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Corporate financial reporting and taxes: How important is prior performance?

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Abstract

***Research Question*:** How do firms behave after significantly missing or exceeding analysts' earnings estimates in terms of managing earnings and avoiding taxes?

***Motivation*:** Prior research provides strong evidence suggesting that managers are motivated to perform at or above analysts' expectations and steer earnings higher to prevent unpleasant earnings surprises. Prior studies have also documented that firms are likely to manage their earnings when they are close to meeting or missing analysts' expectations. However, little is known about how firms behave after either substantially missing or beating analyst earnings estimates.

***Idea*:** This study provides evidence on firms' earnings management and tax avoidance activities subsequent to the year in which firms substantially fail or succeed meeting analysts' earnings consensus forecasts.

Data: The data were collected from a sample of South Korean firms listed on the Korean Composite Stock Price Index for the years between 2013 and 2020.

***Tools*:** Multiple panel data regressions and robustness tests were conducted. Propensity score matching is also used to minimize endogeneity related problems.

***Findings*:** Firms are more likely to manage their earnings upward subsequent to significantly missing analysts' expectations. However, their tendency to avoid taxes is lower.

***Contribution*:** Little has been explored on how firms significantly missing analysts' expectations could behave in the subsequent period. The findings reported in this study have important implications for regulators, investors, and auditors. This research is also different from most prior related studies in terms of its setting.

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1. Introduction

Kasznik (1999) and lots of subsequent studies document that managers tend to report earnings that meet or beat analysts' consensus estimates. Graham *et al.* (2005) found that firms are more likely to manage their earnings when they are close to meeting or missing analysts' expectations. Meeting or beating expectations signals better future performance (Bartov *et al.*, 2002) and, therefore, increases stock price (Kasznik & Mcnichols, 2002). On the other hand, the stock market reacts negatively to failure to meet analysts' expectations (Skinner and Sloan, 2001). Failure to meet expectations is also related to a higher firm's transaction costs with its customers, suppliers, lenders, and employees (Brown & Caylor, 2005)**.** Therefore, managers perceive benefits from managing earnings upward to avoid negative earnings surprises. However, we rarely know how firms behave subsequent to significantly missing analysts' expectations. This study attempts to understand firms' behavior subsequent to significantly missing analysts' expectations by focusing on their earnings management and tax avoidance activities. Consistent with Frank *et al.* (2009), we define earnings management as upward earnings manipulation to increase reported accounting income and tax avoidance as downward manipulation of taxable income through tax planning that may or may not be considered fraudulent tax evasion.

Earlier research on the relationship between accounting income and corporate taxes assumed a tradeoff between the two (see Shackelford & Shevlin, 2001, for reviews). That is, managers trying to boost accounting income pay more taxes because they report higher taxable income, and vice versa. Consistent with this prediction, Erickson *et al.* (2004) find evidence showing that "a sample of 27 U.S. firms who were accused by the SEC of fraudulently overstating their earnings during the years 1996 to 2002 paid approximately an amount equal to 1.3 percent of their market value in taxes on the overstated earnings". However, later studies show that firms do not always trade-off financial and tax reporting decisions. For example, when managers manipulate earnings upward, they may report taxable income at lower amount and save cash taxes instead of reporting the inflated income in tax reports (see Hanlon & Heizman, 2010, for reviews). Using a sample of 8,100 U.S. firms for the period ranging from 1991 to 2005, Frank *et al.* (2009) are pioneers in providing evidence supporting the later prediction that firms manipulate both by inflating their accounting income and deflating their taxable income simultaneously.

While taxes represent a major part of firms' cash payments and firms are likely to be eager to invest in tax planning, the notion that firms simultaneously manipulate both financial reporting (accounting) income and taxable income is not widely accepted. Inflating accounting income, while understating taxable income, widens the gap between the two incomes. This gap or difference is called the book-tax difference. Firms with large book-tax differences could face two problems. First, book-tax differences could provide information to the market about the earnings manipulation, which would reduce the credibility of reported earnings and adversely affect firm value (Desai & Dharmapala, 2005). Second, large book-tax differences may provide a "red flag" and increase the likelihood that firms' tax manipulations would be detected if the taxing authority uses book-tax differences as an indicator of some form of tax aggressiveness (Hoopes *et al.*, 2012; Kubick *et al.*, 2016). Consequently, as opposed to Frank *et al.* (2009), Lennox *et al.* (2013) provide evidence against the notion of simultaneous manipulation by showing that accounting fraud falls with increased tax aggressiveness. Therefore, using data collected from a sample of South Korean firms listed on the Korean Composite Stock Price Index for the years between 2013 and 2020, this study provides additional evidence on firms' earnings management and tax avoidance activities subsequent to the year in which firms fail or succeed meeting analysts' expectations.

Firms that feel outcompeted by their competitors and incompetent to achieve their own expectations because they missed analysts' expectations in the prior year are likely to take risks and strive more to reverse the poor-performance and reclaim the status quo (Eggers & Kaul, 2018), motivated by their myopic desire to meet or beat the expected performance (Xu *et al.*, 2019). Therefore, such firms are likely to manage their earnings upward. However, our results in this study show that the tendency to avoid taxes decreases. There are two possible explanations for firms not aggressively lowering their taxes subsequent to missing analysts' expectations. First, such firms try to hide their income-increasing earnings management activities to protect their reputation (Desai & Dharmapala, 2005). Avoiding more taxes could widen the gap between reported financial income and tax income, and such book-tax differences could provide information to the public that earnings are manipulated (Hanlon & Heizman, 2010). Second, increased book-tax differences increase scrutiny from regulatory agencies, posing the risk that regulatory measures could be taken if the financial or tax related misstatements get identified (Hoopes *et al.*, 2012; Kubick *et al.*, 2016).

This study has at least three important contributions to the existing literature. First, while it is documented that firms manage their earnings to meet analysts' expectations (Burgstahler & Dichev, 1997; Brown, 1997; Graham *et al.*, 2005, Koh *et al.*, 2008), little has been explored on how firms significantly missing analysts' expectations could behave in the subsequent period. Particularly, we document that firms that substantially missed analysts' expectations in the prior year are more likely to manage their current earnings upward. Second, we also posit an important finding

on the relationship between earnings management and tax avoidance consistent with the existing research claiming that managers boosting their accounting income also pay more taxes to avoid the costs related to loss of reputation and regulatory burden (Lennox *et al.*, 2013). This finding has important implications for regulators, investors, and auditors. The results of this study may indicate that the benefits (costs) related to tax avoidance are lower (severe) compared to the risk of inaccurate financial reporting.

Finally, this research is different from most prior related studies in terms of its research setting. While the majority of prior research examining the determinants of corporate tax avoidance has been conducted primarily in the United States (Kanagaretnam *et al.*, 2016), our study is based on South Korean firms and adds empirical evidence to the relevant literature. In addition to being an Asian nation, while the majority of previous research has focused on Western nations, South Korea is an intriguing country for this study. According to Doupnik (2008), the Korean culture is distinguished from most Western nations, including the United States, by its higher level of uncertainty avoidance and lesser level of individualism. Doupnik also finds that countries with higher levels of uncertainty avoidance and lower levels of individualism engage in more earnings smoothing activities than other nations. Another study of 34 countries by Blaylock *et al.* (2014) reveals that South Korea is among the nations with the highest level of discretionary accruals. Higher levels of uncertainty avoidance and lower levels of individualism are also associated with greater tax evasion, according to a study of 50 nations including South Korea (Tsakumis *et al.*, 2007). Consequently, this research is conducted in a nation with an anticipated higher level of earnings management and tax evasion.

The rest of this paper is organized as follows: In Section 2, we discuss related research and develop hypotheses on the relationships between missing analysts' expectations, earnings management, and tax avoidance. We describe the measures of our variables of interest and empirical models in Section 3. We discuss the main results and present additional tests in Section 4. We provide our conclusions and limitations in Section 5.

