MANDATORY REVENUE DISAGGREGATION AND VOLUNTARY MANAGEMENT SALES FORECASTS: EVIDENCE FROM ASC 606

AURELIUS AARON

PhD

The Hong Kong Polytechnic University

2024

The Hong Kong Polytechnic University

School of Accounting and Finance

Mandatory Revenue Disaggregation and Voluntary Management Sales Forecasts: Evidence from ASC 606

Aurelius Aaron

A thesis submitted in partial fulfilment of the requirements for the degree of Doctor of Philosophy

March 2024

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ABSTRACT

In 2018, US firms adopted a new revenue recognition standard, ASC 606, Revenue from Contracts with Customers, which alters revenue recognition and mandates new and more granular revenue disaggregation. This paper examines whether a mandated change in the quantity of revenue information, which is driven by the adoption of ASC 606, leads to a change in management's voluntary disclosure of revenue information. Specifically, we examine whether managers are more likely to provide revenue forecasts following ASC 606. On the one hand, the greater detail provided by ASC 606 may enrich the information environment, reducing the need for voluntary disclosure. On the other hand, the complexity and additional disclosures of ASC 606 may lead to divergent investor opinions, increasing the need for guidance from management. Our main findings suggest that firms that disaggregate their revenue following the adoption of ASC 606 are more likely to provide management sales forecasts. We further find that the effect is stronger for firms whose revenue attracts more investor attention and for firms with high regulatory scrutiny, a poor information quality, and weaker for firms with high proprietary cost concerns. Overall, this study provides novel insights into the interplay between mandatory and voluntary disclosure.

Keywords: ASC 606. Revenue Disaggregation, Management Sales Forecasts, Voluntary Disclosure

ACKNOWLEDGEMENT

This thesis would not have been possible without the blessing of God and support of many people. For the foremost, I am deeply and extremely grateful to my chief supervisor, Dr. Tjomme Rusticus. "*From Rusticus … I learned to read carefully and not be satisfied with a rough understanding of the whole, and not to agree too quickly with those who have a lot to say about something"* (Aurelius, M., Meditations, 1.7.3). It might be a pure coincidence with the history that occurred in ancient Rome around 2,000 years ago. However, to me, Dr. Rusticus is exactly the one who taught me the same thing. With his perseverance and patience in his teaching, I was able to overcome the most difficult time in my life. Moreover, because of him, I am now able to face the world with more kindness.

I would also like to express my gratitude to my co-supervisors, Dr. Chong Wang and Prof. Jeffrey Ng (The University of Hong Kong). Specifically, Dr. Wang is the one who taught me how to deal with empirical analysis comprehensively. Through his excellent teaching, I learned how to handle research data effectively and efficiently. Meanwhile, Prof. Ng is the one who passionately taught me how research is connected to the real world. Through his experience and actions, I learned how to deal with multiple projects simultaneously and complete them. I am forever grateful to be the pupil of my supervisory team, who diligently coached me in developing my conceptual thinking, empirical skills, and project management skills over the years.

Furthermore, I would also like to express my gratitude to Dr. Tracie Frost, and the two external examiners, Dr. Xiangang Xin (City University of Hong Kong) and Dr. Byron Song (Hong Kong Baptist University) for their guidance on this PhD thesis. This thesis benefited greatly from their useful comments. Without them, I believe this thesis would not be as novel, robust, and interesting as it is.

I would also like to thank Prof. James (Jim) Ohlson who taught me the wisdom in accounting research. Through our in-depth conversations, I learned the big picture and dynamics of accounting research. His invaluable experience gained from conducting accounting research over the past 50 years provides me guidance on what really matters in the long run, not only in accounting research but also life in general.

In addition, I would like to thank Blue Hall Warden, Prof. Jiyan (James) Dai, for his trust in me to become the Blue Hall's Senior Hall Tutor. He is my role model outside academia. I learned a lot from him in managing and providing pastoral care to students living at Blue Hall over the years. He showed me that kindness can overcome many problems that arise from miscommunication and cultural differences. He further taught me about cultural diversity and inclusivity in a community by providing me the opportunity to plan, organize, lead, and participate in student talent show events. I also thank the Blue Hall students who continue to hone their talents so that they can perform well at university-level events representing Blue Hall.

Finally, I would also like to acknowledge the support from all the lecturers and staffs in School of Accounting and Finance at the Hong Kong Polytechnic University who always give me their fullest support and encourage me to be a better person. In particular, I gratefully acknowledge the support of Prof. Nancy Su, our School Head. Last but not least, I would like to thank my family, colleagues, Blue Hall, SAO, Graduate School and friends for their continuous support.

TABLE OF CONTENTS

1. INTRODUCTION

On May 28, 2014, the Financial Accounting Standards Board (FASB) issued Accounting Standards Codification (ASC) 606, *Revenue from Contracts with Customers*, perhaps the most comprehensive and important change to financial reporting standards since Sarbanes Oxley (Ahn et al., 2021).[1] In a move towards principles-based accounting standards, the new revenue standard relies heavily on the judgement of managers and makes extensive changes to revenue disclosures. One of the more controversial disclosure requirements of the new standard is the requirement to disaggregate revenue (Hinson et al., 2022) into categories that depict how economic factors affect revenue and cash flows (ASC 606-10-50-5). Although investors largely support mandatory disaggregation (FASB, 2009), some market participants caution that revenue disaggregation could lead to unnecessary and confusing detail that may limit the decision usefulness of the disclosures. Consequently, the FASB invited research into whether the disclosures are sufficient for investors to understand the application of management judgment in revenue recognition (FASB Webinar, 2021).

In response to the FASB's call, in this paper, we investigate whether investors' demand for management sales guidance changes after ASC 606 (for other research on management sales guidance, see Koo & Lee, 2018; Crawford et al., 2020; Aaron et al., 2023). We expect that if disaggregated revenue disclosures are sufficient to convey useful information to investors, then the demand for management sales forecasts (MSFs) will remain stable after ASC 606 adoption. However, if overly detailed disclosures create disagreement among investors, we expect investor demand for management sales guidance to increase due to confusion or complexity regarding the new disclosures (e.g., Guay, Samuels, and Taylor, 2016). We examine two specific research questions. First, are firms that disaggregate their

[1] The FASB spent almost 10 years developing this accounting standards update, and the final standard applies to almost all private and public firms following GAAP.

revenue after adopting ASC 606 more likely to issue MSFs than firms that do not disaggregate revenue? If so, then it could indicate that disaggregated revenue disclosures after ASC 606 increase investor demand for revenue-related information due to a lack of clarity in the disclosures. However, if disaggregation provides complete and sufficient information, investors would not find MSFs to be incrementally informative. Second, does the relation between revenue disaggregation and MSFs vary with firm characteristics? Specifically, we examine three contexts in which we expect the relation between revenue disaggregation and MSFs to vary: (1) greater investor attention to revenue (Lang & Lundholm, 1993; Baginski et al., 2004); (2) a weak information environment pre-ASC 606 (Koo & Lee, 2018; Lang & Lundholm, 1993); and (3) a high proprietary cost of disclosure (Beyer et al. 2010; Crawford et al., 2020).

We focus specifically on revenue disaggregation for our tests because, among ASC 606 disclosure requirements, uncertainty around the merits of additional revenue disaggregation is especially high (Hinson et al., 2022). Given the uncertainty of the value of additional revenue disaggregation, our study is of particular interest to investors and the FASB, who are concerned about whether disclosures provide decision-useful information. Additionally, because of the unique characteristics of revenue disaggregation disclosure, we may observe investor demand for additional information provided by managers.

Two characteristics of revenue disaggregation make it an appropriate setting to investigate investor demand for management guidance. First, as a principles-based standard, ASC 606 requires managers to make significant judgements in determining revenue disaggregation depending on the facts and circumstances of each entity, which could lead to lack of comparability in revenue disaggregation even between two firms in the same industry. Investors then may demand information to understand how revenue disclosures compare across firms. Second, ASC 606 mandates a level of disaggregation that "fundamentally altered the

volume and granularity of revenue information" in financial reports (Hinson et al., 2022, p. 1). This detail may obscure relevant information or duplicate information contained in segment disclosures, making the reports hard for investors to use, thereby necessitating an increase in MSFs. In contrast, the need for MSFs may decline after ASC 606 if revenue disaggregation provides decision-useful information about the nature, timing, and uncertainty of revenue recognition, thereby facilitating more precise analyses than were possible before ASC 606 (Hinson et al., 2022). It is also possible that revenue disaggregation will have no effect on the provision of MSFs.

Audit Analytics maintains an *Accounting Pronouncements – Revenue Recognition* database. Using information collected by Audit Analytics to identify firms that disaggregate revenues after ASC 606, we exploit the mandatory adoption of ASC 606 in 2018 as an exogenous shock. We employ a difference-in-differences design in which we test the effect of revenue disaggregation on the frequency and likelihood of MSFs before and after the adoption of ASC 606, since not all firms need to provide disaggregated revenue, only those whose revenue are subject to different economic factors. See Appendix A for examples of the additional revenue disaggregation following ASC 606.

We collect MSF data from the Institutional Brokers' Estimate System (I/B/E/S) guidance database. Using a sample of 42,810 firm quarters from 2016 to 2019, we find a significant increase in quarterly MSFs for firms with additional revenue disaggregation following ASC 606. This primary finding is robust to alternative specifications, including the use of propensity score matching, the exclusion of financial firms from our sample, and the use of annual forecasts. In terms of economic significance, we document a 4.1 percentage point increase in the likelihood of providing a MSF for disaggregating firms, corresponding to a 14.3% increase relative to the mean sample value.[2] Similarly, we find a 10.9% increase in the

[2] See p.15-16 for the calculation details of economic significance.

frequency of MSFs relative to the mean sample values. These findings suggest that investors do not obtain all the information they require from revenue disaggregation disclosures alone and that they demand more information related to revenues, which managers provide in MSFs.

Next, we conduct several cross-sectional analyses to provide deeper explanations of our primary findings. First, we posit that the effect of revenue disaggregation on MSFs is stronger for firms with high investor attention to revenue. Liu et al. (2023) suggest that revenue can convey information about firm value in addition to earnings, particularly for firms with negative earnings. Therefore, we examine whether the effect of revenue disaggregation on MSFs is stronger for loss firms. Consistent with MSFs serving as a vital tool through which firms can respond to elevated information demand and address investors' concerns, we find that the positive association of revenue disaggregation with MSFs is more pronounced for those with negative earnings. Second, we posit that the effect of revenue disaggregation on MSFs is stronger for firms with high regulatory scrutiny. Following the adoption of ASC 606, increased regulatory scrutiny related to revenue recognition may draw additional investor demand for MSFs. Using SEC comment letters as a measure of regulatory scrutiny, we predict and find that the effect of revenue disaggregation on MSFs is stronger for firms in industries with more comment letters regarding ASC 606.

Third, we consider the influence of the information environment on our primary findings. We argue that when the prior information environment is poor, it is critical for managers to provide guidance on how to interpret the additional disclosures. To the extent that managers aim to reduce information asymmetry between firms and their stakeholders by providing guidance, the effect will be stronger when there is more pre-ASC 606 confusion among their stakeholders. Consistent with this expectation, we find that the association of revenue disaggregation on MSFs is more pronounced for firms with a weak information environment, measured using low analysts' sales forecast accuracy, high analysts' sales

forecast dispersion, and high bid-ask spread. Finally, we explore whether the association of revenue disaggregation and MSFs weakens when the firm has high proprietary costs for disclosure. Firms facing high proprietary cost concerns may be less willing to provide MSFs in addition to disaggregated revenue disclosures under ASC 606. Consistent with this, we find that the effect of revenue disaggregation on MSFs is less pronounced for firms with high proprietary cost concerns, measured using high product market threats and high product similarity compared to their competitors (Hoberg et al., 2014, Hoberg and Phillips, 2016).

We make the following contributions. First, we provide novel insights into the interplay between mandatory and voluntary disclosure. Evidence suggests that regulatory (mandated) changes in accounting and disclosure can lead to changes in voluntary disclosure (through either substitution or complementary effects). For example, Noh et al. (2019) show that firms reduce management earnings guidance after the 2004 expansion of mandatory 8K disclosure, indicating that mandatory and voluntary disclosures work as substitutes. Meanwhile, Li and Yang (2016) document a complementary effect by showing that the likelihood and volume of management earnings forecasts increase following mandatory IFRS adoption. Our findings provide additional evidence on the complementary relation between mandatory disclosure (i.e., revenue disaggregation) and voluntary disclosures (i.e., MSFs).

Second, we contribute to the literature on MSFs. Although management forecasts are one of the most significant forms of voluntary disclosure for firms (Beyer et al., 2010), the management forecast literature has primarily focused on disclosure settings related to management earnings forecasts. In recent years sales forecast have become the most common form of management guidance (Lu and Skinner, 2023, Call, Hribar, and Volant, 2023). There is a small but growing literature on the determinants and consequences of MSFs (Koo & Lee, 2018, Crawford et al., 2020, Aaron et al., 2023). We contribute to this literature by investigating

the demand for revenue-related information in the context of a major new revenue recognition standard.

Third, we respond to the FASB's call for research on the decision-usefulness of revenue disclosures from ASC 606. Our results suggest that managers respond to investor demand for greater revenue disclosure following ASC 606 by making more frequent MSFs. As such, we provide new information about the impact of accounting standards adoption on investors' and managers' information requirements. This study also adds to the broader understanding of the effects of ASC 606, showing that the impact of the standard extends beyond financial reporting changes and has implications for the evolving information requirements of investors and managers.

Finally, we also contribute to studies examining the effects of ASC 606. Existing research finds conflicting results for the disclosure requirements of ASC 606. Hinson et al. (2022) find evidence that revenue disaggregation provides decision-useful information for analysts when measuring decision-usefulness as analysts' forecast errors and forecast dispersion. On the other hand, Lee and Lee (2020) show that firms' earnings predictability decreases after ASC 606 adoption, whereas the use of discretion in preparing earnings numbers increases. Our study contributes to the literature by investigating how investors and managers respond to the new standard in terms of information demand and information acquisition.

The remainder of this paper is organized as follows. Section 2 describes the background of the study and the development of our hypotheses. Section 3 details the sample, the construction of the variables, and the descriptive statistics. Section 4 presents the empirical research design and our baseline results. Section 5 reports the cross-sectional tests. Section 6 concludes.

