

## A Tale of Two Forecasts: An Analysis of Mandatory and Voluntary Effective Tax Rate Forecasts\*

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### Abstract

We exploit a setting where firms provide two forecasts of the same underlying metric – effective tax rates (ETRs) – to examine the interaction between voluntary and mandatory disclosures. The integral method (ASC 740-270) requires firms to forecast *de facto* annual ETRs while some firms additionally provide voluntary ETR forecasts in earnings calls. Using a self-constructed dataset of voluntary ETR forecasts, we document that managers are more likely to issue voluntary ETR forecasts when tax complexity is higher. More importantly, voluntary ETR forecasts are incrementally informative over mandatory ETR forecasts as analysts revise their ETR forecasts based on the news in voluntary ETR forecasts, especially for voluntary non-GAAP ETR forecasts and in the presence of discrete tax items. Overall, our results suggest that managers resort to voluntary disclosure when mandatory disclosure constrains their ability to convey private information, thus we offer new insights on the interaction between voluntary and mandatory *forward-looking* disclosures.

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## I. INTRODUCTION

In this study, we exploit a setting where firms provide two forecasts of the same underlying metric – the effective tax rate (ETR) – to examine the interaction between voluntary and mandatory forward-looking disclosures and how tax information is communicated to outsiders. Under ASC 740-270, firms are required to use the integral method to compute tax expense for interim reporting periods. In each interim quarter, managers forecast the full-year annualized tax rate based on realized and projected pretax income and compute quarterly tax expense using the full-year ETR estimate. Accordingly, the year-to-date ETR represents a *de facto* mandatory annual ETR forecast.<sup>1</sup> In addition to the mandatory ETR forecast, some firms also voluntarily provide ETR forecasts in earnings conference calls (see Appendix A for examples). The co-existence of both mandatory and voluntary ETR forecasts allows us to examine managerial incentives behind the voluntary disclosure decision and the interplay between voluntary and mandatory disclosures. Specifically, we first explore why firms voluntarily provide ETR forecasts in conference calls when ASC 740-270 already mandates ETR forecasts. We then assess the informativeness of voluntary and mandatory ETR forecasts by examining the extent to which analysts ETR forecast revisions incorporate the two forecasts.

We conjecture that firms provide voluntary ETR forecasts for two reasons. First, theoretical work on the interaction between voluntary and mandatory disclosures predicts that the probability of voluntary disclosure increases with the level of noise in mandatory disclosure, and that voluntary disclosure is more likely when the mandatory disclosure regime is less flexible (Einhorn 2005). Under the integral method, tax effects of unusual or infrequent items, referred to

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<sup>1</sup> See Bratten et al. (2017) Appendix A for a more detailed explanation of the integral method. Note that the year-to-date ETR represents a *de facto* mandatory annual ETR forecast only for interim quarters (not the case for the fourth quarter, see Figure 1 for details).

as “discrete items,” must be recognized in the quarter they occur.<sup>2</sup> As such, in the presence of discrete items, the mandatory ETR forecast is a noisy proxy for the ETR that managers expect to apply for the rest of the year, and managers do not have much flexibility to communicate their expected ETR via mandatory disclosure (i.e., financial statements). The noise and lack of discretion in mandatory ETR forecasts provide managers incentives to voluntarily disclose a less noisy ETR estimate. Second, investors and analysts view disaggregated management guidance (earnings and its components) as more credible than aggregated guidance (earnings alone) (e.g., Hutton et al. 2003; Hirst et al. 2007; Merkley et al. 2013). Because voluntary ETR forecast is a form of disaggregated management guidance, providing such forecast responds to capital markets’ demand for granular account-level information and enhances the credibility of management earnings guidance.

To assess the informativeness of voluntary ETR forecasts, we examine the extent to which analysts incorporate voluntary and mandatory ETR forecasts into their ETR forecast revisions. Compared to mandatory ETR forecasts restricted by the integral method, managers have more discretion in conveying their private tax information via voluntary disclosure. Anecdotal evidence suggests that analysts update their ETR forecasts based on management voluntary ETR forecasts.<sup>3</sup> In addition, prior research shows that analysts do not fully understand the tax accounts which are governed by a complex set of rules, so voluntary ETR forecasts could potentially help analysts form more accurate ETR forecasts (e.g., Chen and Schoderbek 2000; Plumlee 2003; Weber 2009; Donelson et al. 2018).

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<sup>2</sup> See Appendix B for a list of common discrete items and related discussions from earnings conference calls.

<sup>3</sup> For example, Value Line analyst Mario Ferro issued a report on the outlook of Hasbro, Inc. (HAS) highlighting management’s full-year ETR forecast of 17% and his ETR forecast was revised downward from 23% to 17% accordingly (May 4<sup>th</sup>, 2018). In addition, on April 6<sup>th</sup>, 2018, Value Line analyst Michael Ratty issued a report on Merck & Co (MRK) commenting on management’s going-forward ETR forecast of 19%-20% as persistent through the past few years. His ETR forecast was 19%, consistent with the management forecast.

Nonetheless, Hutton et al. (2012) find that management earnings guidance is more accurate than analyst earnings forecasts only about 50% of the time, suggesting that managers do not always have better information. Bratten et al. (2017) document that 74% of the time analyst ETR forecasts differ from mandatory ETR forecasts by more than 0.5%, suggesting that analysts do not always rely on management when forming ETR forecasts. In addition, when firm performance closely comoves with macroeconomic factors (e.g., interest rates, foreign exchange rates, tax law changes), analysts may obtain insights from in-house macroeconomic experts and produce more accurate forecasts than managers (Hutton et al. 2012).<sup>4</sup> Analysts can also become knowledgeable about firm-level income taxes by conducting extensive tax-specific research (e.g., Bratten et al. 2017; Chen et al. 2018). Finally, in earnings calls management might simply re-iterate information already embedded in mandatory ETR forecasts. Overall, whether voluntary ETR forecasts are informative to analysts beyond mandatory ETR forecasts remains an empirical question.

To answer our research questions, we construct a detailed dataset, including the value, forecast horizon, and type of management voluntary ETR forecast, from conference call transcripts between 2006 and 2016. Because mandatory ETR forecasts are by definition annualized measures, our analyses focus on voluntary *annual* ETR forecasts. We first find that 22.6% of firm-quarters provide voluntary annual ETR forecasts. Among these observations, 22.1% are non-GAAP-based ETR forecasts, 9.5% are GAAP-based, and the rest are unspecified.<sup>5</sup> We find that the probability of providing voluntary ETR forecasts is positively related to the firm's tax complexity (for example, the presence of discrete items and tax haven

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<sup>4</sup> For example, see Goldman Sachs Asset Management research report on the effect of U.S. tax reform on corporate pension. (<https://www.gsam.com/content/gsam/us/en/institutions/market-insights/gsam-insights/pension-solutions/2018/us-tax-reform-impact-on-corporate-pensions.html>)

<sup>5</sup> The unspecified ETR forecasts could be GAAP or non-GAAP based. Our study is agnostic about whether unspecified ETR forecasts represent GAAP or non-GAAP based metrics.

operations), information environment, and disclosure practice. As we dive deeper into firms that provide voluntary ETR forecasts and focus on the *type* of the forecast, we find that firms with higher tax complexity are more likely to provide non-GAAP ETR forecasts. This finding is consistent with the prediction in Einhorn (2005) that voluntary disclosure is more likely when mandatory disclosure contains more noise and when the mandatory disclosure regime is less flexible.

To assess the informativeness of voluntary ETR forecasts, we examine whether analyst ETR forecast *revisions* around earnings calls impound the news contained in voluntary and mandatory ETR forecasts. Because issuing voluntary ETR forecasts is a firm decision, we use the Heckman two-stage approach to correct for self-selection. We find that analysts revise their ETR forecasts based on the news contained in voluntary ETR forecasts, controlling for mandatory ETR forecast news, suggesting that voluntary ETR forecasts provide new information to analysts and managers do not simply reiterate their mandatory ETR forecasts in earnings calls. More importantly, analyst ETR forecast revisions are *more* strongly associated with the news contained in voluntary ETR forecasts compared to mandatory ETR forecasts, suggesting that analysts assign a greater weight to voluntary ETR forecasts when forming their ETR expectations. Looking at different types of voluntary ETR forecasts, we find that all three types (non-GAAP, GAAP, and unspecified) are incrementally informative over mandatory ETR forecasts, and there is suggestive evidence that analysts find non-GAAP voluntary ETR forecasts the most informative. Overall, our results show that despite the existence of mandatory ETR forecasts, voluntary ETR forecasts represent an important channel through which firms convey tax-related information to outsiders.

We further conduct several tests to pinpoint situations where voluntary ETR forecasts could be particularly informative. First, under the integral method, discrete items are required to be recorded in full in the quarter they occur, adding noise to mandatory ETR forecasts (Bratten et al. 2017). Hence, we expect voluntary ETR forecasts to be more useful when the firm quarter reports discrete items. We find evidence consistent with voluntary ETR forecasts being more informative than mandatory ETR forecasts when there are discrete tax items, suggesting that analysts resort to voluntary ETR forecasts when mandatory ETR forecasts appear to be “polluted.” Therefore, based on our findings, voluntary disclosure becomes an important channel for managers to convey tax-related information when they do not have the discretion to do so via mandatory disclosure, consistent with the theoretical prediction in Einhorn (2005).

Second, we partition our sample based on whether analysts’ ETR forecasts mimic management mandatory ETR forecasts.<sup>6</sup> Bratten et al. (2017) report that analysts’ ETR forecasts deviate from mandatory ETR forecasts 74% of the time, so we aim to shed light on the following question: when analysts do not follow managers’ mandatory ETR forecasts, where do they obtain tax information? We find that when analysts do not mimic managers’ mandatory ETR forecasts, their ETR forecast revisions are still strongly associated with the information contained in voluntary ETR forecasts. Thus, despite that analysts might ignore mandatory ETR forecasts and obtain tax information through their own research efforts, we show that voluntary ETR forecasts remain an important information source for analysts to form ETR expectations.

After establishing that analysts respond to voluntary ETR forecasts, we examine whether voluntary ETR forecasts are associated with improved analyst ETR forecast accuracy. We find a positive relation between post-conference call (hereafter, post-call) analyst ETR forecast

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<sup>6</sup> Here we classify analyst forecasts as “non-mimicking” forecasts if the absolute difference between the consensus analyst ETR forecast and management mandatory ETR forecast is larger than 0.5%, following Bratten et al. (2017).

*accuracy* and voluntary ETR forecast *accuracy*, controlling for mandatory ETR forecast accuracy and pre-conference call (hereafter, pre-call) analyst ETR forecast accuracy. Hence, despite that managers have incentives to bias voluntary disclosure (e.g., Rogers and Stocken 2005; Cotter et al. 2006), our result is consistent with managers issuing voluntary ETR forecasts mainly to inform outsiders.

In supplementary analyses, we verify that our main result continues to hold after controlling for news contained in management *earnings* guidance and analyst *earnings* forecast revisions, suggesting that voluntary ETR forecast has its own distinctive information content that is not subsumed by the information contained in earnings guidance. We also partition our sample by fiscal quarter and by voluntary ETR forecast frequency. Our main inference that voluntary ETR forecasts are incrementally informative over mandatory ETR forecasts continues to hold in all partitions. We find some suggestive evidence that voluntary ETR forecasts are more informative when issued in the first quarter and when issued frequently.

Our study contributes to three streams of literature. First, we answer the call in Beyer et al. (2010) to examine the interaction between voluntary and mandatory disclosures. One stream of research in this area focuses on the confirmatory role of mandatory disclosure (e.g., Gigler and Hemmer 1998; Ball et al. 2012). Mandatory financial reports, although not timely, increases the credibility of voluntary disclosure through subsequent verification, leading to a positive relation between the quality of mandatory disclosure and the quality and likelihood of voluntary disclosure. Another stream of research studies managers' voluntary disclosure choices when mandatory disclosure is noisy or is restricted by accounting rules (e.g., Einhorn 2005; Guay et al. 2016). Our study contributes to the latter research stream by showing that voluntary disclosure is more likely when the mandatorily disclosed signal contains more noise. We also show that

voluntary ETR forecasts provide incremental information to analysts, suggesting that managers use their discretion to mitigate the deficiencies in mandatory disclosure. Our finding also has implications for accounting standard setters as we show that when accounting rules limit the usefulness of certain mandatory metrics, managers could mitigate the noise in mandatory disclosure by voluntarily disclosing their private information.

In addition, we contribute to the research stream on analysts' understanding of income taxes and how tax information is communicated to market participants. Earlier research generally finds that analysts do not assimilate tax-related information (Plumlee 2003; Chen and Schoderbek 2000; Weber 2009), while more recent research finds that analysts provide informative tax forecasts (Baik et al. 2016; Bratten et al. 2017; Chen et al. 2018; Mauler 2019). A natural question arises as to how analysts obtain tax-related information. Because of the complexity of the tax account, management input is arguably important in helping outsiders better understand taxes. However, our understanding of how firms communicate tax information, especially in a voluntary disclosure setting, is limited. Our study fills this void by providing *direct* evidence of management voluntary ETR forecasts influencing analyst ETR forecast activity. Our findings can be interpreted together with those in Bratten et al. (2017), who show that analysts are less likely to follow management mandatory ETR forecasts when there are discrete items, and their ETR forecasts are relatively more accurate when tax complexity is higher. Our results suggest that analysts derive their ETR forecasts from management voluntary ETR forecasts, especially when there are discrete tax items (i.e., tax complexity is higher), and when they do not follow managers' mandatory ETR forecasts.

We also contribute to the literature on non-GAAP reporting. Prior studies show that non-GAAP earnings are on average more informative than GAAP earnings (e.g., Bhattacharya et al.



2003; Bradshaw et al. 2018). These studies generally focus on the difference between voluntarily disclosed non-GAAP metrics and mandatory GAAP metrics. Little is known about voluntarily disclosed GAAP metrics. Our detailed voluntary ETR forecast data enables us to examine managers' *choice* of GAAP or non-GAAP metrics (i.e., GAAP and non-GAAP ETR forecasts) in a voluntary disclosure setting. In addition, prior non-GAAP studies focus on reported current period performance, while we offer new evidence on the informativeness of forward-looking non-GAAP and GAAP disclosures. Finally, we examine the link between management non-GAAP forecasts and analyst forecasts, hence offering indirect evidence on managers' role in shaping street earnings (Bradshaw 2011).

