Earnings Shortfalls, Earnings Management, and Corporate Performance

Yong-Yi Li[a], Ai-Chi Hsu[b], Ya-Chiu Angela Liu[c]

[a]National Chung Cheng University, Taiwan
[b]National Yunlin University of Science and Technology, Taiwan

This paper examines whether firms tend to manage earnings upward to improve corporate performance and stock returns when their earnings would be below expected earnings thresholds, such as zero earnings, past earnings, and analysts' earnings forecasts. To inflate earnings to gain better financial performance and market response, managers may employ various kinds of tools, including discretionary accruals and non-operating income. These two tools can be used simultaneously, because there are cost and efficiency differences between them with regard to managing earnings. This study aims to explore the association between these two tools, and the effects of various related factors on them. The empirical evidence indicates that there is a significant endogenous relationship between discretionary accruals and non-operating income, and there are significant positive relationships between each of the two tools and each of the three earnings thresholds, except for the effect of past earnings on non-operating income, and thus that in order to meet the expected earnings thresholds, managers will use more than one tool to inflate their earnings. Moreover, by manipulating earnings, managers can improve corporate performance and stock returns.

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1. Introduction

As noted in the seminal papers on earnings management around thresholds (Burgstahler and Dichev, 1997; Degeorge et al., 1999; Hayn, 1995; Lintner, 1956), managers appear especially concerned with avoiding earnings that are lower than expected, which in this study is called an earnings shortfall (hereafter ES). The literature suggests that earnings management may be used to meet or beat three specific earnings benchmarks: zero earnings, prior-period earnings, and analyst forecasts (Abarbanell & Lehavy, 2003a; Burgstahler & Dichev, 1997; Degeorge et al., 1999; Matsunaga & Park 2001), and that manager may engage in such behavior for a wide range of reasons, including to signal their inside knowledge about the firm's expected future profitability (Subramanyam, 1996; Holland & Ramsay, 2003), to get higher compensation or keep their jobs (Healy, 1985; Guidry, Leone & Rock, 1999), to avoid debt covenants (Watts and Zimmerman, 1986; Young, 1998), or to affect stakeholders' beliefs and behaviors (Teoh, Welch, & Wong, 1998a & 1998b; Ducharme, Malatesta, & Sefcik, 2001; Gaa and Dunmore, 2007). These earlier studies have generally examined empirical distributions of scaled earnings levels, earnings changes, and earnings surprises, but there are significant differences in deciding on the width of the distribution intervals, and this may lead to inconsistencies in their empirical results. To address this issue, this study begins by estimating three kinds of ES (i.e., ES1, ES2, and ES3) in response to three earnings benchmarks, and then investigates their relationships with earnings management.

The three ES examined in this work are defined as follows: ES1 takes the value of zero when pre-managed earnings are greater than zero earnings. When pre-managed earnings are lower than this, ES1 equals the absolute value of pre-managed earnings, scaled by prior period assets. ES2 takes the value of zero when past earnings are lower than pre-managed ones. When past earnings are greater than pre-managed ones, ES2 equals past earnings minus pre-managed ones, scaled by prior

period assets. ES3 takes the value of zero when analysts' earnings forecasts are lower than pre-managed earnings, while ES3 equals analysts' earnings forecasts minus pre-managed earnings, scaled by prior period assets, when analysts' earnings forecasts are higher than pre-managed ones. This study hypothesizes that all three kinds of ES are positively associated with earnings management.

Much of the existing literature states that managers use discretionary accruals (hereafter DA) (Baber, Kang, & Li, 2011; Bradshaw, Richardson, & Sloan, 2001; Dechow et al., 2003; Hribar & Collins, 2002; Jones, 1991; Daniel, Denis, & Naveen, 2008) and/or non-operating income (hereafter NOI) (Bartov, 1993; Chu, 1997; Herrmann et al., 2003) to manipulate earnings to achieve their desired outcomes. In the earnings management literature, there are two opposing views on the relationship between DA and NOI, the substitute versus complement hypotheses. One strand of the literature provides strong evidence in support of the substitute hypothesis, and suggests that managers trade-off DA and NOI based on their relative cost-benefit advantages to smooth earnings (Barton, 2001; Zang, 2007). The other strand of the literature supports the complement hypothesis, and suggests that managers can use both DA and NOI to inflate earnings to gain the greatest effect via a coordinated approach, with DA and NOI complementing each other (Chen et al., 2012; Mizik and Jacobson, 2007, 2008). It is thus worth examining whether managers use DA and NOI as alternative methods under the substitute hypothesis or as coordinated ones under the complement hypothesis to manage earnings upwards when pre-managed earnings are expected to fall short of earnings targets.

There has been debate in the literature about the relationship between earnings management and corporate performance. From the opportunistic perspective, several studies indicate that managers with bonus plans are more likely to make accounting choices that mislead investors in order to maximize their own compensation at the expense of other contract parties (Healy, 1985; Holthausen, Larcker and Sloan, 1995; Guidry, Leone and Rock, 1999). The opportunistic perspective expects a negative association between accounting discretion and corporate performance. In contrast, the efficient contracting perspective proposes that accounting methods will be chosen to facilitate internal control and decision making, minimize taxes, limit opportunism, reduce costly debt covenant renegotiations, and maximize the aggregate wealth of all contract parties (Malmquist, 1990; Mian and Smith, 1990; Christie and Zimmerman, 1994). This perspective implies that firms make use of a chosen accounting method to minimize the agency costs among the various interested parties, and expects a positive relation between accounting discretion and corporate performance.

On the other hand, the information perspective suggests that accounting discretion enables managers to improve the informativeness of earnings (Trueman, 1986; Subramanyam, 1996), implying that managers have a comparative advantage in providing information about the firms' future cash flows. Subramanyam (1996) finds that returns are positively associated with contemporaneous discretionary accruals, while Louis and Robinson (2005) find a positive correlation between abnormal accruals and abnormal returns around stock split announcements. If managers have incentives to engage in different types of earnings management, a question naturally arises as to whether firms employ earnings management procedures to improve their financial numbers, and thus impress investors.

Chen, Leung, and Daouk (2003) characterize the Taiwanese stock market as a highly volatile, less well established one with relatively low levels of capitalization, while Chin et al. (2009) characterize it as a smaller market with low transparency, weak legal protection of investor property rights, and low litigation costs. Leuz, Nanda and Wysocki (2003) provide a comparison of earnings management across 31 countries, and similarly find that Taiwan is characterized by having a less developed stock market, concentrated ownership, and weak investor rights, but strong legal enforcement, and they rank Taiwan as the sixth highest nation in terms of earnings management. Since earnings management appears to be a significant problem in Taiwan, this study takes firms listed on this market as its sample. In addition, Chen and Hsueh (2003) note that electronic products typically have a short life cycle and a high level of income uncertainty, and this study thus explores

whether earnings are more likely to be manipulated in the electronics industry than in other industries.

