Back on Track? Role of Managerial Ability between Sustainable Practices and Earnings Management

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Abstract

Sustainable development is a current business trend and academic field of interest. This study investigates the relationship between sustainable practices (SPs) and use of earnings management (EM) and the effect of managerial ability (MA) on this relationship. An SP is any practice aiming to achieve or support a sustainable value. Three indicators of EM are employed: abnormal cash flow from operating activities; production costs; and sales, general, and administrative expenses. The research sample in this study is Taiwanese electronics firms. A significant negative correlation is discovered between SPs and real EM, but SPs is found to not influence the accrual-based management strategies used to manipulate earnings. The interaction term between SPs and MA is determined to be significantly negative; thus, MA strengthen the effect of SPs on the likelihood of real EM. To the best of our knowledge, this is the first study that extends the investigation of SPs to the EM setting and tests the SPs–EM relationship. The results show the likelihood of real EM is lower for firms if they are promoting SPswith higher MA. One such SP, sustainability information disclosure, can improve profits or minimize losses, further reducing the motivation of managers to engage in real EM.

Keywords: Sustainable practices, managerial ability, earnings management, information disclosure.

1. Introduction

According to the Global Risk Report released at the World Economic Forum, various risks currently exist globally, including an increasingly wide wealth gap, international political conflict, extreme climatic events, and fragile network systems. The report states that nearly 60% of global opinion leaders believe that global risks are likely to increase in five areas, namely the economy, the environment, geopolitics, society, and technology (Papakonstantinou, 2019). When confronting these global trends together with systemic risks—such as rapid population aging, a decrease in industry competitiveness, a widening inequality gap, and a highly fragile climate (Muntean, 2018)—the key to Taiwan achieving its sustainable development goals is discriminating the field of sustainability. On the basis of this distinction, detailed schedules and policy goals can be formulated. Using suitable policy tools, the impact of systemic risks can be strengthen and the opportunities for transformation can be capitalized upon (Jung and Jeong, 2018). During the promotion of sustainable development, improving corporate governance and enhancing information transparency are also required(Annunziata et al., 2018). Establishing an excellent business operation mechanism is imperative, as is the reduction of manipulation, irregularities, favoritism, inefficient operation, and incentives and opportunities for manipulating earnings(Chen and Tsai, 2010).

The motives, behaviors, and methods of corporate earnings management (EM) have long been topics of academic interest (Chan et al., 2014; Kothari et al., 2015). Research has focused on the investigation of firm-level characteristics that result in managers' decision to perform EM (Cohen et al., 2014; Cupertino et al., 2015). However, in addition to firm-level characteristics, the executive characteristics can influence the utilization of EM. Our study investigates the relationship between managerial ability (MA) and use of EM. Studies have demonstrated that EM has a detrimental effect on value and future corporate performance. Our study contributes a new perspective to the role played by MA in the relationship between sustainability practice (SP) and EM. EM behaviors in real corporate business activities are investigated in addition to incentives for using EM and concerns about SP.

Because recent research has obtained evidence of earnings manipulation, corporate EM is usually conducted by adjusting the net operating profit or deferring income tax (Cupertino et al., 2015). Firms with unsatisfactory financial statements tend to employ the upward approach (Burgstahler and Eames, 2003) to make a positive impression on the market and raise their stock price or management dividends (Healy, 1985). A middle ground between the upward and downward approaches enables smooth EM(Cohen et al., 2014).

Essentially, an SP is any practice aiming to achieve or support a sustainable value (Schaltegger and Burritt, 2015). For instance, information transparency is the degree to which a firm's operating status is made public by management and is a major indicator of the effectiveness of corporate governance (Chiang and He, 2010). Because the management of a firm has an informational advantage over the firm's capital providers (i.e., investors and creditors), insufficient information disclosure and quality influence the fund allocation decisions of those capital providers (Cassell et al., 2015). By contrast, the disclosure of information provides outsiders access to information that has traditionally been exclusive to management (Yeh et al., 2014), thereby reducing the information asymmetry between managers and external stakeholders (Korajczyk et al., 1992). When analyzing the predictors of sustainable business performance, scholars have discovered that managers' ability to suppress negative information is significantly associated with lower transparency (Duréndez and Madrid-Guijarro, 2018), inefficient information disclosure (Liedong and Rajwani, 2018), opaque financial reporting (De Meyere et al., 2018), and poor internal governance (Cheng et al., 2013) within the firm. These results can help standard-setters and regulators better understand the business practices within investment markets and accounting behavior in light of managerial abilities.