In a concurrent study, Koutney (2018) examines whether analysts improve on management voluntary ETR forecasts. He focuses on analyst ETR forecasts that deviate from managers' voluntary ETR forecasts and concludes that analysts do *not* add useful information. Our study differs from Koutney (2018) in two fundamental respects. First, we are interested in whether voluntary ETR forecasts convey incremental information over mandatory ETR forecasts. As both mandatory and voluntary disclosures are important channels through which managers convey information to outsiders, our study provides new insights on the interactions between voluntary and mandatory disclosure and how analysts gather tax-related knowledge. Second, Koutney (2018) assumes that management voluntary ETR forecasts are on a non-GAAP basis. However, as we discuss in more detail in Section 3.1 and Appendix A, our study separately examines the determinants and information content of GAAP and non-GAAP ETR forecasts. Overall, we view both papers as complementary studies on the important question of income taxes and financial reporting.

We organize the remainder of the paper as follows. Section II discusses the related prior literature and develops hypotheses. Section III describes the data collection process, research design, and key variables. Section IV presents empirical results and Section V concludes.

## **II. PRIOR LITERATURE AND HYPOTHESIS DEVELOPMENT**

### **2.1 The interaction between voluntary and mandatory disclosures and the decision to provide voluntary ETR forecasts (H1)**

The relation between voluntary and mandatory disclosures has long been of interest to researchers. Understanding such interaction helps one better assess the overall effect of mandatory disclosure regulation; hence this line of research is also of interest to accounting regulators. Theoretical work modeling the relation between voluntary and mandatory disclosures looks at different disclosure settings and makes different assumptions. For example, Gigler and Hemmer (1998) argue that mandatory disclosure serves a confirmatory role, indicating a complementary relation between mandatory and voluntary disclosures. In Gigler and Hemmer (1998), managers' private signal cannot be credibly communicated through voluntary disclosure alone. Mandatory disclosure such as audited financial statements that occur after voluntary disclosure can be used to verify the voluntarily disclosed signal. Ball et al. (2012) provide empirical evidence for the prediction in Gigler and Hemmer (1998) by showing that higher levels of financial statement verification are associated with more frequent and better quality management forecasts.

Our study is closely related to the theoretical work of Einhorn (2005). In Einhorn (2005), both voluntary and mandatory disclosures are credible, and the two signals can be disclosed at the same time. She shows that the probability of voluntary disclosure is increasing in the total

level of noise in mandatory disclosure.<sup>7</sup> In our setting, Einhorn's (2005) prediction implies that managers are likely to issue voluntary ETR forecasts when mandatory ETR forecasts under the integral method are noisy as a result of tax complexity. Einhorn (2005) also shows that voluntary disclosure is more likely under a strict mandatory disclosure regime where managers' discretion in financial reporting is limited. Mergenthaler (2010) develops a measure that classifies accounting standards into rules-based versus principles-based. ASC 740 (SFAS 109 in Mergenthaler 2010) meets all four criteria of a rules-based standard. Hence, managers have limited discretion in applying ASC 740, and they have incentives to convey tax information via voluntary disclosure.<sup>8</sup>

Prior literature on voluntary tax disclosure documents that management voluntarily discloses tax-related information to improve transparency, especially when the firm engages in aggressive tax planning. Schwab (2014) shows that firms with greater tax avoidance are more likely to voluntarily disclose book-tax difference (BTD) information in earnings releases. Balakrishnan et al. (2018) find that firms engaging in aggressive tax planning include a larger number of tax-related words in the Management Discussion & Analysis (MD&A) Section of 10-Ks and conference calls. Similarly, Ehinger et al. (2017) find that the likelihood of income tax mention in conference calls is positively associated with tax aggressiveness.<sup>9</sup>

On the other hand, prior studies also suggest that voluntary disclosure is a decreasing function of information uncertainty. When information uncertainty is high, outsiders are less certain about management's information endowment (Dye 1985; Jung and Kwon 1988; Houston

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<sup>7</sup> Einhorn (2005) shows that the monotonic relation holds as long as the total level of noise in mandatory disclosure does not exceed the variance of the underlying value, i.e., the mandatory disclosure needs to at least provide some information about the underlying value.

<sup>8</sup> The four criteria for a rules-based standard include: (1) bright-line thresholds; (2) scope and legacy exceptions; (3) high levels of implementation guidance; and (4) high levels of detail.

<sup>9</sup> Different from other studies, McGuire (2009) finds that firms are less likely to explain a fourth quarter ETR decrease in earnings announcements when it is due to tax planning.

et al. 2010), so withholding is less costly. In addition, managers themselves may not always have better or more precise information. Chen et al. (2011) show that the lack of predictability is often a reason why firms stop providing earnings guidance. In addition, *ex post* inaccurate guidance diminishes future guidance credibility and management reputation (e.g., Graham et al. 2005; Feng and Koch 2010). Finally, firms with higher tax complexity might want to withhold tax disclosure to avoid regulatory scrutiny. Hence, when tax complexity is high, managers might be reluctant to provide forward-looking tax information. Overall, whether the decision to provide voluntary ETR forecasts is *positively* or *negatively* associated with tax complexity is an open question. We state our first hypothesis as follows in null form:

*H1: The likelihood of management providing voluntary ETR forecasts is not associated with a firm's income tax complexity.*

## **2.2 Analysts' understanding of tax information**

Analysts are often viewed as sophisticated information intermediaries. However, the evidence on analysts' ability to process tax-related information is mixed. Earlier studies find that analysts fail to incorporate tax-related accounts (e.g., carryforwards, book-tax differences) or regime changes (e.g., the adoption of ASC 740, the Tax Reform Act of 1986) into earnings or ETR forecasts (Abarbanell and Bushee 1997; Amir and Sougiannis 1999; Chen and Schoderbek 2000; Plumlee 2003; Weber 2009).

Recent studies paint a different picture of analysts as being sophisticated with regard to income taxes. Baik et al. (2016) show that the presence of analysts' pre-tax income forecasts attenuates the tax expense anomaly documented in Thomas and Zhang (2011). In a similar vein, Mauler (2019) shows that analysts' tax forecasts help investors see through earnings management via the tax account. Chen et al. (2018) suggest that analysts' influence on firms' tax-planning activities derives from their tax-specific research efforts. Bratten et al. (2017)

document that more than 70 percent of analyst ETR forecasts do not mimic management mandatory ETR forecasts and analyst ETR forecasts are sometimes more accurate than management ETR forecasts. They conclude that “analysts understand complex tax environments.” Our study extends this recent line of research by asking where do analysts obtain their seemingly superior tax knowledge. In particular, we focus on an under-explored source of tax-related information – management voluntary ETR forecasts.

### **2.3 The informativeness of management voluntary ETR forecasts (H2 and H3)**

Management voluntary *earnings* guidance aligns market expectations with managers’ private information (Ajinkya and Gift 1984). Prior research shows that earnings guidance is positively associated with analyst earnings forecast revisions (Cotter et al. 2006), forecast accuracy (Waymire 1986), analyst following (Cotter et al. 2006), and negatively associated with analyst forecast dispersion (Bagniski et al. 1993; Clement et al. 2003).

We focus on management voluntary ETR forecast and its effect on analyst ETR forecasts. Anecdotal evidence suggests that voluntary ETR forecast is a key input to analysts’ ETR forecasts (see footnote 3 for examples). A growing literature documents that management disclosure of tax-related information improves analyst forecasting performance. Schwab (2014) focuses on management voluntary disclosure of book-tax-difference (BTD) related information in earnings releases. He finds that voluntary BTD disclosure alleviates the positive association between BTD and analyst earnings forecast errors, suggesting that such disclosure helps analysts incorporate BTD into earnings forecasts. In a similar vein, Balakrishnan et al. (2018) show that the volume of tax-related information (i.e., the number of tax-related words) in the Management Discussion & Analysis (MD&A) section and conference calls marginally attenuates the positive relation between aggressive tax planning and analyst earnings forecast errors.

More closely related to our study are Koutney (2018) and Ehinger et al. (2017). Koutney (2018) examines the determinants and information content of analyst ETR forecasts that disagree with management voluntary ETR forecasts. Using a hand-collected sample of management voluntary annual ETR forecasts from *fourth-quarter* conference calls, he first finds that about one-third of analysts issue disagreeing ETR forecasts and less experienced analysts are more likely to issue disagreeing ETR forecasts. He also finds that disagreeing analyst ETR forecasts are less accurate, suggesting that these analyst ETR forecasts do not improve on management voluntary ETR forecasts. Ehinger et al. (2017) examine the determinants and consequences of tax-related discussions in conference calls and find that analysts' ETR forecasts are more accurate when income tax-related topics are mentioned during the conference calls. Different from Ehinger et al. (2017) who rely on the bag-of-words approach, our study, as well as Koutney (2018), focus on numeric voluntary ETR forecasts to better quantify the forward-looking tax information.<sup>10</sup>

Although prior research documents a positive relation between voluntary disclosure and analyst forecasting performance, analysts may not find voluntary ETR forecasts informative for several reasons. If managers simply reiterate their mandatory ETR forecasts in earnings calls, such voluntary ETR forecasts do not add new information because sophisticated analysts should be able to figure out mandatory ETR forecast values from financial statements. Also, the fact that management earnings guidance is only more accurate than analyst earnings forecasts half of the time (Hutton et al. 2012) implies that managers do not always have an information advantage. In addition, analysts could gather tax-related information by conducting tax-specific research (e.g., Bratten et al. 2017; Chen et al. 2018). Analysts could also seek help from in-house

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<sup>10</sup> Ehinger et al. (2017) find that 71.2% of their conference calls contain forward-looking tax information, while we find that 22.6% of conference calls contain numerical ETR forecasts. Hence, empirically our construct (numeric voluntary ETR forecast) is different from that in Ehinger et al. (2017).

macroeconomic experts as income tax expense is affected by macroeconomic policies (see footnote 4 for an example), while firms might not be equipped with such resources. Overall, whether voluntary ETR forecasts are incrementally informative over mandatory ETR forecasts remains an open question. Based on our discussion above, we state our second hypothesis in null form as follows:

*H2: Management voluntary ETR forecasts are not incrementally informative over their mandatory ETR forecasts to analysts.*

In addition, managers have more discretion in conveying their private tax information via voluntary disclosure, while mandatory ETR forecasts, on the other hand, are subject to the integral method rules. When there are discrete items, current quarter year-to-date ETR is no longer a good proxy for managers' true expectation of full-year tax rates (Bratten et al. 2017) and managers have stronger incentives to issue voluntary ETR forecasts to convey their true ETR expectation. As such, we expect voluntary ETR forecasts to be particularly informative in the presence of discrete tax items and state our final hypothesis as follows:

*H3: Management voluntary ETR forecasts are more informative than their mandatory ETR forecasts in the presence of discrete tax items.*

### **III. VARIABLE MEASUREMENT AND RESEARCH DESIGN**

In this section, we first describe how we extract and measure management voluntary ETR forecasts. We then present our empirical models and describe the measurement of our main variables.

#### **3.1 Management voluntary ETR forecasts**

We collect management voluntary ETR forecasts from quarterly earnings conference call transcripts from [seekingalpha.com](http://seekingalpha.com). We focus on managers' explicit ETR forecasts expressed in

the form of tax rates.<sup>11</sup> Our focus on tax rate forecasts is consistent with industry practice (see footnote 3; McKinsey & Co., Koller, Goedhart, and Wessel 2010) that analysts forecast tax expense by applying ETR forecasts to pretax earnings forecasts. We observe that the majority of voluntary ETR forecasts are located in the presentation section of conference calls.<sup>12</sup>

We identify sentences potentially containing voluntary ETR forecasts using the following three criteria: 1) keywords – *ETR*, *effective tax rate*, or *tax rate*; 2) verbs in the future tense, such as *expect*, *will be*, and *project*; and 3) numerical values followed by “percent” or “%.” In addition to point and range voluntary ETR forecasts, we also collect the types – GAAP, non-GAAP, cash, and unspecified – as well as the forecasting period – quarterly, annual, or long-term – of voluntary ETR forecasts. Appendix A presents the detailed data construction process, data fields, and summary statistics prior to merging with other databases.

## 3.2 Empirical models

### 3.2.1 The decision to issue voluntary ETR forecasts

We employ the following probit model to investigate factors driving the voluntary ETR forecast decision (H1):

$$Pr(\text{Guide}) = \beta_0 + \beta_k \text{Tax Complexity} + \beta_m \text{Operation Complexity} + \beta_n \text{Information Environment and Disclosure Practice} + \text{YearFE} + \text{QuarterFE} + \text{IndustryFE} + \varepsilon \quad (1)$$

where *Guide* is an indicator variable coded one if firm *i* provides a voluntary *annual* ETR forecast in quarter *q*'s earnings call and zero otherwise. We focus on the *annual* forecast horizon (forecast period indicator = 1) because the mandatory ETR forecast required under the integral

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<sup>11</sup> Management may also voluntarily provide implicit ETR forecasts by forecasting pretax income and net income (or tax expense).

<sup>12</sup> Voluntary ETR guidance provided in the presentation section is sometimes accompanied by a discussion of possible tax law changes (e.g., R&D credit extension) and changes in geographical composition of earnings. The discussion of voluntary ETR guidance in the question-and-answer section is relatively brief and often times qualitative.



method represents a full-year ETR forecast. 77.6% of voluntary ETR forecasts are for annual ETR in our sample.