This study contributes to three lines of the accounting and finance literature. First, to reduce the empirical conflicts resulting from the distribution interval width, this study employs three kinds of earnings shortfall as managers' incentives to manage earnings upwards. Our evidence suggests that managers use earnings management tools to avoid earnings that are lower than expected when their pre-managed earnings would be below thresholds such as zero earnings, past earnings, and analysts' earnings forecasts. Second, this study contributes to the growing literature on how managers strategically use earnings management tools. To this end, this study tests the relationship between DA and NOI using simultaneous equations estimated by three-stage least squares (3SLS) regression. In contrast to prior studies (e.g., Barton 2001, Zang 2007, Cohen et al. 2008) that focus on Anglo-Saxon countries, this study examines the association between discretionary accruals and non-operating income using data from an emerging market. Our findings are consistent with the complement hypothesis, which states that managers make DA and NOI decisions jointly and simultaneously. Third, and most importantly, it is difficult for investors to examine managers' intrinsic motivations with regard to earnings management. If managers have an incentive to engage in different types of earnings management, it is particularly important that investors have an understanding of the relationship between earnings management and both corporate performance and shareholder wealth. This study thus goes one step further to explore whether earnings management is carried out in order to improve their financial numbers and impress investors.

The remainder of this work is organized as follows: Section 2 provides a review of the literature and proposes the research hypotheses, and Section 3 then presents the research design. The results of our empirical tests are summarized in Section 4, and the conclusions of this work are given in Section 5.

2. Literature review and hypotheses development

2.1. Earnings shortfalls and earnings management

The existing literature presents several definitions of earnings management (Davidson, Stickney, & Weil, 1987; Guan, He, & Yang, 2006; Healy & Wahlen, 1999; Schipper, 1989; Jones, 2011; Koumanakos, Siriopoulos, & Georgopoulos, 2005). Healy and Wahlen (1999) define it from the perspective of various standard setters, and state that it occurs when managers use their discretion in financial reporting and in structuring transactions to alter financial reports in order to either mislead some stakeholders about the underlying economic performance of the company, or to influence contractual outcomes that depend on reported accounting numbers. Adopting an accounting perspective, Schipper (1989) cites Davidson et al. (1987) and states that earnings management occurs when managers intervene in external financial reporting in order to achieve a desired level of reported earnings under generally accepted accounting principles. Jones (2011) suggests that earnings management is carried out to deliver a predetermined profit or achieve a specific objective by using the flexibility that exists within accounting standards. According to these definitions, managers tend to manipulate earnings to make up earnings shortfalls when pre-managed earnings would be lower than expected ones. Previous research has provided mixed evidence on the relative importance of three earnings thresholds that managers seek to achieve, namely avoiding losses, avoiding earnings declines, and meeting analysts' forecasts.

First, a signal about a firm's negative earnings may induce outsiders, in particular credit raters and stock analysts, to lower a firm's credit rating and thus raise the cost of debt (e.g. Dechow, Richardson, & Tuna, 2000). However, such a signal may be weighed differently by outsiders, depending on the firms' past signals. Smith, Lipin, and Naj (1994) document that firms try to smooth earnings by timing the recognition of gains and losses. Fox (1997) suggests that managers often embellish reported earnings in order to report an increasing trend. In addition, some studies provide persuasive evidence consistent with the premise that managers appear willing to go to great lengths

to avoid reporting losses (Burgstahler & Dichev, 1997; Hayn, 1995; Roychowdhury, 2006), and thus are very reluctant to make pre-managed earnings lower than zero earnings.

Secondly, in order to facilitate the reading of financial statements, it is common that current earnings are listed and compared with past earnings on the same page, and so investors can easily learn whether a firm is growing or contracting, with Barth et al. (1999) showing that investors give a higher rating to firms with continuous earnings growth. Graham et al. (2005) report that, in a survey of 401 financial managers, more than 85% stated that they aim to at least maintain the level of previous earnings per share (EPS). Managers may thus have strong incentives to manipulate earnings if real current earnings (pre-managed earnings) are lower than past ones (Burgstahler & Dichev, 1997; Myers et al., 2007; Phillips et al., 2003; Thomas et al., 2004

Finally, with improvements in information technology, investors can now easily gather and analyze firm-specific financial information supplied by insiders and outsiders before making investment decisions. Among the various sources of information available from outsiders, financial analysts' earnings forecasts are the easiest and most direct way to assess firm performance, and are typically reported in the form of future earnings estimates along with investment advice. Moreover, it has been shown that analysts' earnings forecasts are more accurate than time series forecasts (O'Brien, 1988), and thus are an important threshold that firms strive to meet, and the literature shows that firms who meet or beat analysts' earnings forecasts perform better than those who fail to do so (Bartov, Givoly, & Hayn, 2002; Kasznik & McNichols, 2002; Matsumoto, 2002; Phillips et al., 2003).

Consistent with previous research, discretionary accruals are used as a proxy for measuring earnings management in this work. Following the method in Kothari, Leone, and Wasley (2005), discretionary accruals are used to identify earnings management. However, using only one tool to manipulate earnings to make up various earnings shortfalls may be very difficult, and a key characteristic of individual investors is that they tend to focus on short-term returns and to neglect the stock-related risk (Flannery, 1991). A portion of a firm's income is derived from activities not related to its core operations. For example, non-operating income would include such items as dividend income, profits (or losses) from investments, other non-operating revenues and expenses, and so on. It is important to differentiate between operating and non-operating income when exploring a firm's performance over a recent quarter or year. Chu (1997) shows that one of the institutional characteristics in Taiwan's stock market is that many of the listed companies have a considerable proportion of non-operating income, which can be quite helpful to managers if they need to reduce an earnings shortfall. Therefore, in addition to DA, this study also employs NOI, which is income from sources other than operations and a non-recurring component of earnings. The reason for not using the changes in accounting methods as earnings management tools is mainly because companies listed on the Taiwan Stock Exchange usually choose to apply the same accounting treatment[1], and thus it is rare for them to use an accounting change to meet earnings targets.

As discussed above, this study expects that when firms have a greater level of earnings shortfall, they will be more likely to engage in earnings management behavior, using tools such as DA and NOI. Consequently, this study proposes the following hypotheses.

H1: A greater level of earnings shortfall leads to higher DA.

H2: A greater level of earnings shortfall leads to higher NOI.

