Managerial Ability and Tax Planning: Trade-Off between Tax and Nontax Costs

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Abstract: This study aims to investigate the effects of managerial ability (MA) on the trade-off between tax and nontax costs in the sustainability perspectives of firms. An effective tax planning for corporate sustainability is to consider tax and financial reporting costs at the same time and find the optimal cost balance that exists between these two costs. MA is measured by the data envelopment analysis (DEA) frontier and Tobit regression model. DEA frontier methods can be measured by capturing the changes in market value, excluding the characteristics of firms, which are beyond management control. The interest variables of this study are tax costs, nontax costs, and the trade-off between them. This study has three main findings. First, a significantly positive relationship exists between MA and the tax cost variable. Second, a significantly negative relationship exists between MA and the nontax cost variable. Third, MA has a negative relation with the trade-off between tax and nontax costs. Therefore, this study is the first to analyze the relationship between MA and the trade-off between tax and nontax costs. This study implies that a manager should consider the trade-off between tax and nontax costs to improve the firm’s value as MA is reflected by tax and financial reporting simultaneously.

Keywords: managerial efficiency; sustainability of firms; tax planning; tax costs; nontax costs; trade-off

1. Introduction

Does managerial ability (hereby, MA), which most prior studies have used interchangeably with efficiency, affect efficient tax planning? MA in this study represents the pure discretionary ability of managers after removing firm-specific characteristics from managerial efficiency, while managerial efficiency is the ability to utilize the limited resources of a firm efficiently for deriving maximum output. In addition to the MA defined above, this study also addresses the analysis of management efficiency.

Managers make important strategic decisions throughout the overall corporate management for their firms’ sustainability [1,2]. Managers are continuously making decisions to increase the value of their firms by using limited resources [1,3]. However, in agency perspective, a conflict exists between the behaviors of managers in their attempts to maximize their own profits and corporate profits [1]. Given that tax planning is a managerial decision-making activity in a typical business environment, the analysis of differences in corporate tax planning based on MA is a crucial subject for analyzing the differences in managerial activities [4]. The purpose of management decision-making is to maximize the firm’s value and secure its sustainability. The value of a firm is generally calculated by converting the future expected value into the present value [2,3,5]. MA can be regarded as closely related to firm value. Therefore, this study attempts to determine the trade-off between tax and nontax costs such as financial reporting costs, costs related to moral hazard, litigation costs, etc., assuming that managers will consider maximizing the firm’s value when making tax-related
decisions. Tax is an essential element for the operation of state or local governments and public welfare, but direct cash outflows for tax payment could be a burden to firms. Furthermore, excessive tax burden to firms can increase the possibility of tax avoidance by individual firms [3,6,7]. Dyreng et al. [8] presented evidence that tax planning is influenced by the CEO and attempted to explain the influences of managers’ demographic characteristics, such as academic background, gender, age, and CEO career experience, on tax planning. However, the specific demographic characteristics of managers that are related to tax planning could not be identified. Arguably, the level of tax avoidance is affected by the manager, and tax planning changes accordingly [3].

Prior research about managers’ influence on corporate tax avoidance has been conducted, but the research on tax avoidance level or related tax planning based on MA has not actively progressed [1,3,7,9,10]. Gallemore and Labro [10] and Baik et al. [3] emphasized the importance of understanding the overall business within a firm to understand the tax planning process fully. Managers conduct appropriate tax planning by comprehensively considering various factors, such as managers’ performance compensation and firm value, which is the foremost interest of stakeholders, including stockholders. Managers with relatively high ability have a high level of knowledge about their firms, the industry, and the corporate environment in which they are working [1,3,9,11]. In other words, managers with high-level ability use corporate resources efficiently and achieve maximum output. Tax planning is a management activity and managers with high-level ability establish tax planning and determine the level of tax costs through their comprehensive judgment, considering various factors [7]. Thus, this study aims to investigate whether managerial abilities affect the trade-off between tax and nontax costs to enhance managerial efficiency, with Korean firms as examples.

This study analyses the firms listed in Korea Exchange from 2012 to 2015 as a sample, that includes 834 firm-years in eight industries. Based on the Standard Industrial Classification (SIC), eight industries with more than 30 individual firms are extracted. This study utilizes the Tobit model to estimate managerial efficiency and MA, and uses the ordinary least square (OLS) regression model to analyze the relationship between tax and nontax costs variables.

The remainder of this paper is organized as follows: Section 2 establishes the research hypothesis on the basis of previous studies about the relationships between MA and nontax costs and MA and the trade-off between tax and nontax costs. To test the hypothesis, Section 3 suggests a testing model for verifying the relationship between MA and tax or nontax costs. In addition, the selection process is described for the samples used for empirical analysis. Section 4 presents the empirical results of this study, and Sections 5 and 6 present the discussion and conclusion based on the summary and empirical analysis results, respectively.