We include ten variables to capture various dimensions of tax complexity, including the difficulty of forecasting ETRs, as well as tax planning and tax law induced uncertainty.<sup>13</sup> First, following Bratten et al. (2017), we include the absolute value of the change in quarterly ETR from quarter  $q-1$  to  $q$  ( $\Delta ETR$ ),<sup>14</sup> quarterly ETR volatility ( $\sigma ETR$ ), and the absolute value of the difference between quarterly ETR and the statutory rate (*PermDiff*) to proxy for tax uncertainty and the difficulty of forecasting taxes. In addition, under the integral method, discrete tax items are recognized in the quarter they occur, and such items increase the difficulty of forecasting ETRs. Donelson et al. (2018) find that IBES actual ETR is a “street” number that often excludes discrete items. Hence, the difference between IBES actual ETR and quarterly GAAP ETR can be used to identify the existence of discrete items, and we set *Discrete* equal to one (zero) when the absolute value of the difference between the two is greater (less) than 0.5% (Bratten et al. 2017). Relatedly, we include net operating loss carry-forward (*NOL*), retroactive R&D tax credit extension (*RetroLegislation*), and stock compensation (*StockComp*) as those are common sources of discrete items (see Appendix B).

Finally, firms engaging in tax planning are more likely to voluntarily disclose tax information to mitigate transparency issues resulted from tax aggressiveness (Schwab 2014; Balakrishnan et al. 2018). Therefore, we include total book-tax-difference (*BTD*), foreign income

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<sup>13</sup> We acknowledge that some variables may proxy for both tax complexity and operation complexity, and there is some subjectivity in classifying these variables.

<sup>14</sup>  $\Delta ETR$  is set to zero for the first fiscal quarter. As the integral method applies to interim reporting of tax expense, the difference between fourth quarter ETR of the prior year and first quarter ETR of the current year does not necessarily proxy for the difficulty of forecasting ETR of the current year. Our inferences remain unchanged if we calculate the first fiscal quarter  $\Delta ETR$  as the absolute value of the difference between ETR in Quarter 1, year  $t$  and Quarter 4, year  $t-1$ .

(*ForIncome*), and the number of subsidiaries in tax haven countries (*TaxHaven*) to proxy for firms' tax-planning activity.

In addition, we control for variables that capture various aspects of operation complexity, including firm size (*Size*), market to book (*MB*), R&D expense (*RD*), ROA, and leverage (*Leverage*). We also include a loss indicator (*Loss*) as loss firms are less likely to provide voluntary earnings guidance (e.g., Chen et al. 2011). To proxy for firms' information environment, we include analyst coverage (*Coverage*), institutional ownership (*IO*), bid-ask spreads (*Spread*), and volatility of monthly stock returns (*StdRet*). We expect *IO* and *Coverage* (*StdRet* and *Spread*) to be positively (negatively) associated with the issuance of voluntary ETR forecasts. Finally, we include two proxies for firms' disclosure practice that could be associated with voluntary ETR forecasts. First, because providing an ETR forecast is a form of disaggregated disclosure, we expect the extent of disaggregation in management guidance (*N\_Disagg*) to be positively related to the issuance of voluntary ETR forecasts. Second, we include whether managers provide voluntary ETR forecasts in the prior quarter (*Guide<sub>q-1</sub>*) because providing such forecasts can be part of firms' disclosure practice.

We cluster standard errors by firm because disclosure practice and firm characteristics could be serially correlated. We also include industry, year, and quarter fixed effects in all specifications throughout our study. Appendix C provides detailed variable definitions.

### 3.2.2 *The incremental informativeness of voluntary ETR forecasts*

Providing voluntary ETR forecasts is a firm choice. To alleviate the self-selection concern that firms providing forecasts are inherently different from firms that do not forecast, we employ the Heckman (1979) two-stage approach (Lennox et al. 2011). We estimate Eq. (1) as the first-stage regression and use the number of income statement line items provided in

management guidance ( $N\_Disagg$ ) as the exclusion variable. We expect that firms issuing more disaggregated guidance are more likely to provide voluntary ETR forecasts. Yet we do not have a strong reason to expect that management guidance disaggregation ( $N\_Disagg$ ) directly affects analyst ETR forecasts.

To test H2, we regress analyst ETR forecast revisions on the news contained in voluntary and mandatory ETR forecasts and control for the inverse-Mills-ratio ( $IMR$ ) derived from the first stage. Specifically, we estimate the following model:

$$A\_Rev = a_0 + a_1 V\_News + a_2 M\_News + Controls + IMR + Year\ FE + Industry\ FE + Quarter\ FE + \varepsilon \quad (2)$$

We compute analyst ETR forecast revision ( $A\_Rev$ ) as the *signed* difference between post-call analyst consensus ETR forecast and pre-call analyst consensus ETR forecast as we are interested in both the magnitude and the direction of revision. The pre (post)-call period covers a 45-day window  $[-45, -1]$  ( $[0, 45]$ ) where day 0 is the conference call date (Figure 1 Panel A). We measure news in voluntary ETR forecasts ( $V\_News$ ) as the difference between voluntary ETR forecast and pre-call analyst consensus ETR forecast. We calculate news in mandatory ETR forecasts ( $M\_News$ ) in a similar fashion. *Controls* include all independent variables from Eq. (1), except for  $N\_Disagg$  (the exclusion variable). A positive  $a_1$  in Eq. (2) is consistent with voluntary ETR forecasts being incrementally informative over mandatory ETR forecasts.

We provide a detailed timeline of voluntary ETR forecasts, analyst ETR forecasts, and mandatory ETR forecasts in Figure 1 Panel A. Note that mandatory ETR forecasts (i.e., year-to-date ETR) become available on the earnings announcement day, the same day of voluntary ETR forecasts. To properly examine the incremental information content of voluntary ETR forecasts over mandatory ETR forecasts, we utilize voluntary and mandatory ETR forecasts released in the *first*, *second*, and *third* fiscal quarter earnings announcements (shaded area in Figure 1 Panel B)

when estimating Eq. (2) as the year-to-date ETR released in the fourth quarter earnings announcement is the actual realized annual ETR, *not* annual ETR forecast under the integral method.

*[Insert Figure 1]*

## IV. SAMPLE AND EMPIRICAL RESULTS

### 4.1 Sample construction

We construct our voluntary ETR forecast sample using earnings call transcripts from 2006 to 2016 (123,908 transcripts) as seekingalpha.com coverage of earnings calls before 2006 is sparse. 16,127 firm-quarters provide numeric ETR forecasts (more details in Appendix A), and 77.6% of these ETR forecasts are on an annual basis. Our voluntary ETR forecast sample is generally evenly distributed throughout the fiscal year with slightly more observations in the last two fiscal quarters (Table A1 Panel B). On average, firms issuing voluntary ETR forecasts in the prior quarter or the same quarter last year are likely to issue voluntary ETR forecasts in the current quarter, suggesting that firms issue voluntary ETR forecasts consistently (untabulated).

For our determinant analysis, we start with the Compustat Fundamentals Quarterly file and retain U.S. firms and firm-quarters with conference call transcripts (77,181 observations remain). We then remove observations with missing control variables in Eq. (1) (44,383 observations remain). Among the 44,383 observations, 10,027 provide voluntary annual ETR forecasts. Among the 10,027 observations, 22.1% (2,212) of observations are explicit non-GAAP ETR forecasts, 9.5% (950) of observations are explicit GAAP ETR forecasts, and 71.5% (7,170) of observations are unspecified ETR forecasts (Table 1).

To examine the relation between management voluntary ETR forecasts and analyst ETR forecasts, we start with the 10,027 firm-quarters with non-missing voluntary annual ETR

forecasts and available analyst ETR forecasts. In addition, because we are interested in the interaction between voluntary and mandatory ETR forecasts, the year-to-date ETR released in the fourth quarter earnings announcements are dropped from our sample as discussed in Section 3.2.2. Sample construction details are presented in Table 1.

*[Insert Table 1]*

## 4.2 Descriptive statistics

Table 2 Panel A presents summary statistics for variables used in the determinant model. 22.6% firm-quarters provide either point or range annual ETR forecasts, and 5% provide non-GAAP annual ETR forecasts.<sup>15</sup> The mean volatility of quarterly GAAP ETR over the prior 12 quarters ( $\sigma ETR$ ) is 0.082. The mean absolute value of quarter-to-quarter change in ETR ( $\Delta ETR$ ) is 0.051. The presence of discrete items and net operating loss is prevalent as the mean values of *Discrete* and *NOL* are 46.8% and 48.5%, respectively. On average, firms in our sample have at least one tax haven subsidiary (*TaxHaven*).

Turning to other firm characteristics, the mean debt-to-asset ratio (*Leverage*) is 24.1%. An average firm is followed by 10.7 analysts, and 39.2% of its shares are owned by institutions. The mean *N\_Disagg* is 0.44 unconditionally. Conditional on management providing guidance for at least one income statement item, the mean *N\_Disagg* is 2.5 (untabulated), suggesting that on average firms provide guidance on 2.5 income statement items.

The descriptive statistics of variables in the revision and accuracy tests are reported in Panel B. The first eight variables are reported for informational purpose and are not used in subsequent regressions. On average, voluntary ETR forecasts (31.3%) are higher than mandatory

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<sup>15</sup> In our sample, firms provide voluntary ETR forecasts 22.6% of the time. Chapman and Green (2018) examine whether analysts' requests for forward-looking information (e.g., CAPEX, cash flow, EBITDA, EPS, operating margin, and tax rate) during conference calls influence management decision to voluntarily provide similar guidance in future quarters. Using textual analysis, they find that firms in their sample provide tax rate guidance 19% of the time on average (their Table 2 Panel A).

ETR forecasts (30.4%) (p-value < .001). The correlation between mandatory and voluntary ETR forecasts is 0.64, and for 70% of the sample, the two forecasts differ by more than 0.5% (untabulated).<sup>16</sup> In general, mandatory ETR forecasts are lower than pre-call analyst consensus ETR forecasts (the mean of  $M\_News$  = -0.008), and voluntary ETR forecasts are slightly higher than pre-call analyst consensus ETR forecasts (p-value = 0.08). With regard to accuracy, voluntary ETR forecasts ( $V\_Acc$ ) are significantly more accurate than mandatory ETR forecasts ( $M\_Acc$ ) (p-value < .0001). Overall, the above univariate findings suggest that information embedded in voluntary and mandatory ETR forecasts is different and voluntary ETR forecasts are relatively more accurate.

[Insert Table 2]

### 4.3 The determinants of issuing voluntary ETR forecasts (H1)

We report Eq. (1) estimates in Table 3. In Column 1, we include all firm-quarters (with or without voluntary ETR forecasts) in the regression. In Column 2, we retain observations with voluntary ETR forecasts and investigate the factors driving the decision to provide non-GAAP ETR forecasts. Focusing on Column 1, we observe that managers are more likely to provide voluntary ETR forecasts when quarter-to-quarter ETR changes are large ( $\Delta ETR$ ), when discrete items occur in the quarter (*Discrete*), when there are net operating loss carryforwards (*NOL*), and when the firm has more extensive foreign operations (*ForIncome* and *TaxHaven*). An F-test suggests that the tax complexity variables as a group are jointly different from zero (p-value < .0001), indicating a positive association between tax complexity and the issuance of voluntary ETR forecasts.

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<sup>16</sup> Our main inferences remain unchanged if we restrict our test sample to firm-quarters for which voluntary and mandatory ETR forecasts differ by greater than 0.5%.

With regard to the relation between operation complexity and the decision to provide voluntary ETR forecasts, firms with higher market-to-book ratio are more likely to forecast, consistent with growth firms having more incentives to provide voluntary disclosure to mitigate information asymmetry (Core 2001). Larger firms are less likely to issue voluntary ETR forecasts. We fail to find a significant relation between other operational complexity variables and voluntary ETR forecasts.

Finally, turning to proxies that capture firms' information environment and disclosure practice, we find a weak positive relation between analyst coverage (*Coverage*) and voluntary ETR forecasts. We also find that firms with more volatile stock returns (*StdRet*) and higher bid-ask spread (*Spread*) are less likely to issue voluntary ETR forecasts. The coefficient on *Guide<sub>q-1</sub>* is significantly positive, indicating that voluntary ETR forecasts are persistent as firms providing forecasts in prior quarters are also more likely to do so in future quarters. Finally, we find that the level of guidance disaggregation (*N\_Disagg*) is positively associated with the issuance of ETR forecasts. An F-test suggests that the information environment and disclosure practice variables as a group are jointly different from zero (p-value < .0001), indicating a positive association between firms' information environment and disclosure practice and the issuance of voluntary ETR forecasts.

We further investigate factors associated with the *type* of voluntary ETR forecasts conditional on management issuing a voluntary ETR forecast. We replace *Guide* in Eq. (1) with *NonGAAP\_Guide*, an indicator variable coded one if firm *i* provides a voluntary non-GAAP ETR forecast in quarter *q* earnings call and zero otherwise. Column 2 shows that managers are more likely to provide voluntary *non-GAAP* ETR forecasts when quarterly ETRs are more volatile ( $\sigma ETR$ ), in the presence of discrete items (*Discrete*), and when there is a large difference between

GAAP ETR and statutory tax rate (*PermDiff*). An F-test suggests that the tax complexity variables as a group are jointly different from zero (p-value < .0001), indicating that tax complexity is positively related to the decision to provide voluntary non-GAAP ETR forecasts. Taken together, Table 3 suggests that firms with higher tax complexity are more likely to provide voluntary ETR forecasts, and conditional on issuing ETR forecasts, these firms are more likely to issue non-GAAP ETR forecasts. We also find that firms' information environment and disclosure practice are significantly associated with the voluntary ETR forecast decision.

*[Insert Table 3]*

#### **4.4 The incremental informativeness of voluntary ETR forecasts**

In Section 4.4.1, we investigate whether voluntary ETR forecasts provide incremental information over mandatory ETR forecasts (H2). We report the tests for H3 in Section 4.4.2. The results of additional analyses are presented in Section 4.4.3.

##### *4.4.1 Voluntary ETR forecasts and analyst ETR forecast revisions (H2)*

To examine the incremental informativeness of voluntary ETR forecasts, we estimate Eq. (2), controlling for the inverse Mills ratio obtained from the determinant model (i.e., the first-stage regression). As described in Section 3.2.2, we employ management guidance disaggregation (*N\_Disagg*) as the exclusion variable.