The Asia-Pacific region urgently needs progress in realizing the SDGs, transforming the current unfavorable trends, and it is necessary to reduce the massive consumption and destruction of environmental resources particularly(Allen et al., 2020).Of the countries investigated in the literature, Taiwan and South Korea are reported to be exportoriented. Both countries have export-based industrial structures similar to those of the United States, China, Japan, and other major markets(Chen and Tsai, 2010). However, the industrial structures of South Korea and Taiwan differ from those of the aforementioned countries. In South Korea, the main industries are operated by group-based enterprises through vertical integration, diversification, and leveraging the enterprises' internal strengths. By contrast, Taiwan's economy is dominated by small and medium-sized enterprises(Huang et al., 2011);consequently, the main industries are operated with professional division of labor and flexible efficiency.

Limited by natural resources and high population density, resulting in environmental load in Taiwan. Thus, the pursuit of sustainable development is more urgent than in other countries. The government attaches great importance to promoting sustainable development. and has also become a topic of concern to the people of the whole country. The positioning of Taiwan is unique. First, it has long-term and symbiotic economic relationships with the United States and China. Second, Taiwan's high-tech industry has a strong foundation and a complete and dense network of industrial clusters(Lin et al., 2019). These features enable Taiwan to play a crucial role in the aforementioned relationships. Because of changes to the global economic and trading map, the rise of emerging markets has affected the status of Taiwan's trading partners(Yeh et al., 2014). EM is implemented to enhance short-term performance in response to analysts' pressure. To attract foreign investment, Taiwan must leverage the advantage of its geographical location to function as a gateway to the Chinese and Southeast Asian markets and to exploit its close relationship with the East Asian market. This will enable Taiwan to establish a foothold in both the Asia-Pacific and global economy. This is why the Taiwanese context is a useful setting for testing the relationship between SP and real earnings management (REM) and the effect of MA on that relationship.

This study is a first step toward filling this gap by dealing with the identification of results manipulation through sustainable practices affecting real operational activities. Our study makes several contributions. First, REM is riskier than previous studies have stated (Bratten et al., 2016; Francis et al., 2016; Roychowdhury, 2006); however, several studies have also mentioned accrual EM (Enomoto et al., 2015; Kothari et al., 2015). If REM is highly common in Taiwan, this study provides justification for real EM. A question that remains unanswered is why scholars focus only on REM and do not also consider accrual management. In contrast to related studies that have focused on the correlation between discretionary accruals (DA) and EM, this study targets both accruals and REM to explore earnings manipulation in corporate financial reports. The findings of this study provide support for the conclusion that greater talent and superior knowledge of their firm and the firm's operating environment enable managers to avoid earnings manipulation strategies to a greater degree.

Second, our findings strengthen the supervision of firms and investor protection. This paper addresses the uniqueness of Taiwanese firms and explains why EM is an essential issue in the Taiwanese market by re-examining EM issues. We discover that even in a relationship-based economy, superior MA results in a lower likelihood of EM manipulation. This finding has critical implications for the selection of managers by a firm's board of directors because the manager who is hired not only affects the future operating performance of the firm but also the likelihood of fraud and penalty costs, even in a relationship-based economy.

Third, because the association between organizations' SPs and financial performance effects has been inconsistently reported in the literature.

Finally, the comprehensive analysis on EM, organizational sustainability, and MA that is performed in the present study bridges a gap in the literature. This study contributes to the literature that links MA to organizational sustainability (Demerjian et al., 2012)and other managerial decision-making outcomes (Koester et al., 2016).

The remainder of the paper is organized as follows. Section 2 discusses the orientations of prior research on EM, MA, and organizational sustainability. Section 3 describes the sample and empirical methods employed in this study. Section 4 presents a summary analysis of EM measures, and Section 5 concludes the paper.

2. Related literature and hypothesis development

2.1 Earnings management

Several recent studies (Cohen and Zarowin, 2010; Zang, 2011)have constructed empirical models for estimating real operational activities from research and development expenses, rising sales, production costs, and discretionary expenditures. Cooper et al. (2018)showed that firms engage in income-decreasing REM before open market stock repurchases to reduce the cost of stock buybacks. Francis et al. (2016)examined the impact of firms' abnormal business operations on the future crash risk of their stock price. Firms performing REM were discovered to have a significantly increased crash risk in the following year. Cheng et al. (2015)investigated whether internal governance affects the extent of REM in US corporations. The extent of REM was found to be lower when key subordinate executives' had greater influence. We summarize from many studies that corporations engage in REM through certain behaviors (Bratten et al., 2016; Cooper et al., 2018; McInnis and Collins, 2011). Such behaviors are less effective than prudent daily operational decision making in their magnitude and breadth, and a focus on specific aspects can easily result in detection by accountants or external auditors(Francis et al., 2016; Soliman and Ragab, 2014).