2. Hypotheses development

2.1 Analysts' expectations and earnings management

Firms sometimes falsify their financial reports and raise reported financial performance to meet or beat a given performance goal. Managers may interfere in the financial reporting system of the firm by exercising discretion and judgment regarding accounting choices and misrepresenting the true performance of the firm without altering operations (Kothari *et al.*, 2016). Extant research shows that managers relied extensively on upward earnings management and downward

expectations management to meet or beat analyst forecasts (Kasznik, 1999; Matsumoto, 2002; Bartov *et al.*, 2002; Dhaliwal *et al.*, 2004; Burgstahler & Eames, 2006). Meeting or beating expectations signals better future performance (Bartov *et al.*, 2002) and, therefore, increases stock price (Kasznik & Mcnichols, 2002). On the other hand, the stock market reacts negatively to failure to meet analysts' expectations (Skinner and Sloan, 2001). Failure to meet expectations is also related to a higher firm's transaction costs with its customers, suppliers, lenders, and employees (Brown & Caylor, 2005). Therefore, managers perceive benefits from managing earnings upward to avoid negative earnings surprises. However, all firms are not equally vulnerable to such acts. Nelson & Skinner (2013) made estimates based on survey responses from chief finance officers and found that only 20% of firms misrepresent earnings in a given accounting period.

Falsifying financial reports poses a risk to the firm and its stakeholders (Harris & Bromiley, 2007). Once such manipulations are detected, one may expect a decline in the firm's reputation and stock price and an increase in the costs related to scrutiny and penalties from regulatory and monitoring bodies. A revelation of an earnings management activity decreases the firm's transparency and increases its cost of capital and the manager's risk of ouster (Dechow *et al.*, 1996; Hazarika *et al.*, 2012), but managers still have incentives to take risks and manage earnings upward. Managers' compensation and stock ownership in the firm could be related to meeting or beating a given target (Cheng & Warfield, 2005; McVay *et al.*, 2006). Lower audit quality, which may not be able to uncover the misstatements in the financial statements, is also found to be among the factors triggering earnings management (Brown and Pinello, 2007). A large number of studies have also documented the determinants and consequences of earnings management for meeting or beating analyst forecasts (Dechow *et al.*, 2010). However, no prior study has documented how firms would behave in the year following their failure to meet analysts' forecast targets.

According to the behavioral theory of the firm (BTOF), firms that perform below their aspired target level intend to take more risk in the subsequent period than firms that perform above their target level. Such firms feel outcompeted by their competitors and incompetent to achieve their own expectations and, therefore, strive more to reverse the poor-performance and reclaim the status quo (Eggers & Kaul, 2018). Therefore, the lower the performance (relative to the target level), the higher the managers' risk-taking and motivation for change, driven by the search for ways to improve performance (Lehman & Hahn, 2013). This notion has broad empirical support. Bromiley (1991) finds a negative relationship between prior firm performance and risk-taking as measured by the variance in security analysts' earnings forecasts. Rudy & Johnson (2013) find that performance declines lead to a subsequent increase in firms' lobbying activities in an attempt to improve economic performance by engaging in political action. Xu *et al.* (2019) also document more bribery spending by Chinese firms with prior lower performance compared to their

targets. Consistent with this proposition, Harris & Bromiley (2007) find an inverse relationship between firms' prior relative performance (measured by the difference between the firm's return on assets and its historical or industry average return on assets) and the probability of making restatements to their financial statements. There are also some pieces of evidence in the accounting literature implying the existence of a positive relationship between performance shortfall and earnings management. Studies find the existence of a negative relationship between prior year(s) poor performance (loss) and the current year's earnings quality (Dechow & Dichev, 2002; Prawitt, 2009). Firms performing below their target are more likely to take deviant risks motivated by their myopic desire to meet or beat the target level (Xu *et al.*, 2019) and, therefore, are expected to aggressively engage in income-increasing earnings management. The first hypothesis is stated as follows:

> **H_{1a}**: Firms performing far below the analysts' expectations in the prior period tend to show more income-increasing earnings management during the current period.

However, as performance rises above the aspiration level, there is no longer strong problem-driven motivation for the firm to solve. A negative event in a successful company is more likely to attract public attention than in average firms due to stakeholders' high expectations (Zavyalova *et al.*, 2016). Managers of such firms would prefer to be long-term oriented and avoid activities that would impact their reputation (Xu *et al.*, 2019). Therefore, firms performing substantially above their target are less likely to aggressively engage in income-increasing earnings management.

> **H_{1b}**: Firms performing far above the analysts' expectations in the prior period tend to show lower income-increasing earnings management during the current period.

2.2 Analysts' expectations and corporate taxes

Several accounting studies examine a range of factors associated with tax avoidance. Most of the determinant factors identified in the literature are related to managers' incentives and compensation. An earlier study (Phillips, 2003) finds that compensating business unit managers on an after-tax basis is associated with higher tax avoidance, and Atwood *et al.* (2012) document the importance of management compensation base in examining corporate tax avoidance. Consistent with their hypothesis that managers expect greater personal benefits from increased tax avoidance, Rego and Wilson (2012) and Armstrong *et al.* (2015) find that firms at which managers have relatively larger risk-taking equity incentives engage in more tax avoidance, which is also supported by the evidence that firms increase tax avoidance following hedge fund intervention events" (Cheng *et al.*, 2012).

Armstrong *et al.* (2012) find that tax executives' compensation is negatively associated with GAAP effective tax rate (i.e., positively associated with tax avoidance). Dyreng *et al.* (2010) also document that specific members of the top management team (CEO, CFO, or others) play a significant role in determining the level of tax avoidance that firms undertake. While Dhaliwal *et al.* (2004), Krull (2004), Frank and Rego (2006), and Gupta *et al.* (2015) provide evidence that managers lower accrued tax expenses to meet or beat analysts' forecasts, the relationship between the firm's performance relative to analysts' expectations and their subsequent tax avoidance behavior is not clear.

According to studies conducted based on the BTOF, as performance decreases far below the target level, the organization typically faces increasing resource constraints (Audia & Greve, 2006) and, therefore, is likely to prefer resource-freezing or cheaper activities such as divestment than highly resource-consuming investments such as acquisitions and research and development (Kuusela *et al.*, 2016). Generating additional funds via tax planning does not come at the cost of reduced productive investment, making constrained firms receptive to using tax planning as a source of cash (Edwards *et al.*, 2016). It is also expected that the greater the performance shortfall below the target level, the more likely the firm will take deviant actions in its eagerness to restore its performance to the target level (Xu *et al.*, 2019). By lowering their tax burden, firms can increase their after-tax profits and attempt to meet forecasted earnings per share. Therefore, one would expect that firms that failed to meet analysts' expectations in the prior year would have higher tax avoidance levels (low tax rates) compared to other firms. However, while taxes are a major part of firms' cash payments and firms are likely to be eager to invest in tax planning, the notion that firms simultaneously manipulate both financial reporting (accounting) income and taxable income is a very risky decision. Inflating accounting income while understating taxable income could widen the gap between the two incomes (book-tax difference). Lennox *et al.* (2013) provide evidence against the notion of such simultaneous manipulations by showing that accounting fraud in the United States fell with tax aggressiveness for the years from 1981 to 2001.

Hanlon and Heizman (2010) discuss two problems that firms with large book-tax differences could face. First, book-tax differences could provide information to the market about the earnings manipulation reducing the credibility of reported earnings and adversely affecting firm value. Desai and Dharmapala (2005) reported that the value-relevance of reported earnings have decreased with the widening of book-tax differences. Second, large book-tax differences may raise a red flag and increase the likelihood that firms' tax manipulations will be detected if the taxing authority uses book-tax differences as an indicator of some form of tax aggressiveness. The findings by Hoopes *et al.* (2012) provide evidence that a firm's tax avoidance level decreases with an increase in the probability that it will be audited by the Internal Revenue Service (IRS). Kubick *et al.* (2016) also find that large book-tax differences

increase Securities Exchange Commission (SEC) scrutiny and that firms engage in lower tax avoidance after receiving tax-related comment letters from the SEC. Therefore, whether firms performing substantially below the analysts' expectations are likely to avoid more taxes in the subsequent year or not is an empirical question. We put our third hypothesis in null form.

> **H_{2a}**: Compared to others, firms performing far below the analysts' expectations in the prior period do not avoid more taxes during the current period.

On the other hand, as performance rises above the analysts' estimates, such firms are less likely to manipulate their earnings, and book-tax differences are not a concern. Additionally, such firms are more likely to report higher profits and pay more taxes than expected. Consistent with this notion, prior research on Korean firms shows a positive relationship between profitability and tax avoidance (Park *et al.*, 2015). Therefore, firms performing substantially above the analysts' estimates are more likely to engage in tax planning activities and avoid taxes in the future.

> **H_{2b}**: Firms performing far above the analysts' expectations in the prior period tend to avoid more taxes during the current period.