Table 4 presents the results of Eq. (2). In Column 1, where we include all types of voluntary ETR forecasts, the coefficients on both voluntary ETR forecast news (*V\_News*) and mandatory ETR forecast news (*M\_News*) are positive and significant (p-values of .000 and .021), suggesting that analysts incorporate the information/news in both voluntary and mandatory ETR forecasts into their ETR forecast revisions. In terms of economic significance, a one standard deviation increase in *V\_News* (*M\_News*) is associated with analyst ETR forecast revision of 1%



(0.4%).<sup>17</sup> In addition, an F-test indicates that the coefficient on  $V\_News$  is significantly greater than the coefficient on  $M\_News$  (p-value = 0.001), suggesting that analysts place a greater weight on voluntary ETR forecasts when forming ETR forecasts. The coefficient on the inverse Mills ratio ( $IMR$ ) is insignificant, suggesting that self-selection is unlikely to be a significant concern.

Voluntary disclosure also offers managers the discretion to convey their private information using either GAAP or non-GAAP based metrics. In Columns 2-4, we separately assess the informativeness of non-GAAP, GAAP, and unspecified ETR forecasts. The non-GAAP literature shows that managers are more likely to report non-GAAP earnings when GAAP earnings are less informative and more volatile (e.g., Bhattacharya et al. 2003; Lougee and Marquardt 2004; Curtis et al. 2014). When the voluntary ETR forecast is non-GAAP based, we anticipate it to add incremental information over GAAP-based mandatory ETR forecasts. For example, the mandatory ETR forecast may include one-time items (such as tax settlements) that will not persist, and managers can use their discretion to communicate “core” ETRs via non-GAAP voluntary ETR disclosure. In Column 2, we find that the coefficient on  $V\_News$  is significant and statistically larger than the coefficient on  $M\_News$ , which is insignificant.

With regard to voluntary GAAP ETR forecasts, in our setting, mandatory ETR forecast is already a GAAP-based metric. On the surface, one might expect that voluntary GAAP ETR forecasts are not incrementally informative to analysts as it shares largely the same underlying tax-information set as mandatory ETR forecasts. Yet there is nuance between mandatory ETR forecasts and voluntary GAAP ETR forecasts. Mandatory ETR forecasts – reflected in year-to-date ETRs – can be affected by discrete items from past quarters while voluntary GAAP ETR

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<sup>17</sup> For example, the 1% increase is calculated as the coefficient on  $V\_News$  (0.185) multiplied by the standard deviation of  $V\_News$  (0.056) from Table 2.

forecasts could be more forward-looking.<sup>18</sup> As such, voluntary GAAP ETR forecasts could still be informative to outsiders, and this is indeed what we find in Column 3. In addition, we find that the coefficients on  $V\_News$  and  $M\_News$  do not differ significantly (p-value = 0.8019), suggesting that analysts assign a similar weight on voluntary GAAP ETR forecasts and mandatory ETR forecasts.

Finally, in Column 4, when managers do not specify the type of voluntary ETR forecasts, there is some suggestive evidence that analysts place a higher weight on voluntary ETR forecasts (one-tailed p-value = 0.083). Overall, the results in Table 4 are consistent with H1 that voluntary ETR forecasts have incremental information content over mandatory ETR forecasts.

*[Insert Table 4]*

#### *4.4.2 Voluntary ETR forecasts and analyst ETR forecast revisions: the role of discrete items (H3)*

In H3 we hypothesize that voluntary ETR forecasts become a particularly important information source for outsiders (analysts) in the presence of discrete tax items. As such, we partition our sample into firm-quarters with and without discrete tax items and repeat the analyses in Eq. (2).

We report the results in Table 5. In Panel A, we find that, when there are discrete tax items, the coefficients on  $V\_News$  remain significantly positive in Columns 1-4. Also, the coefficients on  $V\_News$  are statistically larger than the coefficient on  $M\_News$  in all columns except for Column 3, where the voluntary ETR forecast is GAAP-based. Note that the coefficients on  $M\_News$  are either insignificant or only marginally significant. Overall, the

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<sup>18</sup> For example, at the beginning of the year, firm A expects the full-year GAAP ETR to be 30% (\$100 pretax income and \$30 tax expense in each quarter). In Q1, it reports \$100 pretax income as expected, and recognizes a \$20 discrete tax item. Because discrete tax items must be recorded fully in the quarter they occur, the year-to-date GAAP ETR for Q1 will be 50%  $((30+20)/100)$ , while the “correct” full-year ETR should be  $(30*4+20)/400 = 35\%$ . In this case, the mandatory ETR forecast embedded in year-to-date ETR (50%) does not truly reflect managers’ expectation of full-year ETR (which is now 35%) and managers can voluntarily disclose their full-year GAAP ETR forecast, 35%, in earnings calls.

results suggest that in the presence of discrete items analysts place a greater weight on voluntary ETR forecasts compared to mandatory ETR forecasts. Our results can be interpreted together with that in Bratten et al. (2017), who focus on mandatory ETR forecasts and show that in the presence of discrete items analysts are less likely to rely on mandatory ETR forecasts. Here we show that when mandatory ETR forecasts are less informative due to discrete tax items, managers convey useful information via voluntary ETR disclosure and analysts do rely on such information when forming their ETR forecasts.

Next, in Panel B, in the absence of discrete tax items, the coefficient on  $V\_News$  is positive and significant only in Columns 1 and 4. On the other hand, the coefficients on  $M\_News$  are significantly positive in three out of four columns. More importantly, the coefficients on  $V\_News$  are no longer statistically larger than the coefficients on  $M\_News$  in all four columns, suggesting that mandatory ETR forecast, free of discrete items, is at least as informative as voluntary ETR forecasts. Overall, we conclude that voluntary ETR forecasts provide incremental information for financial analysts, particularly in the presence of discrete tax items, consistent with H3.

*[Insert Table 5]*

#### *4.4.3 Additional Analyses*

##### *4.4.3.1 Subsample analyses*

Bratten et al. (2017) document that when analysts do not “mimic” managers’ mandatory ETR forecasts (i.e., the difference between analyst ETR forecast and mandatory ETR forecast is greater than 0.5%), their ETR forecasts are sometimes more accurate. This result suggests that the non-mimicking analysts have the sophistication to process tax-related information. Non-mimicking analysts may derive superior ETR forecasts from tax-specific research efforts (Chen

et al. 2018). Alternatively, when non-mimicking analysts do not follow mandatory ETR forecasts, they may still rely on management voluntary tax rate disclosure, an important information channel previously under-explored. Hence, we also examine whether these non-mimicking analysts incorporate management voluntary ETR forecasts into their ETR expectations.

In Table 6 we re-estimate Eq. (2) in the subsample of non-mimicking analysts.<sup>19</sup> We classify firm-quarters into  $Mimic = 0$  if the post-call consensus analyst annual ETR forecast differs from the mandatory ETR forecast by more than 0.5%.<sup>20</sup> In our sample, we have 76% firm-quarters with  $Mimic = 0$ , consistent with the 74% reported in Bratten et al. (2017). We find that when analysts do *not* mimic management mandatory ETR forecasts, the coefficients on  $V\_News$  are positive and significant across all types of voluntary ETR forecasts. Also, the coefficient on  $V\_News$  is statistically larger than the coefficients on  $M\_News$  in the overall sample (Column 1) and particularly when the voluntary ETR forecast is non-GAAP based (Column 2). This result suggests that analysts derive their ETR forecasts from voluntary ETR forecasts, even though they might ignore mandatory ETR forecasts. Hence, our analysis of both voluntary and mandatory ETR forecasts paints a more complete picture of how tax information is communicated between managers and outsiders.

[Insert Table 6]

#### 4.4.3.2 Voluntary ETR forecast accuracy and analyst ETR forecast accuracy

So far, we document that analysts respond to the news contained in management voluntary ETR forecasts. Prior literature shows that voluntary earnings guidance can be strategic

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<sup>19</sup> In the subsample of mimicking analysts ( $Mimic = 1$ ), mandatory ETR forecast news explain almost all variation in analyst forecast revisions (evidenced by the close to 100% R-squared and close to one coefficient on  $M\_News$ ) so we do not present the results.

<sup>20</sup> Bratten et al. (2017) classify firm-quarters into  $Mimic = 0$  when *individual* analyst's implied quarterly ETR forecast is different from mandatory ETR forecast by more than 0.5%. Because our analysis is at the firm-quarter level, modified from Bratten et al. (2017), we classify firm-quarters into  $Mimic = 0$  if the post-call *consensus* analyst annual ETR forecast differs from mandatory ETR forecast more than 0.5%.

(i.e., walk-down of analyst earnings forecasts) and serve managers' self-interest (e.g., Cotter et al. 2006). Hence, it is possible that managers provide optimistically biased ETR forecasts to lower analyst after-tax earnings expectations.<sup>21</sup> In this section, we examine whether voluntary ETR forecasts improve analyst ETR forecast accuracy to shed further light on the “inform” versus “mislead” role of voluntary ETR forecasts.

Empirically, we investigate whether post-call analyst ETR forecast accuracy is positively related to voluntary ETR forecast accuracy, controlling for mandatory ETR forecast accuracy. We replace  $A\_Rev$ ,  $V\_News$ , and  $M\_News$  in Eq. (2) with post-call analyst ETR forecast accuracy ( $A\_Acc$ ), voluntary ETR forecast accuracy ( $V\_Acc$ ) and mandatory ETR forecast accuracy ( $M\_Acc$ ), respectively, and control for pre-call analyst ETR accuracy ( $A\_Acc_{pre-call}$ ).  $A\_Acc$  is the absolute value of the difference between I/B/E/S actual ETR and post-call mean analyst ETR forecast, multiplied by -1.<sup>22</sup>  $V\_Acc$ ,  $M\_Acc$ , and  $A\_Acc_{pre-call}$  are defined similarly. Higher values represent more accurate ETR forecasts.

Consistent with results in Table 4, Table 7 shows that voluntary ETR forecast accuracy is positively and significantly associated with post-call analyst ETR forecast accuracy after controlling for mandatory ETR forecast accuracy and pre-call analyst ETR forecast accuracy across in all columns. The coefficients on  $M\_Acc$  are also positive and significant in three out of four columns. In Column 1, the coefficient on  $V\_Acc$  is not statistically different from the coefficient on  $M\_Acc$ , suggesting that both voluntary and mandatory ETR forecasts are equally

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<sup>21</sup> Univariately, we find that 54% of voluntary ETR forecasts are lower than pre-call consensus analyst ETR forecasts (untabulated).

<sup>22</sup> Following Bratten et al. (2017), we use the implicit actual ETR from I/B/E/S as the benchmark to calculate analyst ETR forecast accuracy because analysts commonly exclude special items from their forecasts and I/B/E/S actual numbers are also adjusted for these exclusion items such that IBES actual and analyst forecasts are on a comparable basis. We also use Compustat annual GAAP ETR (total tax expense divided by pre-tax income) as another benchmark since GAAP-based (Compustat) and “street”-based (IBES) benchmarks (e.g. earnings) may produce different interpretation of results (Bradshaw and Sloan 2002). The results (untabulated) are very similar with the ones using IBES actual ETR as the benchmark.

useful in enhancing analyst ETR forecast accuracy. There is some suggestive evidence that voluntary non-GAAP (based on one-tailed p-value) and GAAP ETR forecasts are more useful in enhancing analyst ETR forecast accuracy, compared to mandatory ETR forecasts. Collectively, the evidence in Table 4 suggests that analysts find voluntary ETR forecast informative and respond to it accordingly. Table 7 further shows that voluntary ETR forecasts indeed enhance analyst ETR forecast accuracy, so managers issue voluntary ETR forecasts mainly to inform outsiders.

[Insert Table 7]

#### 4.4.3.3 Controlling for management earnings guidance and analyst earnings forecasts

The effect of management *earnings* guidance on analyst earnings forecasts is well established in the literature as voluntary disclosure aligns market expectation with managers' (e.g., Ajinkya and Gift 1984; Waymire 1986; Baginski et al. 1993; Clement et al. 2003; Cotter et al. 2006). As such, our main finding is potentially consistent with the following alternative explanation. The news contained in management *earnings* guidance subsume the news contained in voluntary ETR forecasts. Hence, it is not the voluntary ETR forecast *per se* that is informative to analysts. Rather, management *earnings* guidance induces both analyst *earnings* forecast revision and ETR forecast revision. To this end, we additionally control for news contained in management earnings guidance ( $V\_EPS\_News$ ) and analyst earnings forecast revision ( $A\_EPS\_Rev$ ) in Eq. (2).

We present the results in Table 8. The news contained in management earnings guidance is generally not related to analyst ETR forecast revisions. The coefficients on analyst earnings forecast revision are negative and significant in three out of four columns, consistent with tax rate being an input in analyst earnings forecasts. More importantly, the positive relation between

news contained in voluntary ETR forecasts and analyst ETR forecast revisions continues to hold. Thus, our results suggest that voluntary ETR forecasts convey unique forward-looking tax information to the market that is not subsumed by management earnings guidance.

*[Insert Table 8]*

#### 4.4.3.4 The effects of voluntary ETR forecast timing and frequency

In the final set of analyses, we exploit the heterogeneity of firms' disclosure practice to examine whether such heterogeneity affects the positive relation between voluntary ETR forecasts and analyst ETR forecasts. We first consider the timing of voluntary ETR forecasts. Table A1, Panel B suggests that our voluntary ETR forecast sample is generally evenly distributed throughout the year with some concentration in the third and fourth quarters. A possible explanation is that certain discrete items are more likely to occur toward the end of the year. For example, 90% of firms file calendar year tax returns and the majority of those firms receive a six-month filing extension, so the provision-to-return adjustment (the difference between the estimated book tax provisions and tax amounts on income tax returns) usually occurs in the third fiscal quarter (Internal Revenue Service 2013; Example 1 in Appendix B). Because discrete items add difficulty to forecasting ETR, we expect voluntary ETR forecasts issued in the third fiscal quarter earnings announcements to be more informative for analysts.<sup>23</sup> On the other hand, analysts may rely on management more to form their annual ETR forecasts in the early quarters because of the longer forecast horizon and lack of information (e.g., Bradshaw et al. 2016).