2. BACKGROUND AND DEVELOPMENT OF THE HYPOTHESES

2.1. ASC 606 and Mandated Disclosure of Revenue Disaggregation

ASC 606, *Revenue from Contracts with Customers*, is considered the most consequential accounting standards change since Sarbanes-Oxley (Ahn et al., 2021). The standard revised the rules for revenue recognition, superseding ASC 605's industry-specific recommendations with a unified five-step process and implementing a "principles-based" standard that applies to most industries (Deloitte, 2018). Roughly 30% of businesses were materially impacted by the new revenue recognition standards, forcing them to register sizable modifications to their revenues (AuditAnalytics, 2017; FASB, 2021). ASC 606 made many changes to revenue recognition and disclosure, including changes to the determination of contract price and performance obligations, enhanced disclosures for contract balances and significant judgements, and disaggregation of revenues into categories depicting how economic factors affect revenues and cash flows (ASC 606-10-50-5). We focus on revenue disaggregation because uncertainty around the merits of additional revenue disaggregation is especially high (Hinson et al., 2022), making disaggregation an appropriate setting in which to test our theory that the new standards may drive managers to make voluntary disclosures to reduce information asymmetry.

Two characteristics of the ASC 606's disaggregated revenue requirements are especially relevant to our context because they potentially increase the complexity of revenue disclosures: (1) management discretion in determining categories for disaggregation and (2) the level of detail required in disaggregation. First, noting that "the most useful disaggregation of revenue depends on various entity-specific or industry-specific factors" (Accounting Standards Update 2014-09, BC336), the FASB declined to provide specific guidance on the categories firms should use in disaggregation. Rather, managers are expected to determine the best disaggregation based on the economic factors that affect the firm. Firms must weigh

several factors in determining the best disaggregation, including whether to disaggregate revenue based on product or service, market or consumer type, contract type and length, geography, or sales channels (ASC 606-10-55-91). The categories used for disaggregation are ultimately up to the discretion of management, potentially leading to a lack of comparability in revenue reporting across firms.

Second, the standard explicitly states that qualitative disclosure is not sufficient and that most firms must disaggregate more than one category to comply with the rule (ASC 606-10-50-70). Market participants warned that the revenue disaggregation could lead to "excessively granular," "duplicative," and "unnecessary" disclosures that create confusion about revenue fundamentals (FASB, 2021), especially because firms must provide enough information for financial statement users to understand the relationship between disaggregated revenue and the revenue disclosed by reportable segment. Corroborating these concerns, research suggests that disaggregation has led to uninformative or confusing disclosures. For example, Hinson et al. (2022) find that in a sample of firms with higher-than-median segment disclosure prior to ASC 606, disaggregating revenue is not associated with analyst forecast accuracy, suggesting that users may find it difficult to distinguish between segment disaggregation and revenue disaggregation. Moreover, Lee and Lee (2020) observe decreased predictability of earnings, demonstrated by an increase in absolute analyst forecast error and analyst forecast dispersion. Both findings highlight that ASC 606 increases the complexity of revenue disclosures for financial statement users.

2.2. Revenue Disaggregation and MSF

Research indicates that when uncertainty and information asymmetry are high, investor demand for information increases, leading managers to make voluntary disclosures such as sales forecasts (Koo & Lee, 2018). MSFs reduce information asymmetry in revenue forecasting between managers and financial statement users (Ajinkya & Gift, 1984; Verrecchia, 2001).

Managers have incentive to reduce information asymmetry through these voluntary forecasts because lower information asymmetry is associated with higher liquidity (Diamond & Verrecchia, 1991) and lower cost of capital (Leuz & Verrechia, 2000). Prior work identifies several factors associated with increased frequency of management forecasting. For example, managers issue more guidance when investor attention is high, such as for large firms (Lang & Lundholm, 1993) or firms with financial analyst following (Baginski et al., 2004), when the information environment is weak (Koo & Lee, 2018; Lang & Lundholm, 1993), and when the cost of disclosure is lower (Beyer et al., 2010; Crawford et al., 2020).

In addition to these findings, evidence suggests that regulatory changes can lead to changes in voluntary disclosure. For example, after Reg FD, the mean number of management earnings forecasts tripled, consistent with greater investor demand for information after private channels closed (Heflin et al., 2003). Li and Yang (2016) further suggest that the likelihood and volume of management earnings forecasts increase after mandatory IFRS adoption. Noh et al. (2019) document that mandatory disclosure can substitute for voluntary disclosure by showing that firms reduce management earnings guidance after the 2004 expansion of mandatory 8K disclosure. Moreover, Myers et al. (2022) document that the decision usefulness of reported earnings and revenues is greater for firms with more transparent adoption disclosures under Accounting Standards Update 2009-14, suggesting that the market rewards managers who reduce information asymmetry related to accounting standards changes. However, ex ante, it is unclear whether managers react to revenue disaggregation under ASC 606 by changing their sales forecasting behavior. Accordingly, in this study, we focus on how mandated disclosure of revenue disaggregation due to the implementation of ASC 606 affects MSFs.

On the one hand, opponents of revenue disaggregation argue that greater management discretion and more detailed information will induce information overload, leading to a loss of

focus, less accurate analyses (which may lead to divergence of opinions among investors), and greater need for guidance from management (e.g., Guay, Samuels, and Taylor, 2016). First, disaggregated revenue items may lack comparability across firms because of the judgement required to determine the division of aggregation based on economic factors. Users might require additional resources to understand differences between firms in the same industry. To help investors understand how the firm compares to others in its industry, managers may provide more information about revenue disaggregation. Second, revenue disaggregation fundamentally alters the volume and detail of revenue information provided in financial statements. The disclosure rules and SEC enforcement led to a notable rise in the quantity of revenue items reported by certain corporations (Driscoll & Wilks, 2020).[3] Consequently, market participants voiced concerns about the effect of complex or duplicative disclosures on financial statement users, who may not understand the differences between segment disaggregation under ASC 280 and revenue disaggregation under ASC 606 (FASB, 2021).[4] Although ASC 606 requires firms to reconcile disaggregated revenues with segment detail, the complexity of these disclosures could offset any benefits from the additional detail. Thus, to reduce uncertainty and information asymmetry for financial statement users related to new disaggregated revenue disclosures, we expect managers to increase the frequency of sales forecasts following ASC 606 adoption.

On the other hand, supporters of the regulation believe that more detailed information enables more granular and accurate analyses, thereby reducing the need for voluntary disclosure. Disaggregation of revenue under ASC 606 may improve investors' ability to understand financial statements by providing economically meaningful and comprehensible

[3] See Appendix A for an illustration of revenue disaggregation post ASC 606.
[4] Mandated revenue disaggregation disclosure under ASC 606 and mandated segment reporting disclosure under ASC 280 do overlap. However, disaggregated revenue under ASC 606 provides more granular information about revenue that is not covered by the disclosure regulation under ASC 280 (i.e., revenue by product/service type offered).

information (Barth & Schipper, 2008). Studies show that disaggregated reports are associated with better transparency, monitoring, and forecasting (Lipe, 1986; Berger & Hann, 2003, 2007; Chen et al., 2015). Consistent with these studies, Hinson et al. (2022) find that disaggregation under ASC 606 leads to greater analyst sales forecast accuracy. These findings suggest that revenue disaggregation under ASC 606 responds to financial statement users' demand for granular information and indicates that demand for management's voluntary sales disclosures may be low.

It is unclear whether more detailed revenue reporting will lead to better analysis and decision making or whether revenue disaggregation will cause a divergence of opinions between investors, thereby increasing management's incentives to provide revenue guidance. In addition, it is worth noting that enhanced revenue reporting may also facilitate investors' monitoring of managers and reduce the costs of issuing MSFs, such as information processing costs and proprietary information costs. Therefore, based on those two alternative channels, firms are more likely to issue MSFs as well. Accordingly, we expect managers to issue more frequent guidance, on average, following ASC 606 adoption. We formulate our primary hypothesis as follows:

H1: Firms that disaggregate their revenue after adopting ASC 606 will be more likely to issue MSFs than firms that do not.

2.3. Cross-Sectional Analyses

To support our primary hypothesis, in this section, we develop four supporting hypotheses that can enrich our understanding of why revenue disaggregation may have a positive effect on the provision of MSFs. Based on previous research that identifies investor attention (Lang & Lundholm, 1993; Baginski et al., 2004), regulatory scrutiny (Barniv & Cao, 2009), a weak information environment (Koo & Lee, 2018; Lang & Lundholm, 1993), and cost of disclosure (Beyer et al., 2010; Crawford et al., 2020) as determinants of MSFs, we propose

cross-sectional tests to investigate whether the primary association of revenue disaggregation with MSFs varies based on these three factors.

2.3.1 Investor Attention to Revenue

In this section, we investigate whether differences in investor attention between firms affect the relation between revenue disaggregation and MSFs. Following prior research, we suggest that greater investor attention will increase market demand for management guidance. We propose that investor attention may increase through uncertainty of future revenues. Specifically, revenue conveys important information about firms and is valued by financial statement users (Liu et al., 2023). In particular, for firms with negative earnings, revenue forecasts may allow investors to estimate the firm's growth more accurately than relying on earnings alone. Managers of loss firms are likely to face more uncertainty about future revenues, whereas investors' demand for revenue guidance might be higher for loss firms because of the difficulty of valuing them (Bowen et al., 2002). Consequently, investor attention may be higher for loss firms. Accordingly, we present our second hypothesis as follows:

> *H2*: The effect of revenue disaggregation on MSFs will be more pronounced when firms' investors pay more attention to revenue.

2.3.2 Regulatory Scrutiny

Following prior research (e.g., Barniv & Cao, 2009), we also suggest that greater regulatory scrutiny will increase market demand for management guidance. Specifically, regulatory scrutiny from the SEC regarding ASC 606 may lead investors to be skeptical on revenue disclosures. Evidence suggests that following SEC action, investors seek more information related to the financial statements (Barniv & Cao, 2009). SEC enforcement of ASC 606 resulted in a significant increase in the number of revenue-related comment letters, drawing attention to potential issues with revenue as reported in the financial statements. With more enforcement and scrutiny from regulators, it is expected that investors will demand more

information to improve their understanding of the regulation and its effects. Consequently, investor demand for MSFs may be higher for firms with high regulatory scrutiny. Accordingly, we present our third hypothesis as follows:

H3: The effect of revenue disaggregation on MSFs will be more pronounced when firms face higher regulatory scrutiny.

2.3.3 Information Environment

Next, we examine whether the firm's information environment affects the relation between revenue disaggregation on MSFs. Firms issuing management earnings forecasts have higher information asymmetry (measured by bid-ask spreads prior to the forecast), compared to firms that do not issue such forecasts (Coller & Yohn, 1998). Moreover, information asymmetry decreases after the issuance of management forecasts, suggesting that forecasts improve investors' understanding of firm fundamentals (Hirst et al., 2008). Investors' information needs likely increase in weak information environments (Cheng et al., 2013). For example, management forecasts are more precise in weak rather than strong institutional environments (Cheng et al., 2013), suggesting that managers respond to investors' greater need for information by providing better forecasts. We argue that when the prior information environment is poor, it is critical for managers to provide guidance on how to interpret the revenue disaggregation after ASC 606 adoption. Consequently, we expect that when the firm's pre-ASC 606 information environment is poor, we will observe a stronger relation between revenue disaggregation and MSFs. Accordingly, we present our fourth hypothesis as follows:

H4: The effect of revenue disaggregation on MSFs will be more pronounced when firms' information environment is weak.

2.3.4 Proprietary Cost Concerns

Our last hypothesis concerns the role of proprietary cost on the positive effect of revenue disaggregation on MSFs. Managers avoid providing information that may be useful

for competitors' decision making (Verrecchia, 1983). Indeed, research indicates that managers with high proprietary costs avoid issuing guidance to protect their firm's proprietary information (Bamber & Cheon, 1998). Because revenue disaggregation may give competitors information about abnormally profitable segments or products, disaggregating revenue could attract competitors and eventually erode the firm's abnormal profits (Berger & Hann, 2007). In this context, managers are less likely to issue sales guidance that would assist competitors in further discovering and using proprietary information. Therefore, we expect managers with high proprietary costs to be less likely to issue MSFs. Accordingly, we present our final and fourth hypothesis as follows:[5]

H5: The effect of revenue disaggregation on MSFs will be less pronounced among firms with high proprietary costs.

3. DATA AND VARIABLES

3.1. Sample

Our initial sample comprises all listed U.S. firms in the Compustat database. We then merge it with the ASC 606 database obtained from Audit Analytics. Our sample period includes fiscal quarter 2016-Q1 through 2019-Q4. As almost all firms in our sample adopted ASC 606 in 2018, we exclude both early and late adopters. Therefore, in our analysis, we have eight quarters in the pre-adoption period (i.e., 2016-Q1 to 2017-Q4) and another eight quarters in the post-adoption period (i.e., 2018-Q1 to 2019-Q4). After excluding observations with missing identifiers, observations without complete data for the control variables, and firms with singleton observations, our final sample contains 42,810 firm-quarter observations. Table 1 presents our sample distribution. Panel A reports the sample development process, and Panel B reports sample distribution by quarter.

[5] We note a tension in this hypothesis. The relation between revenue disaggregation and MSFs can also be stronger for firms with higher proprietary costs. If firms with higher proprietary costs are affected by ASC 606 to a larger extent, then they may issue more MSFs following ASC 606.

3.2. Construction of the Variables

For each distinct firm in our sample, Audit Analytics identifies whether it provides disaggregated revenue disclosure in its filings after ASC 606 adoption. To ensure the validity of our data, we further cross-checked that label by manually inspecting filings for several firms (see Appendix A for illustrations). Accordingly, we construct *Treat* as an indicator equal to 1 for firms with disaggregated revenue in at least one quarter following ASC 606 adoption, and 0 otherwise.[6] We also construct *Post* as an indicator equal to 1 for observations after the ASC 606 adoption, and 0 otherwise. Thus, our key independent variable is the interaction of *Treat*×*Post*, for which a value of 1 indicates firms with disaggregated revenue after ASC 606 adoption, and 0 otherwise. Next, following Koo and Lee (2018) and Crawford et al. (2020), we construct two dependent variables, the likelihood of an MSF, and MSF frequency. $DumMSF_t$ is an indicator equal to 1 for firms that issue MSFs in the current quarter, and 0 otherwise. $FreqMSF_t$ is the natural logarithm of 1 plus the total number of MSFs issued by a firm in the current quarter.