While much of the existing literature states that managers use DA (Baber, Kang, & Li, 2011; Bradshaw, Richardson, & Sloan, 2001; Dechow et al., 2003; Hribar & Collins, 2002; Jones, 1991; Daniel, Denis, & Naveen, 2008) and NOI (Bartov, 1993; Chu, 1997; Herrmann et al., 2003) to manipulate earnings to achieve their desired outcomes, few studies examine the relationship between DA and NOI, and whether they complement or substitute each other. In practice, there are many ways to

[1] For example, fixed assets are depreciated by using the straight-line method and inventory is evaluated by using the average one. It is also assumed that accounting policies are consistent from one financial period to another.

manage earnings. Under generally accepted accounting principles (GAAP), managers can determine the timing of the period in which an asset or an investment is sold, and can manage earnings by deferring recognition of expenses, accelerating recognition of revenues, changing the depreciation method used for fixed assets, changing the inventory accounting method, and so on. DA can influence operating income, while NOI can directly affect cash flow, and both can achieve earnings management[2] (Barton, 2001; Supanvanij, 2005). Moreover, both may be used simultaneously, as there are cost and efficiency differences between them. As discussed above, this study attempts to investigate whether there is a complementary relationship between DA and NOI, and thus it proposes the following hypothesis.

H3: There is a complementary relationship between DA and NOI.

2.2. Earnings management and corporate performance

A firm's stakeholders, including its board of directors, blockholders, financial analysts, and so forth, can closely monitor it by reviewing its reported earnings, which can convey a great deal of important information about its strengths and weaknesses. The reported earnings also influence the reactions of stock market investors (Barth et al., 1999). In view of this, managers of different firms may have many similar incentives and pressures to influence earnings, and this can worsen the conflicts between current and future stakeholders (Guthrie & Sokolowsky, 2010). Moreover, managers may manipulate earnings for their own self-interest (Bergstresser & Philippon, 2006; Healy, 1985), such as to increase short-term returns, prevent legal problems, issue new equity, and so on. Earnings management can affect investors' investment decisions or enhance financial performance measures such as ROA, ROE EPS, and stock returns (Bergstresser & Philippon, 2006; Das & Zhang, 2003; Degeorge et al., 1999; Roychowdhury, 2006), and managers may use earnings management tools to inflate corporate earnings in order to achieve better corporate performance and market reactions. As discussed above, this study argues that higher earnings management, in terms of DA and NOI, leads to better corporate performance, and thus the following hypotheses are proposed.

H4: Higher DA leads to better corporate performance.

H5: Higher NOI leads to better corporate performance.

2.3 The effect of industry type

As compared with traditional industries, the electronics industry has the following characteristics (Chen & Hsueh, 2003): (1) greater volatility of commodity prices; (2) shorter product lifecycles; (3) more uncertain cash flows; and (4) more capital and technology intensity. Therefore, this study classifies the listed companies into two groups, electronics and non-electronics industries, and analyzes whether companies in the former are more likely to manipulate earnings. The sixth hypothesis is thus as follows:

H6: Firms in the electronics industry have more incentives to manipulate earnings.

3. Methodology

3.1. Data collection and sample

The sample used in this study, which includes 22,228 observations from 553 non-financial firms with fiscal years ranging from 2001 to 2010 (quarterly data), is drawn from firms listed on the Taiwan Stock Exchange. Quarterly data are employed due to the following considerations: (1) this frequency allows us to more deeply investigate what goes on behind earnings management, because DA typically reverses within four quarters; (2) semiannual or annual reports may make it difficult to differentiate the various motivations related to different events; and (3) quarterly data for both variables (DA and NOI) are well-established in the literature on earnings manipulation (Bartov,1993; Shivakumar, 2000; Kim & Park, 2005).

2 In the existing literature, derivatives are also used for earnings management, with the aim of smoothing earnings. However, it is not possible to estimate in advance the magnitude and direction which derivatives affect earnings.

Taiwan has a shallow domestic stock market with the following characteristics: (1) It has long been dominated by individual investors, with the Taiwan Stock Exchange Company reporting that nearly 70% of equity transactions were generated by such investors in 2010. Therefore, the unique structure and investor characteristics of Taiwan's equity markets may augment the existing literature about earnings management, particularly in a relatively immature market. (2) Compared with individual investors, institutional ones have professional teams and vast resources to gather and analyze information in order to profit from short- and long-term investments based on specialized knowledge (Goodfellow, Bohl, & Gebka, 2009; Grinblatt & Keloharju, 2000). In 2010, securities trading by institutional investors accounted for only about 32 percent of all trades in Taiwan stock market. (3) Since the abolishment of the Qualified Foreign Institutional Investor (QFII) system in 1983, the amount of transactions by foreign investors has increased dramatically, from 2.41% in 1999 to 18.47% in 2010. Although individual investors still dominate the Taiwanese stock market, foreign investors are having a growing influence. (4) Companies in this market have long experienced a high stock market turnover rate due to the predominance of individual investors. According to the statistics published by the Taiwan Stock Exchange, the turnover rate was 136.74% in 2010, compared with New York's 131.29%, Hong Kong's 62.17%, Singapore's 53.29%, Tokyo's 109.64%, and Korea's 176.31%. The Taiwanese stock market is thus one of the most important emerging stock markets.

This study retrieves all its variables from the Taiwan Economic Journal (TEJ) data bank, and uses panel data to investigate whether managers behave differently with regard to earnings management. Panel data, which combines time-series and cross-section data, can be used to not only explore the time-series movement process, but also the characteristics of firms in different industries. In addition, panel data also has the following advantages: (1) it allows for more accurate inferences of model parameters; (2) it has a greater capacity for capturing the complexity of human behavior than a single cross-section or time series data; and (3) it simplifies the development of computational and statistical inferences (Hsiao, 1986).

Our main research question is whether firms inflate earnings (H1 and H2) to improve corporate performance (H4 and H5) when they anticipate that pre-managed earnings will be lower than expected. Furthermore, this study attempts to investigate whether there is a complementary relationship between DA and NOI (H3), because there are cost and efficiency differences between them in managing earnings. Following Chen and Hsueh (2003), this study also analyzes whether there are more possibilities to manipulate earnings in the electronics industry than in other industries (H6).