In Table 9 Panel A, we estimate Eq. (2) separately for each fiscal quarter. We observe that the coefficients on  $V\_News$  are positive and significant in all three columns, suggesting that

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<sup>23</sup> As illustrated in Figure 1 Panel B and explained in Section 3.2.2, voluntary ETR forecasts from the fourth quarter earnings announcements are not used when we estimate Eq. (2).

analysts incorporate the news contained in voluntary ETR forecasts in all three quarters. On the other hand, the coefficient on  $M\_News$  is significant only in the second quarter. In addition, analysts place a greater weight on voluntary ETR forecasts compared to mandatory ETR forecast in the first quarter (p-value = 0.0003). Collectively, Panel A provides some suggestive evidence that voluntary ETR forecasts are more informative when issued earlier in the year.

We also explore the effect of forecast frequency on analysts' incorporation of voluntary ETR forecasts. In Panel B, we classify firm-quarters as frequent (sporadic) issuers when managers provide voluntary ETR forecasts more than (less than or equal to) twice in the prior four quarters. 40% of observations issue voluntary ETR forecasts frequently. We then separately estimate Eq. (2) for frequent versus sporadic issuers. We observe that, for both groups, the coefficients on  $V\_News$  are significantly greater than the coefficients on  $M\_News$ , suggesting that analysts place a greater weight on voluntary ETR forecasts when updating their ETR forecasts. In addition, mandatory ETR forecasts are informative to analysts only in the subsample of sporadic issuers. For frequent issuers, analysts seem to ignore mandatory ETR forecasts and only rely on voluntary ETR forecasts. Overall, these results imply that analysts weigh the information in voluntary disclosure more heavily than the information in mandatory disclosure when firms commit to providing voluntary ETR disclosure.

*[Insert Table 9]*

## **V. CONCLUSION**

In this study, we exploit a unique setting under which we observe both mandatory and voluntary disclosures of the same metric – ETR forecasts – to study the interaction between forward-looking mandatory and voluntary disclosures. Under the integral method, managers have limited discretion in communicating their private tax information via mandatory ETR



forecasts, especially when the company's tax situation is more complex (e.g., foreign operations, discrete tax items). We find that firms are more likely to disclose voluntary ETR forecasts when tax complexity is higher, consistent with the prediction in Einhorn (2005) that managers provide voluntary disclosure when mandatory disclosure is noisy and allows less discretion. Conditional on providing ETR forecasts, we further find that firms with higher tax complexity are more likely to issue *non-GAAP* ETR forecasts.

More importantly, we find that analysts place a greater weight on voluntary ETR forecasts when updating their ETR forecasts, suggesting that voluntary ETR forecasts are incrementally informative over mandatory ETR forecasts. In addition, we find that all types – GAAP, non-GAAP and unspecified – of ETR forecasts are informative to analysts. Cross-sectionally, we find that voluntary ETR forecast becomes a particularly important information source for analysts in the presence of discrete tax items, when issued early in the year, and when issued frequently. Our findings are robust in subsamples where analysts do not mimic management mandatory ETR forecasts and where voluntary and mandatory ETR forecasts differ by a meaningful amount. Results based on analyst ETR forecast accuracy show that voluntary ETR forecasts help analysts form better ETR forecasts, suggesting that managers issue voluntary ETR forecasts mainly to inform outsiders. Taken together, we provide strong evidence that voluntary ETR forecasts, which convey managers' private tax-related information, are incrementally useful over mandatory ETR forecasts for analysts.

Our study should be of interest to researchers and regulators. First, we enhance the understanding of channels through which financial analysts obtain tax-related information as we show that management voluntary ETR forecast is an important information source for analysts to form ETR forecasts. Second, we add to the literature on the interaction between voluntary and

mandatory disclosure by providing new insights that managers use discretion to communicate their private information via voluntary disclosure when mandatory disclosure does not allow such discretion. Hence, our study employs a unique setting to provide empirical evidence for the predictions in Einhorn (2005). Third, we add to the literature on non-GAAP reporting by offering new insights on the use of GAAP versus non-GAAP metrics in forward-looking voluntary disclosures. The results are also valuable in informing regulators. For example, Regulation G requires a reconciliation between forward-looking GAAP and non-GAAP measures to the extent possible. However, there is limited empirical evidence on the informativeness of and managerial incentives behind forward-looking non-GAAP measures. Our analysis takes a preliminary step in understanding these issues. Finally, our finding of an increased likelihood of voluntary tax rate disclosure when the GAAP-based mandatory disclosure contains more noise is relevant for the Financial Accounting Standards Board (FASB) when designing and implementing mandatory financial accounting standards.

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## Appendix A: Management Voluntary ETR Forecast Sample Construction

We obtain earnings conference call transcripts from seekingalpha.com. The sample covers April 24, 2004 to November 28, 2016 (123,908 transcripts). We describe the data cleaning process and present the summary statistics of the voluntary ETR forecast sample (before merging with other databases) in this section.

### A.1. Extraction of Voluntary ETR Forecasts

*Step 1.* We begin with extracting sentences with “tax rate(s),” “effective tax rate(s),” or “ETR” (We use “tax rate” hereafter). Sentences with tax rates include mentions of GAAP, cash, non-GAAP, and unspecified tax rates.

*Step 2.* We then retain the sentences that forecast future tax rates rather than describe current or past tax rates. Identifying future tense verbs is crucial. We iterate three times in this step to make sure that we do not miss important verbs and patterns. We list the key verbs and patterns used as follows:

- a) expect|expects|expecting| is (now) expected to|
- b) project|projects|projecting|is (now) projected to|are (now|currently|presently) projecting
- c) forecasting|forecast|forecasts|is (now) forecast to|are also forecasting|are (now|currently|presently) forecasting|
- d) target|targets|targeting|
- e) estimate|estimates|estimating|is estimated to|is now estimated to|
- f) anticipate|anticipates|anticipating|is anticipated to|
- g) plan|plans|planning|is (now) planned to|are still planning|are planning
- h) assume|assumes|assuming|is assumed to|
- i) remain|remains|remaining|
- j) guide|guides|guiding|guidance
- k) outlook|outlooks
- l) continues to be|should be|is|will be|are|

Overall, we identify four sentence patterns that contain voluntary ETR forecasts as follows:

1. ...guidance... future tense verbs...ETR... number (% or percent). *Example: “This EPS guidance assumes taxes of \$49 million to \$51 million based on an estimated quarterly non-GAAP tax rate of roughly 33%.” (Akamai Technologies Q2 2015 Earnings Call)*

2. ...ETR...is|will be|remains... number (% or percent). *Example: “We continue to expect our full year tax rate will be between 26% and 27% reflecting the continued benefits of our improvement in business operations...” (Eastman Chemical Co. Q2 2015 Earnings Call)*

3. ...future tense verbs... ETR.... number (% or percent). *Example: “We expect a full-year as reported tax rate to be in the range of 34% to 34.5%.” (Stericycle, Inc. Q2 2015 Earnings Call)*

4. ...future tense verbs... number (% or percent)... ETR. *Example: “We continue to anticipate improvements in the tax rates throughout 2009 and are now forecasting a 22% tax rate for the year.” (Celgene Corporation Q1 2009 Earnings Call)*

*Step 3.* After identifying future tense ETR mentions, we extract the numerical percentages that appear in the same sentence of the ETR mention. We are able to extract 17,791 observations.

*Step 4.* We last extract the periodicity (annual or quarterly) and the type of ETR forecasts (GAAP, cash, non-GAAP, or unspecified) from the sentences. We also ask research assistants to manually check the final 17,791 observations to ensure that all data fields are extracted correctly.<sup>24</sup>

*Step 5.* After manually checking the 17,791 observations, we delete (1) observations for which we cannot link to a specific fiscal year/quarter in Compustat; (2) observations where the tax rate mention is not forward-looking. We have a sample of **16,127** firm-quarter observations containing **19,950** ETR forecasts. We have more ETR forecasts than firm-quarter observations because firms sometimes provide ETR forecasts for multiple fiscal periods (e.g., annual and quarterly), as well as forecasts of various types (e.g., both GAAP and cash tax rates).

## **A.2. Data Fields**

1. Compustat *gvkey*
2. Compustat fiscal period end (*datadate*)
3. *value\_1*: Either a point ETR forecast or the lower end of a range ETR forecast
4. *value\_2*: The upper end of a range ETR forecast
5. Forecasting period (*FPI*):
  - FPI* = 1 if an annual ETR forecast for the current year.
  - FPI* = 2 if an annual ETR forecast for the next year.
  - FPI* = 6 if a quarterly ETR forecast for the current quarter.
  - FPI* = 7 if a quarterly ETR forecast for the next quarter.
  - FPI* = 0 if a long-term ETR forecast.
6. Type
  - Type* = 1 for “GAAP ETR,” “book ETR,” “as reported ETR,” “ETR including depreciation, special items or discrete items,” or “ETR after...”  
*Example*: “...the GAAP tax rate is expected to be approximately 23.5%...”  
(Becton, Dickinson and Company Q3 2012 Earnings Call)
  - Type* = 2 for “non-GAAP ETR,” “adjusted ETR,” “normalized ETR,” “operating ETR,” “ETR excluding depreciation, special items or discrete items,” “pro forma ETR,” “core ETR,” or “ETR before...”  
*Example*: “Our estimated income tax rate is 26%, excluding discrete events.”  
(Martin Marietta Materials Q3 2013 Earnings Call)
  - Type* = 3 for “cash ETR”  
*Example*: “...we’re guiding towards a cash tax rate of 15.6% in Q4.”  
(priceline.com Incorporated Q3 2012 Earnings Call)
  - Type* = 4 for unspecified ETR

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<sup>24</sup> We have four research assistants independently verify all the numerical values and the type of ETR guidance.

*Example: “We expect the effective tax rate to be approximately 28.3%. This reflects our recently approved tax-related benefit of \$55 million, including interest of \$0.15 per diluted share, related to multiple prior years’ tax filings. This will be booked in the third quarter. As a result, we’ve increased our full year GAAP, EPS outlook announcing the range of \$4.82 to \$4.97 per share.” (Raytheon Q2 2011 Earnings Call)*

7. Open/qual

Indicator variable coded one if the ETR forecast is open range or qualitative, and zero otherwise.



### *A.3. Descriptive Statistics*

Table A1 presents summary statistics for the management voluntary ETR forecast sample before merging with Compustat and I/B/E/S. Panel A reports the number of firm-quarters with ETR forecasts by fiscal year. The SeekingAlpha coverage was incomplete before 2006 – we have only 81 observations with voluntary ETR forecasts in fiscal 2005. Because our sample stops in 2016 – the fiscal 2017 coverage is also incomplete. In our voluntary ETR forecast determinant model and subsequent analyses, we discard fiscal years before 2006 and after 2016.

Table A1 Panel B presents the frequency of management ETR forecasts by fiscal quarter. We observe slightly more observations in the third and fourth quarters. We provide two possible explanations. First, towards the end of the fiscal year, tax-related uncertainty is resolved and management is more willing to publicly disclose their ETR estimate. Second, certain discrete tax items (e.g., provision-to-return adjustment) occur more frequently in the last two quarters, “polluting” the mandatory ETR forecast embedded in year-to-date ETRs. Hence managers have incentives to voluntarily provide a cleaner ETR estimate.

In Table A1 Panel C, we tabulate the frequency of different types of management ETR forecasts. Because our algorithm requires a numeric value to appear near the word “tax rate,” by construction we do not extract qualitative ETR forecasts. The 429 open-range/qualitative ETR forecasts that appear in our sample typically look like: *we expect our full-year tax rate to be in the upper 30%*. We have 6,558 range and 12,963 point-estimate ETR forecast observations.

We also code whether the ETR forecast is for GAAP ETR, cash ETR, non-GAAP ETR, or unspecified. Non-GAAP ETR is the tax rate adjusted for discrete/special items. During the data collection, we note that management often times does not explicitly specify the type of tax rate forecasted. Hence, we have 12,904 unspecified ETR forecasts. These ETR forecasts could be on a GAAP or non-GAAP basis. We also have 4,500 (explicitly stated) non-GAAP ETR forecasts, 2,008 (explicitly stated) GAAP ETR forecasts, and 538 cash ETR forecasts. We exclude cash ETR forecasts from our main analysis.

Finally, in Table A1 Panel D, we present summary statistics for the management voluntary ETR forecast sample prior to merging with Compustat and IBES. We exclude all open-range/qualitative forecasts (19,521 left). The minimum value of voluntary ETR forecasts is negative, due to management forecasting a tax benefit. In Panel D we also report summary statistics by ETR forecast type. The mean (median) value of cash ETR forecasts is much smaller than the other three types, consistent with the empirical observation that cash ETR is on average lower than GAAP ETR. In addition, we see that non-GAAP ETR forecasts also have smaller mean and median values compared to unspecified and GAAP ETR forecasts.