3 Research design and data

3.1 Variables measurement

Dependent variable:

Tax Avoidance*:* The two most popular metrics for tax avoidance are used in this study. Current book effective tax rate ($GAAP\_ETR_{it}$), that represents tax-avoidance activities that directly affect net income, is the ratio of total tax expense less deferred taxes to pre-tax book income less special items (Cheng *et al.*, 2012). However, since ETR fails to reflect changes in tax accounting accruals which generate temporary tax differences (Hanlon & Heitzman, 2010), cash effective tax rate ($CASH\_ETR_{it}$) is primarily used in this study. $CASH\_ETR_{it}$ is cash taxes paid during the year divided by pre-tax book income less special items. Consistent with prior studies, we restrict $CASH\_ETR_{it}$ to fall in the interval between 0 and 1 and multiply each by -1".

Earnings Management **(EM_{it})*:*** This study uses the most popular earnings management metric (discretionary accrual) measured as a "performance-adjusted cross-sectional variation" of the modified Jones model (Kothari *et al.* 2005).

$$\frac{TA_{it}}{A_{it-1}} = \alpha_0 \frac{1}{A_{it-1}} + \alpha_1 \frac{\Delta S_{it} - \Delta R_{it}}{A_{it-1}} + \alpha_2 \frac{PPE_{it}}{A_{it-1}} + \alpha_3 ROA_{it} + \varepsilon_{it} \quad \text{..... (1)}$$

where TA_{it} is total accrual determined by deducting total operating cash flow from earnings before extraordinary items. A_{it-1} is total assets at the beginning of the year. ΔS_{it} and ΔR_{it} are changes in sales and receivables between year t_{-1} and year t, respectively. PPE_{it} is gross property, plant, and equipment, and ROA_{it} is return on assets. Year and industry dummies are included. The subscripts $_i$ and $_t$ indicate a specific firm and year to which the firm-year observations belong, respectively. After estimating the parameters in equation 1, the value of the residuals is used as a measure of earnings management (EM_{it}). Larger residual values indicate the existence of more income-increasing earnings management .

Independent variables:

Performance far Below Expectations (***PBE_{it-1}***)***:*** PBE_{it-1} is dummy coded 1 (0 otherwise) if the difference between the firm's actual earnings per share and expected earnings per share in the prior year is in the lowest tertile among the firms performing below the analysts' expectations. A firm is performing below/above the analysts' expectations if the firm's earnings per share in the prior year were less/more than the median earnings per share forecasted by the analysts. Consistent with prior studies, we use forecasts made within 90 days before the earnings announcement.

Performance far Above Expectations (***PBE_{it-1}***)***:*** PAE_{it-1} is dummy coded 1 (0 otherwise) if the difference between the firm's actual earnings per share and expected earnings per share in the prior year is in the highest tertile among the firms performing above the analysts' expectations.

Control Variables:

Several control variables that prior research has documented to be associated with tax avoidance and/or earnings management are included in the model. Firm size ($SIZE_{it}$) is the log of total assets of the firm at the end of the year. Prior studies show small and large firms respond differently to low performance (Audio & Greve, 2006), and large firms may have better resources and political sensitivity to plan and avoid more taxes (Kubick *et al.*, 2015). We also include the change in the operating cash flows (ΔCFO_{it}) deflated to beginning total assets. It is expected that existence of excess cash flow (Jenson, 1986) may affect the decision to take risky decisions, and therefore firms with excess cash reserves may be less likely to save cash using risky tax avoidance measures. Since current tax payments are likely to include amounts deferred from prior years, deferred tax liabilities (DTL_{it-1}) are controlled. DTL_{it-1} is the prior year's deferred tax liabilities deflated to total assets of the same period .

Consistent with McGuire *et al.* (2014) and others, we control firm capital intensity, growth opportunity, intangible assets, firms' accounting performance, leverage, and prior year accruals. Change in sales ($\Delta SALES_{it}$) is the difference between the current and prior years' sales revenues deflated to beginning total assets. $\Delta SALES_{it}$ is used to control a firm's growth opportunity. Fast-growing firms require more funds and

are more likely to enjoy greater marginal benefits from tax savings, and hence may avoid more taxes (Edwards *et al.*, 2016). PPE_{it} is a proxy for capital intensity calculated by dividing net property, plant, and equipment by lagged total assets. $INTN_{it}$ is a firm's intangible assets deflated to its beginning assets. ADV_{it} and $R\&D_{it}$ are advertising expenses and research and development expenses, respectively, both divided by sales. Firms' capital and intangible resource requirements and investments on advertisement and research may affect their desire to use additional tax planning opportunities and avoid more taxes (McGuire *et al.*, 2014). Profit margin (PM_{it}) and asset turnover ($TURN_{it}$) control accounting profitability and efficiency of a firm. PM_{it} is accounting income divided by sales, and $TURN_{it}$ is calculated by dividing sales to total assets. The desire to avoid taxes may increase with the amount of income earned. Leverage ($LEVER_{it}$) is measured as the ratio of total liabilities to total assets, which captures firm's borrowing ability. Firms with more leverage are less likely to engage in risk-taking behaviors (Iyer and Miller, 2008), and it is expected that they are less vulnerable to tax avoidance. We also include prior year total accruals ($ACCR_{it-1}$), calculated by deducting total operating cash flow from earnings before extraordinary items and deflating it to total assets, to control for the effect of prior accruals on current earnings management activities.

Finally, we control corporate governance, management's compensation and equity incentive, the firm's foreign stake, and firm's age. GOV_{it} is a dummy coded 1 if the firm is rated B+ or more for its corporate governance performance during the year by the Korea Corporate Governance Services (KCGS). $OPTIONS_{it}$ is the natural logarithm of the market value of equity options held by firms' top management. $COMP_{it}$ is the natural logarithm of total compensation paid to top management during the year. Poor governance and compensation-related incentives may increase managers' tendency to avoid taxes (Phillips, 2003; Atwood *et al.*, 2012). $FOREIGN_{it}$ is the percentage of the firm's stake in foreign countries. Firms with more foreign stakes are more likely to avoid taxes because of the tax incentives provided by foreign countries to attract foreign investors. AGE_{it} is the natural logarithm of the firm's age. Industry and year-fixed effects are also included to control for cross-sectional and time-varying effects.

3.2 Data and sample

This study used a sample of Korean firms listed on the KOSPI market. The sample period ranges from 2013 to 2020. We started from 2013 because our governance data is only available starting from 2012. Except for the governance (GOV_{it}) data, the data used in this study are extracted from the Fn Guide database for more than 800 companies listed on the KOSPI market. We obtain the governance data from the Korea Corporate Governance Services (KCGS). KCGS ranks firms from A+ to D for their corporate governance performance. Consistent with Kubick *et al.* (2015) and other prior studies, we exclude financial institutions, utility firms, firm-years

with fiscal year ends other than December and observations with missing data for any of the variables. We also exclude firm-years with negative total tax expense, cash taxes paid, pretax book income before special items, and discretionary accruals. After calculating the variables of interest, our final sample size comprises 2,511 firm-year observations. We winsorize each continuous variable at one percent and ninety-nine percent levels to eliminate the influence of outliers.

