four observations (two early adopters and two non-early adopting peers) with LEV $_{t-1}$ over 1 and re-ran the regression. I find a positive but not statistically significant coefficient on LEV$_{t-1}$*ΔRE $_{t-1}$ (*b =0.261, p = .827; Exp(B) = 1.298*). Moreover, the prediction accuracy dropped to 69.4% when the sample size became 36.

　　H2 predicts a negative relationship between the adoption effect of ASC 606 and the propensity of firms with an increasing pre-adoption financial performance to adopt the standard early. The coefficient β_7 on the second interactive term GROWTH $_{t-1}$*ΔRE $_{t-1}$ is negative as predicted with a statistical significance slightly above the 10% level (*b = -0.276, p = .106; Exp(B) = 0.759*). This finding is also consistent with the evidence from the independent samples test (see Table 10) and the univariate test on preadoption financial performance (see Table 12A), which show that early adopters have statistically significantly lower growth rates than non-early adopters. In addition, the coefficient on ΔRE $_{t-1}$ is statistically significant and positive at a 10% level (*b =0.856, p = .091; Exp(B) = 2.353*) and consistent with its predicted sign. Thus, the multivariate results provide evidence supporting hypothesis 2 that there is a negative relationship between the adoption effect of ASC 606 and the propensity of firms with an increasing pre-adoption financial performance to adopt the standard early. Based on the results of the omnibus tests of model coefficients ($\chi 2[7]$ =13.803, *p* = 0.055), the Nagelkerke pseudo-R^2 (38.9%), and the classification accuracy (75%), the interaction model improves the predicting power for early adopters of ASC 606 compared with the baseline model.

Chapter 5: Discussion and Conclusion

As discussed in previous chapters, ASC 606 has brought the most influential accounting changes since the Sarbanes-Oxley Act (SOX) of 2002. The changes by ASC606 call for more research to better understand the impacts and consequences of this standard. Most concurrent research on ASC 606 took an information perspective and examined the relationship between the new revenue standard and its market effect, focusing on the tests of market efficiency and value relevance for new accounting information. The results from these market-based studies provided mixed findings on whether the new standard improves the comparability of financial statements, earnings informativeness, earnings predictability, and stock liquidity.

This study complemented existing research on ASC 606 by taking a contracting perspective and drawing from the positive accounting theory to examine the adoption effect on firms' financial statements and the timing of the adoption decisions. This study provided evidence of the impact of ASC 606 on firms' financials and examined whether the likelihood of adopting ASC 606 early is associated with firm-specific characteristics and adoption effects on firms' financial statements. Collectively, the market-based approach and the contracting costs-based approach complemented each other to enhance our understanding of ASC 606 and its impact.

5.1 Implications for Research

Using a sample of 20 early adopters and 20 non-early adopting peers, I found that the adoption effects of ASC 606 on firms' financials vary by industry. Firms in the computer programing and software industry reported the largest dollar amount increase in retained earnings while the transportation industry reported the largest dollar amount decrease in retained earnings in the year of adoption. Overall, the majority of the sample firms (83%) reported

positive adoption effects on financial statements, which on average increased opening retained earnings by 2.95% as of the date of adopting ASC 606.

I also found that both the mean and median adoption effects of early adopters are higher than those of their non-early adopting peers. The multivariate test of the interaction model shows that the adoption effects (ΔRE_{t-1}) are statistically significant and positively associated with the likelihood of adopting ASC 606 early. These results are consistent with the expectation that early adopters of ASC 606 had more favorable adoption effects than their non-early adopting peers. The positive adoption effects could be a potential consideration for firms' adoption timing decisions since it could help reduce contracting costs associated with restrictive debt covenants and meet market expectations of earnings and growth.