To test hypotheses 1 and 2, this study employs OLS. Accordingly, the following OLS is specified:

$$DA_{ijt} = a_1 + b_1 ES1(2,3)_{ijt} + c_1 NOA_{ijt} + d_1 OCF_{ijt} + e_1 LR_{ijt} + f_1 R\&D_{ijt} + g_1 Grow_{ijt} + h_1 LA_{ijt} + i_1 IDLE_{ijt} + j_1 IND_{ijt} + \Sigma k_1 Year + \Sigma l_1 Season + \varepsilon_1 \quad (1)$$

$$NOI_{ijt} = a_2 + b_2 ES1(2,3)_{ijt} + c_2 DI_{ijt} + d_2 DFA_{ijt} + e_2 LR_{ijt} + f_2 R\&D_{ijt} + g_2 Grow_{ijt} + h_2 LA_{ijt} + i_2 IDLE_{ijt} + j_2 IND_{ijt} + \Sigma k_2 Year + \Sigma l_2 Season + \varepsilon_2 \quad (2)$$

To test hypothesis 3, this study employs 3SLS, and the following 3SLS is specified:

$$DA_{ijt} = a_3 + b_3 NOI_{ijt} + c_3 ES1(2,3)_{ijt} + d_3 NOA_{ijt} + e_3 OCF_{ijt} + f_3 LR_{ijt} + g_3 R\&D_{ijt} + h_3 Grow_{ijt} + i_3 LA_{ijt} + j_3 IDLE_{ijt} + k_3 IND_{ijt} + \Sigma l_3 Year + \Sigma m_3 Season + \varepsilon_3 \quad (3)$$

$$NOI_{ijt} = a_4 + b_4 DA_{ijt} + c_4 ES1(2,3)_{ijt} + d_4 DI_{ijt} + e_4 DFA_{ijt} + f_4 LR_{ijt} + g_4 R\&D_{ijt} + h_4 Grow_{ijt} + i_4 LA_{ijt} + j_4 IDLE_{ijt} + k_4 IND_{ijt} + \Sigma l_4 Year + \Sigma m_4 Season + \varepsilon_4 \quad (4)$$

To test hypotheses 4 and 5 using OLS, this study employs the traditional measures of accounting profits (including ROA, ROE, EPS, and stock return) as financial performance measures. Accordingly, the following OLS is specified:

$$Performance_{ijt} = a_5 + b_5 DA_{ijt} + c_5 LR_{ijt} + d_5 R\&D_{ijt} + e_5 Grow_{ijt} + f_5 LA_{ijt} + g_5 IDLE_{ijt} + h_5 IND_{ijt} + \Sigma i_5 Year + \Sigma j_5 Season + \varepsilon_5 \quad (5)$$

$$Performance_{ijt} = a_6 + b_6 NOI_{ijt} + c_6 LR_{ijt} + d_6 R\&D_{ijt} + e_6 Grow_{ijt} + f_6 LA_{ijt} + g_6 IDLE_{ijt} + h_6 IND_{ijt} + \Sigma i_6 Year + \Sigma j_6 Season + \varepsilon_6 \quad (6)$$

3.2. Measurement

As in Peasnell, Pope, and Young (2005), this study estimates pre-managed earnings as operating cash flow. Our key independent variables consist of three types of earnings shortfall, ES1, ES2, and ES3. The first is ES1, which equals Max (0, ES1), where ES1 is calculated as zero earnings minus pre-managed earnings, scaled by prior period assets. ES1 takes the value of zero when pre-managed earnings are larger than zero earnings. When pre-managed earnings are lower than zero earnings, ES1 equals zero earnings minus pre-managed earnings, scaled by prior period assets. The second shortfall is ES2, which equals Max (0, ES2), where ES2 is calculated as past earnings minus pre-managed ones, scaled by prior period assets. ES2 takes the value of zero when past earnings are lower than pre-managed ones. When past earnings are larger than pre-managed ones, ES2 equals past earnings minus pre-managed earnings, scaled by prior period assets. The third shortfall is ES3, which equals Max (0, ES3), where ES3 is calculated as analysts' earnings forecasts minus pre-managed earnings, scaled by prior period assets. ES3 takes the value of zero when analysts' earnings forecasts are lower than pre-managed earnings. When analysts' earnings forecasts are greater than pre-managed earnings, ES3 equals analysts' earnings forecasts minus pre-managed earnings, scaled by prior period assets. To avoid multicollinearity problems, these three variables are not used together in the same regression equation.

DA and NOI are examined in this study for the following three reasons: (1) they are standard measures of earnings management in the finance and accounting literature; (2) using accruals to enhance earnings entirely complies with Taiwan's GAAP, and the cost of using accruals to achieve earnings benchmarks is likely to be lower than that of other methods (Guthrie & Sokolowsky, 2010); and (3) since managers can determine when an asset will be sold, they have an opportunity to enhance earnings by selling at a relatively high price (Bartov, 1993)

Since the various existing models that estimate accruals are most affected by firm performance, Kothari et al. (2005) develop the cross-sectional modified Jones model, which uses data that are sorted by industries and seasons to estimate the coefficient for each independent variable, as shown in Eq. (7), and then substitutes these estimated values for the coefficients in Eq. (8) to determine the value of NDA_{ijt}. Next, the difference (equals DA_{ijt}) between TAC_{ijt} and NDA_{ijt} can be calculated in Eq. (9). In order to increase the power of the test, Kothari et al. (2005) add the variable ROA_{ijt} to revise other widely-used modified Jones models (Hribar & Collins, 2002; Dechow, Sloan, & Sweeney, 1995). Following the method in Kothari et al. (2005), this study estimates accruals using the following regression equation:

$$TAC_{ijt} = \alpha_0 + \alpha_1 \left(\frac{1}{Assets_{ijt-1}}\right) + \alpha_2 \left(\frac{\Delta SALE_{ijt} - \Delta REC_{ijt}}{Assets_{ijt-1}}\right) + \alpha_3 \frac{PPE_{ijt}}{Assets_{ijt-1}} + \alpha_4 ROA_{ijt} + \varepsilon_{ijt} \quad (7)$$

$$NDA_{ijt} = \hat{\alpha}_0 + \hat{\alpha}_1 \left(\frac{1}{Assets_{ijt-1}}\right) + \hat{\alpha}_2 \left(\frac{\Delta SALE_{ijt} - \Delta REC_{ijt}}{Assets_{ijt-1}}\right) + \hat{\alpha}_3 \frac{PPE_{ijt}}{Assets_{ijt-1}} + \hat{\alpha}_4 ROA_{ijt} \quad (8)$$

$$DA_{ijt} = TAC_{ijt} - NDA_{ijt} \quad (9)$$

where TAC_{ijt} is total accruals for firm *i* in industry *j* in period *t*, $Assets_{ijt-1}$ is the assets for firm *i* in industry *j* in period *t*-1; $\Delta SALE_{ijt}$ is the change in sales revenues for firm *i* in industry *j* in period *t*; ΔREC_{ijt} is the change in accounts receivable for firm *i* in industry *j* in period *t*; ROA_{ijt} is return on assets for firm *i* in industry *j* in period *t*; and PPE_{ijt} is property, plant, and equipment for firm *i* in industry *j* in period *t*.

$$NOI_{ijt} = \frac{disposal\ of\ fixed\ assets_{ijt} + disposal\ of\ investment_{ijt}}{market\ value\ of\ common\ equity_{ijt}} \quad (10)$$

where NOI_{ijt} is equal to the gain (loss) on the sale of fixed assets and investments scaled by the market value of common equity for firm *i* in industry *j* in period *t*.