Lo et al. (2019)indicated that composite forecasts are a favorable proxy for investors' earnings expectations when firms exhibit negative performance in the preceding year. Studies have detailed the types of REM behavior, such as cash flow from operating activities; research expenses; sales, general, and administrative expenses; gains from the disposal of assets; and production costs (Gunny, 2010). Most of these behaviors are (1) sales manipulation in the form of abnormal promotional events such as year-end sales and lenient credit terms (Dechow and Skinner, 2000; Roychowdhury, 2006); (2) expense manipulation such as cutting research and development, advertisement, and maintenance expenditures (Graham et al., 2005); or (3) production manipulation such as using overproduction to reduce the cost per unit product and increase the gross profit margin (Thomas and Zhang, 2002) as well as treasure stocks for higher earnings per share (Graham et al., 2005).

2.2 Sustainability practices

The higher the quality of disclosed information, the more the information helps a firm implement its SPs, reduce agency costs, and reduce information asymmetry (Healy and Palepu, 2012), thereby enhancing the firm's market value (Leuz and Wysocki, 2016). In the highly competitive business environments of the contemporary world, disclosed information is no longer limited to conventional financial information; equal attention must be paid to the critical economic resources, activities, and future benefits reflected in nonfinancial information (Mangena et al., 2016). Compared with firms with high information transparency, those with low information transparency were discovered by Huang et al. (2011)to exhibit significantly lower cumulative abnormal returns. Katmon and Al Farooque (2017) investigated the impact of internal corporate governance on the relationship between disclosure quality and EM in UK-listed companies. The results revealed a significant negative association between EM and disclosure quality.

Sustainability practice has been extensively discussed in the past decade(Kim et al., 2018), with studies indicating the existence of a significant negative correlation between corporate governing mechanisms and EM. Corporate governing mechanisms are crucial SPs (Magon et al., 2018). Thus, firms with strong governing mechanisms are less prone to resort to EM (Adut et al., 2011). The present study reviews the literature (Dutta and Gigler, 2002) and concludes that the greater the public demand for a firm to disclose its earnings, the less likely the management will manipulate earnings due to the fear of being discovered. Hunton et al. (2006) further contended that the transparency of financial information is a critical factor affecting the manipulation of earnings information. High information transparency limits the opportunities and room for manipulating reported earnings and reduces a firm's motivation and incentive to do so (Katmon and Al Farooque, 2017). Therefore, our objective is to investigate the role of SPs, particularly the relationship between SPs and EM, to provide a different perspective to users of organizational sustainability information. Thus, the present study develops the following hypothesis:

Hypothesis 1:Firms with SPs are less likely to engage in EM than those without SPs.

2.3. Managerial ability

Scholars have highlighted manager-specific effects on various organizational outcomes (Gan and Park, 2017; Habib and Hasan, 2017; Huang and Sun, 2017; Wang et al., 2017). Companies with highlyable managers can perform more highly through use of cash resources. Chen et al. (2017) noted that a higher degree of earning smoothing is associated with a greater crash risk. However, managers with superior ability reduce the negative impact of REM on future firm performance (Huang and Sun, 2017). Consequently, high-level MA tends to be related to higher current and future performance, mitigating the risks of poor performance and firm failure.

One method to prevent a manager from hiding bad news is to observe the manager's ability (Cornaggia et al., 2017). A greater number of able managers results in more detailed financial information (Koester et al., 2016). Capable managers can generate high revenue by using the resources provided by their company; therefore, they are less likely to perform EM (Luo and Zhou, 2017). Managers understand the adverse effects of EM on future corporate performance and are thus dissuaded from resorting to such practices. Furthermore, opportunity cost is a vital factor for managers during the decision-making process. Because of the limited time and effort they can spend, talented managers prefer to invest their effort in normal operations than in EM. Therefore, high-quality managers are expected to wisely restrain themselves from performing EM and reduce the risk of firm failure (Gan and Park, 2017). Given the influence of MA, this study proposes the following hypothesis:

Hypothesis 2:The MA of firms strengthen the effect of SPs on EM.

3. Research design

3.1. Measurement of real earnings management

Real earnings management composite index (*REM*):
This variable is used to measure a firm's degree of use of REM. Abnormal cash flow from operating activities; production costs; and sales, general, and administrative expenses (i.e., *ab_CFO*, *ab_PROD*, and *ab_SG&A*, respectively). To normalize the direction of the models, *ab_CFO* and *ab_SG&A* are multiplied by −1. Subsequently, the sum of the three proxies is defined as the composite index *REM* to determine the degree of use of REM.
Cash flow from operating activities model
The present study adopts the regression model developed by Roychowdhury (2006) for calculating the normal value of cash flow from operating activities (*CFO*). The amount of abnormal cash flow from operating activities (*ab_CFO*) in Model (1) is calculated as the actual cash flow from operating activities minus the normal cash flow from operating activities.

$$CFO_t / A_{(t-1)} = \alpha_0 + \alpha_1 1/ A_{(t-1)} + \alpha_2 S_t / A_{(t-1)} + \alpha_3 \Delta S_t / A_{(t-1)} + \varepsilon_t^{CFO} \quad (1)$$

where CFO_t is the firm's cash flow from the operations of year t, $A_{(t-1)}$ denotes the assetsof year $t-1$, and ΔS denotes the firm's revenue in year t minus the revenue in year $t-1$.