Positive accounting theory suggests that managers are more likely to increase reported earnings to reduce the risk of a technical default when a firm is close to its debt covenant limits (Watts & Zimmerman; 1990). In hypothesis 1, I predict that there is a positive relationship between the adoption effect of ASC 606 and the propensity of firms that approach debt limits to adopt the standard early. This hypothesis predicts the coefficient on the interactive term $LEV_{t-1}*\Delta RE_{t-1}$ to be positive. Although there is evidence that early adopters are more leveraged and report larger cumulative adoption effects than non-early adopters in univariate analysis, I did not find a statistically significant association between the adoption timing decision and the interaction of leverage and adoption effects in the multivariate analysis. This result might be because some sample firms are highly leveraged (debt-to-asset ratios close to or above 1). These firms are more sensitive to economic and earnings declines and are subject to a higher default risk or bankruptcy risk. They are monitored closely by creditors and have limited flexibility to

use income-increasing strategies from accounting changes to influence the leverage ratios, which could influence the reporting choices that managers can make.

Positive accounting theory also suggests that managers have incentives to manage accounting-based earnings to meet market expectations, justify increased compensations, or increase job security (Watts & Zimmerman; 1990). This is because a consistent trend of revenue growth affects the perception of management performance and stock prices. If the revenue growth rate is below internal or external expectations, managers are more likely to choose income-increasing accounting changes to get closer to or meet the targeted growth rate. In hypothesis 2, I predict that there is a negative relationship between the adoption effect of ASC 606 and the propensity of firms with an increasing preadoption performance to adopt the standard early. This hypothesis predicts the coefficient on the interaction term $GROWTH_{t-1}*\Delta RE_{t-1}$ to be negative. I found the coefficient on $GROWTH_{t-1}*\Delta RE_{t-1}$ negative and just right above the significance level of 10% ($p = 0.106$). This finding is consistent with the evidence from the independent samples tests and the univariate tests, which show that $GROWTH_{t-1}$ and ROE_{t-1} are negatively and significantly related to the likelihood of early adoption. This finding is also consistent with the evidence from the multivariate test which shows that ΔRE_{t-1} is positively and significantly related to the likelihood of adopting ASC 606 early. Taken together, this study provides evidence supporting hypothesis 2 that early adopters of ASC 606 are associated with decreased earnings in the year before adoption and more favorable adoption effects than non-early adopting peers.

Finally, positive theory suggests that firm size is a proxy variable for political costs and information production costs. Large firms are associated with higher political costs but lower information production costs. Prior literature provides mixed findings on whether large firms are

more or less likely to be early adopters. The results of my study show that $SIZE_{t-1}$ is positively

related to the likelihood of early adoption, but it is not statistically significant. Statistics show

that "24 percent of non-reliance notices (alert investors not to rely on financial statements) are

caused by the problems with the ASC 606 adoption in 2018. And 2 percent of late filings in 2018

cited revenue recognition problems as the reason for tardy filings" (Whitehouse, 2019). The

result about firm size is not surprising as it indicates that large firms are likely to have the

resources and expertise to adopt ASC 606 earlier than small firms considering the complexity of

the new standard and its enhanced disclosure requirements, the time and level of effort needed to

implement it.

This study has made the following contributions to the literature. First, this paper

contributes to the broad literature studying the impact of the new revenue standard. While most

existing studies focused on the impact of the new standard on market efficiency and value

relevance, limited research examined the direct impact of ASC 606 on firms' financials. One

paper (Arora, 2019) assessed the impact of ASC 606 on the airline industry and found that the

new standard increased aggregated net income of eight airline firms by about 2%. Another paper

(Choi, Kim & Wang, 2022) found that software firms are more affected by ASC 606 than

electronic computer firms and ASC 606 improves financial statement comparability and

informativeness for software firms. Both papers focused on specific industries in their

examination of the financial reporting impact of ASC 606. This study focuses on early adopters

but does not limit the sample to any specific industry. By comparing the adopting effects

between early and non-early adopters, this study helps us understand the potential incentives

underlying financial reporting. Thus, this study highlights the variations in managerial responses

to ASC 606. These variations could be circumstances-dependent (e.g., how leveraged the firm is

or how profitable it is before adoption) and may provide insight into mixed findings of the ASC 606 effects in existing market-based studies. Second, this study tests positive accounting theory in the context of ASC 606 and finds differences between early and non-early adopting peers in both the adoption effects and their preadoption financial performance. Third, this study provides additional evidence for the employment of the interactive effects model in the accounting choice literature, which echoes the recommendation in prior research (Ali & Kumar, 1994; Gujarathi & Hoskin, 2003). Finally, this study provides information about ASC 606 effects in response to the calls from the FASB for its ongoing post-implementation review of the new revenue standard.