2. Literature Review and Hypothesis

2.1. Literature Review

Most firms simultaneously maximize their accounting profits and minimize corporate tax burden to secure their sustainability [12]. However, if the net income increases when the net profit is equal to the taxable income, then the taxable income increases, and additional corporate tax is imposed as much as increased net profit. Therefore, the goals of simultaneously maximizing net income and minimizing corporate tax burden cannot be achieved. The positive relationship between net income and corporate tax is called trade-off between tax and nontax costs. The general argument of the literature is that, for the sustainability of a firm, a balance between financial reporting costs and non-tax costs must be achieved. Shackelford and Shevlin [13] classified the studies about the trade-off between tax and nontax costs as the ones dealing with the interactions between tax and financial reporting costs and the effects of agency costs to minimize tax burden. Prior studies about the trade-offs between tax and nontax costs are generally focused on the existence of trade-off itself, rather than the trade-off size [4]. These results verify that as tax costs are increased, the likelihood of profit adjustment to reduce net income or profit adjustment is increased [14]. Consequently, if tax costs increase, then the management decision to reduce tax costs will be made. Therefore, a trade-off exists between tax and nontax costs.
Choi [12] analyzed the existence of trade-off between tax and nontax costs and the trade-off size and reported conflicting results from the assumption of prior studies that tax and nontax costs are in a complete trade-off relationship. Among the previous studies about MA, Demerjian et al. [9] examined the method of measuring managerial efficiency by estimating the corporate efficiency after eliminating the effects of corporate characteristic factors. Similarly, accounting studies about MA are gradually increasing. Baik et al. [11] also confirmed that the tendency and frequency of profit forecasting increase on the basis of MA through media exposure, the revised data envelopment analysis (DEA) score, and the industry-adjusted return on asset (ROA) as proxies for MA.

The forecast of the manager with high ability is more accurate and sensitively responsive to the market than that of the manager with low ability. Krishnan and Wang [1] reported the relationship between MA and corporate performance. Demerjian et al. [9] followed the methodology for measuring MA but modified the measurement methods to suit the Korean business environment.

Demerjian et al. [9] asserted that MA is not related to corporate performance. Firm performance is not determined by the ability of an individual manager but influenced by the core corporate competitiveness, the combination of products, and the innovativeness of firm members. In addition, a firm’s performance is determined by external factors, which cannot be controlled by the manager, such as preference changes in the market of firm products, the changes in input costs, and exchange rate changes [15].

However, managers generally establish and implement management strategies to maximize firm value [1]. The CEO is the final decision maker; therefore, management decision-making is influenced by the leadership formed by the values, management environment, and management philosophy of the CEO. The CEO’s personal tendency, academic background, accumulated experiences, and position in the organization ultimately affect the management’s decision-making and strategic choices. Therefore, dividend policy or investment decision-making can be changed depending on the CEO’s characteristics. With these decisions, MA is reflected in the sustainable profit generation power or growth potential of the firm [15–17].

The literatures reviewed above suggest that managers should do tax planning to balance the tax burden and financial reporting costs in order to maximize the firm value. They also show that MA generates management efficiency and leads to firm value. However, there has not been much research done on how to balance tax and non-tax expenses using MA. An effective tax planning for corporate sustainability is required to consider tax and financial reporting costs simultaneously and find the optimal cost balance that exists between these two costs. In particular, an attempt to explain the optimized status in tax planning should be made, if the MA has a statistically significant relationship to the trade-off between tax and nontax costs.

2.2. Hypothesis Development

Determining tax costs is also a part of the diverse decision-making tasks of managers. Managers with high ability have more knowledge about the firm, industry, and management environment to perform management activities than those with low ability [1,3,9]. To expand the traditional perspectives about the relationship between the determination of tax avoidance and firm value, managers with high ability can maximize tax avoidance and save as much in economic resources that could be transferred to the government. Moreover, these managers can increase the amount of resources that could be returned to the investors for the firm’s sustainability. Hence, a manager with high ability will exercise his or her abilities in tax strategies that maximize tax avoidance and eventually increase the stockholders’ wealth.

To expand the perspectives on agency theory regarding the relationship between tax avoidance and firm value, high-performance managers are likely to consider tax avoidance less, which could cause related risks, such as government intervention, consequent long-term monetary costs, and political costs [14], and to maximize the output of the entire firm by efficiently using the resources. MA refers to the relative efficiency of managers in the same industry in converting corporate resources for profit [9]. When managing the firm with diverse resources, highly capable managers will efficiently use the resources to obtain the maximum output. Therefore, the firm’s value and
performance are expected to be higher than those of the managers with low ability in the same industry. Therefore, when investors regard tax avoidance as a factor for reducing firm value, highly competent managers will recognize this situation and try to reduce the tax avoidance levels to increase firm value [18].