**Table A1 Descriptive Statistics of the Voluntary ETR Forecast Sample**

**Panel A: Number of firm-quarters with voluntary ETR forecasts by fiscal year**

<b>Fiscal Year</b>	<b>N</b>
2005	81
2006	265
2007	891
2008	1,583
2009	1,176
2010	1,006
2011	1,159
2012	1,619
2013	2,342
2014	2,222
2015	2,240
2016	1,513
2017	30
<b>Total</b>	<b>16,127</b>

**Panel B: Number of firm-quarters with voluntary ETR forecasts by fiscal quarter**

<b>Fiscal Quarter</b>	<b>N</b>
<b>1</b>	3,602
<b>2</b>	3,892
<b>3</b>	4,055
<b>4</b>	4,578
<b>Total</b>	<b>16,127</b>

**Panel C: Frequency of different types of voluntary ETR forecasts**

	<b>N</b>		<b>N</b>
Open range or qualitative	429	Unspecified	12,904
Range forecasts	6,558	GAAP	2,008
Point forecasts	12,963	Non-GAAP	4,500
		Cash	538
<b>Total</b>	<b>19,950</b>	<b>Total</b>	<b>19,950</b>

**Table A1** (cont'd)

**Panel D: Summary statistics for point and range voluntary ETR forecasts**

<b>Fiscal Year</b>	<b>N</b>	<b>Mean</b>	<b>Std Dev</b>	<b>Min</b>	<b>P25</b>	<b>P50</b>	<b>P75</b>	<b>Max</b>
2005	93	0.30	0.10	0.02	0.25	0.32	0.38	0.51
2006	338	0.30	0.11	-0.20	0.24	0.31	0.37	0.70
2007	1,085	0.31	0.09	-0.17	0.27	0.33	0.38	0.70
2008	1,935	0.32	0.09	-0.38	0.28	0.34	0.38	0.96
2009	1,472	0.30	0.09	-0.38	0.25	0.33	0.37	0.63
2010	1,193	0.30	0.09	-0.10	0.25	0.32	0.37	0.70
2011	1,368	0.30	0.08	0.01	0.25	0.31	0.36	0.69
2012	1,966	0.30	0.09	-0.20	0.25	0.32	0.37	1.00
2013	2,912	0.31	0.09	-0.12	0.26	0.32	0.37	0.99
2014	2,659	0.31	0.09	-0.53	0.27	0.33	0.37	0.76
2015	2,645	0.31	0.09	-0.46	0.26	0.32	0.37	0.85
2016	1,824	0.30	0.10	-0.44	0.25	0.31	0.36	0.82
2017	31	0.29	0.09	0.09	0.25	0.29	0.35	0.50
<b>Total</b>	<b>19,521</b>	<b>0.31</b>	<b>0.09</b>	<b>-0.53</b>	<b>0.26</b>	<b>0.32</b>	<b>0.37</b>	<b>1.00</b>

<b>Type</b>	<b>N</b>	<b>Mean</b>	<b>Std Dev</b>	<b>Min</b>	<b>P25</b>	<b>P50</b>	<b>P75</b>	<b>Max</b>
unspecified	12,661	0.31	0.08	-0.44	0.28	0.33	0.37	0.96
GAAP	1,939	0.32	0.11	-0.20	0.26	0.34	0.38	1.00
non-GAAP	4,418	0.29	0.09	-0.53	0.24	0.30	0.36	0.74
cash	503	0.17	0.10	-0.07	0.10	0.15	0.23	0.50
<b>Total</b>	<b>19,521</b>							

Note: The total number of observations in Panel C (19,950) is greater than the total number of firm-quarters with ETR forecasts in Panels A and B (16,127) because some firms provide more than one ETR forecast in a given earnings call. For example, a firm could provide both GAAP and cash ETR forecasts or provide both annual and quarterly ETR forecasts. In Panel D, open range and qualitative ETR forecasts are further deleted from Panel C.

## Appendix B List of Discrete Items

Under ASC 740-270, quarterly income tax provision is computed by applying an estimated annual ETR to year-to-date pretax income. However, income tax expense (benefit) related to a discrete item must be recognized in the quarter when the item occurs. We list common discrete items and provide some examples from conference call transcripts in this appendix.

1) Provision-to-return adjustment

*Example: "...the provision for taxes in the third quarter was at a 29% effective tax rate, lower than the 33% previously forecasted, primarily due to ... a provision to return true-up related to 2007." (Intel Corporation Q3 2008 Earnings Call)*

2) Changes in valuation allowance resulting from changes of expectation about future earnings, but not from changes of expectation about current year earnings or temporary book-tax difference

*Example: "Excluding the impact from additional deferred tax asset valuation allowance reversals, we expect to have an effective tax rate going forward of approximately 39%." (Lennar Corporation Q4 2012 Earnings Call)*

3) Changes in tax rates

*Example: "Our effective tax rate for the quarter is 51% and for the full year it's 64%. These rates are higher than our expected operational rates, primarily due to discrete charges related to tax rate changes....." (Alcoa Corporation Q4 2014 Earnings Call)*

4) Changes in tax status

*Example: "...the resolution of some IRS audit issues helped reduce our overall effective income tax rate to 35.5% for the quarter." (Dominion Resources Q2 2012 Earnings Call)*

5) Changes in tax laws

*Example: "What will happen in 2013 is we recorded the 2012 benefit in Q1 and then 2013 benefit we record throughout the year, just in terms of the accounting mechanics of the R&D tax credit." (Pfizer Inc. Q4 2012 Earnings Call)*

6) "Unusual" or "infrequent" events

*Example: "... the Harris Microwave and Stratex combination is expected to be neutral to fiscal 2007 earnings, excluding the anticipated integration and acquisition costs estimated at \$0.16 per diluted share and the after tax gain to Harris that will be recorded in our third quarter of approximately \$0.92 per diluted share. " (Harris Corporation Q2 2007 Earnings Call)*

7) Excess tax deduction from certain equity-based compensation

*Example: "Note that our GAAP earnings per share includes the impact of the early adoption of the new accounting standard update for share based compensation. This update requires excess tax benefits realized upon the settlement of a share-based*

*compensation award that flows through the earnings statement instead of the balance sheet... The impact on GAAP earnings per share is an increase of approximately \$0.07 in the first quarter and \$0.12 for the full year.” (Intuit Inc. Q1 2017 Earnings Call)*

- 8) Changes in assertion of indefinitely reinvested earnings in foreign subsidiaries or joint ventures

*Example: “During the quarter we also incurred... \$42 million of income tax expense for planned repatriation of earnings in 2016.” (The Emerson Electric Company Q4 2015 Earnings Call)*

## Appendix C Variable Definitions

Variable	Definition
<u>Main Variables</u>	
<i>Guide</i>	Indicator variable coded one if a firm provides voluntary annual ETR forecast in quarter $q$ 's earnings call, and zero otherwise.
<i>NonGAAP_Guide</i>	Indicator variable coded one if a firm provides voluntary non-GAAP annual ETR forecast in quarter $q$ 's earnings call, and zero otherwise. Details on the classification of non-GAAP ETR forecasts are in Appendix A2.
<i>A_Rev</i>	Post-call mean analyst annual ETR forecast minus pre-call mean analyst annual ETR forecast. Implicit analyst annual ETR forecast is the difference between analyst pretax income forecast (measure = "PRE") and analyst net income forecast (measure = "NET"), divided by analyst pretax income forecast. Analyst ETR forecasts are winsorized between 0 and 1. The post (pre)-call period is defined as 0 to 45 days after (before) the conference call date.
<i>M_News</i>	Year-to-date ETR minus pre-call mean analyst annual ETR forecast. Year-to-date ETR is calculated as: $\frac{\sum_1^q txt_q}{\sum_1^q pi_q}$ . Year-to-date ETR released in the fourth fiscal quarter earnings announcement is set to missing.
<i>V_News</i>	Voluntary annual ETR forecast minus pre-call mean analyst annual ETR forecast. For range forecasts, we use the midpoint value. Voluntary annual ETR forecast is winsorized between 0 and 1.
<i>A_Acc</i>	$-1 \times  I/B/E/S \text{ actual annual ETR} - \text{post-call mean analyst annual ETR forecast} $ . Implicit I/B/E/S actual annual ETR is calculated as the difference between I/B/E/S actual pretax income and I/B/E/S actual net income, divided by I/B/E/S actual pretax income. IBES actual ETRs are winsorized between 0 and 1.
<i>A_AccPre</i>	$-1 \times  I/B/E/S \text{ actual annual ETR} - \text{pre-call mean analyst annual ETR forecast} $ .
<i>M_Acc</i>	Mandatory ETR forecast accuracy, calculated as: $-1 \times  \text{actual IBES annual ETR} - \text{year-to-date ETR} $ .
<i>V_Acc</i>	$-1 \times  \text{actual IBES annual ETR} - \text{voluntary annual ETR forecast} $ .

### Tax-related control variables

$\sigma ETR$	The standard deviation of quarterly ETRs over the past 12 quarters, $q-12$ to $q-1$ . Quarterly ETRs are winsorized between 0 and 1 before we calculate the standard deviation.
$\Delta ETR$	The absolute value of the change in quarterly ETR from $q-1$ to $q$ . If fiscal quarter = 1, $\Delta ETR$ is set to zero. Quarterly ETRs are winsorized between 0 and 1 before we calculate the change.
$A\_Acc_{precall}$	$-1 \times  I/B/E/S \text{ actual annual ETR} - \text{pre-call mean analyst annual ETR forecast} $ .
$BTD$	Total book-tax difference scaled by total assets. Total book-tax difference is calculated as the difference between book income and taxable income. Book income is pretax book income ( $pi$ ). Taxable income is computed by grossing up the sum of the current federal tax expense ( $txfed$ ) and current foreign tax expense ( $txfo$ ), using the top statutory tax rate (35% during our sample period), and subtracting change in NOL carryforward ( $tlcf$ ). Missing current foreign tax expense and change in NOL carryforward is set to be zero. If current federal tax expense is missing, total current tax expense is computed as total tax expense ( $txt$ ) subtracting deferred taxes ( $txdi$ ), state income taxes ( $txs$ ), and other income taxes ( $txo$ ).
$Discrete$	Indicator variable set to one if the difference between quarterly GAAP ETR and implicit I/B/E/S actual quarterly ETR differ by greater than 0.5%, and zero otherwise.
$ForIncome$	Pretax foreign income ( $pifo$ ) scaled by total assets.
$NOL$	Indicator variable set to one if the firm has positive net operating loss carryforward ( $tlcf$ ) in year $t-1$ , and zero otherwise.
$PermDiff$	The absolute value of the difference between 35% and quarterly ETR. Quarterly ETR is winsorized between 0 and 1 before we calculate the difference.
$RetroLegislation$	Indicator variable set to one in quarters during which Congress retroactively extended tax credits such as the R&D credit (i.e., quarters ending in the 90 days following December 20, 2006, October 3, 2008, December 17, 2010, January 2, 2013, December 19, 2014, and December 18, 2015), and zero otherwise.
$StockComp$	Stock option compensation expense ( $stkco+xintopt/0.65$ ) scaled by total assets in year $t-1$ .

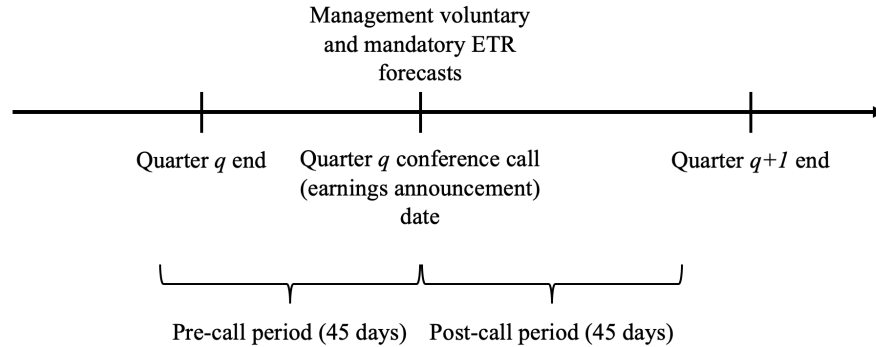
<i>TaxHaven</i>	Number of subsidiaries in tax haven countries for firm <i>i</i> per Exhibit 21 disclosure in 10-K. If the firm operates domestically, <i>TaxHaven</i> is set to zero.
<u>Non-Tax Related Control Variables</u>	
<i>A_EPS_Rev</i>	(Post-call mean analyst EPS forecast – pre-call mean analyst EPS forecast) × number of shares outstanding, scaled by total assets.
<i>Coverage</i>	Number of analysts following.
<i>IMR</i>	Inverse Mills ratio from Heckman first-stage regression.
<i>IO</i>	Percentage of outstanding shares held by institutional investors at the end of quarter <i>q</i> .
<i>Leverage</i>	Sum of current and long-term debt scaled by total assets, calculated as $\text{sum}(dlttq, dlcq)/atq$ for quarter <i>q</i> .
<i>Loss</i>	Indicator variable set to one if income before extraordinary items ( <i>ib</i> ) is negative for quarter <i>q</i> , and zero otherwise.
<i>MB</i>	Market-to-book ratio, calculated as $\text{abs}(prccq * cshoq)/ceqq$ for quarter <i>q</i> .
<i>N_Disagg</i>	Number of income statement management guidance items (IBES Guidance measure type: CPX, EBS, EBT, EPS, FFO, GPS, GRM, NET, POR PRE, SAL) for fiscal year <i>t</i> .
<i>RD</i>	R&D ( <i>xrd</i> ) scaled by total assets measured in year <i>t-1</i> . <i>RD</i> is set to zero if <i>xrd</i> is missing.
<i>ROA</i>	Return on assets, calculated as income before extraordinary items divided by total assets.
<i>Size</i>	Natural log of total assets, calculated as $\log(1+atq)$ for quarter <i>q</i> .
<i>Spread</i>	Average daily bid-ask spread over the 12-month period ending on the last day of quarter <i>q</i> . Daily bid-ask spread is defined as the difference between ask price and bid price divided by the midpoint of the ask and bid price.
<i>StdRet</i>	The standard deviation of monthly return over the 12-month period that ends on the last day of quarter <i>q</i> .
<i>V_EPS_News</i>	(Management annual EPS guidance - pre-call consensus analyst annual EPS forecast) × number of shares outstanding, scaled by total assets.