3.3 Empirical models

We test the four hypotheses stated above using the following multivariate regression models. The subscripts $_i$ and $_t$ refer to a specific firm and year to which the observation belongs, respectively. For parsimony, control variables are listed only in equation 2. All equations 2 to 4 use the same controls. The first two hypotheses predict a positive/negative relationship between performance far below/above analysts' expectations in the prior year and current income-increasing earnings management. If these hypotheses are supported, the coefficient estimate should be positive on $PBE_{it-1,}$ and negative on PAE_{it-1} in equation 2.

$$EM_{it} = \beta_0 + \beta_1 PBE_{it-1}/\ PAE_{it-1} + \beta_2 SIZE_{it} + \beta_3 \Delta CFO_{it} + \beta_4 DTL_{it-1} + \beta_5 PPE_{it} + \beta_6 \Delta SALES_{it} + B_7 INTN_{it} + \beta_8 ADV_{it} + \beta_9 R\&D_{it} + \beta_{10} PM_{it} + \beta_{11} TURN_{it} + \beta_{12} LEVER_{it} + \beta_{13} ACCR_{it-1} + \beta_{14} GOV_{it} + \beta_{15} OPTIONS_{it} + \beta_{16} COMP_{it} + \beta_{17} FOREIGN_{it} + \beta_{18} AGE_{it} + \text{Industry \& Year effects} + \varepsilon_{it} \quad (2)$$

The third and fourth hypotheses predict a no/positive relationship between performance far below/above analysts' expectations in the prior year and corporate tax avoidance. If these hypotheses are supported, the coefficient estimate on PAE_{it-1} in equation 3 should be positive and no significant coefficient estimate is expected on PBE_{it-1}.

$$CASH\_ETR_{it} = \beta_0 + \beta_1 PBE_{it-1}/\ PAE_{it-1} + \beta Controls + \text{Industry \& Year effects} + \varepsilon_{it} \quad (3)$$

4. Results and discussion

4.1 Descriptive statistics

Table 1 presents the mean, median, standard deviation, lower quartile, and upper quartile values of all variables used in our multivariate test. From the total sample, around 35.9 (901) firms missed analysts' expectations in the prior years. While Panel A presents the descriptive statistics for the whole sample, Panels B and C present the sample of firms significantly beating analysts' expectations and those performing far below expectations, respectively. At the univariate level, firms substantially missing

analysts' expectations in the prior year, pay more (avoid less) taxes compared to all other firms or firms performing far above expectations. However, they make slightly lesser earnings management in the current year and have relatively more volatile (higher standard deviation) values for these variables. These firms are relatively large in size and have more deferred taxes, fixed assets, intangible assets, leverage, and foreign stakes. They are also older, less profitable, have smaller prior accruals, and provide lower equity options.

Table 1: Descriptive Statistics

	Panel A: Full Sample					Panel B: Firms Performing Far Above Expectations					Panel C: Firms Performing Far Below Expectations				
Variable	Mean	Median	Std Dev	q1	q3	Mean	Median	Std Dev	q1	q3	Mean	Median	Std Dev	q1	q3
GAAP_ETR$_t$	-0.28	-0.25	0.20	-0.32	-0.19	-0.26	-0.25	0.16	-0.31	-0.17	-0.33	-0.26	0.25	-0.41	-0.20
CASH_ETR$_t$	-0.32	-0.25	0.27	-0.41	-0.15	-0.28	-0.23	0.24	-0.32	-0.12	-0.38	-0.26	0.31	-0.50	-0.17
PAL$_t$	0.004	0.003	0.04	0.00	0.00	0.004	0.003	0.05	0.00	0.05	0.04	0.02	0.04	0.01	0.05
PAL$_{t-1}$	0.21	0.00	0.39	0.00	0.00										
PBL$_{t-1}$	0.11	0.00	0.38	0.00	0.00										
SIZE$_t$	20.29	20.11	1.44	19.13	21.22	19.87	19.75	1.15	18.91	20.76	20.74	20.68	1.52	19.65	21.82
ACFO$_t$	-0.03	-0.02	0.06	-0.05	0.01	-0.04	-0.02	0.08	-0.06	0.00	-0.02	-0.02	0.05	-0.04	0.01
DTL$_{t-1}$	0.02	0.01	0.02	0.00	0.03	0.02	0.01	0.02	0.00	0.02	0.03	0.02	0.03	0.00	0.04
PPE$_t$	0.36	0.36	0.18	0.23	0.46	0.36	0.34	0.20	0.22	0.48	0.37	0.38	0.15	0.26	0.47
ASALES$_t$	-0.03	-0.01	0.24	-0.09	0.05	-0.02	-0.01	0.19	-0.09	0.05	-0.03	0.00	0.32	-0.06	0.05
INTAN$_t$	0.04	0.02	0.08	0.01	0.05	0.04	0.02	0.05	0.01	0.04	0.06	0.03	0.15	0.01	0.06
ADV$_t$	0.01	0.00	0.02	0.00	0.01	0.01	0.00	0.02	0.00	0.01	0.01	0.00	0.03	0.00	0.01
R&D$_t$	0.01	0.00	0.02	0.00	0.01	0.01	0.00	0.03	0.00	0.01	0.01	0.00	0.02	0.00	0.01
PAL$_t$	0.07	0.04	0.10	0.02	0.08	0.06	0.05	0.08	0.02	0.08	0.06	0.03	0.12	0.01	0.06
TURN$_t$	0.96	0.85	0.55	0.60	1.16	0.98	0.85	0.56	0.59	1.23	0.91	0.77	0.50	0.59	1.10
LEVER$_t$	0.46	0.48	0.18	0.33	0.60	0.45	0.47	0.20	0.27	0.57	0.47	0.49	0.17	0.34	0.61
ACCR$_{t-1}$	-0.01	-0.02	0.09	-0.04	0.01	-0.01	-0.01	0.06	-0.04	0.02	-0.03	-0.03	0.05	-0.05	-0.01
GOV$_t$	0.34	0.00	0.47	0.00	1.00	0.22	0.00	0.41	0.00	0.00	0.41	0.00	0.49	0.00	1.00
OPTIONS$_t$	1.07	0.00	4.46	0.00	0.00	1.37	0.00	5.02	0.00	0.00	0.88	0.00	4.08	0.00	0.00
COMP$_t$	21.14	21.07	0.89	20.54	21.76	20.90	20.89	0.73	20.44	21.27	21.42	21.52	0.90	20.76	21.97
FOREIGN$_t$	0.13	0.10	0.13	0.04	0.19	0.12	0.07	0.12	0.04	0.15	0.157	0.113	0.136	0.060	0.208
AGE$_t$	3.15	3.26	0.63	2.71	3.76	3.14	3.26	0.58	2.77	3.50	3.21	3.43	0.64	2.71	3.78
Number of observations	2,511					535					300				

This table presents summary statistics for the variables used in the empirical analyses. The sample is comprised of 2,511 firm-years spanning the period 2013–2020. While Panel A presents summary statistics for the whole sample, Panels B and C show comparative summary statistics for the sample divided into firm-years significantly beating analysts' expectations and those performing far below expectations in the prior year, respectively. All variables are defined under Section 3.1.

4.2 Correlation

Table 2 presents the Pearson correlation for all the variables used in this study with p-values written in italics. The table shows that the two tax avoidance metrics are highly (49.8 percent) correlated to each other. However, the tax avoidance metrics are not related to our earnings management metric (EM_{it}). On the other hand, prior performance far below the analysts' expectations (PBE_{it-1}) is negatively related to the two tax avoidance metrics and not related to earnings management (EM_{it}). $CASH\_ETR_{it}$ is positively related to prior performance far above the analysts' expectations (PAE_{it-1}). Among the control variables, change in cash flows, change in sales, research and development expenses, and profit margins are positively related to our tax avoidance metrics. Intangible assets, asset turnover, leverage, and equity options are negatively related to tax avoidance. Earnings management is positively related to intangible assets, profit margin, leverage, and prior accruals and negatively related to firm size, change in cash flow, deferred taxes, fixed assets, management compensations, and foreign stakes. PBE_{it-1} is positively related to firm size, deferred taxes, intangible assets, governance, management compensation, and foreign stake and negatively related to prior accruals. On the other hand, PAE_{it-1} is negatively related to firm size, deferred taxes, leverage, governance, and management compensation.