This study uses control variables to verify the correctness of the empirical results, and these are classified into three categories, namely the DA-related, NOI-related, and common control variables for both DA and NOI. First, the two DA-related control variables include net operating assets in period *t*-1 (hereafter NOA_{t-1}) and operating cash flow (hereafter OCF). Based on empirical findings (Barton & Simko, 2002; Cheng & Warfield, 2005), the ratio of net operating assets to assets is a good proxy for the earnings management constraint, because net operating assets can reflect the cumulative effects of past earnings overstatements, and thus indicate the increasing difficulty of future income increasing earnings management, and so firms with high net operating assets are less likely to engage in earnings management. This study employs NOA_{t-1} to explore the effect of net operating assets on earnings management, and expects that the sign of the coefficient on NOA_{t-1} is negative. Earlier studies (Beneish & Vargus, 2002; Payne & Robb, 2000) show that a significant negative relation exists between operating cash flows and total accruals, and this influences the estimation of DA (Shivakumar, 1996). To control for this, the variable OCF is incorporated in the model and expected to have a negative relation with DA. Secondly, as suggested by Bartov (1993), NOI is decomposed into two parts, disposal of investments (hereafter DI) and disposal of fixed assets (hereafter DFA), and is expected to have positive relationship with these.

Lastly, several control variables are included to ensure the robustness of the empirical results. The previous empirical findings indicate that firms with high debt/asset ratios (hereafter LR) are more motivated to engage in earnings manipulation to reduce the cost of capital and avoid debt covenant violations (Bartov, 1993; Bartov, 2001; Herrmann et al., 2003), and thus the variable LR is included in this study to examine what relationship it has with the two earnings management tools, DA and NOI. R&D is commonly used as a measure of the future growth of a company, because it can help a firm to develop new products or processes to improve and expand its operations. However, under Taiwan's GAAP, R&D is charged as an expense when incurred, and thus will decrease earnings[3]. In order to avoid this, managers may decide to inflate earnings (Baber & Fairfield, 1991), and thus the variable R&D is included in this study to investigate the relation between R&D and the two earnings management tools.

Herrmann et al. (2003) show that firms in the growth stage of their life cycle are less likely to sell their assets, while Park and Park (2004) document that there is a negative relation between DA and firm growth. This study thus expects a negative relation between changes in sales (hereafter GROW) and the two earnings management tools. Inoue and Thomas (1996) report that companies with a large number of assets tend to utilize conservative accounting principles for fixed assets and marketable securities, and thus can easily make a profit on the disposal of assets. Firm size is the main indicator of tangible resources, and greater size is associated with more stable earnings. However, in terms of the size hypothesis (Watts & Zimmerman, 1978), the larger the firm, the more likely the manager is to defer reported earnings from current to future periods. Therefore, this study uses the variable LA, the natural log of total assets, as a proxy of firm size, and expects that it is positively related to the two earnings management tools (Herrmann et al., 2003; Poitras et al., 2002).

[3] According to the statement of ROC Financial Accounting Standards No. 37 for intangible assets, research expenditures should be recognized as expenses when they are incurred, and this has been the rule since Jan, 01, 2007. Because increases in R&D expenses can decrease net income, they may make it more difficult to reduce earnings shortfalls. The higher the R&D expenses/ sales revenue ratio, the more likely a firm will manipulate earnings to cover earnings shortfalls. In the electronics industry, the one examined in this work, the R&D and marketing expenses/sales revenue ratio is higher than in other industries.

Finally, idle assets[4] (hereafter IDLE), such as idle land, non-operating assets, and so on, are assets which have not been used for more than a year, or which have not been put to their best use. These assets may be used opportunistically to fill gaps in earnings when pre-managed earnings are lower than the expected ones, by selling or renting them. For example, firms could generate rent revenue by leasing out idle land, and this should be recognized as non-operating income. On the other hand, the rent revenue could also contribute to pre-managed earnings to reduce an earnings shortfall, and this would be conducive to the use of less DA in order to manipulate earnings. Therefore, this study expects a negative (positive) relationship between idle assets and DA (NOI). Table 1 provides the definitions of the main variables used in this study.

Table 1
Definitions of the main variables used in this study

Discretionary accruals (DA)	% of assets	See Eq.(7)-(9) for details; scaled by total assets lagged.
Non-operating income (NOI)	Fraction of assets	See Eq.(10) for details; scaled by total assets.
Zero earnings (ES1)	% of market value	ES1 is calculated as zero earnings minus pre-managed earnings, scaled by prior period assets, if pre-managed earnings are lower than zero earnings. ES1 takes the value of zero when pre-managed earnings are higher than zero earnings.
Past earnings (ES2)	% of market value	ES2 is calculated as past earnings minus pre-managed earnings, scaled by prior period assets, if past earnings are higher than pre-managed earnings. ES2 takes the value of zero when past earnings are lower than pre-managed earnings.
Analysts' earnings forecasts (ES3)	% of market value	ES3 is calculated as analysts' earnings forecasts minus pre-managed earnings, scaled by prior period assets, if analysts' earnings forecasts are higher than pre-managed earnings. ES3 takes the value of zero when analysts' earnings forecasts are lower than pre-managed earnings.
Net operating assets (NOA)	% of assets	Shareholders' equity - cash and marketable securities + total liabilities at the end of fiscal year t-1, scaled by assets of fiscal year t-1.
Operating cash flow (OCF)	% of assets	Operating cash flow, scaled by assets of fiscal year t-1.
Disposal of investments (DI)	Fraction of assets	Sale of investments scaled by market value of common equity.
Disposal of fixed assets (DFA)	Fraction of assets	Sale of fixed assets scaled by market value of common equity.
Liability ratio (LR)	% of assets	Long-term debt, scaled by assets.
R&D	Fraction of assets	Research and development scaled by assets (lagged).
Sales Growth (GROW)	% of assets	Change in sales deflated by beginning-of-quarter total assets.
Log (asset) (LA)	Log of assets	The log of assets.
Idle assets (IDLE)	% of assets	Idle assets, scaled by assets.
Industry (IND)	Dummy variable	IND=1 if a firm is within the electronics industry, and 0 if otherwise.

[4] In Taiwan, in accordance with regulations governing profit-seeking enterprise income tax, idle assets are not categorized as fixed assets, and are not depreciated over time. Idle assets should be categorized periodically as asset impairments regardless of whether they will be used in operations in the future. Since impairment losses are recognized as non-operating expenses that decrease net income, this can make it more difficult for firms to achieve expected earnings. In addition, if the capital needed to purchase the idle assets comes from bank loans, the interest expense should be recognized as a deferred expense. Once idle assets are sold, the deferred expenses are recognized as income deduction.