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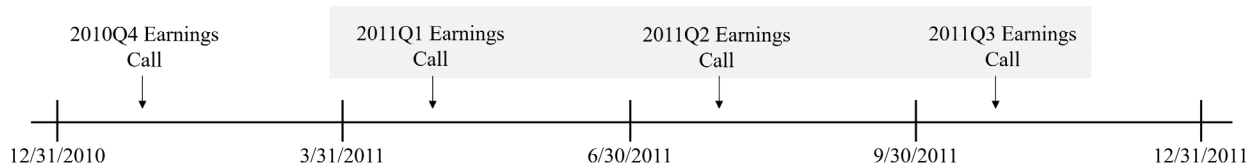


**Figure 1 Timeline**

**Panel A: Timeline of management voluntary ETR forecast, mandatory ETR forecast, and analyst ETR forecast**



**Panel B: The incidence of voluntary and mandatory ETR forecasts throughout the year**



Note: Panel A presents the timeline of management voluntary ETR forecast, mandatory ETR forecast, analyst ETR forecast, and pre- and post-conference call periods. Panel B shows the timing of voluntary and mandatory ETR forecasts for a calendar-year firm. Under the integral method, year-to-date ETRs in the first, second, and third fiscal quarters of year  $t$  represent firms' expected annual ETR in year  $t$ . However, in the fourth fiscal quarter, the year-to-date ETR is the actual realized annual ETR in year  $t$ , and it no longer represents a forecast. For example, in the 2010Q4 earnings call, the firm issues voluntary ETR forecast for fiscal 2011, and no mandatory ETR forecast is available. In 2011Q1 earnings call, the firm issues voluntary ETR forecast for fiscal 2011, and the year-to-date ETR represents a *de facto* mandatory ETR forecast for 2011. Similarly, in 2011Q2 and 2011Q3 earnings, the firm issues voluntary ETR forecasts for fiscal 2011, and the year-to-date ETRs represent mandatory ETR forecasts for fiscal 2011. When estimating Eq. (2), we only retain ETR forecasts issued in the first, second, and third fiscal quarter earnings announcements (shaded area in Panel B).

**Table 1 Sample Construction**

	<b># Firm-quarters</b>
Compustat Fundamentals Quarterly, U.S.-based firms (2006-2016) with conference call transcripts	77,181
Deleting observations with missing tax complexity and control variables	<u>(32,798)</u>
<b>Baseline sample in the determinant model</b>	<b><u>44,383</u></b>
Observations with voluntary annual ETR forecasts	10,027 <sup>25</sup>
Observations with unspecified voluntary annual ETR forecasts	7,170
Observations with GAAP voluntary annual ETR forecasts	950
Observations with non-GAAP voluntary annual ETR forecasts	2,212
Observations with voluntary annual ETR forecasts	10,027
Drop observations with missing post-call analyst ETR forecast	(873)
Drop fourth-quarter observations and observations with missing mandatory ETR forecasts	<u>(2,677)</u>
<b>Sample in analyst ETR revision and accuracy tests</b>	<b><u>6,477</u></b>
Observations with unspecified voluntary annual ETR forecasts	4,589
Observations with GAAP voluntary annual ETR forecasts	606
Observations with non-GAAP voluntary annual ETR forecasts	1,496

<sup>25</sup> A small number of firms provide more than one type of ETR guidance in an earnings call, thus 10,027 is smaller than 7,170 + 950 + 2,212.

**Table 2 Descriptive Statistics**

**Panel A: Variables used in the determinant model**

	<b>N</b>	<b>Mean</b>	<b>Std Dev</b>	<b>P25</b>	<b>Median</b>	<b>P75</b>
<i>Guide</i>	44,383	0.226	0.418	0.000	0.000	0.000
<i>NonGAAP_Guide</i>	44,383	0.050	0.218	0.000	0.000	0.000
<u>Tax Complexity Measures</u>						
<i>ΔETR</i>	44,383	0.051	0.101	0.000	0.011	0.049
<i>σETR</i>	44,383	0.082	0.076	0.024	0.058	0.117
<i>PermDiff</i>	44,383	0.113	0.125	0.025	0.058	0.158
<i>Discrete</i>	44,383	0.468	0.499	0.000	0.000	1.000
<i>NOL</i>	44,383	0.485	0.500	0.000	0.000	1.000
<i>RetroLegislation</i>	44,383	0.149	0.356	0.000	0.000	0.000
<i>StockComp</i>	44,383	0.008	0.012	0.001	0.004	0.009
<i>BTD</i>	44,383	0.022	0.078	0.002	0.020	0.045
<i>ForIncome</i>	44,383	0.021	0.037	0.000	0.000	0.032
<i>TaxHaven</i>	44,383	1.624	2.796	0.000	0.000	2.000
<u>Operation Complexity Measures</u>						
<i>Leverage</i>	44,383	0.241	0.202	0.070	0.212	0.363
<i>Loss</i>	44,383	0.010	0.101	0.000	0.000	0.000
<i>MB</i>	44,383	3.124	5.048	1.413	2.245	3.709
<i>RD</i>	44,383	0.019	0.039	0.000	0.000	0.019
<i>ROA</i>	44,383	0.017	0.015	0.006	0.014	0.024
<i>Size</i>	44,383	8.008	1.791	6.779	7.983	9.144
<u>Information Environment and Disclosure Practice Measures</u>						
<i>Coverage</i>	44,383	10.654	7.829	4.000	9.000	16.000
<i>IO</i>	44,383	0.392	0.412	0.000	0.176	0.825
<i>Spread</i>	44,383	0.001	0.004	0.000	0.001	0.001
<i>StdRet</i>	44,383	0.092	0.053	0.057	0.079	0.112
<i>N_Disagg</i>	44,383	0.444	1.111	0.000	0.000	0.000

**Table 2 Descriptive Statistics (cont'd)**

**Panel B: Additional variables used in analyst ETR revision and accuracy tests**

	<b>N</b>	<b>Mean</b>	<b>Std Dev</b>	<b>P25</b>	<b>P50</b>	<b>P75</b>
<i>Mandatory ETR forecast</i>	6,477	0.304	0.106	0.255	0.318	0.365
<i>Voluntary ETR forecast</i>	6,477	0.313	0.073	0.273	0.320	0.365
<i>Voluntary ETR forecast (non-GAAP)</i>	1,496	0.294	0.073	0.250	0.300	0.350
<i>Voluntary ETR forecast (GAAP)</i>	606	0.326	0.095	0.280	0.340	0.380
<i>Voluntary ETR forecast (Unspecified)</i>	4,589	0.315	0.070	0.280	0.327	0.365
<i>Analyst ETR forecast<sub>pre-call</sub></i>	5,890	0.310	0.080	0.269	0.323	0.366
<i>Analyst ETR forecast<sub>post-call</sub></i>	6,477	0.307	0.084	0.264	0.319	0.363
<i>IBES implicit actual ETR</i>	6,477	0.301	0.094	0.257	0.316	0.361
<i>M_News</i>	5,890	-0.008	0.088	-0.029	-0.006	0.010
<i>V_News</i>	5,890	0.001	0.056	-0.012	-0.001	0.008
<i>V_News (non-GAAP)</i>	1,354	0.004	0.050	-0.010	0.000	0.013
<i>V_News (GAAP)</i>	557	0.029	0.103	-0.011	0.001	0.040
<i>V_News (Unspecified)</i>	4,182	-0.003	0.048	-0.012	-0.001	0.005
<i>A_Rev</i>	5,890	-0.004	0.036	-0.011	-0.002	0.004
<i>M_Acc</i>	6,477	-0.049	0.084	-0.052	-0.019	-0.007
<i>V_Acc</i>	6,477	-0.035	0.059	-0.035	-0.013	-0.005
<i>V_Acc (non-GAAP)</i>	1,496	-0.035	0.061	-0.036	-0.013	-0.005
<i>V_Acc (GAAP)</i>	606	-0.056	0.091	-0.060	-0.018	-0.006
<i>V_Acc (Unspecified)</i>	4,589	-0.032	0.052	-0.033	-0.013	-0.005
<i>A_Acc</i>	6,477	-0.033	0.057	-0.033	-0.013	-0.005
<i>A_Acc<sub>precall</sub></i>	5,890	-0.035	0.057	-0.037	-0.015	-0.006
<i>IMR</i>	6,477	2.802	4.999	0.554	0.707	3.878
<i>A_EPS_Rev</i>	6,473	0.000	0.007	-0.001	0.000	0.002
<i>V_EPS_News</i>	3,802	0.000	0.004	-0.001	0.000	0.001

Note: Variable definitions are listed in Appendix C. All continuous variables (except for ETRs) are winsorized at 1% tails.

**Table 3 The Determinants of Issuing Voluntary ETR Forecasts (H1)**

	(1) <i>Guide</i>	(2) <i>NonGAAP Guide</i>
<u><i>Tax Complexity</i></u>		
<i>ΔETR</i>	0.255*** (0.095)	0.135 (0.213)
<i>σETR</i>	0.081 (0.147)	0.582* (0.335)
<i>PermDiff</i>	-0.236** (0.112)	0.840*** (0.216)
<i>Discrete</i>	0.059*** (0.021)	0.271*** (0.045)
<i>NOL</i>	0.084*** (0.026)	-0.034 (0.055)
<i>RetroLegislation</i>	0.028 (0.024)	-0.035 (0.047)
<i>StockComp</i>	-0.215 (1.160)	3.077 (2.628)
<i>BTD</i>	-0.011 (0.129)	-0.068 (0.267)
<i>ForIncome</i>	1.068*** (0.389)	0.244 (0.748)
<i>TaxHaven</i>	0.019*** (0.005)	0.015 (0.009)
<u><i>Operation Complexity</i></u>		
<i>Leverage</i>	-0.087 (0.076)	0.120 (0.170)
<i>Loss</i>	0.054 (0.092)	-0.208 (0.190)
<i>MB</i>	0.004** (0.002)	-0.005 (0.003)
<i>RD</i>	-0.327 (0.399)	2.133*** (0.792)
<i>ROA</i>	0.215 (0.863)	-5.074*** (1.949)
<i>Size</i>	-0.028** (0.013)	0.016 (0.030)
<u><i>Information Environment and Disclosure Practice</i></u>		
<i>Coverage</i>	0.005* (0.002)	-0.001 (0.005)
<i>IO</i>	0.043 (0.032)	-0.049 (0.065)
<i>Spread</i>	-38.929*** (8.112)	-67.398*** (21.718)
<i>StdRet</i>	-0.415* (0.238)	0.022 (0.609)
<i>Guide<sub>q-1</sub></i>	1.282*** (0.026)	1.808*** (0.060)
<i>N_Disagg</i>	0.077*** (0.012)	-0.020 (0.024)
<i>Constant</i>	-1.685*** (0.241)	-2.027*** (0.614)
Observations	44,383	10,026

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**Table 3** (*cont'd*)

Cluster	Firm	Firm
Year FE	Yes	Yes
Industry FE	Yes	Yes
Quarter FE	Yes	Yes
Pseudo R2	0.229	0.295

This table presents the results of estimating Eq. (1). The dependent variable is the issuance of voluntary (non-GAAP) annual ETR forecast in a given quarter - *Guide (NonGAAP\_Guide)* – in Column 1 (2). In Column 1, the sample consists of firms with and without voluntary ETR forecasts. In Column 2, the sample only includes firm-quarters with voluntary annual ETR forecasts. Variable definitions are listed in Appendix C. Numbers in parentheses are robust standard errors clustered by firm. \*\*\*, \*\*, and \* denote statistical significance at the 0.01, 0.05 and 0.10 levels, respectively, using one-tailed test when there is a directional prediction and two-tailed test otherwise.

**Table 4 The Incremental Informativeness of Voluntary ETR Forecasts: The Relation Between News in Voluntary ETR Forecasts and Analyst ETR Revisions (H2)**

	DV = $A_{Rev}$			
	(1) All types	(2) Non-GAAP	(3) GAAP	(4) Unspecified
<i>V_News</i>	0.185*** (0.027)	0.244*** (0.056)	0.149** (0.061)	0.151*** (0.038)
<i>M_News</i>	0.047** (0.020)	0.011 (0.023)	0.121** (0.057)	0.069*** (0.025)
$\Delta ETR$	-0.000 (0.013)	0.020 (0.022)	0.005 (0.034)	-0.009 (0.015)
$\sigma ETR$	0.001 (0.010)	0.009 (0.021)	0.052 (0.051)	-0.004 (0.011)
<i>PermDiff</i>	-0.030** (0.013)	-0.019 (0.019)	0.057 (0.034)	-0.046*** (0.017)
<i>Discrete</i>	-0.001 (0.001)	-0.002 (0.003)	-0.007 (0.005)	0.000 (0.001)
<i>NOL</i>	-0.001 (0.001)	-0.001 (0.003)	0.001 (0.006)	-0.001 (0.001)
<i>RetroLegislation</i>	-0.002 (0.001)	-0.002 (0.003)	0.000 (0.009)	-0.003 (0.002)
<i>StockComp</i>	0.156 (0.129)	0.129 (0.254)	0.446 (0.337)	0.063 (0.066)
<i>BTD</i>	0.043 (0.029)	0.057 (0.043)	0.002 (0.040)	0.031 (0.027)
<i>ForIncome</i>	0.037* (0.019)	0.059 (0.037)	0.018 (0.092)	0.043** (0.020)
<i>TaxHaven</i>	0.000 (0.000)	0.001 (0.000)	0.002 (0.001)	0.000 (0.000)
<i>Leverage</i>	-0.011*** (0.003)	-0.017* (0.010)	-0.041* (0.021)	-0.009** (0.004)
<i>Loss</i>	0.046*** (0.015)	0.042* (0.026)	-0.021 (0.052)	0.052*** (0.017)
<i>MB</i>	-0.000** (0.000)	-0.000* (0.000)	-0.000 (0.000)	-0.000 (0.000)
<i>RD</i>	-0.040 (0.027)	-0.037 (0.054)	-0.232** (0.108)	-0.011 (0.022)
<i>ROA</i>	0.007 (0.069)	0.018 (0.174)	0.433** (0.202)	-0.036 (0.055)
<i>Size</i>	0.001 (0.001)	0.001 (0.001)	0.008** (0.004)	0.000 (0.001)
<i>Coverage</i>	-0.000 (0.000)	-0.000 (0.000)	-0.001* (0.000)	-0.000 (0.000)
<i>IO</i>	-0.001 (0.001)	0.002 (0.003)	0.002 (0.006)	0.000 (0.002)
<i>Spread</i>	0.177 (1.030)	11.416* (6.553)	0.845 (2.351)	-0.906 (0.961)
<i>StdRet</i>	-0.041** (0.019)	-0.045 (0.038)	-0.086* (0.048)	-0.044** (0.022)
<i>Guide<sub>q-1</sub></i>	0.000 (0.001)	0.002 (0.003)	0.000 (0.009)	0.001 (0.002)

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**Table 4 (cont'd)**

<i>InvMills</i>	-0.000 (0.000)	-0.000 (0.000)	0.001 (0.001)	0.000 (0.000)
Constant	0.001 (0.009)	-0.011 (0.017)	-0.069* (0.039)	0.007 (0.011)
Test: $V\_News = M\_News$	p-value = 0.001	p-value = 0.001	p-value = 0.803	p-value = 0.166
Observations	6,140	1,394	574	4,379
R-squared	0.143	0.163	0.275	0.156
Cluster	Firm	Firm	Firm	Firm
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes

This table presents the results of estimating Eq. (2). Column 1 is estimated using voluntary annual ETR forecasts issued in the first, second, and third fiscal quarter earnings conference calls (see Figure 1 Panel B). Columns 2-4 are estimated using subsamples of firm-quarters with voluntary annual non-GAAP, GAAP, and unspecified ETR forecasts, respectively. Variable definitions are listed in Appendix C. Numbers in parentheses are robust standard errors clustered by firm. \*\*\*, \*\*, and \* denote statistical significance at the 0.01, 0.05 and 0.10 levels, respectively, using one-tailed test when there is a directional prediction and two-tailed test otherwise.