Following Chen et al. (2021), we control for the following variables in the multivariate tests. $Size_{t-1}$ is the natural logarithm of the market value of equity in the previous quarter. Lev_{t-1} is the total debt divided by total assets in the previous quarter. BM_{t-1} is book value of equity divided by market value of equity in the previous quarter. ROA_t is income before extraordinary items divided by total assets in the current quarter. $Loss_t$ is an indicator equal to 1 when a firm's income before extraordinary items in the current quarter is negative, and 0 otherwise. IO_{t-1} is the percentage of shares held by institutional investors, which we obtained from the Thomson Reuters Institutional Holdings (13f) database, in the previous quarter. $Analyst_{t-1}$ is the natural logarithm of 1 plus the number of analysts covering a firm in the previous quarter. Ret_{t-1} is the

[6] Based on manual check, most of the control firms are firms operating in single segment and thus have no additional disaggregated revenue following ASC 606 adoption.

buy-and-hold market-adjusted return in the previous quarter. $SalesVol_{t-1}$ is the standard deviation of quarterly sales scaled by total assets over the past 5 years with at least 10 non-missing observations. $StkVol_{t-1}$ is the standard deviation of daily stock returns in the previous quarter. $Turnover_{t-1}$ is the average monthly share turnover in the previous quarter, defined as the ratio of total trading volume divided by total number of shares outstanding over a quarter. $Litigation_{t-1}$ is the ex-ante class action litigation risk in the previous quarter calculated using the coefficients from Model 3 in Kim and Skinner (2012). $MidZ_{t-1}$ is an indicator equal to 1 when a firm's Altman (1968) Z-score in the previous quarter falls within the middle quintile of the sample distribution, and 0 otherwise. Last, $Issue_t$ is an indicator equal to 1 when a firm has positive net equity in the current quarter, and 0 otherwise. Appendix B presents detailed variable definitions.

3.3. Descriptive Statistics

Table 2 provides the summary statistics from 2016-Q1 to 2019-Q4 for the sample used in the main analysis. The mean values of $DumMSF_t$ and $FreqMSF_t$ are 0.286 and 0.251, respectively, indicating that 28.6% of firms in our sample issued at least one MSF, and these firms issued 0.285 MSFs on average.[7] The mean value of *Treat* is 0.864, indicating that 86.4% of firms in our sample provided disaggregated revenue disclosure. Meanwhile, the mean value of *Post* is 0.502, indicating a well-balanced number of observations between the periods prior to and after adoption of ASC 606. Therefore, our key independent variable, *Treat*×*Post*, has a mean value of 0.443, suggesting that 44.3% of firm-quarter observations are for firms with disaggregated revenue after ASC 606 adoption. The summary statistics for the control variables are similar to those in Chen et al. (2021).

[7] When we restrict the sample to firms that issue at least one MSF in a quarter, we find that these firms on average issue 1.40 MSFs in a quarter.

4. EMPIRICAL RESULTS

4.1. Revenue Disaggregation and MSFs (H1)

Exploiting the mandatory adoption of ASC 606, we use a difference-in-differences (DiD) design to examine whether and how new and more granular revenue information, such as revenue disaggregation, affects a firm's decision to provide MSFs. Specifically, we estimate the following multivariate regression:

$$DumMSF_{i,t} / FreqMSF_{i,t} = \lambda_0 + \lambda_1 Treat_{i,t} \times Post_{i,t} + \lambda_2 Size_{i,t-1} + \lambda_3 Lev_{i,t-1} + \lambda_4 BM_{i,t-1} + \lambda_5 ROA_{i,t} + \lambda_6 Loss_{i,t} + \lambda_7 IO_{i,t-1} + \lambda_8 Analyst_{i,t-1} + \lambda_9 Ret_{i,t-1} + \lambda_{10} SalesVol_{i,t-1} + \lambda_{11} StkVol_{i,t-1} + \lambda_{12} Turnover_{i,t-1} + \lambda_{13} Litigation_{i,t-1} + \lambda_{14} MidZ_{i,t-1} + \lambda_{15} Issue_{i,t} + FirmFE + Year\text{-}QuarterFE + \varepsilon_{i,t}, \quad (1)$$

where *i* and *t* denote the firm and the year, respectively. The dependent variables are the indicator variable $DumMSF_t$ and frequency variable $FreqMSF_t$. For each specification, the independent variable of interest is *Treat*×*Post*. We use a linear probability model (i.e., an OLS regression).[8] We include firm and time (i.e., year-quarter) fixed effects. We also cluster the standard errors at the firm level and adjust it for heteroscedasticity.

Panel A of Table 3 reports the results from the estimation of Equation 1. Column 1 shows the results with the dependent variable $DumMSF_t$; the coefficient on *Treat*×*Post* is significantly positive at the 1% level, with a coefficient estimate of 0.041. This evidence implies that firms that disaggregate their revenue are more likely to issue MSFs after adopting ASC 606, relative to the corresponding change for control firms that do not disaggregate their revenue during the same period. In terms of economic significance, we document a 4.1 percentage point increase in the likelihood of providing a MSF for disaggregating firms, which corresponds to a 14.3% increase relative to the mean sample value (0.041/0.286=14.3%).

[8] We use an OLS regression rather than non-linear models for ease of interpretation. Ai and Norton (2003) and Greene (2010) show that non-linear models can complicate the interpretation of cross-sectional results (i.e., *H2*-*H4*).

Column 2 shows the results with the dependent variable $FreqMSF_t$; the coefficient on *Treat×Post* is also significantly positive at the 1% level, with a coefficient estimate of 0.031. This result indicates that, relative to control firms, disaggregating firms provide MSFs more frequently in the post-adoption period than in the pre-adoption period. In terms of economic significance, we document a 10.9% increase in the likelihood for disaggregating firms, relative to the mean sample values ($0.031 / e^{(0.251)}-1 = 10.9\%$). The coefficients on the control variables are consistent with those used in previous studies (Lang & Lundholm, 1993; Kasznik & Lev, 1995; Miller, 2002; Kim et al., 2018; Chen et al., 2021). For example, the significantly positive coefficients on $Size_{t-1}$ across all regressions indicate that larger firms are more likely to engage in public disclosure than smaller firms (Lang & Lundholm, 1993; Kasznik & Lev, 1995). Overall, the results presented in Panel A of Table 3 support *H1*, under which firms that disaggregate their revenue are more likely to issue MSFs than non-disaggregating firms.[9]

The validity of our DiD approach requires that treatment and control firms would have shared common dynamics in MSFs in the absence of treatment. While this is inherently untestable, it is commonly verified by examining the dynamics *prior* to the exogenous shock (i.e., the pre-shock, over-time trends of MSFs should be parallel between treatment and control firms). We perform a multi-period dynamic analysis to verify that the treatment and control firms have similar trends before the event. Specifically, we create a series of indicator variables for treatment firms corresponding to different periods in, before, and after the initial ASC 606 implementation quarter. *Treat×Post[1]* equals 1 for firms that disaggregate their revenue in the initial adoption quarter and 0 for these firms in other quarters or for other firms that do not disaggregate their revenue. Similarly, we construct variables *Treat×Pre[-8]* to *Treat×Pre[-1]* to indicate firms that disaggregate their revenue in the respective quarters prior to the adoption

[9] We caution that it is possible that other properties of ASC 606 may confound the effect of revenue disaggregation on MSFs. However, while all firms are subject to ASC 606, our control firms are not subject to additional revenue disaggregation. Using this design, our research attempts to isolate the effect of revenue disaggregation.

of ASC 606 and construct *Treat×Post[2]* to *Treat×Post[8]* to cover the remaining quarters after ASC 606 adoption. We replace the key independent variable, *Treat×Post*, in the baseline model with these newly constructed indicator variables and estimate the new regression, after controlling for firm characteristic variables (collectively denoted by *Controls*) and firm and year-quarter fixed effects. As such, this new model maintains the DiD design and helps capture dynamic changes in MSFs for treatment firms (relative to control firms) over time.

Panel B of Table 3 presents the results. As shown, for both dependent variables, the coefficients in the pre-period, *Treat×Pre[-7]* to *Treat×Pre[-1]*, are small and statistically insignificant. For example, in column 1 where $DumMSF_t$ is the dependent variable, *Treat×Pre[-1]* has a coefficient of 0.013 and t-statistic of 0.96, suggesting that, compared with the reference period (i.e., *Treat×Pre[-8]*, eight quarters before ASC 606 adoption), the difference in forecast issuance likelihood between treatment and control firms does not show any significant deviation. In other words, the trends of MSFs for treatment and control firms are parallel in the period before ASC 606 implementation. Similar patterns are observed for $FreqMSF_t$. These findings support our DiD design.

In contrast, the coefficient on the periods post ASC 606 adoption are generally positive and significant. In column 1, *Treat×Post[1]* has a coefficient of 0.050 and a t-statistic of 3.45; similarly, all coefficients on *Treat×Post[2]* to *Treat×Post[8]* are significantly positive. The corresponding coefficients in column 2 show similar magnitudes and significance levels. Therefore, the differences in MSFs between treatment and control firms are observed only after the exogenous accounting rule change (i.e., after ASC 606 adoption). We also present the parallel trend graphs in Figures 1a ($DumMSF_t$) and 1b ($FreqMSF_t$). This evidence suggests that the change in MSF practices for treatment firms relative to control firms is due to the revenue disaggregation disclosure, which further confirms the source of the MSF effects documented in our main results.

4.2. Robustness Tests Using Alternative Samples

We validate our main findings via a battery of robustness tests. First, in our sample, we observe a high proportion of firms providing revenue disaggregation. Thus, we use a propensity score matching (PSM) approach to control for the observed differences in firm characteristics without imposing strong structural forms on the relation between the outcome variable and these characteristics (Tucker, 2010; Lennox et al., 2012). We conduct this analysis in two steps. In the first step, we define an indicator variable, *Treat*, to equal 1 for firms with disaggregated revenue, and 0 otherwise, and then we regress *Treat* on the set of firm characteristic variables (i.e., $Size_{t-1}$, BM_{t-1}, ROA_t, $Loss_t$, IO_{t-1}, $Analyst_{t-1}$, Ret_{t-1}, $SalesVol_{t-1}$, $StkVol_{t-1}$, $Turnover_{t-1}$, $Litigation_{t-1}$, $MidZ_{t-1}$, and $Issue_t$) used in our baseline regression, with the results reported in Panel A of Table C1 (see Appendix C).

We then use the coefficients on these independent variables to compute the propensity scores and select a PSM sample in which each firm in the treatment group matches a firm in the control group with the closest propensity score. Consistent with Lawrence et al. (2011), we impose the restriction that the difference in the propensity scores between matched observations is at most 0.03. Panel B of Table C1 shows that the difference in each firm characteristic variable is small and insignificantly different from 0, indicating that the propensity score approach is successful in achieving covariate balance. In the second step, we regress $DumMSF_t$ and $FreqMSF_t$ on the indicator variable *Treat*×*Post* using this restrained PSM sample (with 8,938 observations). In Panel A of Table 4, columns 1 and 2, we show that the coefficients on *Treat*×*Post* are significantly positive (0.057 and 0.043; *t*-values = 3.53 and 3.16, respectively). In Panel B of Table 4, columns 1 and 2, we perform a multi-period dynamic analysis using the PSM sample. We continue to find that the differences in MSFs between treatment and control firms are observed only after the exogenous accounting rule change (i.e., after ASC 606 adoption).

Second, due to the natural differences between non-financial and financial firms in recognizing revenue, MSF are less common for financial firms and one might argue that ASC 606 may have a limited impact on financial firms, making these firms less relevant to our study. Hence, we exclude financial firms from our sample. Columns 3 and 4 in Panel A of Table 4 show that the coefficients on *Treat×Post* are significantly positive (0.051 and 0.038; *t*-values = 4.08 and 3.51, respectively). In Panel B of Table 4, columns 3 and 4, we further show that by excluding financial firms from our sample, we continue to observe a positive impact of revenue disaggregation on MSFs only for periods after ASC 606 adoption.

Lastly, given the possible seasonality in quarterly data, we attempt to replicate our main findings using annual specifications. Specifically, using annual data and the sample period (i.e., 2016–2019), we set 2018 as an initial adoption year. Following the same methodology as in the quarterly specification, *Treat×Post[1Yr]* equals 1 for firms that disaggregate their revenue in the initial adoption year and 0 for these firms in other years or for other firms that do not disaggregate their revenue. Similarly, we construct the variables *Treat×Pre[-2Yr]* to *Treat×Pre[-1Yr]* to indicate firms that disaggregate their revenue in the years prior to the adoption of ASC 606 and construct *Treat×Post[2Yr]* to equal 1 for firms that disaggregate their revenue in the year following ASC 606 initial adoption. In Panel A of Table 4, columns 5 and 6, we show that the coefficients on *Treat×Post* are significantly positive (0.036 and 0.047; *t*-values = 3.20 and 2.89, respectively). In Panel B of Table 4, columns 5 and 6, the positive impact of revenue disaggregation on MSFs is significant only in the initial adoption year of ASC 606 and the following year. In conclusion, our robustness tests to alternative samples confirm that firms that disaggregate their revenue are more likely to provide MSFs.

4.3. Robustness Tests Using Alternative Voluntary Management Forecasts

In this section, we further validate our main findings using alternative voluntary management forecasts. Since firms can issue multiple types of management forecasts at the

same time, it is critical to analyse whether mandatory revenue disaggregation can facilitate the issuance of MSFs alone, or also other types of management forecasts. If mandatory revenue disaggregation only facilitates the issuance of MSFs, no significant increase in the likelihood and frequency of other guidance types will be observed following ASC 606 adoption. However, if the positive effect of mandatory revenue disaggregation is not unique to MSFs, spillover effects will be observed as the issuance of other types of management forecasts increases, which could expand the real impact of ASC 606 beyond MSFs.

In particular, we examine the effect of ASC606 on management earnings forecasts, the most studied management forecast item. To conduct the analyses, we follow the same variable development procedure as for MSF and create an indicator variable for management earnings forecasts issuance and a continuous variable for management earnings forecast frequency. Specifically, $DumMEF_t$, is an indicator equal to 1 for firms that issue management earnings forecasts in the current quarter, and 0 otherwise, and $FreqMEF_t$ is the natural logarithm of 1 plus the number of management earnings forecasts that a firm issues in the current quarter.

In Panel A of Table 5, columns 1 and 2 show the results with the dependent variable $DumMEF_t$ ($FreqMEF_t$); the coefficient on *Treat*×*Post* is significantly positive at the 1% level, with a coefficient estimate of 0.027 (0.017). The results for management earnings forecasts are consistent with our baseline results (i.e., MSFs as the dependent variable), though the coefficients are a bit lower compared to our baseline results coefficients as shown in columns 1 and 2 of Table 3. These findings indicate that there might be a spillover effect of mandatory revenue disaggregation on other types of voluntary management forecasts.[10] Columns 3 and 4 further suggest that even after including the management earnings forecasts as an additional control variable into our main regression specification, the coefficient on *Treat*×*Post* is still

[10] In untabulated analyses, we also find firms that disaggregate their revenue are more likely to issue any type of management forecasts after adopting ASC 606, relative to the corresponding change for control firms that do not disaggregate their revenue during the same period.

significantly positive at the 1% level, with an estimate of 0.033 (0.023). The results indicate that the inclusion of management earnings forecasts does not subsume our baseline results.