Production costs model
The present study employs the regression model developed in previous studies (Gunny, 2010) to obtain the normal value of production costs (*PROD*).The abnormal value of production costs (*ab_PROD*) in Model (2) is calculated as the actual value of production costs minus the normal value of production costs.
The present study follows previous studies (Gunny, 2010; Roychowdhury, 2006) in using Model (2) to obtain the production costs under normal circumstances, sales revenue (*S*), change in sales (Δ*S*), and sales revenue in the previous year (S_{t-1}) to control the influence of a change in demand on production costs. A firm's high throughput may not be caused by market factors; high throughput is equally likely to be caused by corporate management's abnormal preferential prices for overstocking to increase sales or a firm's attempt to reduce the unit cost of sales (Gunny, 2010; Roychowdhury, 2006). Hence, the present study uses overproduction costs to measure corporate EM through behaviors such as preferential price setting and overproduction.

$$PROD_t / A_{(t-1)} = \alpha_0 + \alpha_1 1/ A_{(t-1)} + \alpha_2 S_t / A_{(t-1)} + \alpha_3 \Delta S_t / A_{(t-1)} + \alpha 4 \Delta S_{(t-1)} / A_{(t-1)} + \varepsilon_t^{PROD} \quad (2)$$

Sales, general, and administrative expenses model

The present study uses the regression model developed by Gunny (2010) to obtain the normal value of sales, general, and administrative expenses (*SG&A*).

The abnormal value of sales, general, and administrative expenses (*ab_SG&A*) in Model (3) is calculated as the actual sales, general, and administrative expenses minus the normal sales, general, and administrative expenses.

Anderson et al. (2003)suggested that sales, general, and administrative expenses are sticky. "Cost stickiness" refers to the phenomenon that costs increase with sales, but the scale of increase in costs is greater than that of decrease in costs. Therefore, in addition to market value, Tobin's Q, and internal funds, equation (3) contains a control variable for cost stickiness. Sales revenue is the primary source of revenue for firms, and a greater change in sales revenue thus signifies a greater operational risk. If their firm is in a profit recession, management may make different decisions regarding sales, general, and administrative expenses. Therefore, cost stickiness [$\Delta S_t * DD$ in equation (3)]is used to control changes in sales revenue, which if not properly controlled, increases (reduce) sales revenue, causing underestimation (overestimation) of sales, general, and administrative expenses by the model.

$$\begin{aligned}\mathrm{SG\&A}_t / A_{(t-1)} &= \alpha_0 + \alpha_1 1/A_{(t-1)} + \alpha_2 MV_t + \alpha_3 Q_t + \alpha_4 INT_t / A_{(t-1)} + \alpha_5 \Delta S_t / A_{(t-1)} \\ &\quad + \alpha_6 \Delta S_t / A_{(t-1)} * DD + \varepsilon_t^{\mathrm{SG\&A}}\end{aligned} \quad (3)$$

3.2. Measurement of discretionary accruals

The most common method adopted in EM is the manipulation of DAbecause it is easy to implement in practice (Cohen and Zarowin, 2010; Enomoto et al., 2015), incurs low costs. DA is calculated in accordance withCapalbo et al. (2018) as follows:

$$TAC_t / A_{(t-1)} = \alpha_0 + \alpha_1 1/A_{(t-1)} + \alpha_2 \left(\Delta S_t - \Delta REC_t\right)/A_{(t-1)} + \alpha_3 PPE_t / A_{(t-1)} + \varepsilon_t^{TAC} \quad (4)$$

where TAC_t is the total accruals for the firm in year t, A_{t-1} is the assets of year $t-1$, ΔS is the firm's revenues in year t minusthe revenues in year $t-1$, ΔREC is the firm's accounts receivable in year t minus the revenues in year $t-1$,and PPE is the gross value of property, plant, and equipment in year t. Next, we estimate the non-DA (NDA_t) using $\hat{\alpha}_1$ to $\hat{\alpha}_3$ as follows:

$$NDA_t = \hat{\alpha}_0 + \hat{\alpha}_1 1/A_{(t-1)} + \hat{\alpha}_2 \left(\Delta S_t - \Delta REC_t\right)/A_{(t-1)} + \hat{\alpha}_3 PPE_t / A_{(t-1)} \quad (5)$$

The calculation is made by substituting the coefficient obtained using equation (4) into equation (5), determining the NDA_t, and then using equation (6) to calculate the DA_t by subtracting the NDA_t from the TAC_t.