Table 2: Correlations

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
GAAP_ETR$_{it}$ (1)																						
CASH_ETR$_{it}$ (2)	0.498																					
	<.0001																					
EM$_{it}$ (3)	0.041	0.044																				
	0.235	*0.206*																				
PBE$_{it-1}$ (4)	-0.122	-0.096	-0.005																			
	0.001	*0.005*	*0.875*																			
PAE$_{it-1}$ (5)	0.052	0.075	0.002	-0.217																		
	0.133	*0.031*	*0.964*	*<.0001*																		
SIZE$_{it}$ (6)	0.008	0.004	-0.133	0.149	-0.133																	
	0.809	*0.903*	*0.00*	*<.0001*	*0.00*																	
ΔCFO$_{it}$ (7)	0.032	0.123	-0.413	0.064	-0.047	0.103																
	0.362	*0.00*	*<.0001*	*0.066*	*0.171*	*0.003*																
DTL$_{it-1}$ (8)	0.001	0.026	-0.097	0.131	-0.099	0.125	0.122															
	0.983	*0.444*	*0.005*	*0.00*	*0.004*	*0.00*	*0.00*															
PPE$_{it}$ (9)	0.035	0.054	-0.118	0.034	-0.004	-0.052	0.163	0.129														
	0.309	*0.117*	*0.001*	*0.323*	*0.918*	*0.131*	*<.0001*	*0.00*														
ΔSALES$_{it}$ (10)	0.053	0.167	0.02	-0.002	0.01	-0.03	0.118	0.017	0.001													
	0.124	*<.0001*	*0.569*	*0.965*	*0.782*	*0.388*	*0.001*	*0.615*	*0.973*													
INTN$_{it}$ (11)	-0.103	-0.067	0.078	0.109	-0.046	0.144	0.00	-0.045	-0.12	-0.031												
	0.003	*0.052*	*0.025*	*0.002*	*0.182*	*<.0001*	*0.995*	*0.197*	*0.001*	*0.369*												
ADV$_{it}$ (12)	-0.038	-0.026	0.062	0.029	-0.003	0.144	-0.013	-0.052	-0.056	-0.029	0.119											
	0.271	*0.454*	*0.071*	*0.407*	*0.92*	*<.0001*	*0.701*	*0.136*	*0.106*	*0.402*	*0.001*											
R&D$_{it}$ (13)	0.089	-0.003	0.062	-0.065	0.046	0.13	-0.006	-0.159	-0.05	-0.01	0.069	0.143										
	0.01	*0.922*	*0.072*	*0.061*	*0.185*	*0.00*	*0.867*	*<.0001*	*0.149*	*0.766*	*0.047*	*<.0001*										
PM$_{it}$ (14)	0.232	0.204	0.367	-0.03	-0.016	0.101	0.024	0.015	-0.194	0.002	0.007	0.155	0.079									
	<.0001	<.0001	<.0001	0.392	0.642	0.003	0.485	0.657	<.0001	0.957	0.849	<.0001	0.022									
TURN$_{it}$ (15)	-0.082	-0.029	0.023	-0.043	0.018	-0.087	-0.171	-0.197	-0.158	0.127	0.037	-0.124	-0.13	-0.271								
	0.017	*0.396*	*0.498*	*0.213*	*0.596*	*0.012*	*<.0001*	*<.0001*	*<.0001*	*0.00*	*0.283*	*0.00*	*0.00*	*<.0001*								
LEVER$_{it}$ (16)	-0.176	-0.106	0.079	0.031	-0.075	-0.009	0.036	-0.163	0.16	-0.02	0.168	-0.173	-0.145	-0.283	0.233							
	<.0001	*0.002*	*0.022*	*0.368*	*0.03*	*0.796*	*0.299*	*<.0001*	*<.0001*	*0.558*	*<.0001*	*<.0001*	*<.0001*	*<.0001*	*<.0001*							
ACCR$_{it-1}$ (17)	0.032	-0.072	0.07	-0.10	-0.013	0.055	0.261	0.04	-0.224	-0.025	-0.027	0.054	0.02	0.122	-0.069	-0.127						
	0.362	*0.038*	*0.043*	*0.004*	*0.712*	*0.113*	*<.0001*	*0.245*	*<.0001*	*0.478*	*0.439*	*0.118*	*0.559*	*0.00*	*0.045*	*0.00*						
GOV$_{it}$ (18)	-0.012	-0.001	-0.023	0.072	-0.113	0.363	0.044	-0.043	-0.038	-0.016	0.08	-0.005	-0.02	0.023	0.037	0.085	0.006					
	0.725	*0.978*	*0.498*	*0.036*	*0.001*	*<.0001*	*0.205*	*0.212*	*0.269*	*0.651*	*0.021*	*0.885*	*0.571*	*0.504*	*0.283*	*0.014*	*0.861*					
OPTIONS$_{it}$ (19)	-0.126	-0.058	0.001	-0.021	0.031	0.008	0.064	-0.041	-0.027	-0.069	0.074	-0.015	0.028	0.007	0.04	0.037	0.00	0.093				
	0.00	*0.091*	*0.969*	*0.542*	*0.377*	*0.81*	*0.065*	*0.235*	*0.429*	*0.047*	*0.033*	*0.67*	*0.426*	*0.829*	*0.242*	*0.279*	*0.998*	*0.007*				
COMP$_{it}$ (20)	-0.06	-0.04	-0.11	0.15	-0.12	0.58	0.07	0.11	-0.03	-0.03	0.11	0.1	0.00	0.05	-0.04	0.02	0.02	0.32	0.01			
	0.08	*0.22*	*0.00*	*<.0001*	*0.00*	*<.0001*	*0.05*	*0.00*	*0.36*	*0.33*	*0.00*	*0.01*	*0.93*	*0.12*	*0.23*	*0.58*	*0.65*	*<.0001*	*0.8*			
FOREIGN$_{it}$ 21)	0.02	0.04	-0.08	0.08	-0.06	0.57	0.01	0.09	-0.07	-0.02	0.02	0.13	-0.01	0.07	-0.03	-0.1	0.03	0.22	-0.03	0.40		
	0.49	*0.27*	*0.02*	*0.01*	*0.06*	*<.0001*	*0.69*	*0.01*	*0.06*	*0.52*	*0.57*	*0.00*	*0.67*	*0.03*	*0.33*	*0.00*	*0.32*	*<.0001*	*0.32*	*<.0001*		
AGE$_{it}$ (22)	-0.021	0.037	-0.038	0.046	-0.005	0.037	0.094	0.194	-0.015	-0.01	-0.06	0.001	-0.044	-0.008	-0.082	-0.016	0.012	-0.118	-0.056	0.05	0.03	
	0.553	*0.279*	*0.274*	*0.186*	*0.894*	*0.285*	*0.006*	*<.0001*	*0.657*	*0.763*	*0.082*	*0.973*	*0.199*	*0.809*	*0.017*	*0.644*	*0.73*	*0.001*	*0.108*	*0.14*	*0.32*	

This table presents Pearson correlations coefficients and the related p-values (written in italics) for the variables of interest. The sample is comprised of 2,511 firm-years spanning the period 2013–2020. All variables are under Section 3.1.

4.3 Multivariate test

Table 3 presents multiple regression results testing the first two hypotheses predicting positive/ negative relationships between PBE_{it_1}/PAE_{it_1} and EM_{it}, respectively. Consistent with the prediction in the first hypothesis, firms that missed analysts' expectations by far in the prior year have shown higher earnings management (with a t-value of 2.79). However, there is no significant relationship observed between prior higher performance far above analysts' expectations and earnings management. EM_{it} is also positively related to fixed assets (capital intensity), sales growth, intangible assets, research and development expenses, profit margin, asset turnover, and prior accruals. While firm size and change in operating cash flow show negative relationships, the remaining variables are not statistically related to EM_{it} at the multivariate level.

Table 4 presents multiple regression results testing the third and fourth hypotheses predicting no/positive relationships between PBE_{it_1}/PAE_{it_1} and current tax avoidance. The tax avoidance metric is $CASH\_ETR_{it}$ in Panels A and C and $GAAP\_ETR_{it}$ in Panels B and D. Contrary to our prediction in the third hypothesis, tax avoidance is negatively related to PBE_{it_1}. Our fourth hypothesis is partially supported. PAE_{it_1} is positively related (at a 5% significance level) to $CASH\_ETR_{it}$ but not related to $GAAP\_ETR_{it}$. Our main tax avoidance metric ($CASH\_ETR_{it}$) is also positively related to changes in operating cash flows, capital intensity, sales growth, and profit margin. Leverage, prior accrual, and equity options are negatively related to $CASH\_ETR_{it}$. The remaining variables do not show statistically significant relationships at multivariate level.