For a firm to pay taxes, cash outflow is implied. From the stance of a manager who seeks to maximize firm value, minimizing taxes could be a way to maximize firm value and reduce cash outflows [12,18]. However, in the case of specific tax-saving behaviors, legal or illegal judgment criteria are unclear in practice. When considering not only explicit tax costs but also nontax costs, maintaining the lowest tax burden could maximize the firm value [19]. Therefore, MA and tax costs could have negative and positive relationships.

Scholes et al. [20] argued that nontax costs are small when the profit level is high, and vice versa, because the tangible and intangible costs borne by the firm are higher when the profit level is smaller than when the profit level is larger [21]. For example, in the case of bond issue or capital increase, firms with a low profit must pay relatively higher commissions and take lower issue price than those with a high profit. Additionally, firms with low firm value in the capital market are likely to violate bonds and debt contracts and consequently bear high additional costs, implying that higher interest rates on debt are applied than those with high profitability [22]. Consequently, firms with low profit have higher contract costs, such as capital financing costs, than those with high profit. In addition to the cost of capital financing, firms with low reporting profits are in a disadvantageous situation compared with those with high profits in many aspects of corporate activities due to low social credibility.

Nontax costs arising from disadvantageous conditions in the aspects of financial reporting refer to all additional tangible and intangible costs that should be borne by the firm. From the following points of view, this study identifies debt ratio with nontax costs as a proxy. Debt ratio has been used for nontax costs related to bonds and debt contracts [23,24]. Watts and Zimmerman [25] verified that the managers of firms under high surveillance of creditors due to high debt ratios favor the income-increasing accounting method. In other words, firms with high debt ratios tend to be conscious of their creditors because of debt compliance, which leads to preferring profit-increasing accounting methods.

Thus, firms with high debt ratios want to report high profit, and nontax costs at this moment become small [4]. However, in the case of big bath in a loss-incurred firm, the manager with a high debt ratio is likely to report additional losses in the current period. Therefore, MA and nontax costs could reflect a positive or negative relationship. To verify the effect of MA on the trade-off between tax and nontax costs, the following hypothesis is tested.

Hypothesis: Managerial ability is not related to the trade-off between tax and nontax costs.

3. Materials and Methods

3.1. Research Model

To analyze the effects of tax costs, nontax costs, and the trade-off between tax and nontax costs on MA, a research model is established and expressed as Equation (1) following the studies of Scholes et al. [20], Lynch et al. [26], and Demerjian et al. [9]. This regression model includes the year and industry to control the fixed effects of the variables. The dependent variable, namely, MA, is the MA component measured on the basis of the methodology of Demerjian et al. [9] and Ferri and Oesch [27]. Independent variables TAX, NONTAX, and TAX × NONTAX are included in the model following the methodology of Scholes et al. [20] and Lynch et al. [26]. Interaction variable TAX × NONTAX tests the trade-off between TAX and NONTAX as stated in the hypothesis. However, tax is endogenous because it can be affected by MA, which depends on the manager’s decision-making. In other words, the endogeneity issue should be considered in Equation (1) because TAX and NONTAX may be affected by dependent variable MA. Therefore, the results of the Heckman selection model are presented in the analysis part of this study.
MA_i,t = \alpha_i,t + \beta_1TAX_i,t + \beta_2NONTAX_i,t + \beta_3TAX_i,t \times NONTAX_i,t + \beta_4FOREIGN_i,t + \beta_5ROA_i,t + \beta_6SIZE_i,t + \beta_7RND_i,t + \beta_8OCF_i,t + \beta_9MARKET_i,t + \beta_{\sum YD_i,t} + \beta_{\sum IND_i,t} + \varepsilon_i,t
(1)

Additionally, to analyze the trade-off between management efficiency and tax and nontax costs, a research model (Equation (2)) is established by adding the DEA variable to the dependent variable.

DEA_i,t = \alpha_i,t + \beta_1TAX_i,t + \beta_2NONTAX_i,t + \beta_3TAX_i,t \times NONTAX_i,t + \beta_4FOREIGN_i,t + \beta_5ROA_i,t + \beta_6SIZE_i,t + \beta_7RND_i,t + \beta_8OCF_i,t + \beta_9MARKET_i,t + \beta_{\sum YD_i,t} + \beta_{\sum IND_i,t} + \varepsilon_i,t
(2)

MA: managerial ability by Demerjian et al. [9]
DEA: Management efficiency by Demerjian et al. [9]
TAX: 1 if Cash basis ETR (= (Current tax expense − Δdeferred tax assets − Δdeferred tax liabilities) ÷ pre-tax net income) over the first quarter of the ETR (Top 25%), otherwise 0.
NONTAX: Leverage (= liabilities ÷ total assets)
TAX × NONTAX: Interaction variable of TAX and NONTAX
FOREIGN: Equity ratio of foreign investors
ROA: Net income ÷ total assets
SIZE: Natural logarithm of total assets
RND: R & D expenditure ÷ total assets
OCF: Cash flow from operating activities ÷ total assets
MARKET: Total market value of stock ÷ total assets
\(\sum YD\): Year dummy
\(\sum IND\): Industry dummy

3.2. Measurement of Major Variables

Demerjian et al. [9] defined managerial efficiency as the degree to utilize the limited resources of a firm efficiently for deriving maximum output. It is measured by the MA to determine how much profit a firm generates by injecting various assets and costs. Therefore, on the basis of the methodology of Demerjian et al. [9], it is defined in this study as the MA to generate sales by investing cost of goods sold (COGS), selling and general administrative expenses, property, plant and equipment, and intangible assets.