5.2 Implications for Practice

To shed light on the adoption effects of ASC 606, I read through and collected information from the disclosures of the accounting changes and revenue recognition. The disclosures on the revenue recognition policies and process from 10-Ks provide more information about the nature and scope of changes in earnings and revenue due to the adoption of ASC 606, which is useful for understanding the impact of this new standard. I focused on the revenue recognition section under Part II, Item 8 - Financial Statement and Supplemental Data, and summarized the findings as follows.

First, private firms that worked toward IPO offerings in 2017, 2018, and 2019 may benefit from early adoption of the new revenue standard because proactive actions to update systems, internal controls, and process help firms understand the impact of the new revenue standard on financial statements sooner and reduce future information production costs. These firms would save time on reviewing contracts for modification and avoid performing dual tracking of revenues, especially for firms that opted for the full retrospective method. Retroactively recalculating revenue would be time-consuming and resource intensive. Firms that

expect major differences between revenue accounted for under ASC 606 vs ASC 605 may benefit from the full retrospective method as it improves the comparability of financial reports and helps firms mitigate negative adoption effects if ASC 606 accelerates revenue recognition.

Second, some emerging growth companies (EGCs) as defined in the Jumpstart Our Business Startups Act of 2012 (JOBS Act) chose to be early adopters as EGCs have the option to adopt ASC 606 early or at the standard adoption date for either a public company or a private company (e.g., Docusign, Inc.). These firms may take advantage of specified reduced reporting and disclosure requirements (e.g., present only two years of selected financial statements on the initial registration form). Early adoption could reduce the negative impact of ASC 606 on EGCs as the periods presented would be post-adoption periods on form S-1. This might be more important for newly incorporated firms.

Third, several high-tech early adopters disclosed that the impact of the new standard relates to their accounting for distributor and reseller revenue when they change from the more conservative "sell-through method" (revenue is not recognized until goods are sold from distributors to end-users) to the more aggressive "sell-in method" (revenue is recognized upon transfer of control to customers including distributors). Under the sell-in method, firms need to make estimates for variable consideration (e.g., sales returns and rebates) at the time of transfer of control. The new standard results in a reduction in deferred distributor revenue and accounts receivable for estimated returns (see Extreme Networks Inc., 2017 Annual Report). This finding may bring additional information to the studies of sell-in versus sell-through revenue recognition, where prior research shows that high-tech firms are less likely to use the "sell-in method" when they have higher growth opportunities and strong corporate governance (Rasmussen, 2009).

Last, some early adopters (e.g., Commvault Systems, Inc.; Datadog, Inc.) disclosed that they elected to early adopt ASC 606 using the full retrospective method and the adoption increased retained earnings due to the deferral of commission costs, which are capitalized under ASC 606 but expensed under ASC 605.

As indicated in the concurrent study (Choi, Kim & Wang, 2022), the effects of ASC 606 are likely to vary by industry because of the fundamental differences in their operating environment, business models or practices, contract designs, and pre-ASC 606 revenue rules. The evidence in this study could be of interest to investors, practitioners, and regulators.

5.3 Limitations and Future Studies

There are several limitations to this study. First, the final sample size of early adopters is relatively small due to data limitations and the firms are mostly from eight industries, which potentially limits the generalization of the findings to the other industries. Second, the size of the control sample is limited due to the limitation of manual data collection. Manually collecting adoption effects from Financial Statements and Supplemental Data requires extensive time and accounting skills. I manually collected the cumulative adoption effects of early adopters and non-early adopting peers matched by industry and size. Future studies can expand to include more non-early adopters in the study to conduct an imbalanced sample test. Third, the study finds that early adopters tend to choose the full retrospective method while non-early adopters tend to use the modified retrospective method when adopting ASC 606. Future studies can investigate whether significant differences exist between the firms in choosing the full retrospective method and the modified retrospective method, and what the implications are to decision-makers. Last, future studies may replicate this study using sample firms that chose to early adopt IFRS 15.