Nonetheless, we note that including endogenous variables (i.e., management earnings forecasts) as control variables in our main regression specification can introduce bias (e.g., Angrist and Pischke, 2009; 2014). Hence, we develop a new variable, $BundledMSF_t$, to identify whether firms issue both management sales and earnings forecasts in the current quarter. To analyse the effect of mandatory revenue disaggregation on bundled (non-bundled MSFs), we run a regression for samples with non-MSF issuance and bundled (stand-alone) MSFs only. In Panel B of Table 5, columns 1-4 show that while our main inference hold for samples with both bundled and non-bundled MSFs, the coefficients on *Treat*×*Post* for the samples with bundled MSFs (i.e., columns 1 and 3) is higher than in the sample with stand-alone MSFs (i.e., columns 2 and 4).[11] In conclusion, the evidence provided in this section suggests that the effect of mandatory revenue disaggregation on MSFs might have a spillover effect on the issuance of other management forecast types.

5. CROSS-SECTIONAL ANALYSES

5.1. The Influence of Investor Attention to Revenue (H2)

Next, we conduct cross-sectional analyses to complement our main findings. For *H2*, we hypothesize that the positive effect of revenue disaggregation on MSFs is stronger for firms with high investor attention to revenue. We use loss firms to measure high investor attention to revenue. Specifically, for firms with negative net income (i.e., loss firms), revenue is more important in assessing the firm's prospects (Liu et al., 2023). Hence, loss firms may drive increased investor attention to revenue and lead to more revenue-related disclosure. Table 6 reports the results of this cross-sectional analysis. Columns 1 and 2 present the results with the

[11] In other untabulated analyses, we find similar results when we change the definition of bundled MSFs into an indicator equal to 1 for firms that issue both management sales and any type of forecasts in the current quarter, and 0 otherwise.

dependent variable, $DumMSF_t$. The coefficients on *Treat×Post* are 0.030 and 0.063 for the profit and loss firms, respectively. The difference between coefficients for the profit and loss firm subsamples is statistically significant at the 1% level. Columns 3 and 4 show similar results when $FreqMSF_t$ is the dependent variable. The findings indicate that the positive effect of revenue disaggregation and MSF issuance is stronger for loss firms. Hence, we confirm our *H2* that high investor attention to revenue enhances the effect of revenue disaggregation on MSFs.

5.2. The Influence of Regulatory Scrutiny (H3)

For *H3*, we hypothesize that the positive effect of revenue disaggregation on MSFs is stronger for firms facing higher regulatory scrutiny. Specifically, to measure regulatory scrutiny, we use an industry-level measure, which equals 1 if an industry is one of the 15 industries that received the most comment letters from the SEC regarding ASC 606 disclosures in their filings and 0 otherwise. These letters are public information and provide additional details about a company's filings, especially regarding issues that require significant judgment. The comment letters also indicate which topics the SEC is currently most concerned about, and the trends can be very informative. Driscoll and Wilks (2020) note that the SEC issued 160 such comment letters as of January 31, 2020. To the extent that comment letters provide insight into how the SEC interprets the standard, they can help investors better understand ASC 606-related disclosure. Informed investors may be more likely to scrutinize firms, which may lead management to provide more voluntary disclosure in response to higher information demand.

Table 7 reports the results of this cross-sectional analysis. Columns 1 and 2 present the results with the dependent variable, $DumMSF_t$. The coefficients on *Treat×Post* are 0.028 and 0.083 for the low and high partitions, respectively. The difference between coefficients for the low and high partition subsamples is statistically significant at the 1% level. Columns 3 and 4 show similar results when $FreqMSF_t$ is the dependent variable. The findings indicate that the

positive effect of revenue disaggregation and MSF issuance is stronger for firms under high scrutiny by regulators. We therefore confirm our *H3* that high regulatory scrutiny enhances the effect of revenue disaggregation on MSFs.

5.3. The Role of Information Environment (H4)

In this section, we conduct cross-sectional analyses to determine whether the positive effect between revenue disaggregation and MSFs is stronger for firms surrounded by a weak rather than strong information environment. Following *H4*, we expect a weak information environment to motivate management to voluntarily disclose MSFs and align market participants' expectations with sales guidance.

First, we use prior analysts' sales forecast accuracy, defined as the inverse of absolute difference between actual sales value and mean consensus value scaled by actual sales value, to measure the quality of a firm's information environment. We partition our sample into firms with high and low accuracy according to the sample median. Table 8 Panel A reports the results of the cross-sectional analyses. As columns 1 and 2 show, with the dependent variable $DumMSF_t$, the coefficients on *Treat*×*Post* are 0.069 for low and 0.032 for high analysts' sales forecast accuracy. The coefficient on *Treat*×*Post* for the low partition is significant at the 1% level, whereas the coefficient for the high partition is not significant. The difference between coefficients for the two subsamples is also statistically significant at the 1% level. Columns 3 and 4, with the dependent variable $FreqMSF_t$, exhibit similar results as in column 1, suggesting a consistent inference.

Second, we use prior analysts' sales forecast dispersion and prior information asymmetry among investors to measure the financial reporting users' divergence of opinion. We measure analysts' sales forecast dispersion as the standard deviation of issued sales forecasts scaled by actual sales value (Hinson et al., 2022). Meanwhile, for measuring information asymmetry among investors, we take the average of the difference between ask

and bid values scaled by closing price across the event window [EA_{t-1}+3, EA_t +2]. Panels B and C of Table 8 report the results of the cross-sectional analyses.

As columns 1 and 2 in Panel B show, with the dependent variable $DumMSF_t$, the coefficients on *Treat*×*Post* are 0.023 for low and 0.070 for high analysts' sales forecast dispersion. The coefficient on *Treat*×*Post* for the low partition is not significant, whereas the coefficient for the high partition is significant at the 1% level. The difference between coefficients for the two subsamples is also statistically significant at the 1% level. Columns 3 and 4, with the dependent variable $FreqMSF_t$ provide similar inferences. In Panel C, columns 1 and 2, with the dependent variable $DumMSF_t$, the coefficients on *Treat*×*Post* are 0.024 for the low and 0.040 for the high bid-ask spread samples. The coefficient on *Treat*×*Post* for the low partition is not significant, whereas the coefficient for the high partition is significant at the 1% level. The difference between coefficients for the two subsamples is also statistically significant at the 1% level. Taken together, all results confirm our *H4* by suggesting that firms that disaggregate their revenue are more likely to voluntarily disclose their sales guidance when the firms' prior information environment is weak, as reflected by poor information quality and high divergence of opinion.

5.4. Proprietary Cost Concerns (H5)

For H5, we hypothesize that the positive effect of revenue disaggregation and MSFs is weaker for firms with greater proprietary cost concerns. We argue that more competition increases uncertainty that a firm can achieve its target because competitors' actions can have spillover effects on the focal firm's performance; moreover, these actions and spillover effects can be difficult to determine. Hence, intense competition in the product market will reduce the benefits of voluntary disclosure, including the provision of MSFs. To measure competition and proprietary cost concerns, we use product market threats and product similarity. Following Hoberg et al. (2014), we measure product market threats as product market fluidity around a

firm change in each year. Following Hoberg and Phillips (2016), we measure product similarity in terms of comparable products and services offered by a firm's industry competitors. Firms with high product market threats and product similarity should have more proprietary concerns.

Panel A of Table 9 presents the results of this cross-sectional analysis using product market threat. Columns 1 and 2 present the results with the dependent variable, $DumMSF_t$. The coefficients on *Treat*×*Post* are 0.055 and 0.026 for the low and high partitions, respectively. The difference between coefficients for the low and high partition subsamples is statistically significant at the 1% level. Columns 3 and 4 show similar results when $FreqMSF_t$ is the dependent variable. The findings indicate that the positive effect of revenue disaggregation and MSF issuance is weaker for firms with greater proprietary cost concerns. Next, Panel B of Table 9 reports the results of this cross-sectional analysis using product similarity. Columns 1 and 2 present the results with the dependent variable, $DumMSF_t$. The coefficients on *Treat*×*Post* are 0.048 and 0.019 for the low and high partitions, respectively. The difference between coefficients for the low and high partition subsamples is statistically significant at the 1% level. Columns 3 and 4 show similar results when $FreqMSF_t$ is the dependent variable. Taken together, we confirm *H5* by providing evidence that proprietary cost concerns weaken the effect of revenue disaggregation on MSFs.

6. CONCLUSION

ASC 606 marks a significant shift in financial reporting standards. Greater reliance on managerial judgment and increased detail to revenue disclosures has spurred debates about whether the standard provides decision-useful information to investors. We address these questions by exploiting the adoption of ASC 606 in a DiD framework. We find evidence that managers respond to the complexity and uncertainty of revenue disaggregation by providing more frequent management sales forecasts (MSFs). We further find that the positive association of revenue disaggregation with MSFs is more pronounced under conditions where (1) investor

attention to revenue is high, (2) regulatory scrutiny is high, (3) firms' information environment is weak, and less pronounced when (4) proprietary cost concerns are high. Together, these results reinforce the idea that revenue disaggregation disclosures alone do not satisfy the full spectrum of investors' information needs. Instead, investors seek more information related to revenues, which managers provide through MSFs.

The contributions of this paper extend beyond addressing the specific research questions. We add to the literature on MSFs, offering insights into the demand for revenue-related information in the context of a significant accounting standard on revenue. Our study sheds light on the real effects of an important accounting rule change regarding revenue recognition and disclosure, which is an underexplored area. MSFs provide much needed transparency to economic agents and signal forthcoming financial prospects. To the extent that the mandated disclosure of revenue disaggregation was introduced to provide "more useful information to users of financial statements through improved disclosure requirements (FASB, ASU 2014-09)," our finding of an increased demand for MSF after revenue disaggregation represents an unintended consequence of ASC 606 implementation. Overall, this study provides novel insights into the interplay between mandatory and voluntary disclosure in the context of a major new accounting standard.

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APPENDIX A. Illustration of revenue disaggregation mandated disclosure post ASC 606

A. AAR Corp.

After adopting ASC 606 on June 1, 2018, AAR Corp. provided additional segment data based on its geographical sales, as shown below. Prior to that, it provided segment data based on its business operation segments and types of products and services only.

<table>
<tr><td>Prior to ASC 606 adoption
(10-K for reporting period ended on May 31, 2018):</td><td>After ASC 606 adoption:
(10-K for reporting period ended on May 31, 2019)</td></tr>
<tr><td>(i) sales by business operation segments:
<table><tr><th></th><th colspan="3">For the Year Ended May 31,</th></tr><tr><th></th><th>2018</th><th>2017</th><th>2016</th></tr><tr><td>Net sales:</td><td></td><td></td><td></td></tr><tr><td>Aviation Services</td><td>$ 1,618.9</td><td>$ 1,485.4</td><td>$ 1,425.0</td></tr><tr><td>Expeditionary Services</td><td>129.4</td><td>105.4</td><td>100.4</td></tr><tr><td></td><td>$ 1,748.3</td><td>$ 1,590.8</td><td>$ 1,525.4</td></tr></table></td><td>(i) sales by business operation segments:
<table><tr><th></th><th colspan="3">For the Year Ended May 31,</th></tr><tr><th></th><th>2019</th><th>2018</th><th>2017</th></tr><tr><td>Net sales:</td><td></td><td></td><td></td></tr><tr><td>Aviation Services</td><td>$ 1,920.6</td><td>$ 1,635.8</td><td>$ 1,485.4</td></tr><tr><td>Expeditionary Services</td><td>131.2</td><td>112.5</td><td>105.4</td></tr><tr><td></td><td>$ 2,051.8</td><td>$ 1,748.3</td><td>$ 1,590.8</td></tr></table></td></tr>
<tr><td>(ii) sales by type of products/services:
<table><tr><th></th><th colspan="3">For the Year Ended May 31,</th></tr><tr><th></th><th>2018</th><th>2017</th><th>2016</th></tr><tr><td>Aviation supply chain</td><td>$ 1,066.0</td><td>$ 998.7</td><td>$ 903.2</td></tr><tr><td>Maintenance, repair and overhaul services</td><td>552.9</td><td>486.7</td><td>521.8</td></tr><tr><td>Mobility products</td><td>112.5</td><td>105.4</td><td>100.4</td></tr><tr><td>Airlift</td><td>16.9</td><td>—</td><td>—</td></tr><tr><td></td><td>$ 1,748.3</td><td>$ 1,590.8</td><td>$ 1,525.4</td></tr></table></td><td>(ii) sales by type of products/services:
<table><tr><th></th><th colspan="3">For the Year Ended May 31,</th></tr><tr><th></th><th>2019</th><th>2018</th><th>2017</th></tr><tr><td>Aviation supply chain</td><td>$ 1,395.2</td><td>$ 1,082.9</td><td>$ 998.7</td></tr><tr><td>Maintenance, repair and overhaul services</td><td>525.4</td><td>552.9</td><td>486.7</td></tr><tr><td>Mobility products</td><td>131.2</td><td>112.5</td><td>105.4</td></tr><tr><td></td><td>$ 2,051.8</td><td>$ 1,748.3</td><td>$ 1,590.8</td></tr></table></td></tr>
<tr><td>(iii) sales by geographical segments:

N/A</td><td>(iii) sales by geographical segments:
<table><tr><th></th><th colspan="3">For the Year Ended May 31,</th></tr><tr><th></th><th>2019</th><th>2018</th><th>2017</th></tr><tr><td>Aviation Services:</td><td></td><td></td><td></td></tr><tr><td>North America</td><td>$ 1,426.8</td><td>$ 1,131.4</td><td>$ 1,077.4</td></tr><tr><td>Europe/Africa</td><td>323.4</td><td>325.9</td><td>272.4</td></tr><tr><td>Other</td><td>170.4</td><td>178.5</td><td>135.6</td></tr><tr><td></td><td>$ 1,920.6</td><td>$ 1,635.8</td><td>$ 1,485.4</td></tr><tr><td>Expeditionary Services:</td><td></td><td></td><td></td></tr><tr><td>North America</td><td>$ 124.1</td><td>$ 105.3</td><td>$ 101.0</td></tr><tr><td>Europe/Africa</td><td>5.8</td><td>6.9</td><td>4.3</td></tr><tr><td>Other</td><td>1.3</td><td>0.3</td><td>0.1</td></tr><tr><td></td><td>$ 131.2</td><td>$ 112.5</td><td>$ 105.4</td></tr></table></td></tr>
</table>

B. American Airlines Group, Inc.

After adopting ASC 606 on January 1, 2018, American Airlines Group, Inc., provided new sales information data based on its types of products and services, as shown below. Prior to that, it provided segment data based on its geographical sales only.