The dependent variable in Equation (1) measures MA by using the MA measurement model of Demerjian et al. [9]. The dependent variable in Equation (2) measures the managerial capability through a two-step analysis method. In the first step, the DEA method is used to create an efficient frontier that considers the amount and combination of resources that individual firms within the same industry use to generate their revenues. The efficiency score of a firm operating on an efficient frontier is 1 point, and a firm that is moving away from the frontier is given a lower score [2,17,27]. This case can be interpreted as the relative efficiency among firms. In other words, the score reflects the efficiency with which an individual firm achieves the sales within the same industry because efficiency is a measure of the outputs achieved by the firm, and the inputs are simply quantified and expressed as a ratio [2]. Therefore, the variables for the inputs on which a manager can decide at his/her discretion are included in the model.

The COGS; sales and general administrative costs; property, plant, and equipment (PPE); and INTANGIBLE assets are included [2,27]. The efficiency of a firm is estimated through Equation (3).

\[
\max Q = \frac{\text{Sales}}{(y_1 \text{COGS} + y_2 \text{SG&A} + y_3 \text{PPE} + y_4 \text{INTANGIBLE})}
\]  
(3)

Regarding the efficiency measurement of a firm using the DEA, coefficients u and v are calculated by the outputs and inputs that maximize the above equation in each industry [17,28]. Then, the efficiency score is obtained for each firm by multiplying the coefficients for the outputs and that for the inputs [4]. Subsequently, the measurement value of the firm with the highest efficiency score in the relevant industry at the relevant year is set to 1, and the adjustment process is followed to show the relative efficiency among firms [1,28].
The second step measures the MA by excluding the parts affected by firm-specific factors from the firm efficiency score, which is calculated in the first step [2,27]. As firm efficiency is the combined result of firm-specific factors and MA, firm-specific factors should be eliminated from the efficiency score. For example, firms that have managers with the same ability could exhibit different efficiencies in small- and medium-sized enterprises (SMEs) and large corporations [27] because large firms are in a stronger position to negotiate with suppliers than SMEs. Therefore, firm-specific characteristics, which are expected to help or impede the MA, must be eliminated.

Finally, these firm-specific characteristics are eliminated from the overall firm efficiency measurement value, which is calculated by the DEA using Tobit regression [17]. In other words, MA is defined as the factor unexplained by corporate efficiency after eliminating the factors that help the manager and the firm-specific characteristics that provide difficulty to the manager [1,28]. To separate efficiency, which is attributed to the manager, Tobit regression analysis is conducted following Krishnan and Wang [1] and Sun [28], including the yearly fixed effects in each industry, and the residuals are derived using Equation (4).

\[
DEAi,t = \Phi_0 + \Phi_1 \log(\text{Assets})_{i,t} + \Phi_2 \text{Market Share}_{i,t} + \Phi_3 \text{Free Cash Flow}_{i,t} + \Phi_4 \log(\text{Firm Age})_{i,t} + \Phi_5 \text{Business Segment}_{i,t} + \Phi_6 \text{Foreign Currency}_{i,t} + \beta \sum YD_{i,t} + \varepsilon_{i,t}
\]  

(4)

DEA: Management's efficiency by DEA methodology
log(ASSET): Natural logarithm of total assets
Market Share: Sales ÷ total industry firm's sales
Free Cash Flow: 1 if net free cash flow is positive and 0 if otherwise.
Log(Firm Age): Natural logarithm of firm age (from established year to the current year)
Business Segment: Number of business segment = natural logarithm of sales
Foreign Currency: Sum of foreign accounts

Firm-level factors that affect the MA in corporate efficiency measures exist [8,17]. Therefore, MA is defined as the aspect that six kinds of firm-level factors cannot explain the firm efficiency, including firm assets, market stock, free cash flow, firm age, business segment, and foreign currency [1,28].