$$DA_t = TAC_t / A_{(t-1)} - NDA_t \quad (6)$$

3.3. Managerial ability measures

The measurement method proposed by Demerjian et al. (2012)has been employed in various studies for investigating MA(Gan and Park, 2017; Habib and Hasan, 2017; Huang and Sun, 2017; Wang et al., 2017). Thepresent study follows Demerjian et al. (2012)in its measurement of MA. The data envelopment analysis method is used to identify the relative efficiency of each company in each year. The objective function is as follows:

$$Max\ \theta = \frac{Sale}{v_1 COGS + v_2 SG\&A + v_3 PPE + v_4 R\&D + v_5 Goodwill + v_6 NOL + v_7 OtherIn} \quad (7)$$

The six input variables are as follows: (1) *COGS*: cost of goods sold; (2) *SG&A*: sales, general, and administrative expenses; (3) *PPE*: property, plant, and equipment; (4) *R&D*: research and development costs; (5) *Goodwill*: the goodwill of the company; and (6) *NOL*: Net Operating Lease;(7)*OtherIn*: other intangibles. The output variable is net sales. The residual from Model 8 captures MA.

$$\begin{aligned}FirmEfficiency &= \alpha + \beta_1 \ln\left(TotalAssets\right) + \beta_2 MarketShare + \beta_3 FreeCashFlowIndicator \\ &\quad + \beta_4 \ln\left(Age\right) + \beta_5 Bu\sin essSegmentConcentration + \beta_6 ForeignCurrencyIndicator + Year + \varepsilon\end{aligned} \quad (8)$$

To explore the relationship between SPs and accrual-based EM and REM, we employ the following pooled cross-sectional model by using firm fixed-effects regression:

$$\begin{aligned}\mathrm{REM}_{it} &= \beta_0 + \beta_1 \mathrm{MA}_{it} + \beta_2 SIZE_{it} + \beta_3 DBR_{it} + \beta_4 ROA_{it} \\ &\quad + \beta_5 MTB_{it} + Yeardummy_{it} + Industrydummy_{it} + \varepsilon_{it}\end{aligned} \quad (9)$$

$$\mathrm{DA}_{it} = \beta_0 + \beta_1 \mathrm{MA}_{it} + \beta_2 SIZE_{it} + \beta_3 DBR_{it} + \beta_4 ROA_{it} + \beta_5 MTB_{it} + Yeardummy_{it} + Industrydummy_{it} + \varepsilon_{it} \quad (10)$$

3.4. Sustainability practice measures

Corporate SP evaluation is one of the major projects that has the goal of giving investors and enterprises better understanding of a firm's performance in corporate SPs and is performed by comparing evaluation results among companies. The assessment framework used in this study adapts the six principles of corporate governance released in 2004 by the Organization for Economic Co-operation and Development into five major aspects, namely the protection of shareholders' rights and interests, equitable treatment of shareholders, enhancement of the structure and operation of the board of directors, improvement of information transparency, and implementation of social responsibility. In addition, assessment pertinent to corporate governance, development trends, and regulations both in Taiwan and internationally are referred to for the design and analysis of indicators. The principle of design of assessment indicators is established by referring to the "yes" or "no" system used in other countries. Moreover, qualitative assessment is added gradually. The scope of information assessed is based on public information, making the assessment transparent. Through a comparison of corporate governance in the entire market, this study hopes to assist investors and companies to comprehend the effectiveness of corporate governance. This set of assessment systems is also expected to guide healthy competition among companies, strengthen corporate governance, and further forge a culture that encourages companies to actively improve their corporate governance.

To test Hypothesis 2, we analyze the coefficient (β_3) of $\mathrm{MA*SP}$ in Models 11and 12. If SPs strengthen the negative impact of REM, the coefficient is negative and significant.

$$\mathrm{REM}_{it} = \beta_0 + \beta_1 \mathrm{MA}_{it} + \beta_2 \mathrm{SP}_{it} + \beta_3 \mathrm{MA*SP}_{it} + \beta_4 SIZE_{it} + \beta_5 DBR_{it} + \beta_6 ROA_{it} + \beta_7 MTB_{it} + Yeardummy_{it} + Industrydummy_{it} + \varepsilon_{it} \quad (11)$$

$$\mathrm{DA}_{it} = \beta_0 + \beta_1 \mathrm{MA}_{it} + \beta_2 \mathrm{SP}_{it} + \beta_3 \mathrm{MA*SP}_{it} + \beta_4 SIZE_{it} + \beta_5 DBR_{it} + \beta_6 ROA_{it} + \beta_7 MTB_{it} + Yeardummy_{it} + Industrydummy_{it} + \varepsilon_{it} \quad (12)$$