<table>
<tr><td>Prior to ASC 606 adoption:
(10-K for reporting period ended on December 31, 2017)</td><td>After ASC 606 adoption:
(10-K for reporting period ended on December 31, 2018)</td></tr>
<tr><td>(i) sales by geographical segments
<table><tr><th></th><th colspan="3">Year Ended December 31,</th></tr><tr><th></th><th>2017</th><th>2016</th><th>2015</th></tr><tr><td>DOT Domestic</td><td>$ 29,612</td><td>$ 28,620</td><td>$ 28,761</td></tr><tr><td>DOT Latin America</td><td>5,422</td><td>4,995</td><td>5,539</td></tr><tr><td>DOT Atlantic</td><td>5,059</td><td>4,769</td><td>5,146</td></tr><tr><td>DOT Pacific</td><td>2,114</td><td>1,796</td><td>1,544</td></tr><tr><td>Total operating revenues</td><td>$ 42,207</td><td>$ 40,180</td><td>$ 40,990</td></tr></table></td><td>(i) sales by geographical segments
<table><tr><th></th><th>2018</th><th>2017</th><th>2016</th></tr><tr><td>Domestic</td><td>$ 29,573</td><td>$ 28,749</td><td>$ 27,202</td></tr><tr><td>Latin America</td><td>5,125</td><td>4,840</td><td>4,676</td></tr><tr><td>Atlantic</td><td>4,376</td><td>4,028</td><td>3,873</td></tr><tr><td>Pacific</td><td>1,602</td><td>1,514</td><td>1,294</td></tr><tr><td>Total passenger revenue</td><td>$ 40,676</td><td>$ 39,131</td><td>$ 37,045</td></tr></table></td></tr>
<tr><td>(ii) sales by type of products/services:

N/A</td><td>(ii) sales by type of products/services:
<table><tr><th></th><th>2018</th><th>2017</th><th>2016</th></tr><tr><td>Passenger revenue:</td><td></td><td></td><td></td></tr><tr><td>Passenger travel</td><td>$ 37,457</td><td>$ 36,152</td><td>$ 34,278</td></tr><tr><td>Loyalty revenue - travel [1]</td><td>3,219</td><td>2,979</td><td>2,767</td></tr><tr><td>Total passenger revenue</td><td>40,676</td><td>39,131</td><td>37,045</td></tr><tr><td>Cargo</td><td>1,013</td><td>890</td><td>785</td></tr><tr><td>Other:</td><td></td><td></td><td></td></tr><tr><td>Loyalty revenue - marketing services</td><td>2,352</td><td>2,124</td><td>1,872</td></tr><tr><td>Other revenue</td><td>500</td><td>477</td><td>440</td></tr><tr><td>Total other revenue</td><td>2,852</td><td>2,601</td><td>2,312</td></tr><tr><td>Total operating revenues</td><td>$ 44,541</td><td>$ 42,622</td><td>$ 40,142</td></tr></table></td></tr>
</table>

C. Tesla, Inc.

After adopting ASC 606 on January 1, 2018, Tesla, Inc., provided more detailed sales information based on its types of products and services, as shown below.

Prior to ASC 606 adoption:
(10-K for reporting period ended on December 31, 2017)

(i) sales by type of products/services

Revenues

(Dollars in thousands)	Year Ended December 31, 2017	2016	2015
Automotive sales	$ 8,534,752	$ 5,589,007	$ 3,431,587
Automotive leasing	1,106,548	761,759	309,386
Total automotive revenues	9,641,300	6,350,766	3,740,973
Services and other	1,001,185	467,972	290,575
Total automotive & services and other segment revenue	10,642,485	6,818,738	4,031,548
Energy generation and storage segment revenue	1,116,266	181,394	14,477
Total revenues	$ 11,758,751	$ 7,000,132	$ 4,046,025

(ii) More detailes sales information by type of products/services:

N/A

After ASC 606 adoption:
(10-K for reporting period ended on December 31, 2018)

(i) sales by type of products/services

Results of Operations

Revenues

(Dollars in thousands)	Year Ended December 31, 2018	2017	2016
Automotive sales	$17,631,522	$ 8,534,752	$ 5,589,007
Automotive leasing	883,461	1,106,548	761,759
Total automotive revenues	18,514,983	9,641,300	6,350,766
Services and other	1,391,041	1,001,185	467,972
Total automotive & services and other segment revenue	19,906,024	10,642,485	6,818,738
Energy generation and storage segment revenue	1,555,244	1,116,266	181,394
Total revenues	$21,461,268	$11,758,751	$ 7,000,132

(ii) More detailed sales information by type of products/services:

Revenue by source

The following table disaggregates our revenue by major source (in thousands):

	Year Ended December 31, 2018
Automotive sales without resale value guarantee	$ 15,809,890
Automotive sales with resale value guarantee	1,403,014
Automotive regulatory credits	418,618
Energy generation and storage sales	1,056,543
Services and other	1,391,041
Total revenues from sales and services	20,079,106
Automotive leasing	883,461
Energy generation and storage leasing	498,701
Total revenues	$ 21,461,268

APPENDIX B. Variable definitions

Variable	Definition
$DumMSF_t$	An indicator equal to 1 for firms that issue MSFs in the current quarter, and 0 otherwise.
$FreqMSF_t$	Natural logarithm of 1 plus the number of MSFs issued by the firm in the current quarter.
Treat	An indicator equal to 1 for firms with additional disaggregated revenue in at least one quarter following ASC 606 adoption, and 0 otherwise.
Post	An indicator equal to 1 for observations after the ASC 606 adoption, and 0 otherwise.
Treat×*Post*	An indicator equal to 1 for firms with disaggregated revenue after ASC 606 adoption, and 0 otherwise.
$Size_{t-1}$	Natural logarithm of the market value of equity in the previous quarter.
Lev_{t-1}	Total debt divided by total assets in the previous quarter.
BM_{t-1}	Book value of equity divided by market value of equity in the previous quarter.
ROA_t	Income before extraordinary items divided by total assets in the current quarter.
$Loss_t$	An indicator equal to 1 when a firm's income before extraordinary items in the current quarter is negative, and 0 otherwise.
IO_{t-1}	Percentage of shares held by institutional investors in the previous quarter.
$Analyst_{t-1}$	The natural logarithm of 1 plus the number of analysts covering a firm in the previous quarter.
Ret_{t-1}	Buy-and-hold market-adjusted return in the previous quarter.
$SalesVol_{t-1}$	Standard deviation of quarterly sales scaled by total assets over the past 5 years with at least 10 non-missing observations.
$StkVol_{t-1}$	Standard deviation of daily stock returns in the previous quarter.
$Turnover_{t-1}$	Average monthly share turnover in the previous quarter, defined as the ratio of the total trading volume divided by the total number of shares outstanding over a quarter.
$Litigation_{t-1}$	Ex ante class action litigation risk in the previous quarter calculated using the coefficients from Model 3 in Kim and Skinner (2012).
$MidZ_{t-1}$	An indicator equal to 1 when a firm's Altman (1968) Z-score in the previous quarter falls within the middle quintile of the sample distribution, and 0 otherwise.
$Issue_t$	An indicator equal to 1 when a firm has positive net equity in the current quarter, and 0 otherwise.
$DumMEF_t$	An indicator equal to 1 for firms that issue management earnings forecast in the current quarter, and 0 otherwise.
$FreqMEF_t$	Natural logarithm of 1 plus the number of management earnings forecasts issued by the firm in the current quarter.
$BundledMSF_t$	An indicator equal to 1 for firms that issue both management sales and earnings forecasts in the current quarter, and 0 otherwise.
RegulatoryScrutiny	An industry-level measure that equals 1 if an industry is one of 15 industries that received the most comment letters from the SEC related to disclosure of ASC 606 in their filings, and 0 otherwise. See Appendix D for more details.
$AccASF_{t-1}$	The inverse of absolute difference between actual sales value and mean consensus value scaled by actual sales value. This dummy variable equals 1 if the value exceeds the sample median, and zero otherwise.
$DispASF_{t-1}$	Standard deviation of issued sales forecasts scaled by actual sales value. This dummy variable equals 1 if the value exceeds the sample median, and 0 otherwise.
$Spread_{t-1}$	Average of the difference between ask and bid values scaled by closing price across the event window [EA_{t-1}+3, EA_t +2].
$ProdMarketThreats_{t-1}$	The fluidity of the product market around a firm change in each year. This dummy variable equals 1 if the value exceeds the sample median, and 0 otherwise.
$ProdSimilarity_{t-1}$	The similarity of products/services offered by a firm, compared to competitors within a similar industry. This dummy variable equals 1 if the value exceeds the sample median, and 0 otherwise.

APPENDIX C. Properties of propensity score matching analysis

Table C1. First-stage results and comparison of average firm characteristics

Panel A reports the first-stage regression results of the propensity score matching analysis (i.e., estimating the likelihood of a firm providing revenue disaggregation disclosure). *Treat* equals 1 if a firm disaggregates its revenue, and 0 otherwise. Other variables are defined in Appendix B. The regression is estimated using a logistic model. The z-statistics (in parentheses) are based on heteroskedasticity-robust standard errors and clustered by firm. Panel B shows the comparison of firm characteristics between the treatment sample (*Treat* = 1) and the control sample (*Treat* = 0). *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel A. First-stage regression results

	Treat
	(1)
$Size_{t-1}$	0.649***
	(12.24)
Lev_{t-1}	0.732***
	(2.96)
BM_{t-1}	-0.120
	(-1.35)
ROA_t	1.354**
	(1.96)
$Loss_t$	0.172*
	(1.90)
IO_{t-1}	2.129***
	(11.27)
$Analyst_{t-1}$	0.011
	(0.16)
Ret_{t-1}	-0.176**
	(-2.25)
$SalesVol_{t-1}$	2.508**
	(2.56)
$StkVol_{t-1}$	0.427**
	(2.42)
$Turnover_{t-1}$	0.096
	(0.32)
$Litigation_{t-1}$	-12.833***
	(-8.76)
$MidZ_{t-1}$	-0.117
	(-0.99)
$Issue_t$	-0.017
	(-0.17)
Constant	-3.366***
	(-3.07)
Industry FE	Yes
Year-Quarter FE	Yes
N	42,389
R^2	0.291

Panel B. Comparison of average firm characteristics

	Treatment Group (*Treat*=1)	Control Group (*Treat*=0)	Diff	p-value for Diff=0
$Size_{t-1}$	5.870	5.848	0.022	0.611
Lev_{t-1}	0.247	0.241	0.006	0.237
BM_{t-1}	0.686	0.687	-0.001	0.911
ROA_t	-0.031	-0.028	-0.003	0.102
$Loss_t$	0.453	0.444	0.009	0.407
IO_{t-1}	0.315	0.314	0.001	0.961
$Analyst_{t-1}$	1.023	1.027	-0.004	0.831
Ret_{t-1}	-0.018	-0.016	-0.002	0.735
$SalesVol_{t-1}$	0.043	0.043	0.000	0.862
$StkVol_{t-1}$	1.335	1.333	0.002	0.811
$Turnover_{t-1}$	0.159	0.157	0.002	0.513
$Litigation_{t-1}$	0.041	0.044	-0.003	0.056
$MidZ_{t-1}$	0.166	0.167	-0.001	0.843
$Issue_t$	0.349	0.333	0.016	0.100

APPENDIX D. Industries that received the most comment letters from the SEC

Driscoll and Wilks (2020) describe SEC commentary on ASC 606 revenue recognition disclosures, noting that it issued 160 comment letters concerning revenue recognition disclosure requirements as of January 31, 2020. SEC comment letters are public information that provide additional detail about a company's filings, especially issues requiring significant judgment. The comment letters also indicate topics that the SEC is currently most concerned about, and the trends can be very informative. Below is the list of 15 industries that received the most comment letters from the SEC in descending order as of the end of January 2020, in regard to ASC 606 revenue recognition, along with their respective standard industrial classification (SIC) code and numbers of comment letters received:

1. Prepackaged Software (SIC 7372, 15 comment letters)
2. Cable/Other Pay TV Services (SIC 4841, 11 comment letters)
3. Business Services, NEC (SIC 7389, 8 comment letters)
4. Advertising Agencies (SIC 7311, 7 comment letters)
5. Computer Integrated Systems (SIC 7373, 6 comment letters)
6. Motor Vehicles/Passenger Cars (SIC 3711, 6 comment letters)
7. Pharmaceutical Preparations (SIC 2834, 5 comment letters)
8. TV Broadcasting Stations (SIC 4833, 5 comment letters)
9. Trucking, Except Local (SIC 4213, 4 comment letters)
10. Biological Products, Exceptions (SIC 2836, 4 comment letters)
11. Real Estate Investment Trusts (SIC 6798, 3 comment letters)
12. Railroads, Line-haul Operating (SIC 4011, 3 comment letters)
13. Chemicals & Allied Products (SIC 5169, 3 comment letters)
14. Computer/Data Processing (SIC 7374, 3 comment letters)
15. Catalog and Mail-Order Houses (SIC 5961, 2 comment letters)

APPENDIX E. Figures

Figure 1. Parallel trend graphs

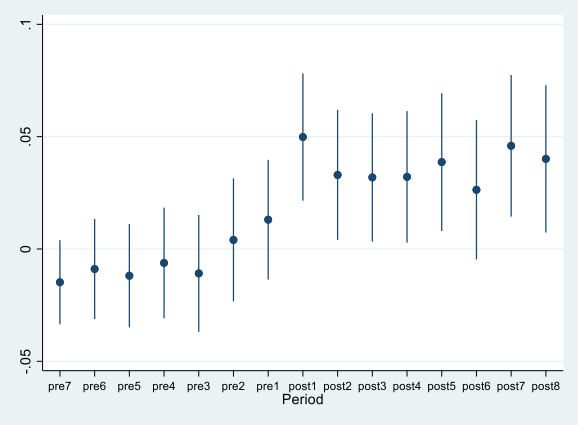

Figure 1a. $DumMSF_t$ (baseline sample)

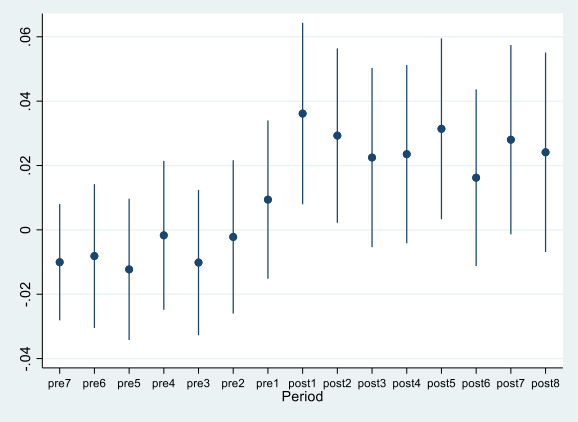

Figure 1b. $FreqMSF_t$ (baseline sample)

APPENDIX F. Tables

Table 1. Sample distribution

This table presents sample development (Panel A) and distribution of our sample (Panel B). Our final sample comprises 42,810 firm-quarter observations for 3,534 distinct firms that adopted ASC 606 in 2018. Our sample period is from 2016 to 2019, in which we determine 2016–2017 as a pre-adoption period and 2018–2019 as a post-adoption period.