Managers with a high level of MA are most likely to be hired by relatively large firms. In addition, firms with large market stocks have larger advantages in negotiations and deals with external stakeholders; therefore, their MA is higher than those with low market values. A firm with a large amount of cash and high free cash flow is more likely to invest in an investment plan with a high net present value [4,29], and its MA is higher than that of the firm with low cash flow. The MA of a manager of a firm that entered the stabilization period, denoted as firm age, is more likely to be higher than that of the manager of the firm that did not [17,30]. In the case of a firm with many business segments, the firm managers would have to consider more factors in managerial decision-making than the firm with few business segments. The managers in a firm that is highly influenced by foreign currency would have to make more complicated decisions than that which only considers domestic currency. Tobit regression analysis, including year fixed effects, is conducted for each industry, and the residuals are measured to determine the MA to contribute to the efficiency of the firm.

The major variables in this study model are TAX, which refers to tax costs, and NONTAX, which refers to nontax costs. For TAX, the cash-based effective tax rate is used. Mills and Newberry [31] verified the effects of ownership structure and debt covenants on the difference between tax and nontax costs. The empirical analysis results in cases of firms with a trade-off between tax and nontax costs show that the degree of consistency between tax and nontax costs is related to the firm’s ownership structure and liability contracts.

Mills and Newberry [31] and Jeon [32] used the debt ratio as a substitute for nontax costs and insisted the debt ratio is a substitute for the possibility of debt contract violation. That is, the higher the debt ratio is, the more likely that the debt contract will be breached. To verify the trade-off relationship between tax and nontax costs empirically, Klassen [33] and Shackelford and Shevlin [13] argued that the variables of the interaction between tax and nontax costs should be included in the model.
To examine the relationship between tax and nontax costs, TAX × NONTAX, which is the trade-off variable between tax and nontax costs, is added in this study, similar to that in the studies of Choi [12] and Jeon [32]. The control variables include foreign investor equity ratio (FOREIGN), ROA ratio (ROA), firm size (SIZE), R & D intensity (RND), operating cash flow (OCF), and market stock (MARKET). These variables are added in the model to control the factors that could affect MA (MA) and the efficiency of the individual firm (DEA).

### 3.3. Sample Selection

This study uses the firms listed in Korea Exchange from 2012 to 2015 as samples through KIS-VALUE. In the case of financial service firms, limitations in comparison and analysis exist due to the differences in the accounting principles and accounts applied to the firms. Therefore, the samples classified as financial service business are excluded. In addition, the samples are limited to December-closing firms to control varied results, which are caused by the differences in closing month.

Firms that meet the above criteria for sample selection are classified by industry. Industry is classified by a medium (industrial sector) level by using the Korean Standard Industry Classification System. On the basis of medium classification, eight industries with more than 30 individual firms within are extracted. The corporate efficiency and MA of individual firm are measured.

When the MA level reaches extreme values in the DEA analysis results, the relevant sample in the industry is removed, and the efficiency is calculated to estimate the MA. The final sample includes 834 firm-years in Table 1 and consists of eight industries, including (1) the food manufacturing industry, 97 firm-years; (2) the chemical materials and product manufacturing industry, 168 firm-years; (3) the medical materials and drug manufacturing industry, 111 firm-years; (4) the primary metal manufacturing industry, 117 firm-years; (5) the electronic component, computer, video, sound, and communication equipment manufacturing industry, 89 firm-years; (6) the other machinery and equipment manufacturing industry, 89 firm-years; (7) the wholesale and commodity brokerage industry, 115 firm-years; and (8) the professional service industry, 48 firm-years.

**Table 1. Sample Distribution.**

| Industries                                    | Year     |          |          |          | Total |
|-----------------------------------------------|----------|----------|----------|----------|-------|
| Food manufacturing                            | 2012     | 24       | 24       | 25       | 24    | 97    |
| Chemical materials and product manufacturing   | 2013     | 44       | 41       | 42       | 41    | 168   |
| Medical materials and drug manufacturing      | 2014     | 28       | 26       | 27       | 30    | 111   |
| Primary metal manufacturing                   | 2015     | 25       | 28       | 32       | 32    | 117   |
| Electronic component, computer, video, sound  |          | 26       | 33       | 0        | 30    | 89    |
| and communication equipment manufacturing     |          |          |          |          |       |       |
| Other machinery and equipment manufacturing   |          | 20       | 23       | 23       | 23    | 89    |
| Wholesale and commodity brokerage             |          | 28       | 28       | 30       | 29    | 115   |
| Professional service                          |          | 12       | 8        | 13       | 15    | 48    |
| Total                                         |          | 207      | 211      | 192      | 224   | 834   |

### 4. Empirical Analysis Results

**Descriptive Statistics**

This study attempts to analyze the relationships between MA and the trade-off between tax and nontax costs. Table 2 presents the descriptive statistics of major variables used in this study. The average of MA measure (MA) is 0.002, the standard deviation is 0.191, and the median value is −0.068, ranging from to −0.221 to 0.908. Particularly, the MA measure, which is the residual estimated variable, is near the zero average and exhibits normal distribution. In addition, the average tax costs
(TAX) is 0.217 and the standard deviation is 0.412, indicating that 181 of the 833 samples are in the first quarter of cash basis effective tax rate (top 25%). That is, 21.7% of the samples have a relatively high tax burden.