4. Empirical results

Table 2 reports the summary statistics for the key variables over the sample period 2001-2010. As shown in Panel A, the average value of NOI is negative. In real life, the sale of an asset (investment) may be at a price lower than the purchase price (cost) when managers feel an urgent need to meet specific targets.[5] In a regression of total accruals on firm characteristics, DA is the residual, and thus its value is close to zero (median=0.0389).

Table 2
Summary statistics on earnings management measures and firm-related control variables.

Panel A: All firms	#	Mean	Median	Standard	Skewness	Kurtosis
DA	22,228	0.1495	0.1239	0.1182	1.3696	3.6787
NOA	22,228	0.5042	0.5296	0.1945	-2.3510	26.2019
OCF	22,228	0.0447	0.0355	0.0851	2.5412	79.3471
NOI	22,228	-0.0012	0.0000	0.0167	36.4429	3,669.7300
DI	22,228	0.0050	0.0000	0.0216	13.0421	274.3033
DFA	22,228	0.0031	0.0001	0.0156	19.2032	610.2864
ES1	22,228	0.0188	0.0000	0.0742	11.0097	223.1705
ES2	22,228	0.0417	0.0007	0.0860	7.4835	131.0176
ES3	22,228	0.0202	0.0000	0.0901	21.5534	1,030.1000
LR	22,228	0.0761	0.0382	0.0935	1.3525	1.5500
R&D	22,228	0.0327	0.0141	0.1544	47.6685	2,872.0200
Grow	22,228	0.4669	14.7852	48.8113	-1.9960	6.8333
Asset	22,228	17,092,479	4,020,341	51,783,126	7.1384	64.8496
IDLE	22,228	0.0155	0.0000	0.0353	5.0012	43.8713
Panel B: Firms with ES(i)>0						
Fraction of firms with ES1>0	5,390	0.0774	0.0347	0.1348	6.1968	70.7523
Fraction of firms with ES2>0	11,237	0.0826	0.0571	0.1060	6.7335	100.1956
Fraction of firms with ES3>0	5,519	0.0815	0.0354	0.1664	12.6277	335.2423

In terms of earnings shortfalls, the average ES1 (the difference between pre-managed earnings and zero earnings) is the lowest among the three types of ES, followed by the average ES3. In fact, there are three reasons why Taiwan's stock market regulations may be a guide for firms that manipulate earnings to avoid reporting losses. First, under the criteria governing the offering and issuance of securities by securities issuers, companies are required to report positive earnings for three consecutive years immediately before issuing new shares. Second, issuance of corporate bonds is not permitted until the average reported earnings for the most recent three-year period is at least 100% of the total amount of interest payable on the corporate bonds to be issued. Finally, building on company law in Taiwan, a company cannot pay dividends or bonuses unless its losses have been covered and its legal reserves have been set aside. A firm without surplus earnings is not allowed to distribute dividends or bonuses unless its legal reserves exceed 50 percent of its paid-in capital. However, it may be not easy to meet past earnings, because of the business cycle and industry co-movements.

The average ES2 (the difference between pre-managed earnings and past earnings) is the largest among the three types of ES. Analysts usually make recommendations for a company's income and profits based on models, research, and economic expectations at the time. In our sample, the analysts' forecast is an average of all the forecasts from individual analysts tracking a particular stock. ES3

5 For example, VIA Technologies Inc. (TWSE: 2388) is a Taiwanese manufacturer of integrated circuits, mainly motherboard chipsets, CPUs, and memory, and is part of the Formosa Plastics Group. The cash flow statement for VIA Technologies Inc. for the year ending 31 December 2006 reported that losses on disposal of assets and investments were NT$ 154,000 and NT$ 22,600,000, respectively.

(the difference between pre-managed earnings and analysts' forecasts of earnings) is the second smallest among the three types of ES.

In our sample, idle assets are relatively small. Panel B presents the summary statistics for the sub-sample of firms with ES>0. The number of firms with ES1>0 is close to the number of firms with >ES3. The number of firms with ES2>0 is more than twice that of the others.

From Table 3 to Table 6, in addition to using the OLS method to explore whether managers use earnings management tools to cover earnings shortfalls, this study reports the empirical result of the 3SLS method in order to further investigate whether the two earnings tools are complements or substitutes. As shown in Panels A and B of Table 3, the results using OLS indicate that ES1 is positively and significantly associated with both DA and NOI, which implies that managers are more likely to use both DA and NOI as the level of the earnings shortfall (the difference between OCF and zero earnings) increases, even in the presence of the firm characteristic variables, consistent with H1 and H2. Finally, we find that inclusion of the firm characteristic variables increases the R^2 from 9.25% to 23.22% in Table 3, and from 6.83% to 6.94% in Table 4.

For the results using OLS in Table 4, ES2 is positively and significantly associated with DA, while negatively and significantly associated with NOI. In other words, managers attempt to cover earnings shortfalls only by using DA. One reason for this may be that the cost of covering a larger earnings shortfall is exorbitant and incurred for successive periods during a period of economic recession. This result is consistent with H1 but not with H2.

Using OLS regression, we find that inclusion of the firm characteristic variables increases the R^2 from 9.21% to 23.19% for the dependent variable DA in Panel A of Table 4, and from 6.83% to 6.95% for the dependent variable NOI in Panel B of Table 4.

For the result using OLS in Table 5, ES3 is also positively and significantly associated with both DA and NOI. Using OLS regression, we find that inclusion of the firm characteristic variables increases the R^2 from 9.23% to 23.19% for the dependent variable DA in Panel A of Table 5, and from 6.79% to 6.82% for the dependent variable NOI in Panel B of Table 5. Therefore, except for the result for NOI in Panel B of Table 3, the findings in Tables 3 to 5 are consistent with both H1 and H2, and indicate that managers would use both DA and NOI to cover earnings shortfalls when pre-managed earnings are lower than the expected earnings, even in the presence of the firm characteristic variables. In addition, the results show that the effects of the three types of earnings shortfall on DA are significantly greater than on NOI. As mentioned earlier, the reason why DA is used more often is that it does not need to be approved in advance by the board of directors, shareholders, or relevant authorities, and managers also do not need to explain afterwards why they have used DA. Among the three types of earnings shortfall, the effects of ES1 on both DA and NOI are the largest, followed by those of ES2, and then ES3. That is to say, managers first tend to avoiding reporting losses, then to achieve the maintenance of past earnings, and finally consider beating the consensus analyst forecast after satisfying the other two thresholds.

Further, the empirical evidence from 3SLS in Tables 3 to 5, consistent with hypothesis H3, shows that DA (NOI) is positively and significantly associated with NOI (DA), even in the presence of the firm characteristic variables, and thus there exists a significant complementary relationship between DA and NOI. Using 3SLS regression, we find that inclusion of the firm characteristic variables increases the weighted R2 from 8.16% to 16.28% for the first earnings shortfall, ES1, from 8.16% to 16.38% for the second earnings shortfall, ES2, and from 8.14% to 16.25% for the third earnings shortfall, ES3.