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5.4 General Conclusions

This study presented evidence of the direct impact of ASC 606 on firms' financial statements and examined the associations between the adoption timing choice and firm characteristics. The results reveal that early adopters of ASC 606 are associated with more favorable adoption effects and decreased earnings in the year before the adoption. The results also show that most early adopters chose the full retrospective while most non-early adopters chose the modified retrospective method. The findings may be interesting to investors to enhance their understanding of the new revenue standard to make well-informed decisions. The findings might also be interesting to managers who can use the increased discretion and judgment under ASC606 to improve the quality of revenue reporting. Finally, the findings could be interesting to standard setters who want to understand the impact and implications of adoption choices when designing new accounting standards and reviewing existing standards.

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Appendix A. Industry Membership of ASC 606 Adopters**

SIC*	Industry	# of Firms	Frequencies
01	Agricultural Production Crops	4	0.22%
02	Agriculture Production Livestock and Animal Specialties	1	0.06%
07	Agriculture Services	1	0.06%
10	Metal Mining	6	0.33%
12	Coal Mining	5	0.28%
13	Oil and Gas Extraction	66	3.65%
14	Mining and quarrying of Nonmetallic Minerals	3	0.17%
15	Building Construction General Contractors	10	0.55%
16	Heavy construction Other than Building Construction	13	0.72%
17	Construction Special Trade Contractors	6	0.33%
20	Food and Kindred Products	29	1.60%
21	Tobacco Products	1	0.06%
22	Textile Mill Products	3	0.17%
23	Apparel and Other Finished Products Made from Fabrics	16	0.89%
24	Lumber and Wood Products, except Furniture	3	0.17%
25	Furniture and Fixtures	8	0.44%
26	Paper and Allied Products	8	0.44%
27	Printing, Publishing, and Allied Industries	16	0.89%
28	Chemicals and Allied Products	248	13.72%
29	Petroleum Refining and Related Industries	6	0.33%
30	Rubber and Misc. Plastics Products	10	0.55%
31	Leasure and Leather Products	3	0.17%
32	Stone, Clay, Glass, and Concrete Products	3	0.17%
33	Primary Metal Industries	14	0.77%
34	Fabricated Metal Products, except Machinery and Transportation Equip	26	1.44%
35	Industrial and Commercial Machinery and Equip	87	4.81%
36	Electronic and Other Electrical Equipment, except Computer Equip	131	7.25%
37	Transportation Equipment	50	2.77%
38	Measuring, Analyzing, and Controlling Instruments	108	5.98%
39	Misc. Manufacturing Industries	8	0.44%
40	Railroad Transportation	1	0.06%
41	Local and Suburban Transit	1	0.06%
42	Motor Freight Transportation and Warehousing	14	0.77%
44	Water Transportation	4	0.22%
45	Transportation by Air	16	0.89%
46	Pipelines, except Natural Gas	10	0.55%
47	Transportation Services	6	0.33%

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48	Communications	50	2.77%
49	Elecric, Gas, and Sanitary Services	113	6.25%
50	Wholesale Trade-durable Goods	32	1.77%
51	Whoesale Trade-non-durable Goods	18	1.00%
52	Building Materials, Hardware, Garden Supply	2	0.11%
53	General Merchandise Stores	10	0.55%
54	Food Stores	4	0.22%
55	Automotive Dealers and Gasoline Service Stations	14	0.77%
56	Apparel and Accessory Stores	25	1.38%
57	Home furniture, Furnishings, and Equipment Stores	12	0.66%
58	Eating and Drinking Places	38	2.10%
59	Misc. Retail	40	2.21%
70	Hotels, Rooming Houses, Camps, and Other Lodging Places	12	0.66%
72	Personal Services	5	0.28%
73	Computer Programming, Data Processing, Prepackaged Software	363	20.09%
75	Automotive Repair, services, and Parking	3	0.17%
78	Motion Pictures	9	0.50%
79	Amusement and Recreation Services	28	1.55%
80	Health Services	38	2.10%
81	Legal Services	1	0.06%
82	Educational Services	9	0.50%
87	Engineering, Accounting, Research, Management Services	31	1.72%
99	Nonclassifiable Establishements	5	0.28%
Total		1807	100.00%

Standard Industry Classification (SIC): https://www.osha.gov/data/sic-manual

*** Identified by "ASU2014-09" in Compustat*