Table 3: Multivariate Test: Relative Performance and Earnings Management

	Panel A				Panel B			
	Performance Far Below Expectations				Performance Far Above Expectations			
	DV = EM_{it}				DV = EM_{it}			
Variable	**Estimate**	**Std. Error**	**t Value**	**Pr > |t|**	**Estimate**	**Std. Error**	**t Value**	**Pr > |t|**
PBE_{it-1}	0.008	0.003	2.790	0.005				
PAE_{it-1}					-0.002	0.003	-0.590	0.556
$SIZE_{it}$	-0.004	0.001	-3.870	0.000	-0.004	0.001	-3.710	0.000
$ACFO_{it}$	-0.333	0.020	-16.90	<0.0001	-0.329	0.020	-16.69	<0.0001
DTL_{it-1}	0.014	0.052	0.270	0.786	0.025	0.052	0.480	0.631
PPE_{it}	0.014	0.007	2.090	0.037	0.014	0.007	2.050	0.041
$ASALES_{it}$	0.015	0.005	3.110	0.002	0.015	0.005	3.090	0.002
$INTN_{it}$	0.029	0.014	2.060	0.040	0.033	0.014	2.290	0.022
ADV_{it}	0.063	0.050	1.270	0.204	0.065	0.050	1.310	0.191
$R\&D_{it}$	0.135	0.048	2.800	0.005	0.127	0.048	2.630	0.009
PM_{it}	0.180	0.012	15.280	<0.0001	0.179	0.012	15.100	<0.0001
$TURN_{it}$	0.001	0.002	0.630	0.530	0.001	0.002	0.560	0.577
$LEVER_{it}$	0.056	0.007	7.960	<0.0001	0.056	0.007	7.860	<0.0001
$ACCR_{it-1}$	0.101	0.014	7.080	<0.0001	0.096	0.014	6.770	<0.0001
GOV_{it}	0.003	0.003	1.110	0.268	0.003	0.003	1.120	0.265
$OPTIONS_{it}$	0.000	0.000	0.880	0.381	0.000	0.000	0.820	0.414
$COMP_{it}$	-0.002	0.002	-1.500	0.134	-0.002	0.002	-1.350	0.177
$FOREIGN_{it}$	-0.001	0.011	-0.050	0.962	-0.001	0.011	-0.060	0.949
AGE_{it}	0.002	0.002	1.230	0.220	0.002	0.002	1.270	0.206
INTERCEPT	0.111	0.031	3.52	0.000	0.104	0.031	3.300	0.001
Number of Observations			2,511				2,511	
Industry and Year Fixed Effects			Included				Included	
R^2			0.430				0.425	

This table presents results for multiple regression where prior performance far below analysts' expectations (PBE_{it-1}) and prior performance far above analysts' expectations (PAE_{it-1}) are the independent variable in Panels A and B, respectively and current earnings management (EM_{it}) is the dependent variable. The sample is comprised of 2,511 firm-years spanning the period 2013–2020. All p-values are two-tailed. All variables are defined under Section 3.1.

Table 4: Multivariate Test: Relative Performance and Tax Avoidance

	Performance Far Below Expectations								Performance Far Above Expectations							
	Panel A				Panel B				Panel C				Panel D			
	DV = CASH_ETR$_{it}$				DV = GAAP_ETR$_{it}$				DV = CASH_ETR$_{it}$				DV = GAAP_ETR$_{it}$			
Variable	Estimate	Std. Error	t Value	Pr > |t|	Estimate	Std. Error	t Value	Pr > |t|	Estimate	Std. Error	t Value	Pr > |t|	Estimate	Std. Error	t Value	Pr > |t|
PBE$_{it-1}$	-0.071	0.023	-3.040	0.003	-0.050	0.017	-2.920	0.004								
PAE$_{it-1}$									0.052	0.024	2.200	0.028	0.021	0.018	1.210	0.227
SIZE$_{it}$	0.001	0.009	0.160	0.873	0.005	0.007	0.800	0.424	0.001	0.009	0.080	0.935	0.004	0.007	0.680	0.499
ACFO$_{it}$	0.628	0.155	4.050	<0.0001	0.104	0.114	0.910	0.363	0.605	0.155	3.900	0.000	0.085	0.115	0.750	0.457
DTL$_{it-1}$	-0.044	0.411	-0.110	0.915	-0.168	0.304	-0.550	0.580	-0.080	0.412	-0.190	0.847	-0.218	0.305	-0.720	0.474
PPE$_{it}$	0.095	0.054	1.780	0.076	0.099	0.040	2.500	0.013	0.096	0.054	1.780	0.075	0.100	0.040	2.520	0.012
ΔSALES$_{it}$	0.150	0.038	3.960	<0.0001	0.027	0.028	0.950	0.343	0.150	0.038	3.940	<.0001	0.027	0.028	0.950	0.343
INTN$_{it}$	-0.060	0.112	-0.530	0.594	-0.108	0.083	-1.310	0.192	-0.086	0.112	-0.760	0.445	-0.127	0.083	-1.540	0.124
ADV$_{it}$	-0.453	0.392	-1.160	0.248	-0.719	0.289	-2.490	0.013	-0.468	0.393	-1.190	0.234	-0.731	0.290	-2.520	0.012
R&D$_{it}$	-0.165	0.379	-0.430	0.664	0.525	0.280	1.880	0.061	-0.117	0.379	-0.310	0.759	0.567	0.280	2.020	0.044
PM$_{it}$	0.579	0.093	6.220	<0.0001	0.427	0.069	6.210	<0.0001	0.593	0.093	6.360	<.0001	0.436	0.069	6.320	<0.0001
TURN$_{it}$	0.024	0.018	1.320	0.187	0.006	0.013	0.440	0.658	0.025	0.018	1.380	0.168	0.007	0.014	0.510	0.612
LEVER$_{it}$	-0.114	0.056	-2.060	0.040	-0.132	0.041	-3.220	0.001	-0.105	0.056	-1.880	0.061	-0.128	0.041	-3.100	0.002
ACCR$_{it-1}$	-0.432	0.112	-3.850	0.000	-0.017	0.083	-0.200	0.838	-0.391	0.112	-3.500	0.001	0.012	0.082	0.140	0.888
GOV$_{it}$	0.011	0.020	0.540	0.588	0.008	0.015	0.510	0.609	0.013	0.021	0.620	0.533	0.008	0.015	0.530	0.595
OPTIONS$_{it}$	-0.003	0.002	-1.710	0.087	-0.006	0.001	-3.770	0.000	-0.003	0.002	-1.710	0.087	-0.005	0.001	-3.720	0.000
COMP$_{it}$	-0.019	0.012	-1.570	0.117	-0.017	0.009	-1.830	0.068	-0.021	0.012	-1.660	0.097	-0.018	0.009	-1.950	0.052
FOREIGN$_{it}$	0.114	0.085	1.330	0.183	0.041	0.063	0.650	0.515	0.113	0.086	1.320	0.187	0.042	0.063	0.660	0.511
AGE$_{it}$	0.017	0.014	1.150	0.249	-0.004	0.011	-0.390	0.697	0.016	0.014	1.080	0.281	-0.005	0.011	-0.440	0.658
INTERCEPT	-0.009	0.246	-0.040	0.969	-0.009	0.182	-0.050	0.963	0.020	0.985	0.020	0.985	0.018	0.183	0.100	0.920
Number of Observations	2,511				2,511				2,511				2,511			
Industry and Year Fixed Effects	Included				Included				Included				Included			
R^2	0.127				0.123				0.123				0.116			

This table presents results for multiple regression where prior performance far below analysts' expectations (PBE$_{it-1}$) and prior performance far above analysts' expectations (PAE$_{it-1}$) are the independent variables and current tax avoidance (CASH_ETR$_{it}$ in panel A&C and GAAP_ETR$_{it}$ in panel B&D) are the dependent variables. The sample is comprised of 2,511 firm-years spanning the period 2013–2020. All p-values are two-tailed. All variables are defined under Section 3.1.

4.4 Additional tests

We have done many additional tests to check the robustness of our results. First, we control for EM_{it} when $CASH\_ETR_{it}$ is the dependent variable, and vice versa. Prior research claims there is no causal link, but an association, between earnings management and tax avoidance. Therefore, it is possible to use both as an independent and dependent variable. The results presented in Tables 3 and 4 persist even after we control for the other variable (See Table 5). Moreover, we find no relationship between earnings management and tax avoidance for the whole sample. Second, we test the relationship between earnings management and tax avoidance separately after dividing the sample into three groups: firms missing analysts' expectations by far, firms beating analysts' expectations by far and others. Untabulated results show that earnings management and tax avoidance are significantly related only for the first group of firms. For the other samples of firms, no relationship was observed between earnings management and tax avoidance.

Third, we re-test the above multivariate tests after constructing the sample using propensity score matching (PSM). PSM is a popular and more robust technique for estimating average treatment effects (Shipman *et al.*, 2016; DeFond *et al.*, 2016) in a non-experimental research setting. Consistent with recommendations from prior studies (Shipman *et al.*, 2016), we use a one-to-one nearest-neighborhood matching techniques without replacement. We use the following model to estimate propensity scores.

$$P(PBE_{it-1}) = \alpha_0 + \alpha_{Controls} + {}_{Industry\ \&\ Year\ effects}\ \varepsilon_{it} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ (4)$$

We use all control variables in equation 2 for the matching. For each of the 300 sample firm-years with performance far below analysts' estimates, we match 300 control firm-years, making a total sample size of 600. The results presented in Table 6 are still consistent with those presented in Tables 3 and 4.