**Table 5 The Incremental Informativeness of Voluntary ETR Forecasts – The Role of Discrete Tax Items (H3)**

**Panel A. Firm-quarters with discrete items**

VARIABLES	DV = $A_{Rev}$			
	(1) All Types	(2) non-GAAP	(3) GAAP	(4) Unspecified
$V\_News$	0.207*** (0.029)	0.303*** (0.059)	0.156** (0.074)	0.170*** (0.042)
$M\_News$	0.032* (0.018)	0.012 (0.019)	0.121* (0.065)	0.036 (0.027)
Controls	Yes	Yes	Yes	Yes
Test: $V\_News = M\_News$	p-value = 0.000	p-value = 0.000	p-value = 0.791	p-value = 0.034
Observations	3,144	982	373	1,951
R-squared	0.152	0.208	0.320	0.141
Cluster	Firm	Firm	Firm	Firm
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes

**Panel B. Firm-quarters without discrete items**

VARIABLES	DV = $A_{Rev}$			
	(1) All Types	(2) non-GAAP	(3) GAAP	(4) Unspecified
$V\_News$	0.156*** (0.042)	0.070 (0.103)	0.106 (0.092)	0.135*** (0.042)
$M\_News$	0.089* (0.049)	0.025 (0.070)	0.238*** (0.056)	0.130*** (0.031)
Controls	Yes	Yes	Yes	Yes
Test: $V\_News = M\_News$	p-value = 0.404	p-value = 0.771	p-value = 0.278	p-value = 0.927
Observations	2,996	412	201	2,428
R-squared	0.183	0.381	0.618	0.254
Cluster	Firm	Firm	Firm	Firm
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes

This table presents the results of estimating Eq. (2). Panel A (B) is estimated in the subsample where the quarterly actual GAAP ETR differs from the actual ETR inferred from IBES by more (less) than 0.5%. In both panels, Column 1 is estimated using voluntary annual ETR forecasts issued in the first, second, and third fiscal quarter earnings conference calls (see Figure 1 Panel B). Columns 2-4 are estimated using subsamples of firm-quarters with voluntary annual non-GAAP, GAAP, and unspecified ETR forecasts, respectively. Variable definitions are listed in Appendix C. Numbers in parentheses are robust standard errors clustered by firm. \*\*\*, \*\*, and \* denote statistical significance at the 0.01, 0.05 and 0.10 levels, respectively, using one-tailed test when there is a directional prediction and two-tailed test otherwise.

**Table 6 The Incremental Informativeness of Voluntary ETR Forecasts – Non-Mimicking Analyst ETR Forecast Subsample**

VARIABLES	DV = <i>A_Rev</i>			
	(1) All Types	(2) non-GAAP	(3) GAAP	(4) Unspecified
<i>V_News</i>	0.181*** (0.028)	0.252*** (0.060)	0.149** (0.063)	0.136*** (0.041)
<i>M_News</i>	0.044** (0.020)	0.016 (0.021)	0.122** (0.060)	0.064** (0.026)
Controls	Yes	Yes	Yes	Yes
Test: <i>V_News</i> = <i>M_News</i>	p-value = 0.002	p-value = 0.001	p-value = 0.819	p-value = 0.247
Observations	4,653	1,203	482	3,153
R-squared	0.137	0.178	0.281	0.143
Cluster	Firm	Firm	Firm	Firm
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes

This table presents the results of estimating Eq. (2) using the subsample where analyst consensus ETR forecast differs from mandatory ETR forecast by more than 0.5%. Column 1 is estimated using voluntary annual ETR forecasts issued in the first, second, and third fiscal quarter earnings conference calls (see Figure 1 Panel B). Columns 2-4 are estimated using subsamples of firm-quarters with voluntary annual non-GAAP, GAAP, and unspecified ETR forecasts, respectively. Variable definitions are listed in Appendix C. Numbers in parentheses are robust standard errors. \*\*\*, \*\*, and \* denote statistical significance at the 0.01, 0.05 and 0.10 levels, respectively, using one-tailed test when there is a directional prediction and two-tailed test otherwise.

**Table 7 Voluntary ETR Forecast Accuracy and Analyst ETR Forecast Accuracy**

VARIABLES	DV = <i>A_Acc</i>			
	(1) All Types	(2) non-GAAP	(3) GAAP	(4) Unspecified
<i>V_Acc</i>	0.073*** (0.028)	0.135*** (0.052)	0.091* (0.054)	0.079** (0.039)
<i>M_Acc</i>	0.083*** (0.016)	0.053*** (0.018)	-0.063 (0.048)	0.118*** (0.025)
<i>A_Acc<sub>pre-call</sub></i>	0.719*** (0.028)	0.683*** (0.052)	0.569*** (0.078)	0.729*** (0.035)
$\Delta ETR$	-0.005 (0.009)	0.013 (0.017)	0.010 (0.022)	-0.007 (0.012)
$\sigma ETR$	-0.000 (0.009)	-0.007 (0.015)	0.043 (0.042)	-0.000 (0.010)
<i>PermDiff</i>	0.029*** (0.008)	0.007 (0.014)	-0.015 (0.029)	0.043*** (0.009)
<i>Discrete</i>	0.002 (0.001)	0.001 (0.002)	-0.001 (0.004)	0.001 (0.001)
<i>NOL</i>	0.001 (0.001)	0.003 (0.002)	0.006 (0.005)	0.001 (0.001)
<i>RetroLegislation</i>	0.000 (0.001)	-0.001 (0.002)	-0.006 (0.007)	0.001 (0.001)
<i>StockComp</i>	-0.012 (0.087)	-0.146 (0.168)	-0.212 (0.287)	0.053 (0.063)
<i>BTD</i>	-0.015 (0.012)	-0.039 (0.025)	-0.012 (0.013)	0.002 (0.008)
<i>ForIncome</i>	-0.002 (0.011)	0.032 (0.027)	0.126* (0.071)	-0.012 (0.012)
<i>TaxHaven</i>	-0.000 (0.000)	-0.000 (0.000)	0.000 (0.001)	-0.000 (0.000)
<i>Leverage</i>	-0.006* (0.003)	0.006 (0.007)	-0.021 (0.016)	-0.007* (0.003)
<i>Loss</i>	-0.001 (0.012)	0.017 (0.019)	-0.078** (0.032)	-0.005 (0.015)
<i>MB</i>	0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	0.000 (0.000)
<i>RD</i>	0.022 (0.018)	0.071** (0.035)	-0.026 (0.077)	-0.028 (0.018)
<i>ROA</i>	0.067* (0.040)	0.006 (0.089)	0.325 (0.197)	0.078* (0.041)
<i>Size</i>	0.000 (0.001)	0.000 (0.001)	-0.003 (0.002)	0.001* (0.001)
<i>Coverage</i>	-0.000 (0.000)	0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)
<i>IO</i>	-0.001 (0.001)	-0.001 (0.002)	-0.002 (0.005)	-0.000 (0.001)
<i>Spread</i>	-0.162 (0.720)	-4.163 (4.807)	1.780 (1.848)	0.355 (0.733)

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**Table 7 (cont'd)**

<i>StdRet</i>	-0.032** (0.014)	-0.029 (0.035)	-0.094** (0.041)	-0.014 (0.014)
<i>Guide<sub>q-1</sub></i>	0.001 (0.001)	0.003 (0.002)	0.012** (0.006)	-0.001 (0.001)
<i>InvMills</i>	0.000 (0.000)	0.000 (0.000)	0.001 (0.001)	-0.000 (0.000)
<i>Constant</i>	0.002 (0.007)	-0.001 (0.015)	-0.030 (0.029)	-0.007 (0.007)
Test: $V\_Acc = M\_Acc$	p-value = 0.786	p-value = 0.157	p-value = 0.088	p-value = 0.503
Observations	5,890	1,354	557	4,182
R-squared	0.737	0.752	0.601	0.777
Cluster	Firm	Firm	Firm	Firm
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes

This table presents the results of estimating Eq. (2). We replace the dependent variable in Eq. (2) with post-call analyst ETR forecast accuracy ( $A\_Acc$ ). The independent variables –  $V\_News$  and  $M\_News$  – are replaced with voluntary ETR forecast accuracy ( $V\_Acc$ ) and mandatory ETR forecast accuracy ( $M\_Acc$ ). We additionally control for pre-call analyst ETR forecast accuracy ( $A\_Acc_{precall}$ ). Column 1 is estimated using voluntary annual ETR forecasts issued in the first, second, and third fiscal quarter earnings conference calls (see Figure 1 Panel B). Columns 2-4 are estimated using subsamples of firm-quarters with voluntary annual non-GAAP, GAAP, and unspecified ETR forecasts, respectively. Variable definitions are listed in Appendix C. Numbers in parentheses are robust standard errors clustered by firm. \*\*\*, \*\*, and \* denote statistical significance at the 0.01, 0.05 and 0.10 levels, respectively, using one-tailed test when there is a directional prediction and two-tailed test otherwise.

**Table 8 The Incremental Informativeness of Voluntary ETR Forecasts – Controlling for Management EPS Guidance and Analyst EPS Forecasts**

VARIABLES	DV = <i>A Rev</i>			
	(1) All Types	(2) Non-GAAP	(3) GAAP	(4) Unspecified
<i>V_News</i>	0.244*** (0.031)	0.326*** (0.074)	0.205** (0.080)	0.225*** (0.045)
<i>M_News</i>	0.040*** (0.013)	0.036* (0.019)	0.095 (0.071)	0.041*** (0.014)
<i>A_EPS_Rev</i>	-0.527*** (0.147)	-0.574* (0.309)	-1.060 (0.709)	-0.379*** (0.136)
<i>V_EPS_News</i>	-0.110 (0.158)	-0.055 (0.471)	-0.006 (0.814)	-0.149 (0.159)
Controls	Yes	Yes	Yes	Yes
Test: <i>V_News</i> = <i>M_News</i>	p-value = 0.000	p-value = 0.000	p-value = 0.429	p-value = 0.000
Observations	3,621	863	351	2,562
R-squared	0.202	0.279	0.332	0.202
Cluster	Firm	Firm	Firm	Firm
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes

This table presents the results of estimating Eq. (2). We additionally control for analyst EPS forecast revision (*A\_EPS\_Rev*) and news in management EPS guidance (*V\_EPS\_News*). Column 1 is estimated using voluntary annual ETR forecasts issued in the first, second, and third fiscal quarter earnings conference calls (see Figure 1 Panel B). Columns 2-4 are estimated using subsamples of firm-quarters with voluntary annual non-GAAP, GAAP, and unspecified ETR forecasts, respectively. Variable definitions are listed in Appendix C. Numbers in parentheses are robust standard errors clustered by firm. \*\*\*, \*\*, and \* denote statistical significance at the 0.01, 0.05 and 0.10 levels, respectively, using one-tailed test when there is a directional prediction and two-tailed test otherwise.

**Table 9 The Incremental Informativeness of Voluntary ETR Forecasts: The Effect of Voluntary ETR Forecast Timing and Frequency**

**Panel A. Early- vs. late-within-year voluntary ETR forecasts**

	DV= <i>A Rev</i>		
	(1) 1 <sup>st</sup> Quarter	(2) 2 <sup>nd</sup> Quarter	(3) 3 <sup>rd</sup> Quarter
<i>V_News</i>	0.225*** (0.039)	0.132*** (0.036)	0.180*** (0.052)
<i>M_News</i>	0.029 (0.024)	0.091*** (0.026)	0.037 (0.047)
Controls	Yes	Yes	Yes
Test: <i>V_News</i> = <i>M_News</i>	p-value = 0.000	p-value = 0.439	p-value = 0.117
Observations	1,988	2,162	1,990
R-squared	0.190	0.189	0.137
Cluster	Firm	Firm	Firm
Year FE	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes
Quarter FE	No	No	No

**Panel B. Frequency of issuing voluntary ETR forecasts**

VARIABLES	DV = <i>A Rev</i>	
	(1) Frequent Issuers	(2) Sporadic Issuers
<i>V_News</i>	0.216*** (0.039)	0.176*** (0.031)
<i>M_News</i>	0.032 (0.025)	0.052** (0.023)
Controls	Yes	Yes
Test: <i>V_News</i> = <i>M_News</i>	p-value = 0.000	p-value = 0.012
Observations	2,441	3,699
R-squared	0.175	0.145
Cluster	Firm	Firm
Year FE	Yes	Yes
Industry FE	Yes	Yes
Quarter FE	Yes	Yes

This table presents the results of Eq. (2) estimated using various subsamples. In Panel A, Columns 1-3 report results estimated using voluntary ETR forecasts issued in the first, second, and third fiscal quarter earnings conference calls, respectively (see Figure 1 Panel B). In Panel B, Column 1 (2) reports results for frequent (sporadic) issuers. Frequent (sporadic) issuers are defined as firms providing voluntary ETR forecasts more than (smaller than or equal to) twice during the prior four quarters. Variable definitions are listed in Appendix C. Numbers in parentheses are robust standard errors clustered by firm. \*\*\*, \*\*, and \* denote statistical significance at the 0.01, 0.05 and 0.10 levels, respectively, using one-tailed test when there is a directional prediction and two-tailed test otherwise.