Panel A. Sample development

	Firm-quarter observations	Unique firms
Firm-quarter observations available from Compustat	138,517	11,210
Retain firms with ASC 606 adoption data	64,402	4,542
Retain firms that adopt ASC 606 in 2018	60,595	4,264
Retain observations with non-missing control variables	42,890	3,614
Retain non-singleton observations (final sample)	42,810	3,534

Panel B. Sample distribution by quarter

Period	Freq.	Percent	Cum.
2016-Q1	2,537	5.93	5.93
2016-Q2	2,592	6.05	11.98
2016-Q3	2,769	6.47	18.45
2016-Q4	2,844	6.64	25.09
2017-Q1	2,754	6.43	31.53
2017-Q2	2,578	6.02	37.55
2017-Q3	2,604	6.08	43.63
2017-Q4	2,645	6.18	49.81
2018-Q1	2,874	6.71	56.52
2018-Q2	2,659	6.21	62.73
2018-Q3	2,703	6.31	69.05
2018-Q4	2,730	6.38	75.42
2019-Q1	2,837	6.63	82.05
2019-Q2	2,642	6.17	88.22
2019-Q3	2,619	6.12	94.34
2019-Q4	2,423	5.66	100
Total	42,810	100	

Table 2. Summary statistics

This table reports the summary statistics for the variables used in the main analysis. The number of observations for all variables is 42,810. To mitigate the effect of outliers, we winsorize all continuous variables at the 1st and 99th percentiles. Appendix B details the variable definitions.

Variable	Mean	SD	P25	Median	P75
$DumMSF_t$	0.286	0.452	0.000	0.000	1.000
$FreqMSF_t$	0.251	0.417	0.000	0.000	0.693
Treat	0.864	0.343	1.000	1.000	1.000
Post	0.502	0.500	0.000	1.000	1.000
Treat×*Post*	0.443	0.497	0.000	0.000	1.000
$Size_{t-1}$	7.063	2.000	5.652	7.059	8.417
Lev_{t-1}	0.269	0.235	0.068	0.233	0.408
BM_{t-1}	0.568	0.545	0.226	0.470	0.787
ROA_t	-0.008	0.061	-0.005	0.004	0.016
$Loss_t$	0.307	0.461	0.000	0.000	1.000
IO_{t-1}	0.557	0.354	0.221	0.665	0.871
$Analyst_{t-1}$	1.643	1.047	0.693	1.792	2.485
Ret_{t-1}	-0.006	0.188	-0.106	-0.013	0.082
$SalesVol_{t-1}$	0.040	0.056	0.009	0.023	0.049
$StkVol_{t-1}$	1.204	0.323	0.969	1.137	1.380
$Turnover_{t-1}$	0.178	0.167	0.074	0.133	0.220
$Litigation_{t-1}$	0.051	0.052	0.019	0.034	0.061
$MidZ_{t-1}$	0.207	0.405	0.000	0.000	0.000
$Issue_t$	0.248	0.432	0.000	0.000	0.000

Table 3. The effects of revenue disaggregation on management sales forecasts: Main results

This table presents the results of analyses conducted to determine whether revenue disaggregation facilitates the issuance of management sales forecasts (MSFs). The key dependent variables are $DumMSF_t$, an indicator equal to 1 for firms that issue MSFs in the current quarter, and 0 otherwise, and $FreqMSF_t$, the natural logarithm of 1 plus the number of MSFs a firm issues in the current quarter. In Panel A, the key independent variable is *Treat×Post*, an indicator equal to 1 for firms with disaggregated revenue after the ASC 606 adoption, and 0 otherwise. Columns 1 and 2 report whether revenue disaggregation increases the likelihood and frequency of MSFs, respectively. In Panel B, the key independent variables are *Treat×Pre[-7]* to *Treat×Post[8]*, in which *Treat×Pre[-8]* is the baseline. Respectively, columns 1 and 2 report whether the increasing effects of revenue disaggregation on the likelihood and frequency of MSFs occurred due to revenue disaggregation after ASC 606 adoption. We present the corresponding parallel trend graphs in Figures 1a and 1b. An intercept is included in all regressions but not reported. OLS is used to conduct regressions. *t*-statistics, in parentheses, are adjusted for heteroscedasticity and clustered by firm. *, **, and *** indicate significance at the 10%, 5%, and 1% levels (two-tailed), respectively. Appendix B details the variable definitions.

Panel A. Baseline results

	$DumMSF_t$	$FreqMSF_t$
	(1)	(2)
Treat×Post	**0.041*** **	**0.031*** **
	(4.06)	**(3.44)**
$Size_{t-1}$	0.019***	0.022***
	(2.69)	(3.36)
Lev_{t-1}	0.055**	0.043*
	(2.10)	(1.76)
BM_{t-1}	-0.003	-0.003
	(-0.39)	(-0.45)
ROA_t	0.039	0.015
	(0.93)	(0.39)
$Loss_t$	-0.002	0.000
	(-0.51)	(0.02)
IO_{t-1}	0.084***	0.087***
	(4.51)	(5.22)
$Analyst_{t-1}$	0.059***	0.053***
	(7.37)	(7.32)
Ret_{t-1}	-0.005	-0.008
	(-0.71)	(-1.35)
$SalesVol_{t-1}$	-0.272**	-0.245**
	(-2.13)	(-2.24)
$StkVol_{t-1}$	-0.006	-0.005
	(-0.68)	(-0.69)
$Turnover_{t-1}$	0.017	0.016
	(0.91)	(0.93)
$Litigation_{t-1}$	0.020	0.023
	(0.32)	(0.38)
$MidZ_{t-1}$	0.003	0.002
	(0.45)	(0.30)
$Issue_t$	-0.006	-0.004
	(-1.28)	(-0.87)
Firm FE	Yes	Yes
Year-Quarter FE	Yes	Yes
N	42,810	42,810
Adj. R^2	0.789	0.779

Panel B. Parallel trend analysis		
	$DumMSF_t$	$FreqMSF_t$
	(1)	(2)
Treat×Pre[-7]	-0.015	-0.010
	(-1.55)	(-1.09)
Treat×Pre[-6]	-0.009	-0.008
	(-0.78)	(-0.71)
Treat×Pre[-5]	-0.012	-0.012
	(-1.01)	(-1.10)
Treat×Pre[-4]	-0.006	-0.002
	(-0.49)	(-0.14)
Treat×Pre[-3]	-0.011	-0.010
	(-0.82)	(-0.88)
Treat×Pre[-2]	0.004	-0.002
	(0.29)	(-0.18)
Treat×Pre[-1]	0.013	0.009
	(0.96)	(0.75)
Treat×Post[1]	**0.050*** **	**0.036** **
	(3.45)	**(2.51)**
Treat×Post[2]	**0.033** **	**0.029** **
	(2.24)	**(2.12)**
Treat×Post[3]	**0.032** **	**0.022**
	(2.19)	**(1.58)**
Treat×Post[4]	**0.032** **	**0.024***
	(2.15)	**(1.67)**
Treat×Post[5]	**0.039** **	**0.031** **
	(2.47)	**(2.19)**
Treat×Post[6]	**0.026***	**0.016**
	(1.66)	**(1.16)**
Treat×Post[7]	**0.046*** **	**0.028***
	(2.86)	**(1.87)**
Treat×Post[8]	**0.040** **	**0.024**
	(2.40)	**(1.52)**
Controls	Yes	Yes
Firm FE	Yes	Yes
Year-Quarter FE	Yes	Yes
N	42,810	42,810
Adj. R^2	0.789	0.779

Table 4. Robustness Tests Using Alternative Samples

This table presents the results of analyses conducted to determine whether revenue disaggregation facilitates the issuance of management sales forecasts (MSFs) using alternative samples. The key dependent variables are $DumMSF_t$, an indicator equal to 1 for firms that issue MSFs in the current quarter, and 0 otherwise, and $FreqMSF_t$, the natural logarithm of 1 plus the number of MSFs that a firm issues in the current quarter. The key independent variable is *Treat*×*Post*, an indicator equal to 1 for firms with disaggregated revenue after the ASC 606 adoption and 0 otherwise. In Panel A, columns 1 and 2 report whether revenue disaggregation increases the likelihood and frequency of MSFs, respectively, in a propensity score matching (PSM) sample. In columns 3 and 4 (5 and 6), we report similar tests using a non-financial firms (annual) sample. In Panel B, columns 1 and 2 respectively report whether the increasing effects of revenue disaggregation on the likelihood and frequency of MSFs occur due to ASC 606 adoption in a PSM sample. In columns 3 and 4 (5 and 6), we report similar tests using a non-financial firms (annual) sample. Note that we use Treat×*Pre[-3Yr]* as the baseline for verifying that the treatment and control firms have similar trends before the exogenous shock using annual sample. An intercept is included in all the regressions but not reported. OLS is used to conduct regressions. *t*-statistics, in parentheses, are adjusted for heteroscedasticity and clustered by firm. *, **, and *** indicate significance at the 10%, 5%, and 1% levels (two-tailed), respectively. Appendix B details the variable definitions.

Panel A. Baseline results using alternative samples

	PSM sample		Non-financial firms sample		Annual sample	
	$DumMSF_t$	$FreqMSF_t$	$DumMSF_t$	$FreqMSF_t$	$DumMSF_t$	$FreqMSF_t$
	(1)	(2)	(3)	(4)	(5)	(6)
Treat x Post	**0.057*** **	**0.043*** **	**0.051*** **	**0.038*** **	**0.036*** **	**0.047*** **
	(3.53)	**(3.16)**	**(4.08)**	**(3.51)**	**(3.20)**	**(2.89)**
$Size_{t-1}$	0.021**	0.019**	0.024***	0.026***	0.008	0.014
	(2.03)	(2.20)	(3.37)	(3.77)	(1.04)	(1.02)
Lev_{t-1}	0.047	0.023	0.055**	0.045*	0.021	0.018
	(1.21)	(0.70)	(1.97)	(1.71)	(0.65)	(0.35)
BM_{t-1}	-0.020	-0.014	-0.001	-0.002	-0.008	-0.001
	(-1.58)	(-1.44)	(-0.12)	(-0.29)	(-0.92)	(-0.07)
ROA_t	0.096*	0.075	0.032	0.010	0.034	0.083**
	(1.68)	(1.52)	(0.75)	(0.25)	(1.38)	(2.18)
$Loss_t$	0.005	0.004	-0.001	0.002	-0.004	-0.003
	(0.61)	(0.51)	(-0.15)	(0.35)	(-0.46)	(-0.29)
IO_{t-1}	0.033	0.028	0.097***	0.101***	0.177***	0.311***
	(1.30)	(1.30)	(4.53)	(5.21)	(7.35)	(7.80)
$Analyst_{t-1}$	0.055***	0.048***	0.066***	0.060***	0.030***	0.062***
	(4.06)	(4.11)	(7.31)	(7.30)	(5.14)	(6.44)
Ret_{t-1}	-0.006	-0.009	-0.006	-0.010	0.006	0.012
	(-0.53)	(-0.95)	(-0.86)	(-1.46)	(0.75)	(1.04)
$SalesVol_{t-1}$	0.227	0.198	-0.288**	-0.260**	0.013	0.013
	(0.90)	(0.98)	(-2.18)	(-2.30)	(0.25)	(0.15)
$StkVol_{t-1}$	-0.000	-0.001	-0.006	-0.005	0.004	0.003
	(-0.01)	(-0.12)	(-0.56)	(-0.56)	(0.54)	(0.22)
$Turnover_{t-1}$	-0.007	0.002	0.018	0.017	-0.001	0.020
	(-0.30)	(0.09)	(0.92)	(0.92)	(-0.05)	(0.44)
$Litigation_{t-1}$	0.083	0.132	0.023	0.027	-0.052	-0.205
	(0.69)	(1.14)	(0.33)	(0.40)	(-0.59)	(-1.42)
$MidZ_{t-1}$	0.006	0.002	0.003	0.002	-0.006	-0.018
	(0.46)	(0.17)	(0.48)	(0.28)	(-0.68)	(-1.28)
$Issue_t$	0.002	0.003	-0.008	-0.005	0.001	0.005
	(0.21)	(0.41)	(-1.27)	(-0.81)	(0.17)	(0.45)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year-Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
N	8,938	8,938	33,702	33,702	14,830	14,830
Adj. R^2	0.762	0.761	0.774	0.763	0.798	0.858

Panel B. Parallel trend analysis using alternative samples

	PSM Sample		Non-financial firms sample		Annual Sample	
	$DumMSF_t$	$FreqMSF_t$	$DumMSF_t$	$FreqMSF_t$	$DumMSF_t$	$FreqMSF_t$
	(1)	(2)	(3)	(4)	(5)	(6)
Treat×Pre[-7]	-0.002	-0.005	-0.018	-0.013		
	(-0.11)	(-0.26)	(-1.56)	(-1.13)		
Treat×Pre[-6]	0.015	0.012	-0.014	-0.011		
	(0.81)	(0.68)	(-1.01)	(-0.79)		
Treat×Pre[-5]	0.013	0.004	-0.015	-0.016		
	(0.63)	(0.22)	(-1.07)	(-1.13)		
Treat×Pre[-4]	0.011	0.033	-0.011	-0.004		
	(0.56)	(1.63)	(-0.70)	(-0.24)		
Treat×Pre[-3]	0.029	0.019	-0.015	-0.013		
	(1.28)	(0.96)	(-0.95)	(-0.95)		
Treat×Pre[-2]	0.027	0.011	0.003	-0.004		
	(1.14)	(0.53)	(0.17)	(-0.24)		
Treat×Pre[-1]	0.025	0.014	0.015	0.011		
	(1.17)	(0.72)	(0.91)	(0.72)		
Treat×Post[1]	**0.073*** **	**0.047** **	**0.057*** **	**0.043** **		
	(2.90)	**(2.01)**	**(3.18)**	**(2.40)**		
Treat×Post[2]	**0.084*** **	**0.070*** **	**0.039** **	**0.034** **		
	(3.34)	**(3.12)**	**(2.16)**	**(2.02)**		
Treat×Post[3]	**0.075*** **	**0.060** **	**0.038** **	**0.027**		
	(2.75)	**(2.51)**	**(2.11)**	**(1.55)**		
Treat×Post[4]	**0.069*** **	**0.061*** **	**0.041** **	**0.031***		
	(2.89)	**(2.62)**	**(2.23)**	**(1.77)**		
Treat×Post[5]	**0.077** **	**0.064** **	**0.045** **	**0.037** **		
	(2.53)	**(2.31)**	**(2.33)**	**(2.11)**		
Treat×Post[6]	**0.051***	**0.028**	**0.031**	**0.021**		
	(1.88)	**(1.11)**	**(1.62)**	**(1.20)**		
Treat×Post[7]	**0.087*** **	**0.062** **	**0.055*** **	**0.035***		
	(3.08)	**(2.44)**	**(2.82)**	**(1.92)**		
Treat×Post[8]	**0.054** **	**0.040**	**0.048** **	**0.030**		
	(1.98)	**(1.54)**	**(2.36)**	**(1.55)**		
Treat×Pre[-2Yr]					0.012	0.014
					(0.98)	(0.81)
Treat×Pre[-1Yr]					0.013	0.020
					(0.94)	(0.97)
Treat×Post[1Yr]					**0.036** **	**0.052** **
					(2.52)	**(2.46)**
Treat×Post[2Yr]					**0.054*** **	**0.068*** **
					(3.34)	**(2.90)**
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year-Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
N	8,938	8,938	33,702	33,702	14,830	14,830
Adj. R^2	0.762	0.761	0.774	0.763	0.798	0.858