The average nontax cost (NONTAX) is 0.439, the standard deviation is 0.222, and the distribution range is from 0.038 to 2.88. The average TAX × NONTAX, which shows the trade-off between tax and nontax costs, is 0.092, and the standard deviation is 0.195. The average and standard deviations of the trade-off variables are lower than the variables of the tax and nontax costs.

The average ROA, as a control variable, is 0.022, the range is from −0.669 to 2.931, and the average firm size (SIZE) is 26.765 with a distribution range of 22.94 to 31.624. In particular, the operating cash flow (OCF) average is 0.052, and the distribution ranges from −0.28 (minimum) to 4.699 (maximum). The average of Market, which represents market stock, is 1.119, and the distribution ranges from 0.002 to 18.312, indicating that this distribution satisfies the basic conditions for conducting OLS regression analysis in this study.

| Variable   | Mean  | STD  | Min   | Q1   | Med  | Q3   | Max  |
|------------|-------|------|-------|------|------|------|------|
| MA         | 0.002 | 0.191| −0.221| −0.108| −0.068| 0.032| 0.908|
| TAX        | 0.217 | 0.412| 0.000 | 0.000| 0.000| 0.000| 1.000|
| NONTAX     | 0.439 | 0.222| 0.038 | 0.278| 0.436| 0.579| 2.880|
| FOREIGN    | 0.094 | 0.124| 0.000 | 0.011| 0.043| 0.126| 0.880|
| ROA        | 0.022 | 0.144| −0.669| 0.000| 0.022| 0.050| 2.931|
| SIZE       | 26.765| 1.352| 22.940| 25.847| 26.581| 27.432| 31.624|
| RND        | 0.009 | 0.031| 0.000 | 0.000| 0.000| 0.006| 0.524|
| OCF        | 0.052 | 0.176| −0.280| 0.011| 0.044| 0.082| 4.699|
| Market     | 1.119 | 2.304| 0.002 | 0.097| 0.331| 1.010| 18.312|

Table 2. Descriptive Statistics of Major Variables (N = 834).

Note (1) Definition of the variables is as follows. MA: managerial ability by Demerjian et al. [9]; DEA: Management efficiency by Demerjian et al. [9]; TAX: 1 if Cash basis effective tax rate (ETR) over the first quarter of rate (top 25%), otherwise 0; NONTAX: Leverage (= liabilities ÷ total assets); TAX × NONTAX: Interaction variable of TAX and NONTAX; FOREIGN: Equity ratio of foreign investors; ROA: Net income ÷ total assets; SIZE: Natural logarithm of total assets; RND: R & D expenditure ÷ total assets; OCF: Cash flow from operating activities ÷ total assets; MARKET: Total Market value of stock ÷ total assets.

5. Results of Multi Regression Analysis

Table 3 shows the results of hypothesis testing. First, the regression coefficient of tax costs (TAX) is 0.068 (p < 0.05), which is different from the prediction that MA and tax costs (TAX) would have no significant coefficient. MA and tax costs have a positive coefficient at the 5% level. MA affects the tax costs, and its influence is positively related. A manager with a high ability bears heavy tax costs, supporting the perspectives of agency theory, which is expanded from previous studies. This expansion suggests that a competent manager will recognize the associated risks from government interference, monetary costs, and political costs and resort less to tax avoidance. In addition, a manager with a high level of MA can produce high output by further efficiently using resources and eventually maintain a high firm value, which can support the results of prior studies.

Second, the regression coefficient of nontax costs (NONTAX) is −0.070 (p < 0.05), which is different from the prediction that the MA and nontax costs (NONTAX) would have no significant coefficient. A significant negative coefficient at 5% confidence level exists between MA and nontax costs, indicating that MA affects nontax costs with a negative coefficient. That is, the manager with a high ability bears low nontax costs. Nontax costs are borne by the firm to cover low financial reporting profit. If the firm value is underestimated from outside because the manager does not report high financial reporting profits, then the manager should take additional costs, that is, nontax
costs. The less financial reporting profit is reported, the higher the increase in nontax costs is. The higher the MA is, the lower the nontax costs borne by the manager. This case implies that the manager with a high ability does not prefer to report low financial reporting profit.

Third, the regression coefficient of the trade-off variable (TAX × NONTAX), which shows the trade-off between tax and nontax costs, is $-0.161$ ($p < 0.05$), indicating that a significant negative relation exists between managerial capacity and the interaction of tax and nontax costs at the 5% level. According to prior studies, a positive relationship exists between the financial and tax reporting profits, which is the trade-off between nontax and tax costs. In addition, the manager’s adjustment is partially possible as tax and nontax costs have a partial trade-off relationship by mitigating the assumption of prior studies that tax and nontax costs have a complete trade-off relationship.