In Panel A of Table 6, the empirical evidence shows that the effects of DA on four corporate performance measures are significant and positive, which means that managers can inflate corporate performance by increasing DA to make up the earnings shortfall, supporting H4. In Panel B of Table 6, only two measures of corporate performance, ROA and ROE, are affected positively by NOI, which means that managers still can increase their firms' performance by increasing NOI to cover an earnings shortfall, and this partially supports H5.

According to the results from OLS in Tables 3 to 5, as far as DA is concerned, the coefficients on the variable IND are significantly positive. In other words, the characteristics of the electronics industry make it more likely that managers will attempt to manipulate earnings. However, as far as NOI is concerned, the coefficients on the variable IND are not significant. The results also show that for our sample both the sum of NOI and the variance of NOI in the electronics industry are only half those in the non-electronics industry. That is, firms in the electronics industry tend not to use NOI to make up earnings shortfalls. As mentioned above, this result partially supports our H6.

Table 3

Panel A	Sign	OLS		3SLS	
DA		Common	Firm	Common	Firm
NOI	+			0.3801***	1.0603***
ES1	+	0.0954***	0.1044***	0.0926***	0.0965***
NOA	+	0.0273***	0.0203***	0.0277***	0.0175***
OCF	-	0.0724***	0.0721***	0.0712***	0.0661***
LR	+		0.0720***		0.0710***
R&D	+		0.0223***		0.0220***
Grow	-		-0.0010***		-0.0010***
LA	+		0.0040***		0.0048***
IDLE	-		-0.2040***		-0.2070***
IND	+		0.0035**		0.0031**
Adj-R^2		0.0925	0.2322		
Weighted R^2				0.0816	0.1628
N			22,228		
Panel B	Sign	OLS		3SLS	
NOI		Common	Firm	Common	Firm
DA	+			0.0039*	0.0464***
ES1	+	0.0067***	0.0065***	0.0064***	0.0031**
DI	+	-0.1770***	-0.1760***	-0.1770***	-0.1680***
DFA	+	0.1182***	0.1182***	0.1182***	0.1133***
LR	+		0.0003		-0.0030**
R&D	+		0.0003		0.0000
Grow	-		0.0000		0.0000***
LA	-		-0.0001***		-0.0001***
IDLE	+		0.0037		0.0137***
IND	+		0.0001		0.0000
Adj-R^2		0.0683	0.0694		
Weighted R^2				0.0816	0.1628
N			22,228		

Notes**:** The main aim of Table 3 is to examine whether managers use DA (NOI) to make up the first earnings shortfall, ES1, when pre-managed earnings are lower than zero earnings. The empirical evidence is obtained from OLS and 3SLS. *, **, and *** denote significance at the 10%, 5%, and 1% levels. OLS equation is as follows: $DA_{ijt}(NOA_{ijt}) = a_1 + b_1ES1_{ijt} + c_1NOA_{ijt}(DI_{ijt}) + d_1OCF_{ijt}(DFA_{ijt}) + e_1LR_{ijt} + f_1R\&D_{ijt} + g_1Grow_{ijt} + h_1LA_{ijt} + i_1IDLE_{ijt} + j_1IND_{ijt} + \Sigma k_1Year + \Sigma l_1Season + \varepsilon_1$; 3SLS equation is as follows: $DA_{ijt}(NOI_{ijt}) = a_3 + b_3NOI_{ijt}(DA_{ijt}) + c_3ES1_{ijt} + d_3NOA_{ijt}(DI_{ijt}) + e_3OCF_{ijt}(DFA_{ijt}) + f_3LR_{ijt} + g_3R\&D_{ijt} + h_3Grow_{ijt} + i_3LA_{ijt} + j_3IDLE_{ijt} + k_3IND_{ijt} + \Sigma l_3Year + \Sigma m_3Season + \varepsilon_3$

Table 4

Panel A	Sign	OLS		3SLS	
DA		Common	Firm	Common	Firm
NOI	+			0.5342***	1.3701***
ES2	+	0.0811***	0.0923***	0.0853***	0.0989***
NOA	+	0.0244***	0.0163***	0.0248***	0.0127***
OCF	-	0.0730***	0.0749***	0.0730***	0.0626***
LR	+		0.0772***		0.0752***
R&D	+		0.0231***		0.0229***
Grow	-		-0.0010***		-0.001***
LA	+		0.0041***		0.0051***
IDLE	-		-0.1980***		-0.202***
IND	+		0.0035**		0.0032**
Adj-R^2		0.0921	0.2319		
Weighted R^2				0.0816	0.1638
N			22,228		

Panel B	Sign	OLS		3SLS	
NOI	+	Common	Firm	Common	Firm
DA	+			0.0063***	0.0627***
ES2	+	-0.0060***	-0.0060***	-0.006***	-0.0100***
DI	+	-0.1750***	-0.1740***	-0.175***	-0.1610***
DFA	+	0.1184***	0.1186***	0.1181***	0.1103***
LR	+		0.0005		-0.0040***
R&D	+		0.0002		-0.0010
Grow	-		0.0000		0.0000***
LA	-		-0.0001***		-0.0001***
IDLE	+		0.0029		0.0160***
IND	+		0.0001		0.0001
Adj-R^2		0.0683	0.0695		
Weighted R^2				0.0816	0.1638
N			22,228		

Notes: The main aim of Table 4 is to examine whether managers use DA (NOI) to make up the second earnings shortfall, ES2, when pre-managed earnings are lower than past earnings. The empirical evidence is obtained from OLS and 3SLS. *, **, and *** denote significance at the 10%, 5%, and 1% levels. OLS equation is as follows: $DA_{ijt}(NOA_{ijt}) = a_1 + b_1ES2_{ijt} + c_1NOA_{ijt}(DI_{ijt}) + d_1OCF_{ijt}(DFA_{ijt}) + e_1LR_{ijt} + f_1R\&D_{ijt} + g_1Grow_{ijt} + h_1LA_{ijt} + i_1IDLE_{ijt} + j_1IND_{ijt} + \Sigma k_1Year + \Sigma l_1Season + \varepsilon_1$; 3SLS equation is as follows: $DA_{ijt}(NOI_{ijt}) = a_3 + b_3NOI_{ijt}(DA_{ijt}) + c_3ES2_{ijt} + d_3NOA_{ijt}(DI_{ijt}) + e_3OCF_{ijt}(DFA_{ijt}) + f_3LR_{ijt} + g_3R\&D_{ijt} + h_3Grow_{ijt} + i_3LA_{ijt} + j_3IDLE_{ijt} + k_3IND_{ijt} + \Sigma l_3Year + \Sigma m_3Season + \varepsilon_3$