Table 5: Additional Multivariate Test 1

	Panel A				Panel B				Panel C				Panel D			
	DV = $CASH\_ETR_{it}$				DV = $GAAP\_ETR_{it}$				DV = EM_{it}				DV = EM_{it}			
Variable	Estimate	Std. Error	t Value	Pr > |t|	Estimate	Std. Error	t Value	Pr > |t|	Estimate	Std. Error	t Value	Pr > |t|	Estimate	Std. Error	t Value	Pr > |t|
PBE_{it-1}	-0.067	0.024	-2.850	0.005	-0.047	0.018	-2.700	0.007								
PAE_{it-1}	0.041	0.024	1.680	0.093	0.012	0.018	0.690	0.494	0.009	0.003	2.890	0.004	0.008	0.003	2.690	0.007
EM_{it}	0.513	0.275	1.870	0.062	-0.053	0.204	-0.260	0.796	-0.001	0.003	-0.190	0.853	0.000	0.003	-0.070	0.944
$CASH\_ETR_{it}$									0.008	0.004	1.870	0.062				
$GAAP\_ETR_{it}$													-0.002	0.006	-0.260	0.796
$SIZE_{it}$	0.004	0.009	0.480	0.634	0.005	0.007	0.780	0.433	-0.004	0.001	-3.890	0.000	-0.004	0.001	-3.850	0.000
ΔCFO_{it}	0.801	0.180	4.460	<.0001	0.087	0.133	0.660	0.511	-0.338	0.020	-17.01	<.0001	-0.332	0.020	-16.87	<0.0001
DTL_{it-1}	0.000	0.412	0.000	0.999	-0.152	0.305	-0.500	0.619	0.014	0.052	0.260	0.792	0.014	0.052	0.260	0.795
PPE_{it}	0.087	0.054	1.620	0.106	0.099	0.040	2.500	0.013	0.013	0.007	1.970	0.049	0.014	0.007	2.100	0.036
$\Delta SALES_{it}$	0.142	0.038	3.730	0.000	0.027	0.028	0.970	0.335	0.014	0.005	2.830	0.005	0.015	0.005	3.120	0.002
$INTN_{it}$	-0.075	0.112	-0.670	0.503	-0.107	0.083	-1.280	0.200	0.030	0.014	2.100	0.036	0.029	0.014	2.040	0.041
ADV_{it}	-0.483	0.391	-1.240	0.217	-0.715	0.290	-2.470	0.014	0.067	0.050	1.350	0.178	0.062	0.050	1.240	0.214
$R\&D_{it}$	-0.245	0.380	-0.650	0.519	0.529	0.281	1.880	0.061	0.136	0.048	2.830	0.005	0.135	0.048	2.810	0.005
PM_{it}	0.491	0.105	4.670	<0.0001	0.438	0.078	5.620	<0.0001	0.175	0.012	14.530	<.0001	0.181	0.012	14.95	<0.0001
$TURN_{it}$	0.023	0.018	1.280	0.201	0.006	0.013	0.450	0.655	0.001	0.002	0.540	0.588	0.001	0.002	0.630	0.528
$LEVER_{it}$	-0.135	0.058	-2.350	0.019	-0.127	0.043	-2.970	0.003	0.057	0.007	8.040	<.0001	0.056	0.007	7.840	<0.0001
$ACCR_{it-1}$	-0.479	0.115	-4.160	<0.0001	-0.010	0.085	-0.120	0.905	0.104	0.014	7.270	<.0001	0.101	0.014	7.070	<0.0001
GOV_{it}	0.012	0.020	0.570	0.566	0.009	0.015	0.560	0.574	0.003	0.003	1.060	0.289	0.003	0.003	1.110	0.269
$OPTIONS_{it}$	-0.004	0.002	-1.830	0.067	-0.006	0.001	-3.780	0.000	0.000	0.000	0.990	0.321	0.000	0.000	0.840	0.404
$COMP_{it}$	-0.018	0.012	-1.430	0.154	-0.017	0.009	-1.820	0.070	-0.002	0.002	-1.400	0.162	-0.002	0.002	-1.510	0.131
$FOREIGN_{it}$	0.112	0.085	1.310	0.189	0.041	0.063	0.640	0.521	-0.001	0.011	-0.130	0.895	0.000	0.011	-0.040	0.967
AGE_{it}	0.015	0.014	1.040	0.296	-0.004	0.011	-0.390	0.696	0.002	0.002	1.160	0.248	0.002	0.002	1.220	0.221
INTERCEPT	-0.102	0.249	-0.410	0.682	-0.014	0.184	-0.070	0.941	0.111	0.031	3.530	0.000	0.110	0.031	3.510	0.001
Sample size	2,511				2,511				2,511				2,511			
Industry and Year Fixed Effects	Included				Included				Included				Included			
R^2	0.134				0.124				0.433				0.430			

Table 6: Additional Multivariate Test 2

	Panel A				Panel B				Panel C				Panel D			
	DV = $CASH\_ETR_{it}$				DV = $GAAP\_ETR_{it}$				DV=EM_{it}				DV=REM_{it}			
Variable	Estimate	Std. Error	t Value	Pr > |t|	Estimate	Std. Error	t Value	Pr > |t|	Estimate	Std. Error	t Value	Pr > |t|	Estimate	Std. Error	t Value	Pr > |t|
PBE_{it-1}	-0.062	0.033	-1.910	0.058	-0.047	0.025	-1.890	0.060	0.003	0.008	2.610	0.006	0.083	0.030	2.290	0.025
$SIZE_{it}$	0.007	0.018	0.380	0.708	0.008	0.014	0.610	0.545	-0.002	0.002	-0.860	0.390	-0.048	0.017	-2.890	0.004
$ACFO_{it}$	0.505	0.287	1.760	0.080	0.112	0.216	0.520	0.606	-0.484	0.036	-13.36	<0.0001	1.469	0.281	5.230	<0.0001
DTL_{it-1}	0.355	0.785	0.450	0.652	-0.595	0.590	-1.010	0.314	-0.066	0.099	-0.670	0.505	-0.115	0.719	-0.160	0.873
PPE_{it}	-0.030	0.103	-0.290	0.774	-0.057	0.078	-0.730	0.463	-0.028	0.013	-2.180	0.030	0.214	0.094	2.280	0.024
$ΔSALES_{it}$	0.097	0.055	1.760	0.080	0.020	0.042	0.490	0.625	0.036	0.007	5.200	<0.0001	0.179	0.068	2.620	0.009
$INTN_{it}$	-0.368	0.324	-1.140	0.257	-0.420	0.244	-1.720	0.086	0.021	0.041	0.530	0.600	0.825	0.293	2.810	0.005
ADV_{it}	-0.539	0.610	-0.880	0.378	-0.588	0.459	-1.280	0.201	-0.015	0.077	-0.200	0.841	6.699	0.696	9.630	<0.0001
$R\&D_{it}$	-0.247	0.844	-0.290	0.770	0.473	0.634	0.750	0.456	-0.013	0.106	-0.130	0.900	3.422	0.748	4.580	<0.0001
PM_{it}	0.397	0.184	2.160	0.032	0.480	0.139	3.460	0.001	0.172	0.023	7.410	<0.0001	0.241	0.185	1.300	0.194
$TURN_{it}$	0.079	0.036	2.190	0.029	0.037	0.027	1.370	0.171	0.002	0.005	0.510	0.610	-0.381	0.035	-10.74	<0.0001
$LEVER_{it}$	-0.434	0.120	-3.610	0.000	-0.270	0.090	-2.980	0.003	0.042	0.015	2.760	0.006	-0.091	0.110	-0.830	0.409
$ACCR_{it-1}$	-0.283	0.275	-1.030	0.303	-0.026	0.207	-0.130	0.899	0.094	0.035	2.710	0.007	-0.284	0.295	-0.960	0.337
GOV_{it}	-0.054	0.037	-1.440	0.151	-0.025	0.028	-0.900	0.368	0.003	0.005	0.630	0.532	0.007	0.034	0.210	0.830
$OPTIONS_{it}$	-0.003	0.004	-0.660	0.508	-0.001	0.003	-0.290	0.769	0.001	0.000	1.610	0.109	0.001	0.004	0.380	0.701
$COMP_{it}$	-0.031	0.025	-1.270	0.206	-0.025	0.019	-1.370	0.173	-0.009	0.003	-3.020	0.003	0.065	0.022	2.910	0.004
$FOREIGN_{it}$	0.187	0.153	1.230	0.222	0.102	0.115	0.890	0.375	0.002	0.019	0.100	0.924	0.111	0.142	0.780	0.435
AGE_{it}	0.000	0.000	0.980	0.330	0.000	0.000	1.460	0.146	0.000	0.000	1.230	0.220	0.000	0.000	-2.340	0.020
INTERCEPT	0.251	0.518	0.490	0.628	0.100	0.390	0.260	0.797	0.254	0.065	3.890	0.000	0.246	0.484	0.510	0.611
Sample size			600				600				600				600	
Industry and Year Fixed Effects			Included				Included				Included				Included	
R^2			0.180				0.149				0.386				0.460	