4. Data source and sampling process

During the United Nations Sustainable Development Summit held in September 2015, the "2030 Agenda for Sustainable Development" was passed. The 17 core sustainable development goals and 169 specific targets in the Agenda guide the policy direction of nations globally. The promotion of sustainable development goals is in fact dependent on the active participation of various stakeholders, including governments, corporations, public citizens, and community members. In its pursuit of achieving sustainable development and integrating with the world, the Taiwanese government has formulated its own sustainable development goals with reference to the aforementioned United Nations Agenda. Since 2015, when the government mandated that public companies should compile Corporate Social Responsibility (CSR) reports, the number of companies compiling CSR reports in Taiwan has increasedconsiderably from 151 in 2014 to 515 in 2017. In 2018, more than 120 companies responded to the United Nations sustainable development goals promotion projects in their CSR reports. The awareness of companies of this Agenda has thus clearly improved. Moreover, social enterprises, which have flourished recently, have actively responded to the sustainable development goals, treating them as development priorities.

Because the goal of the present study is to determine whether firms with capable managers are more likely to restrain the use of REM than those without capable managers, we target listed and over-the-counter firms in Taiwan and the electronics industry (dominant industry in Taiwan) to control for differences in duration and industry, thereby facilitating the observation of EM behaviors among firms in Taiwan. The relevant literature indicates that the variation in cumulative abnormal returns in the electronics industry is greater than that in other industries (Liu and Liang, 2014).SPs are extracted from the Market Observation Post System database of the Taiwan Stock Exchange (www.tse.com.tw) and from the annual reports of the targeted firms. Table 1 indicates that 1,503 observed values are included after eliminating firms that disclose no analyst earnings forecasts.

Table 1. Sample selection.

Duration: 2015–2017	Number of observed values
Usable observed values of all listed and over-the-counter firms (excluding the banking industry)	1,792
Missing values	
Insufficient variable data or financial information	(289)
Final sample size	**1,503**

Table 2presentsthe descriptive statistics. Of the 1,503 observed values, regarding the REM variables, the means of *ab_CFO*, *ab_PROD*, and *ab_SG&A* are 0.001, 0.002, and −0.015, respectively. The results suggest that *ab_SG&A* has a stronger influence on REM scores than the other two variables. The average DBR is 38.436. The minimum and maximum values of the *ROA* suggest that our sample includes both nonprofitable and profitable firms. Table 3 presents the Pearson and Spearman correlations among the variables.

Table 2. Descriptive statistics.

	MA	Ab_ CFO	Ab_ PROD	Ab_ SGA	SP	SIZE	DBR	ROA	MTB
Mean	0.211	0.001	0.002	-0.015	4.692	15.444	38.436	7.525	1.885
Median	0.024	0.011	0.015	-0.023	4.000	15.185	37.750	6.750	1.536
Maximum	0.411	0.346	0.685	0.872	9.000	21.949	81.730	35.270	67.950
Minimum	-0.445	-1.099	-0.623	-0.431	1.000	12.522	1.270	-13.120	0.100
Std. Dev.	0.115	0.093	0.111	0.100	2.661	1.427	15.728	6.545	1.693

Table 3. Correlation matrix.

	REM	MA	SP	SIZE	ROA	DBR
REM	1.000					
MA	-0.282**	1.000				
SP	-0.148**	0.012	1.000			
SIZE	0.065*	-0.111**	0.375**	1.000		
ROA	-0.510**	0.181**	0.077**	.011	1.000	
DBR	0.199**	-0.043	.044	.402**	-0.155**	1.000

Correlation coefficients are significant at *p <0.05, **p <0.01.

5. Results

5.1 Relationship between sustainability practices and earnings management

Sustainability has become an issue that all industries must address. Top-grade companies view sustainability as an opportunity to secure an advantage. A company's operating policy needs to be adjusted to adapt to changes in the economy, society, and environment; this approach also encourages the company to develop or produce more environmentally friendly and competitive products and operating processes. Enterprises with a competitive edge will be able to hire more high-quality employees, foster a more friendly operating environment, improve the corporate image, and attract investors' attention and capital injection.

The results presented in Columns 1 and 2 of Table 4 are the results of testing Hypothesis 1.We employ Model 1 to test the relationship between SP and REM. Specifically, the coefficient of SP is negative and significant at the 1% level (t= −4.541). This suggests that the firms with SPs lead to less REM. Furthermore, the results in Column 2 reveal a nonsignificant relationship between SP and DA (t= −1.085). Taken together, our study finds a significant influence of SP on the method of earnings manipulation only in REM. The finding suggests that SP does not influence accrual-based management strategies used to manipulate earnings. Other studies have indicated that the gradual development of models for measuring DA have made discovering such manipulations increasingly easy (Graham et al., 2005).

The literature indicates that MA is positively associated with firm performance (Habib and Hasan, 2017; Huang and Sun, 2017; Wang et al., 2017). As mentioned previously, the ability of managers to suppress negative information is significantly associated with lower transparency. In this study, we expect that capable managers reveal detailed financial information to decrease the information asymmetry risks, thus reducing the number of opportunities for earnings manipulation. Therefore, if the effect of MA on EM is stronger for those firms, the coefficients of *SP*MA*will be negative and significant.