Table 5

Panel A	Sign	OLS		3SLS	
DA		Common	Firm	Common	Firm
NOI	+			0.3872***	1.0766***
ES3	+	0.0729***	0.0800***	0.0710***	0.0744***
NOA	+	0.0271***	0.0201***	0.0275***	0.0173***
OCF	-	0.0657***	0.0648***	0.0645***	0.0586***
LR	+		0.0724***		0.0712***
R&D	+		0.0224***		0.0220***
Grow	-		-0.0010***		-0.0010***
LA	+		0.0040***		0.0048***
IDLE	-		-0.2050***		-0.2080***
IND	+		0.0035**		0.0030**
Adj-R^2		0.0923	0.2319		
Weighted R^2				0.0814	0.1625
N		22,228	22,228	22,228	22,228

Panel B	Sign	OLS		3SLS	
NOI		Common	Firm	Common	Firm
DA	+			0.0039*	0.0476***
ES3	+	0.0044***	0.0042***	0.0042***	0.0014
DI	+	-0.177***	-0.1760***	-0.1770***	-0.167***
DFA	+	0.1181***	0.1182***	0.1181***	0.1131***
LR	+		0.0004		-0.0030**
R&D	+		0.0003		0.0000
Grow	-		0.0000		0.0000***
LA	-		-0.0000***		-0.0000***
IDLE	+		0.0036		0.0139***
IND	+		0.0001		0.0000
Adj-R^2		0.0679	0.0682		
Weighted R^2				0.0814	0.1625
N		22,228	22,228	22,228	22,228

The main aim of Table 5 is to examine whether managers use DA (NOI) to make up the third earnings shortfall, ES3, when pre-managed earnings are lower than analyst earnings forecast. The empirical evidence is obtained from OLS and 3SLS. *, **, and *** denote significance at the 10%, 5%, and 1% levels. OLS equation is as follows: $DA_{ijt}(NOA_{ijt}) = a_1 + b_1ES3_{ijt} + c_1NOA_{ijt}(DI_{ijt}) + d_1OCF_{ijt}(DFA_{ijt}) + e_1LR_{ijt} + f_1R\&D_{ijt} + g_1Grow_{ijt} + h_1LA_{ijt} + i_1IDLE_{ijt} + j_1IND_{ijt} + \Sigma k_1Year + \Sigma l_1Season + \varepsilon_1$; 3SLS equation is as follows: $DA_{ijt}(NOI_{ijt}) = a_3 + b_3NOI_{ijt}(DA_{ijt}) + c_3ES3_{ijt} + d_3NOA_{ijt}(DI_{ijt}) + e_3OCF_{ijt}(DFA_{ijt}) + f_3LR_{ijt} + g_3R\&D_{ijt} + h_3Grow_{ijt} + i_3LA_{ijt} + j_3IDLE_{ijt} + k_3IND_{ijt} + \Sigma l_3Year + \Sigma m_3Season + \varepsilon_3$

Table 6

Panel A	Sign	ROA	ROE	EPS	Stock Return
DA	+	0.0335***	0.0125*	0.0062***	0.0422**
LR	+	-0.0740***	-0.1540***	-0.0390***	-0.1120***
R&D	+	-0.0230***	-0.0390***	-0.0030***	-0.0190
Grow	+	0.0001***	0.0004***	0.0000***	0.0006***
LA	+	0.0017***	0.0025***	0.0025***	0.0028*
IDLE	-	-0.1950***	-0.3550***	-0.0710***	0.0499
IND	+	0.0158***	0.0127***	0.0036***	0.0032
Year		Yes	Yes	Yes	Yes
Season		Yes	Yes	Yes	Yes
Adj-R^2		0.2484	0.158	0.1724	0.1263
N			22,228		

Panel B	Sign	ROA	ROE	EPS	Stock Return
NOI	+	0.1295***	0.9114***	-0.1510***	-0.1120
LR	+	-0.0720***	-0.1550***	-0.0390***	-0.1080***
R&D	+	-0.0220***	-0.0390***	-0.0030***	-0.0180
Grow	+	0.0001***	0.0003***	0.0000***	0.0005***
LA	+	0.0020***	0.0031***	0.0024***	0.0029**
IDLE	-	-0.2020***	-0.3590***	-0.0730***	0.0408
IND	+	0.0158***	0.0124***	0.0037***	0.0033
Year		Yes	Yes	Yes	Yes
Season		Yes	Yes	Yes	Yes
Adj-R^2		0.2467	0.176	0.1834	0.1262
N			22,228		

Notes: The main aim of Table 6 is to examine whether managers can use DA (NOI) to increase corporate performance including ROA, ROE, EPS, and Stock Return. The empirical evidence is obtained from OLS for four performance measures including ROA, ROE, EPS, and Stock Return. *, **, and *** denote significance at the 10%, 5%, and 1% levels. The equation is as follows: $\text{Performance}_{ijt} = a_5 + b_5\text{DA}_{ijt}(\text{NOI}_{ijt}) + c_5\text{LR}_{ijt} + d_5\text{R\&}D_{ijt} + e_5\text{Grow}_{ijt} + f_5\text{LA}_{ijt} + g_5\text{IDLE}_{ijt} + h_5\text{IND}_{ijt} + \Sigma i_5\text{Year} + \Sigma j_5\text{Season} + \varepsilon_5$

5. Conclusion

Since earnings are one of the main indicators used by stakeholders in their decision making, and are also associated with a manager's job security and salary, managers may be tempted to raise earnings to achieve the expectations of shareholders and potential investors when pre-managed earnings are lower than expected. This study thus examines the relationships among earnings shortfall, earnings management, and corporate performance. More specifically, the aim of this paper is to explore whether firms tend to manipulate earnings upward to improve corporate performance and stock returns when their pre-managed earnings would be below thresholds such as zero earnings, prior-period earnings, and analysts' earnings forecasts.

Our empirical results indicate that both DA and NOI play important roles in strategically and concurrently boosting firm's earnings in Taiwan, namely supporting the complementary association

between DA and NOI. This finding has implications for both academics and regulators. For academics, prior studies which focused exclusively on accruals-based manipulation may not fully have explained earnings management behavior. For regulators, their top priority is to establish mechanisms (e.g., the Information Disclosure and Transparency Rankings System) to alleviate the abuse of both DA and NOI, and even improve firm performance. Given the diverse perspectives on such behaviors, it is difficult for investors to explore the real aims behind earnings manipulations. Most of the prior studies report that while the use of earnings management decreases the frequency of negative earnings surprises, it also results in significantly negative investor reactions to corporate performance. Accordingly, this paper examines the association between earnings management activities and corporate performance, and finds a significantly positive relationship between earnings management and corporate performance, consistent with the efficient contracting and information perspectives.

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