This table presents results for multiple regression for a sample of 600 firm-years constructed based on propensity score matching. The treatment group included 300 firm-years with prior performance significantly lower than the analysts' expectation ($PBEi_{t-1}$ = 1). Prior performance far below analysts' expectations (PBE_{it-1}) is the independent variable and current tax avoidance ($CASH\_ETR_{it}$ in panel A and $GAAP\_ETR_{it}$ in panel B) and earnings management (EM_{it} in panel C & REM_{it} in panel D) are the dependent variables. REM_{it} = (abnormal_discretionary_expenses * -1) + (abnormal_operating_cash_flows * -1) – abnormal_production_costs. All the other variables are defined under Section 3.1. All p-values are two-tailed.

Finally, we re-test the above equations using procedures such as: (1) using other tax avoidance and earning management metrics such as book-tax differences (Hanlon, 2005), accrual quality (Dechow & Dichev, 2002), and real earnings management (Roychowdhury, 2006); (2) using a different metric for firm size:- the natural logarithm of total assets; (3) using a larger sample size by excluding the governance variable from the controls, which helped us extend our sample period between 2009 and 2020. All the tests support our main results presented in Tables 3, 4 and 5.

4.5 Discussion

Prior research extensively explored the relationship between financial and tax reporting decisions. In particular, whether managers trying to boost financial reporting income incur additional tax costs or not has been widely examined. However, existing research reports mixed results. On the one hand, results support the notion that managers boosting their accounting income also pay more taxes to avoid the costs related to loss of reputation and regulatory burden (Lennox *et al.*, 2013). On the other hand, contrary results show that managers manage book income upward while managing taxable income downward since financial accounting and tax rules are different and do not confirm (Frank *et al.*, 2009). This study tries to refine the relationship between earnings management and tax avoidance by focusing on one of the reasons for managers' earnings manipulation. Extant research shows that the market rewards firms that consistently meet analysts' expectations (Kasznik & Mcnichols, 2002), and managers try to prevent reporting earnings that miss analysts' estimates (Burgstahler & Dichev, 1997; Brown, 1997; Burgstahler & Eames, 2006; Koh *et al.*, 2008). Analysts serve an important information function in the capital market and can enhance the visibility of firms to the public. Therefore, firms missing analysts' expectations are more likely to take action in the subsequent year to avoid additional costs related to missing expectations again. This study investigates how firms that substantially missed analysts' expectations in the prior year may behave differently in reporting their current earnings and taxes.

Consistent with our first hypothesis, firms that missed analysts' expectations by far in the prior year have shown higher current earnings management. This is consistent with the behavioral theory of the firm (BTOF) that firms missing their aspired performance target intend to take more risk in the subsequent period than firms performing above their target level. Extant research documented that firms missing performance targets are likely to take deviant risks such as lobbying, bribery, and financial misstatement motivated by their myopic desire to subsequently meet or beat the target level (Harris & Bromiley, 2007; Rudy & Johnson, 2013; Xu *et al.*, 2019). On the other hand, as opposed to our second hypothesis, results in Table 4 (panels A and B) present a negative relationship between significantly missing analysts' expectations in the prior year and tax avoidance.

This study provides evidence against the assertion that firms do not trade-off financial and tax reporting decisions. Aggressive earnings management is not related to aggressive tax avoidance, at least for firms in our sample. According to the behavioral theory of the firm (BTOF), firms that perform below their aspired target level intend to take more risks in the subsequent period than firms performing above their target level. Such firms feel outcompeted by their competitors and incompetent to achieve their own expectations and, therefore, strive more to reverse the poor-performance and reclaim the status quo (Eggers & Kaul, 2018). Firms performing below their expectations are more likely to take deviant risks motivated by their myopic desire to meet or beat the expected level (Xu *et al.*, 2019). Therefore, such firms are likely to aggressively engage in income-increasing earnings management. However, these firms are not intending to take the risk of avoiding more taxes. This may be related to Kubick *et al.* (2016)'s finding that large book-tax differences increase scrutiny from regulatory bodies and, therefore, firms may be willing to pay additional taxes to avoid regulatory costs.

5. Conclusion

Managers have incentives to engage in earnings and tax management. They manage earnings upward to meet requirements related to compensation, debt covenants, or stock valuation and manage taxes downward to maximize shareholders' value or satisfy after-tax compensation schemes (Tang & Firth, 2011). Managers also manage earnings upward to meet analysts' expectations (Burgstahler & Dichev, 1997; Brown, 1997; Koh *et al.*, 2008). However, whether managers simultaneously manage earnings upward (inflating earnings) and taxes downward (avoiding taxes) is debatable. While considerable research supports the simultaneous management of both, it also supports a negative relationship between earnings management and tax avoidance. There are two possible explanations for this negative relationship between missing analysts' expectations and tax avoidance. First, such firms attempt to hide their earnings management activities of inflating earnings to protect their reputation (Desai & Dharmapala, 2005). Avoiding more taxes could widen the gap between reported financial income and tax income, and such book-tax differences could provide information to the public that earnings might have been manipulated (Hanlon & Heizman, 2010; Tang & Firth, 2011). Second, increased book-tax differences increase scrutiny from regulatory agencies, posing the risk that regulatory measures could be taken if the financial or tax related misstatements get identified (Hoopes *et al.*, 2012; Kubick *et al.*, 2016).

This study provides evidence supporting a negative relationship between income-increasing earnings management and tax avoidance, at least for firms performing far below analysts' expectations in the prior year, consistent with the notion that firms may incur costs to trade-off financial and tax reporting decisions. Firms that feel outcompeted by their competitors and incompetent to achieve their own expectations

because of missed analysts' expectations in the prior year are likely to take risks and strive more to reverse the poor-performance and reclaim the status quo (Eggers & Kaul, 2018), motivated by their myopic desire to meet or beat the expected performance (Xu *et al.*, 2019). Therefore, such firms are likely to manage their earnings upward. However, the tendency to avoid taxes is relatively low for these firms.

This study has at least three important contributions to the existing literature. First, while it is documented that firms manage their earnings to meet analysts' expectations (Burgstahler & Dichev, 1997; Brown, 1997; Koh *et al.*, 2008), little has been explored on how firms that miss analysts' expectations could behave in the subsequent period. Particularly, we document that firms that missed analysts' expectations in the prior year are more likely to manage their current earnings upward. Second, we also posit an important finding on the relationship between earnings management and tax avoidance consistent with the existing research claiming that managers boosting their accounting income also pay more taxes to avoid the costs related to loss of reputation and regulatory burden (Lennox *et al.*, 2013). This finding has important implications for regulators, investors, and auditors. This study's findings may indicate that the benefits (costs) associated with tax avoidance are lower (more severe) than the danger of inaccurate financial reporting. Finally, this research is different from most prior related studies in terms of its research setting. While most prior research examining the determinants of corporate tax avoidance is primarily conducted in the United States (Kanagaretnam *et al.*, 2016), our study is based on South Korean firms, providing additional empirical evidence to the related literature.

However, this study is not without limitations. Our results are based on a sample of firms listed on KOSPI (the Korea Composite Stock Price Index). These firms are relatively large in size, and results of this study might not be inferred to smaller firms. On the other hand, these firms are believed to represent the South Korean market and economy. KOSPI also included most of the Korean-based multinational companies, such as Samsung, LG, Hyundai, Kia, and many others. We also encourage future research to investigate why firms' corporate governance is not related to the management of financial and tax reports, at least for the sample of firms included in this study.

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