Studies have noted that the quality of a firm's information disclosure can influence external investors' valuations of the firm. This raises the question of whether the MA of firms restrain the firm's EM behaviors.

Therefore, the present study relies on MA to examine the relationships between SPs and EM. To test this prediction, the empirical results are presented in Table 4, where *SP*MA* represents the interaction effect, which has a negative coefficient. The coefficient of the interaction effect item is−1.583at the 5% level (t= −2.476)in Model 3; thus, Hypothesis 2 is supported. Analyses indicate that higher-ability managers can strengthen the effect of SPs on the likelihood of REM. In sum, the results provide a fresh perspective by showing that the likelihood of REM is reduced firms if they promote SPs for higher-MA. As such, investors should consider the MA of companies when evaluating their REM.

Table 4. Relationship between SP and EM.

Variables	Model 1 REM	Model 2 DA	Model 3 REM
INTERCEPT	-1.052	-.798	.447
	(-1.643)	(-.664)	(.476)
SP	**-.266*****	**-.754**	**-.204****
	(-4.541)	**(-1.085)**	**(-2.175)**
MA			**-3.419*****
			(-5.286)
MA*SP			**-1.583****
			(-2.476)
SIZE	.149***	.244	.019
	(3.432)	(1.235)	(.291)
DBR	.010***	-.006	.024***
	(2.627)	(-1.000)	(4.437)
ROA	-.162***	0.019	-.156***
	(-19.116)	(0.995)	(-11.5364)
Year Effect	Controlled	Controlled	Controlled
Industry effect	Controlled	Controlled	Controlled
Adj-R^2	0.357	0.096	0.396
N	1502	1207	1502

Notes: The numbers in brackets are t values; *p <0.1, **p <0.05, ***p <0.01 (two-tailed test).

5.2 Impact of managerial ability on the relationship between sustainability practices and earnings management

The results of the previous section show that companies with better performance in SP are less likely to engage in REM behavior than companies with poorer performance. The analysis in Table 4 shows that competent managers are more likely to prevent REM than less capable ones. Therefore, this section further explores the correlation between ab_CFO, ab_PROD, and ab_SG&A, which comprise the SP and REM of competent managers. Conformance to corporate social responsibility and sustainability is stipulated as the means by which a company fulfills its social responsibility and obligations; it tends to take the form of general principles and provisions that are encouraging in nature. These provisions are, however, non-compulsory and may dent enterprises' incentives for implementation.

Model 4 in Table 5 shows that the estimated coefficient of (SP * MA) is -0.340 ($p > 0.1$), which is negative but not significant. This shows that companies with higher management competencies cannot use ab_CFO to reduce earnings management behavior. The results of Model 5 show that the estimated coefficient is -0.832 ($p < 0.01$), which is negative and significant. This finding shows that companies with higher management competencies can prevent companies from using the ab_PROD method for REM. The results of Model 6 show that the estimated coefficient is -1.025 ($p < 0.01$), which is negative and significant. This finding indicates that companies with higher management competencies can prevent usage of the ab_SG&A method for REM. Since more capable managers are typically more business savvy, they tend to make effective judgments and estimates (Wang et al. 2017). Based on the results in Table 5, we can confirm that companies with strong management capabilities are likely to prevent REM behavior by inhibiting ab_PROD and ab_SG&A. The key factor in the practice of corporate social responsibility lies in whether a company really understands its true meaning and importance. For managers, sustainable operation, in addition to being a goal and achievement of business operations, also represents a social obligation. The fulfillment of corporate social responsibility demonstrates the company's intention to operate in a sustained fashion.

Table 5. Relationship between CEO narcissism, EM behavioral models, and prior year's reported earnings thresholds.

Variable	Model 4	Model 5	Model 6
	ab_CFO (-1)	**ab_PROD**	**ab_SG&A (-1)**
Intercept	-.833** (-.1991)	-.107 (-.275)	-.398 (-.886)
SP	**.030 (.717)**	**-.077** (-1.972)**	**-.117*** (-2.597)**
MA	**-.312 (-1.082)**	**-2.109*** (-7.869)**	**-2.117*** (-6.825)**
SP* MA	**-.340 (-1.194)**	**-.832*** (-3.140)**	**-1.025*** (-3.345)**
SIZE	.025 (.874)	.033 (1.250)	.029 (.932)
DBR	-.006** (-2.305)	.007*** (3.219)	.010*** (3.705)
ROA	.100*** (16.525)	-.072*** (-12.905)	.010 (1.510)
Year Effect	Controlled	Controlled	Controlled
Industry Effect	Controlled	Controlled	Controlled
Adj-R^2	0.332	0.243	0. 285
N	1502		