The firm size (SIZE) and market value (Market) of the control variables show coefficients of $-0.015$ and $0.009$, which are statistically significant at 5% and 1%, respectively. Thus, the larger the firm is and the higher its market value is, the higher the MA will be. In contrast, FOREIGN, ROA, RND, and OCF do not exhibit statistically significant coefficients.

\[
MA_{i,t} = \alpha_{i,t} + \beta_1\text{TAX}_{i,t} + \beta_2\text{NONTAX}_{i,t} + \beta_3\text{TAX}_{i,t} \times \text{NONTAX}_{i,t} + \beta_4\text{FOREIGN}_{i,t} + \beta_5\text{ROA}_{i,t} + \\ + \beta_6\text{SIZE}_{i,t} + \beta_7\text{RND}_{i,t} + \beta_8\text{OCF}_{i,t} + \beta_9\text{MARKET}_{i,t} + \beta\sum\text{YD}_{i,t} + \beta\sum\text{IND}_{i,t} + \varepsilon_{i,t}
\]

### Table 3. Regression Results of Hypothesis Test.

| Predicted Sign | Coefficient | t-Stat. |
|----------------|-------------|---------|
| Intercept      | 0.396 **    | 2.46    |
| TAX            | +/--        | 0.068 **| 2.11    |
| NONTAX         | +/--        | $-0.070$**| $-2.30$|
| TAX × NONTAX   | +/--        | $-0.161$**| $-2.35$|
| FOREIGN        | +           | $-0.047$ | $-0.86$ |
| ROA            | +           | 0.039   | 0.66    |
| SIZE           | +/--        | $-0.015$**| $-2.41$|
| RND            | +           | 0.037   | 0.21    |
| OCF            | +           | $-0.011$ | $-0.23$ |
| Market         | +           | 0.009 ***| 2.66    |
| $\sum$YD      | +/--        | Included |
| $\sum$IND     | +/--        | Included |
| F-value        | 22.59 ***   |          |
| Adj. R²        | 0.330       |          |
| Observation    | 833         |          |

Note (1) *** and ** indicate statistically significant at the 1% and 5% two-tailed level, respectively.

Note (2) Definition of the variables is as note 1 of Table 2.

Table 4 shows the analyzed results of MA with the managerial efficiency variable as a dependent variable using the DEA methodology. The regression coefficients of tax costs (TAX), nontax costs (NONTAX), and the trade-off variable (TAX × NONTAX) are $0.060$ ($p < 0.1$), $-0.066$ ($p < 0.05$), and $-0.143$ ($p < 0.5$), respectively. All three coefficients are statistically significant at 5% confidence level. Additionally, the second model shows that the three regression coefficients of the independent variables have the same direction as the regression model of MA even though the dependent variables are changed from MA to DEA.

\[
DEA_{i,t} = \alpha_{i,t} + \beta_1\text{TAX}_{i,t} + \beta_2\text{NONTAX}_{i,t} + \beta_3\text{TAX}_{i,t} \times \text{NONTAX}_{i,t} + \beta_4\text{FOREIGN}_{i,t} + \beta_5\text{ROA}_{i,t} + \\ + \beta_6\text{SIZE}_{i,t} + \beta_7\text{RND}_{i,t} + \beta_8\text{OCF}_{i,t} + \beta_9\text{MARKET}_{i,t} + \beta\sum\text{YD}_{i,t} + \beta\sum\text{IND}_{i,t} + \varepsilon_{i,t}
\]
Table 4. Regression Results of Additional Test.

| Predicted Sign | Coefficient | t-Stat. |
|----------------|-------------|--------|
| Intercept      | 0.412 ***   | 2.58   |
| TAX            | +/-         | 0.060 *| 1.88   |
| NONTAX         | +/-         | -0.066 **| -2.20 |
| TAX × NONTAX   | +/-         | -0.143 **| -2.10 |
| FOREIGN        | +           | -0.040 | -0.74  |
| ROA            | +           | 0.048  | 0.82   |
| SIZE           | +/-         | -0.010 *| -1.69  |
| RND            | +           | 0.022  | 0.12   |
| OCF            | +           | -0.001 | -0.02  |
| Market         | +           | 0.001  | 0.23   |

ΣYD +/− Included
ΣIND +/− Included

F-value 25.38 ***
Adj. R² 0.372
Observation 833

Note (1) ***, **, and * indicate statistically significant at the 1%, 5%, and 10% two-tailed level, respectively. Note (2) Definition of the variables is as note 1 of Table 2.

We analyze the trade-off between tax and nontax costs, considering the possible endogeneity problem between the TAX and MA variables. By using the two stage least squared (2SLS) regression of the Heckman selection model, Inverse Mills Ratio is measured using the probit model (TAX) in the first stage, and IMR is added to each model in the second stage to control the endogenous factors. Table 5, which shows the analysis results, is similar to Table 4, with the TAX × NONTAX coefficient of −0.159 (p < 0.05). Therefore, even if the endogeneity issue of the research model is considered, the hypothesis for the trade-off between the tax and nontax costs is supported.