Table 5. Robustness Tests Using Alternative Voluntary Management Forecasts

This table presents the results of analyses conducted to determine whether revenue disaggregation facilitates the issuance of voluntary management forecasts more generally. The key dependent variables are $DumMEF_t$ ($DumMSF_t$), indicator variables that equal to 1 for firms that issue management earnings (sales) forecasts in the current quarter, and 0 otherwise, and $FreqMEF_t$ ($FreqMSF_t$), the natural logarithm of 1 plus the number of management earning (sales) forecasts that a firm issues in the current quarter. The key independent variable is *Treat×Post*, an indicator equal to 1 for firms with disaggregated revenue after the ASC 606 adoption and 0 otherwise. In Panel A, Columns 1 and 2 report whether revenue disaggregation increases the likelihood and frequency of earnings guidance, respectively. Columns 3 and 4 report whether our baseline results hold after including earnings guidance as an additional control variable. In Panel B, columns 1 and 2 (3 and 4), respectively, report whether revenue disaggregation increases the likelihood (frequency) of non-bundled vs. bundled MSFs. $BundledMSF_t$ is an indicator equal to 1 for firms that issue both management sales and earnings forecasts in the current quarter, and 0 otherwise. An intercept is included in all the regressions but not reported. OLS is used to conduct regressions. *t*-statistics, in parentheses, are adjusted for heteroscedasticity and clustered by firm. *, **, and *** indicate significance at the 10%, 5%, and 1% levels (two-tailed), respectively. Appendix B details the variable definitions.

Panel A. Mandatory revenue disaggregation and alternative voluntary management forecasts

	$DumMEF_t$	$FreqMEF_t$	$DumMSF_t$	$FreqMSF_t$
	(1)	(2)	(3)	(4)
Treat×Post	**0.027*** **	**0.017*** **	**0.033*** **	**0.023*** **
	(4.19)	**(3.24)**	**(3.54)**	**(2.88)**
$DumMEF_t$			0.348***	
			(17.29)	
$FreqMEF_t$				0.409***
				(21.25)
$Size_{t-1}$	0.008	0.012**	0.016**	0.017***
	(1.52)	(2.37)	(2.39)	(2.76)
Lev_{t-1}	-0.010	-0.002	0.051**	0.044**
	(-0.53)	(-0.09)	(2.05)	(1.98)
BM_{t-1}	0.000	0.004	0.001	-0.000
	(0.02)	(0.76)	(0.11)	(-0.07)
ROA_t	0.014	0.011	0.042	0.027
	(0.54)	(0.44)	(1.08)	(0.81)
$Loss_t$	-0.002	-0.004	-0.001	0.002
	(-0.42)	(-1.08)	(-0.27)	(0.47)
IO_{t-1}	0.084***	0.080***	0.058***	0.053***
	(4.64)	(4.93)	(3.89)	(4.25)
$Analyst_{t-1}$	0.050***	0.043***	0.042***	0.033***
	(6.37)	(6.10)	(6.21)	(5.82)
Ret_{t-1}	-0.004	-0.008	0.002	0.001
	(-0.93)	(-1.63)	(0.28)	(0.10)
$SalesVol_{t-1}$	-0.230*	-0.235**	-0.174*	-0.114
	(-1.79)	(-2.11)	(-1.65)	(-1.38)
$StkVol_{t-1}$	-0.005	-0.007	-0.006	-0.005
	(-0.77)	(-1.10)	(-0.81)	(-0.73)
$Turnover_{t-1}$	-0.001	-0.002	0.019	0.020
	(-0.09)	(-0.12)	(1.19)	(1.35)
$Litigation_{t-1}$	-0.028	-0.030	0.069	0.073
	(-0.50)	(-0.57)	(1.19)	(1.36)
$MidZ_{t-1}$	0.000	-0.000	0.006	0.006
	(0.02)	(-0.06)	(1.04)	(0.99)
$Issue_t$	0.001	0.002	-0.008*	-0.006
	(0.19)	(0.47)	(-1.71)	(-1.42)
Firm FE	Yes	Yes	Yes	Yes
Year-Quarter FE	Yes	Yes	Yes	Yes
N	42,810	42,810	42,810	42,810
Adj. R2	0.854	0.830	0.813	0.816

Panel B. Bundled vs. non-bundled MSFs

	$DumMSF_t$		$FreqMSF_t$	
$BundledMSF_t$ =	Included	Excluded	Included	Excluded
	(1)	(2)	(3)	(4)
Treat×Post	**0.030*** **	**0.029*** **	**0.023*** **	**0.021*** **
	(5.24)	**(3.12)**	**(4.81)**	**(2.65)**
$Size_{t-1}$	0.007	0.020***	0.010*	0.019***
	(1.34)	(2.87)	(1.96)	(3.00)
Lev_{t-1}	-0.016	0.075***	-0.003	0.053**
	(-0.89)	(2.77)	(-0.16)	(2.22)
BM_{t-1}	0.005	-0.003	0.003	-0.002
	(1.01)	(-0.40)	(0.82)	(-0.30)
ROA_t	0.038	0.016	0.026	0.013
	(1.48)	(0.42)	(1.05)	(0.41)
$Loss_t$	-0.001	-0.002	-0.001	0.001
	(-0.20)	(-0.44)	(-0.25)	(0.25)
IO_{t-1}	0.077***	0.020	0.074***	0.020*
	(4.39)	(1.56)	(4.77)	(1.85)
$Analyst_{t-1}$	0.044***	0.032***	0.039***	0.025***
	(5.59)	(4.69)	(5.54)	(4.56)
Ret_{t-1}	0.004	-0.003	0.001	-0.003
	(0.82)	(-0.40)	(0.30)	(-0.47)
$SalesVol_{t-1}$	-0.243**	-0.101	-0.217**	-0.082
	(-1.98)	(-1.02)	(-2.05)	(-1.06)
$StkVol_{t-1}$	0.004	-0.009	-0.001	-0.005
	(0.63)	(-1.27)	(-0.15)	(-0.79)
$Turnover_{t-1}$	0.013	0.005	0.012	0.006
	(0.85)	(0.33)	(0.85)	(0.48)
$Litigation_{t-1}$	0.094**	0.013	0.053	0.032
	(1.97)	(0.23)	(1.15)	(0.64)
$MidZ_{t-1}$	0.003	0.005	0.004	0.003
	(0.46)	(0.79)	(0.69)	(0.55)
$Issue_t$	-0.003	-0.008	-0.002	-0.007
	(-0.80)	(-1.63)	(-0.54)	(-1.63)
Firm FE	Yes	Yes	Yes	Yes
Year-Quarter FE	Yes	Yes	Yes	Yes
N	38,597	34,733	38,597	34,733
Adj. R2	0.855	0.727	0.841	0.724

Table 6. The influence of investor attention to revenue

This table presents the cross-sectional results of the tests for investor attention to revenue using loss firms as a proxy. $Loss_t$ equals 1 if the firm's net income in the current reporting period is negative, and 0 otherwise. We partition our sample into non-loss firms and loss firms. We compare whether the difference between coefficients on *Treat*×*Post* for the low and high groups is significantly greater than 0 by referencing the p-value calculated from the Fisher's Permutation test with bootstrapping. For brevity, an intercept is included in all regressions but not reported. The *t*-statistics, in parentheses, are adjusted for heteroscedasticity and clustered by firm and year. *, **, and *** indicate significance at the 10%, 5%, and 1% levels (two-tailed), respectively. Appendix B details the variable definitions.

	$DumMSF_t$		$FreqMSF_t$	
$Loss_t$ =	No	Yes	No	Yes
	(1)	(2)	(3)	(4)
Treat*×*Post	**0.030*** **	**0.063*** **	**0.023** **	**0.047*** **
	(2.99)	**(3.86)**	**(2.35)**	**(3.33)**
$Size_{t-1}$	0.013	0.025***	0.018*	0.027***
	(1.09)	(3.07)	(1.69)	(3.28)
Lev_{t-1}	0.026	0.063*	0.001	0.064**
	(0.74)	(1.80)	(0.03)	(1.99)
BM_{t-1}	-0.017	0.006	-0.019	0.008
	(-1.17)	(0.70)	(-1.53)	(1.08)
ROA_t	-0.108	0.055	-0.192	0.034
	(-0.73)	(1.00)	(-1.37)	(0.67)
IO_{t-1}	0.119***	0.029	0.120***	0.032
	(4.68)	(1.30)	(5.08)	(1.60)
$Analyst_{t-1}$	0.060***	0.048***	0.055***	0.043***
	(6.05)	(3.99)	(5.90)	(4.08)
Ret_{t-1}	-0.012	0.001	-0.016*	0.002
	(-1.19)	(0.10)	(-1.85)	(0.20)
$SalesVol_{t-1}$	-0.347*	-0.137	-0.343**	-0.111
	(-1.80)	(-1.00)	(-1.98)	(-0.93)
$StkVol_{t-1}$	-0.009	-0.011	-0.008	-0.007
	(-0.75)	(-0.96)	(-0.72)	(-0.68)
$Turnover_{t-1}$	0.046	0.006	0.048	-0.003
	(1.45)	(0.33)	(1.50)	(-0.18)
$Litigation_{t-1}$	0.066	0.052	0.087	0.046
	(0.59)	(0.67)	(0.82)	(0.60)
$MidZ_{t-1}$	-0.002	0.014	-0.002	0.014*
	(-0.19)	(1.58)	(-0.30)	(1.69)
$Issue_t$	-0.011*	0.002	-0.010*	0.004
	(-1.78)	(0.24)	(-1.73)	(0.47)
Firm FE	Yes	Yes	Yes	Yes
Year-Quarter FE	Yes	Yes	Yes	Yes
p-value	0.000***		0.000***	
N	29,481	12,625	29,481	12,625
Adj. R^2	0.806	0.753	0.796	0.752

Table 7. The influence of regulatory scrutiny

This table presents the cross-sectional results of the tests for regulatory scrutiny. *RegulatoryScrutiny*$_t$ is an industry-level measure. It equals 1 if an industry is one of 15 industries that received the most comment letters from SEC related to their disclosure of ASC 606 in their filings, and zero otherwise. We partition our sample into firms under high and low regulatory scrutiny. We compare whether the difference between coefficients on *Treat*×*Post* for the low and high groups is significantly greater than 0 by referencing the p-value calculated from the Fisher's Permutation test with bootstrapping. For brevity, an intercept is included in all regressions but not reported. The *t*-statistics, in parentheses, are adjusted for heteroscedasticity and clustered by firm and year. *, **, and *** indicate significance at the 10%, 5%, and 1% levels (two-tailed), respectively. Appendix B details the variable definitions. Appendix D lists the 15 industries that received the most comment letters from the SEC.

	DumMSF$_t$		*FreqMSF*$_t$	
RegulatoryScrutiny =	Low	High	Low	High
	(1)	(2)	(3)	(4)
Treat*×*Post	**0.028****	**0.083*****	**0.020***	**0.063*****
	(2.42)	**(3.92)**	**(1.90)**	**(3.70)**
Size$_{t-1}$	0.022**	0.012	0.026***	0.013
	(2.48)	(1.05)	(3.13)	(1.37)
Lev$_{t-1}$	0.072**	0.011	0.051*	0.025
	(2.55)	(0.19)	(1.80)	(0.53)
BM$_{t-1}$	0.000	-0.032	-0.000	-0.019
	(0.05)	(-1.63)	(-0.03)	(-1.17)
ROA$_t$	-0.018	0.122*	-0.035	0.094
	(-0.34)	(1.79)	(-0.62)	(1.63)
Loss$_t$	-0.005	0.005	-0.003	0.010
	(-1.04)	(0.39)	(-0.62)	(0.76)
IO$_{t-1}$	0.087***	0.079**	0.094***	0.070**
	(4.06)	(2.19)	(4.80)	(2.29)
Analyst$_{t-1}$	0.066***	0.031**	0.059***	0.029**
	(7.10)	(2.03)	(7.02)	(2.16)
Ret$_{t-1}$	-0.009	0.003	-0.013*	0.002
	(-1.16)	(0.26)	(-1.77)	(0.16)
SalesVol$_{t-1}$	-0.400**	-0.002	-0.366***	0.023
	(-2.52)	(-0.01)	(-2.69)	(0.16)
StkVol$_{t-1}$	-0.004	-0.014	-0.001	-0.018
	(-0.39)	(-0.82)	(-0.15)	(-1.09)
Turnover$_{t-1}$	0.035	-0.012	0.022	0.011
	(1.46)	(-0.43)	(0.95)	(0.44)
Litigation$_{t-1}$	0.105	-0.147	0.093	-0.108
	(1.35)	(-1.39)	(1.25)	(-1.05)
MidZ$_{t-1}$	0.004	-0.001	0.004	-0.004
	(0.60)	(-0.05)	(0.53)	(-0.22)
Issue$_t$	-0.008	-0.004	-0.004	-0.008
	(-1.34)	(-0.35)	(-0.67)	(-0.74)
Firm FE	Yes	Yes	Yes	Yes
Year-Quarter FE	Yes	Yes	Yes	Yes
p-value	0.000***		0.000***	
N	35,357	7,453	35,357	7,453
Adj. R^2	0.792	0.772	0.781	0.769

Table 8. The role of information environment

This table presents the cross-sectional results of the tests for information environment. In Panel A, we use prior analysts' sales forecast accuracy to measure the quality of a firm's information environment. In Panels B and C, respectively, we use prior analysts' sales forecast dispersion and prior information asymmetry among investors to measure the financial reporting users' divergence of opinion. Analysts' sales forecast accuracy is the inverse of the absolute difference between actual sales value and mean consensus value scaled by actual sales value. Analysts' sales forecast dispersion is the standard deviation of issued sales forecasts scaled by actual sales value. Information asymmetry among investors is the average of the difference between ask and bid values scaled by closing price across the event window [EA_{t-1}+3, EA_t +2]. For each measure, we partition our sample into firms with high and low accuracy according to the sample median. We compare whether the difference between the coefficients on *Treat*×*Post* for the low and high groups is significantly greater than 0 by referencing the p-value calculated from Fisher's Permutation test with bootstrapping. For brevity, an intercept is included in all regressions but not reported. The *t*-statistics, in parentheses, are adjusted for heteroscedasticity and clustered by firm and year. *, **, and *** indicate significance at the 10%, 5%, and 1% levels (two-tailed), respectively. Appendix B details the variable definitions.