5.3 Additional tests

As mentioned earlier, our rating of REM takes into account outliers from ab_CFO, ab_PROD, and ab_SG&A, which were combined into a factor for the evaluation of REM. To test whether the components of REM affected our research results, we conducted an REM sensitivity analysis. Specifically, we coupled the three components of REM in pairs to form a new REM evaluation method (REM1-3). REM1 is the average value of cash flow and production costs generated from operating activities. REM2 is calculated by averaging the cash flow from operating activities and sales, general, and administrative expenses. Finally, REM3 is calculated from the average of production costs and sales, general, and administrative expenses. Table 6 provides the results, which show that most of the new REM evaluation indicators are still significantly negatively correlated with SPs.

Table 6. Sensitivity analysis for REM.

Variables	Model 7 EM1	Model 8 EM2	Model 9 EM3	Model 10 EM1	Model 11 EM2	Model 12 EM3
INTERCEPT	.300 (.736)	.531 (1.203)	-2.399*** (-4.125)	.726 (1.199)	.434 (.670)	-.505 (-.627)
SP	**-.155*** (-4.170)**	**-.174*** (-4.301)**	**-.236*** (-4.440)**	**-.107* (-1.762)**	**-.147** (-2.264)**	**-.193** (-2.400)**
MA				**-1.797*** (-4.307)**	**-1.805*** (-4.038)**	**-4.226*** (-7.604)**
MA*SP				**-.492 (-1.192)**	**-.685* (-1.888)**	**-1.841*** (-3.502)**
SIZE	.085*** (3.100)	.073** (2.443)	.197*** (4.997)	.008 (.199)	.004 (.083)	.062*** (1.123)
DBR	.006** (2.340)	.007** (-2.594)	.004 (1.058)	.013*** (3.661)	.015*** (4.058)	.017*** (3.621)

ROA	-.172***	-.093***	-.077	-.172***	-.090***	-.063
	(-11.845)	(-15.785)	(-10.030)	(-19.707)	(-9.612)	(-5.381)
Year Effect	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled
Industry effect	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled
Adj-R^2	0.320	0.289	0.246	0.382	0.291	0328
N	1502	1502	1502	1502	1502	1502

Notes: The numbers in brackets are t values; *p <0.1, **p <0.05, ***p <0.01 (two-tailed test).

6. Conclusion

Discussion of the findings and contributions

The purpose of this study is to examine whether the SPs of firms lead to less EM and whether highly capable managers strengthen the effect of MA on EM. This paper attempts to clarify the relationship between the mechanisms of supervision and the theory of contradiction to assist investors in making decisions. Using the MA scores and rankings developed by Demerjian et al. (2012), we discover that SPs is negatively associated with EM. The results reveal a significant influence of SPs on the method of earnings manipulation only in REM. To the best of our knowledge, this is the first study that extends the investigation of MA to the EM setting and tests the relationship between SPs and the use of EM. The results show that the likelihood of REM is lower if they are promoting SPs for higher-MA firms. Whether legally bound or not, companies should take into account the implementation of corporate social responsibility initiatives based on their own long-term plans for future operations. It is recommended that when promoting corporate social responsibility, companies not only consider compliance with rules and regulations but also engage in long-term internal strategic planning in terms of their visions and corporate philosophies (from the top down). They should plan short-, medium- and long-term plans to be executed from varying levels of their operations. By regularly reviewing the results and observing changes in the external environment, companies should make strategic adjustments and improvements in their practices to establish their respective sustainable operation models. More importantly, practices of different industries in terms of corporate social responsibility must be adjusted according to characteristics of the relevant industry and corporate culture.

Practical implications

The need to accomplish sustainable development goals is more urgent for Taiwanese firms than forother countries because of factors such as Taiwan's high population density, limited natural resources, frequent natural disasters, and special international status. Most firms realize that corporate information transparency can improve their social recognition and business reputation. However, they do not truly recognize that the spillover effect of transparency is far more significant than the effect on business reputation. In fact, sustainability information disclosure also improves customer relations, increases operational efficiency, and enhances market performance. The transparency of corporate sustainability information has crucial managerial effects. While carefully assessing the most important issues for themselves and their shareholders, firms naturally want to establish key indicators and targets and disclose relevant information periodically based on their schedule. This is a natural process that gives the firms the motivation to reform. From a business perspective, sustainability information disclosure is always regarded as being unrelated to corporate profits. However, in reality, when firms must assess and disclose a series of sustainability agendas, this transparent action naturally activates their self-check process, benefiting corporate performance and enhancing their sustainability. This, in turn, results in a virtuous cycle for the environment as well as society. More importantly, transparent sustainability information disclosure can improve corporate financial profits or minimize losses, further reducing firms' motivation to engage in REM.

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