(First Stage) \( TAX_i,t = \alpha + \alpha_1NONTAX_i,t + \alpha_2FOREIGN_i,t + \alpha_3ROA_i,t + \alpha_4SIZE_i,t + \alpha_5RND_i,t + \alpha_6OCF_i,t + \alpha_7MARKET_i,t + \alpha_8\sum YD_i,t + \alpha_9\sum IND_i,t + \epsilon_i \)

(Second Stage) \( MA_i,t = \beta + \beta_1TAX_i,t + \beta_2NONTAX_i,t + \beta_3TAX_i,t \times NONTAX_i,t + \beta_4FOREIGN_i,t + \beta_5ROA_i,t + \beta_6SIZE_i,t + \beta_7RND_i,t + \beta_8OCF_i,t + \beta_9MARKET_i,t + \beta_{10}YD_i,t + \beta_{11}IND_i,t + \epsilon_i \)

Table 5. Results of Heckman Selection Model.

|               | First Stage | Second Stage |
|---------------|-------------|--------------|
|               | Coefficient| Standard error| Coefficient| Standard error|
| Intercept     | 0.474 ***   | 0.091        | 0.225 **   | 0.097       |
| TAX           | -           | -            | 0.049 **   | 0.224       |
| NONTAX        | -0.041 **   | 0.019        | -0.087 **  | 0.036       |
| TAX × NONTAX  | -           | -            | -0.159 **  | 0.069       |
| FOREIGN       | -           | -            | -0.051     | 0.064       |
| ROA           | 0.088 ***   | 0.023        | 0.101      | 0.083       |
| SIZE          | 0.021 **    | 0.009        | -0.022 **  | 0.009       |
| RND           | 0.095       | 0.161        | 0.035      | 0.175       |
| OCF           | -0.076      | 0.053        | -0.017     | 0.028       |
| Market        | 0.130 ***   | 0.038        | 0.015 ***  | 0.006       |
6. Conclusions

The analysis results are as follows: First, MA and tax costs have a significant positive coefficient. The manager with a high ability would bear high tax costs. This case can be interpreted as the result of supporting prior studies that recent tax planning no longer aims to simply minimize taxation. In addition, the higher the MA is, the less likely he or she will reduce tax costs to maintain the firm's sustainability. Second, MA and nontax costs have a significant negative coefficient. That is, the higher the MA is, the lower the nontax cost will be. According to prior studies, nontax costs are the sum of the additional expenses that should be borne by the firm when the financial reporting profits publicly disclosed are less than the actual reporting profits. In other words, less payed nontax costs indicate that the manager did not report the actual financial reporting profits to the market.

A common notion exists that managers want to minimize the taxes and maximize the financial reporting profits. However, managers do not actually set a tax plan that could reduce the tax base or financial reporting profits to minimize taxes. Rather, a manager with a high ability reports high financial reporting profits. Thus, the manager with a high ability can generate higher performance of individual firms than the manager with a low ability.

Regarding the corporate profits gained by corporate activities, the government collects the taxes with political purposes as a part of the costs to satisfy the public's interests. However, taxes imply direct cash outflows for firms. Therefore, managers are likely to be motivated to establish tax plans for taxation minimization. This study was conducted to verify whether MA is related to tax and nontax costs. That is, if the financial reporting profits are high, then the tax base amount and related tax burden will increase as well, but managers with a high ability place further emphasis on reporting high financial reporting profits even though the tax costs increase. In other words, managers with a high ability place more weight on nontax costs than tax costs when establishing tax plans.

These results are expected to provide stakeholders with theoretical and practical implications on managers' tax planning by examining the relationship between the trade-off effect of tax and nontax costs and MA. However, the study results have a limitation because the test was conducted with a sample of only eight industries listed in Korea Exchange. Therefore, analysis must be performed by increasing the number of samples. Nontax costs include all cost types, except tax costs, which may limit the study results as the debt ratio is used as a proxy for nontax costs. In addition, the DEA method was used to measure MA, which is the most important variable in this study and also has its limitations. The MA was measured by separating firm-specific factors from firm efficiency, but the firm-specific factors that were not separated could remain in the MA.

It is worth considering that in general managers are responsible for their costs and performances, so they will strain for corporate sustainability by creating stakeholder value. Future research needs to analyze how the MA is affecting aggressive tax reporting, tax avoidance, and financial reporting behaviors, and find the factors that prevent managers from considering tax and non-tax expenses at the same time. From the point of view of cost management, managers will strive to discover an optimal cost structure that can exist between tax and non-tax costs. This is may vary depending on the firm sizes due to the management systems they have, which is considered as a future research direction.
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