Panel A. Prior analysts' sales forecast accuracy

	$DumMSF_t$		$FreqMSF_t$	
$AccASF_{t-1}$ =	Low	High	Low	High
	(1)	(2)	(3)	(4)
Treat*×*Post	**0.069*** **	**0.032**	**0.051** **	**0.026**
	(2.99)	**(0.93)**	**(2.18)**	**(0.83)**
$Size_{t-1}$	0.033***	0.012	0.039***	0.014
	(2.71)	(0.76)	(3.30)	(0.89)
Lev_{t-1}	0.086**	0.156***	0.063	0.112*
	(2.12)	(2.63)	(1.60)	(1.82)
BM_{t-1}	-0.002	0.009	0.001	-0.007
	(-0.12)	(0.47)	(0.05)	(-0.36)
ROA_t	0.127	0.286*	0.088	0.096
	(1.58)	(1.65)	(1.13)	(0.54)
$Loss_t$	0.003	-0.006	0.004	-0.000
	(0.41)	(-0.57)	(0.53)	(-0.03)
IO_{t-1}	0.036	0.086**	0.041	0.121***
	(1.08)	(2.20)	(1.32)	(3.14)
$Analyst_{t-1}$	0.019*	0.056***	0.015*	0.048***
	(1.90)	(3.97)	(1.69)	(3.76)
Ret_{t-1}	-0.013	0.008	-0.020*	-0.003
	(-1.10)	(0.51)	(-1.79)	(-0.17)
$SalesVol_{t-1}$	-0.390*	-0.970***	-0.316*	-0.877***
	(-1.71)	(-4.53)	(-1.69)	(-4.22)
$StkVol_{t-1}$	0.017	-0.040*	0.015	-0.033*
	(1.01)	(-1.95)	(0.96)	(-1.70)
$Turnover_{t-1}$	-0.013	0.105**	-0.010	0.081*
	(-0.35)	(2.40)	(-0.29)	(1.79)
$Litigation_{t-1}$	0.028	-0.131	0.147	-0.226
	(0.24)	(-0.84)	(1.27)	(-1.42)
$MidZ_{t-1}$	0.001	-0.005	0.001	-0.003
	(0.09)	(-0.42)	(0.11)	(-0.25)
$Issue_t$	-0.009	-0.008	-0.007	-0.004
	(-1.09)	(-0.76)	(-0.87)	(-0.45)
Firm FE	Yes	Yes	Yes	Yes
Year-Quarter FE	Yes	Yes	Yes	Yes
p-value	0.00***		0.02**	
N	14,911	14,929	14,911	14,929
Adj. R^2	0.778	0.785	0.764	0.769

Panel B. Prior analysts' forecast dispersion

	$DumMSF_t$		$FreqMSF_t$	
$DispASF_{t-1}$ =	Low	High	Low	High
	(1)	(2)	(3)	(4)
Treat*×*Post	**0.023**	**0.070*****	**0.012**	**0.060*****
	(0.51)	**(3.19)**	**(0.25)**	**(3.19)**
$Size_{t-1}$	0.023	0.027**	0.042**	0.023**
	(1.37)	(2.25)	(2.35)	(2.12)
Lev_{t-1}	0.104**	0.100**	0.090	0.063
	(1.98)	(2.18)	(1.59)	(1.49)
BM_{t-1}	0.005	0.003	0.003	-0.008
	(0.17)	(0.25)	(0.10)	(-0.78)
ROA_t	0.319*	0.122	0.087	0.104
	(1.92)	(1.50)	(0.48)	(1.39)
$Loss_t$	-0.001	0.003	0.009	0.003
	(-0.10)	(0.44)	(0.83)	(0.43)
IO_{t-1}	0.138***	0.024	0.176***	0.020
	(3.22)	(0.82)	(4.00)	(0.78)
$Analyst_{t-1}$	0.054***	0.014	0.051***	0.010
	(3.61)	(1.48)	(3.63)	(1.28)
Ret_{t-1}	-0.002	-0.016	-0.013	-0.020*
	(-0.11)	(-1.35)	(-0.88)	(-1.79)
$SalesVol_{t-1}$	-1.117***	-0.276	-0.982***	-0.298*
	(-4.72)	(-1.47)	(-4.47)	(-1.92)
$StkVol_{t-1}$	-0.007	0.001	-0.007	0.003
	(-0.30)	(0.08)	(-0.31)	(0.23)
$Turnover_{t-1}$	0.103**	-0.002	0.096*	0.003
	(2.03)	(-0.07)	(1.74)	(0.09)
$Litigation_{t-1}$	-0.008	-0.118	-0.041	-0.031
	(-0.05)	(-0.96)	(-0.25)	(-0.26)
$MidZ_{t-1}$	-0.000	-0.003	0.001	-0.002
	(-0.01)	(-0.34)	(0.11)	(-0.20)
$Issue_t$	-0.008	-0.001	-0.006	0.003
	(-0.74)	(-0.08)	(-0.55)	(0.41)
Firm FE	Yes	Yes	Yes	Yes
Year-Quarter FE	Yes	Yes	Yes	Yes
p-value	0.00***		0.00***	
N	14,895	14,864	14,895	14,864
Adj. R^2	0.775	0.749	0.756	0.729

Panel C. Prior information asymmetry among investors

	$DumMSF_t$		$FreqMSF_t$	
$Spread_{t-1}$ =	Low	High	Low	High
	(1)	(2)	(3)	(4)
Treat*×*Post	**0.024**	**0.040*** **	**0.025**	**0.031*** **
	(0.82)	**(3.45)**	**(0.90)**	**(3.10)**
$Size_{t-1}$	0.024	0.021***	0.028*	0.020***
	(1.42)	(2.65)	(1.71)	(2.95)
Lev_{t-1}	0.076	0.042	0.058	0.033
	(1.53)	(1.49)	(1.20)	(1.38)
BM_{t-1}	0.016	-0.005	-0.008	-0.002
	(0.62)	(-0.64)	(-0.37)	(-0.36)
ROA_t	0.016	0.049	-0.095	0.029
	(0.13)	(1.09)	(-0.80)	(0.71)
IO_{t-1}	-0.009	0.002	-0.010	0.005
	(-1.11)	(0.38)	(-1.25)	(0.98)
$Loss_t$	0.164***	0.029*	0.152***	0.038**
	(4.58)	(1.70)	(4.82)	(2.38)
$Analyst_{t-1}$	0.068***	0.042***	0.063***	0.037***
	(5.16)	(4.39)	(5.32)	(4.43)
Ret_{t-1}	-0.014	-0.004	-0.024**	-0.004
	(-1.06)	(-0.50)	(-1.97)	(-0.62)
$SalesVol_{t-1}$	-0.178	-0.177	-0.211	-0.142
	(-0.79)	(-1.40)	(-1.05)	(-1.29)
$StkVol_{t-1}$	-0.003	-0.011	-0.003	-0.011
	(-0.14)	(-1.30)	(-0.17)	(-1.40)
$Turnover_{t-1}$	0.008	0.032	0.017	0.023
	(0.19)	(1.63)	(0.43)	(1.27)
$Litigation_{t-1}$	0.116	-0.020	0.130	-0.008
	(0.87)	(-0.35)	(1.02)	(-0.16)
$MidZ_{t-1}$	-0.007	0.004	-0.008	0.006
	(-0.72)	(0.53)	(-0.86)	(0.81)
$Issue_t$	-0.007	-0.004	-0.002	-0.005
	(-0.80)	(-0.71)	(-0.21)	(-0.88)
Firm FE	Yes	Yes	Yes	Yes
Year-Quarter FE	Yes	Yes	Yes	Yes
p-value	0.000***		0.100*	
N	21,194	21,165	21,194	21,165
Adj. R^2	0.783	0.777	0.774	0.766

Table 9. The role of proprietary cost concerns

This table presents the cross-sectional results of the tests for proprietary costs concerns. To measure proprietary cost concerns, we use product market threats and product similarity in Panels A and B, respectively. For each measure, we partition our sample into firms with high and low proprietary cost concerns. A high (low) product market threat and product similarity has a value that exceeds (is below) the sample median. Following Hoberg et al. (2014), we measure product market threats as how fluid the product market around a firm change in each year. Following Hoberg and Phillips (2016), we measure product similarity in terms of comparable products and services offered by a firm's industry competitors. Firms with a high product market threats and product similarity should have more proprietary concerns. We compare whether the difference between the coefficients on *Treat*×*Post* for the low and high groups is significantly greater than 0 by referencing the p-value calculated from Fisher's Permutation test with bootstrapping. For brevity, an intercept is included in all regressions but not reported. The *t*-statistics, in parentheses, are adjusted for heteroscedasticity and clustered by firm and year. *, **, and *** indicate significance at the 10%, 5%, and 1% levels (two-tailed), respectively. Appendix B details the variable definitions.

Panel A. Product market threats

	$DumMSF_t$		$FreqMSF_t$	
$ProdMarketThreats_{t-1}$ =	Low	High	Low	High
	(1)	(2)	(3)	(4)
Treat*×*Post	**0.055*** **	**0.026***	**0.041** **	**0.024***
	(2.85)	**(1.69)**	**(2.33)**	**(1.95)**
$Size_{t-1}$	0.004	0.028***	0.006	0.031***
	(0.32)	(3.77)	(0.50)	(4.29)
Lev_{t-1}	0.038	0.055	0.022	0.037
	(0.89)	(1.59)	(0.58)	(1.16)
BM_{t-1}	-0.021	0.006	-0.017	0.001
	(-1.46)	(0.69)	(-1.50)	(0.14)
ROA_t	0.037	0.030	-0.025	0.021
	(0.48)	(0.59)	(-0.32)	(0.48)
$Loss_t$	-0.007	-0.000	-0.003	0.000
	(-1.03)	(-0.06)	(-0.47)	(0.06)
IO_{t-1}	0.130***	0.034*	0.128***	0.044**
	(3.82)	(1.68)	(4.04)	(2.35)
$Analyst_{t-1}$	0.086***	0.030***	0.073***	0.028***
	(6.68)	(3.11)	(6.60)	(3.23)
Ret_{t-1}	-0.011	-0.003	-0.012	-0.010
	(-0.95)	(-0.36)	(-1.09)	(-1.29)
$SalesVol_{t-1}$	-0.469**	-0.156	-0.398**	-0.151
	(-2.43)	(-0.97)	(-2.42)	(-0.98)
$StkVol_{t-1}$	-0.015	-0.000	-0.014	-0.000
	(-0.99)	(-0.04)	(-1.06)	(-0.01)
$Turnover_{t-1}$	0.040	0.003	0.022	0.016
	(1.18)	(0.12)	(0.66)	(0.80)
$Litigation_{t-1}$	-0.081	-0.060	-0.016	-0.074
	(-0.66)	(-0.78)	(-0.13)	(-0.94)
$MidZ_{t-1}$	0.007	-0.009	0.005	-0.010
	(0.73)	(-1.03)	(0.55)	(-1.24)
$Issue_t$	-0.009	0.000	-0.001	-0.002
	(-0.99)	(0.03)	(-0.17)	(-0.27)
Firm FE	Yes	Yes	Yes	Yes
Year-Quarter FE	Yes	Yes	Yes	Yes
p-value	0.000***		0.010***	
N	19,970	19,952	19,970	19,952
Adj. R^2	0.762	0.827	0.753	0.815

Panel B. Product similarity				
	DumMSF$_t$		*FreqMSF*$_t$	
ProdSimilarity$_{t-1}$ =	Low	High	Low	High
	(1)	(2)	(3)	(4)
Treat*×*Post	**0.048*** **	**0.019**	**0.032***	**0.016**
	(2.62)	**(1.22)**	**(1.96)**	**(1.20)**
Size$_{t-1}$	0.013	0.023***	0.020*	0.023***
	(1.09)	(2.65)	(1.91)	(2.67)
Lev$_{t-1}$	0.045	0.070*	0.026	0.059*
	(1.10)	(1.92)	(0.72)	(1.67)
BM$_{t-1}$	-0.011	0.004	-0.008	0.001
	(-0.82)	(0.39)	(-0.73)	(0.15)
ROA$_t$	-0.009	0.062	-0.031	0.038
	(-0.12)	(1.14)	(-0.43)	(0.79)
Loss$_t$	-0.010	0.000	-0.005	0.001
	(-1.45)	(0.01)	(-0.76)	(0.12)
IO$_{t-1}$	0.130***	0.038*	0.132***	0.043**
	(4.11)	(1.70)	(4.78)	(2.10)
Analyst$_{t-1}$	0.086***	0.037***	0.072***	0.037***
	(6.95)	(3.50)	(6.52)	(3.93)
Ret$_{t-1}$	-0.016	0.003	-0.016	-0.005
	(-1.47)	(0.30)	(-1.59)	(-0.59)
SalesVol$_{t-1}$	-0.275	-0.171	-0.256	-0.169
	(-1.58)	(-1.05)	(-1.63)	(-1.13)
StkVol$_{t-1}$	-0.005	-0.010	-0.006	-0.006
	(-0.37)	(-0.98)	(-0.47)	(-0.65)
Turnover$_{t-1}$	0.023	0.017	0.005	0.025
	(0.75)	(0.65)	(0.18)	(1.12)
Litigation$_{t-1}$	-0.064	-0.014	0.007	-0.032
	(-0.55)	(-0.17)	(0.06)	(-0.38)
MidZ$_{t-1}$	0.001	0.004	0.001	0.003
	(0.11)	(0.42)	(0.13)	(0.31)
Issue$_t$	-0.010	-0.005	-0.004	-0.007
	(-1.29)	(-0.82)	(-0.52)	(-1.03)
Firm FE	Yes	Yes	Yes	Yes
Year-Quarter FE	Yes	Yes	Yes	Yes
p-value	0.000***		0.020**	
N	20,298	20,298	20,298	20,298
Adj. R^2	0.760	0.823	0.752	0.809