

The Effects of ESG Performance on the Relationship between Tax Risk and Cost of Capital: An Empirical Analysis of Korean Multinational Corporations*

JKT 27(1)

Received 7 April 2022
Revised 2 December 2022
Accepted 2 December 2022

Jeong-Yeon Kang

Department of Information Technology Management, Sun Moon University, South Korea

Im-Hyeon Kim[†]

Department of Accounting, Daegu University, South Korea

Abstract

Purpose – Using a sample of Korean multinational corporations, we examine whether the relationship between tax risk and the implied cost of capital discriminates between the environmental, social, and corporate governance (ESG) of highly rated firms.

Design/methodology – Firms with high tax risks have an increased uncertainty of future cash flows. Therefore, as the volatility of future cash flow increases, information asymmetry and the required return increases. Highly rated ESG firms can reduce information asymmetry, thereby weakening the positive relationship between tax risk and cost of capital. We employ the standard deviation of the cash effective tax rate as proxy of tax risk. We utilize the ESG rating data of the Korea Corporate Governance Service (KCGS). We use a PEG model, MPEG model, and GM model to measure the implied cost of capital.

Findings – We find a positive association between the implied cost of capital and tax risk. The positive relationship between tax risk and the implied cost of capital weakens in highly rated ESG firms. Highly rated ESG firms prefer a stable tax position to invest after-tax cash flows into sustainable management. Therefore, the negative effects of tax risk on cost of capital can be reduced.

Originality/value – This study provides empirical evidence that ESG activities can mitigate the negative impact of tax risk on the cost of capital for Korean multinational corporations. In a business environment where ESG activities are more important, the empirical results that ESG activities can reduce the corporate risk of Korean FDI companies are expected to provide implications for the ESG activities of multinational corporations.

Keywords: Cost of Capital, CSR, ESG, FDI, Multinational Corporation, Tax Risk

JEL Classifications: G31, M14, H26

1. Introduction

As environmental concerns have increased due to the impact of COVID-19, corporate ESG activities are increasing globally. Many companies have introduced ESG management and released annual sustainable development reports. A company's ESG activities have an impact on various corporate decisions, such as investment and raising capital. Many institutional investors, including pension funds, make investment decisions based on corporate social responsibility (CSR). Consistent with this trend, this study explores at the impact of ESG

* This research was supported by Daegu University Research Grant, 2020.

[†] **Corresponding author:** hsbkih@daegu.ac.kr

© 2023 Korea Trade Research Association. All rights reserved.

activities on corporate tax strategies and the cost of capital.

Tax avoidance has a positive effect on corporate value by increasing the company's after-tax cash flow, but it can negatively affect corporate value by incurring various non-tax costs. Tax avoidance is negative news that negatively impacts stock prices, reduces transparency in financial reporting, and increases the likelihood of stock crashes. Tax avoidance can lower the cost of equity because it increases future cash flows, but it can increase the cost of equity by increasing the volatility of future cash flows.

Recently, few studies on tax risks arising from corporate tax strategies have been conducted. Previous studies explored determinants and consequences of tax risk (Drake et al., 2019, Guenther et al., 2017, and Hutchens and Rego, 2015). Guenther et al. (2017) and Hutchens and Rego (2015) suggested that tax risk was positively related with firm risk. Drake et al. (2019) also presented the result of the negative relationship between tax risk and value.

Tax risk is defined as uncertainty in the taxation of a firm's tax planning in relation to its transactions, business activities, financial reporting decisions, and corporate reputation, which is unexpected (Hutchens and Rego 2015). Uncertainty in tax planning leads to costs associated with the purchase of external tax services and compliance with tax authorities or financial accounting regulations. A firm's reputational cost due to an aggressive tax strategy can also occur (Hutchens and Rego, 2015; Austin and Wilson, 2017).

Tax risk means potential risk that may have different outcomes from expected tax planning. Management runs the company with an emphasis on stable future performance and a sustainable tax strategy. By constantly maintaining the tax strategy in the long term, the stability of future cash flows is enhanced by minimizing the volatility in the ratio of taxes paid to taxable income. However, if the planned tax strategy faces different problems than expected, uncertainty of the tax to be paid could increase, which is a growing tax risk that can negatively affect future cash flows.

Tax risk represents the sustainability of tax management. Amihud and Mendelson (1986) argued that the difference between bid-ask prices in transactions increases when information asymmetry exists. This difference incurs high transaction costs, which increases the cost of capital. Therefore, we can expect that the effect of tax risk on the implied cost of capital is positive. Tax risk is one of the factors influencing the cost of capital, and maintaining an appropriate level of tax risk is an effective means of lowering the cost of equity.

Several empirical studies have been conducted on CSR activities over the last decade. There are two theoretical perspectives on CSR and tax avoidance. According to corporate culture theory, companies with many CSR activities are expected to reduce aggressive tax avoidance. Lanis and Richardson (2012) and Hoi et al. (2013) reported empirical results consistent with this view. According to a risk-management strategy, aggressive tax avoidance and CSR activities were expected to have a positive relationship. Wei et al. (2019) presented that CSR engagement could provide insurance-like protection for firm value by reducing the reputation risk of tax avoidance using data from the China Stock Exchange.

It was shown that companies that voluntarily disclose the CSR activities reduce the cost of capital (Dhaliwal et al., 2011). Similarly, the strong ESG performance of a company was also reported to reduce the cost of capital. Ng and Rezaee (2015) reported that environmental, social, and governance components of sustainability affect the cost of equity, respectively. Ould (2020) reported the negative relationship between ESG and cost of capital using data on listed companies in the UAE. Companies that disclose ESG activities are expected to play a role in reducing the cost of capital by alleviating information asymmetry. Information on the

relationship between ESG activities and the cost of capital will be useful for investors to make investment decisions.

Tax risk arising from an increase in aggressive tax avoidance incurs various costs, and these costs increase uncertainty in future cash flows, increasing the information asymmetry of investors. Previous studies have provided empirical evidence for the relationship between tax risk and corporate risk, but the effect of tax risk on the cost of capital has not yet been examined. In addition, companies with excellent ESG performance are expected to have a superior information environment compared to those with low ESG performance, which is expected to mitigate the negative effects of tax risk.

This study examines the relationship between tax risk and the implied capital cost of listed Korean firms from 2011 to 2016, and whether this relationship discriminates between ESG good rating firms or not. Our interest variable, tax risk, uses the standard deviation of the effective cash tax rate for 5 years. We use the PEG model and MPEG model from Easton (2004), and the GM model from Gode and Mohanram (2003) as dependent variables. In addition, we confirm the robustness of the analysis result using a variable that measures the average value of three measurements. We utilize the ESG rating of the Korea Corporate Governance Service (KCGS) as a proxy of sustainable management.

As a result, we find a positive and significant association between our measure of the implied cost of capital and tax risk. It is interpreted that the uncertainty of cash flows according to an aggressive tax strategy is taken as firm risk, and the required rate of return increases. The positive relationship between tax risk and the implied cost of capital weakens in highly rated ESG firms. Highly rated ESG firms have a relatively good information environment compared to others, so it is interpreted that the asymmetries related to tax risk among investors are reduced, thereby reducing the implied cost of capital.

Using Korean data, we provided empirical results that the higher the tax risk, the higher the cost of raising capital. This means that sustainable tax planning is important for managers to secure the stable raising of capital. In addition, it was found that the positive relationship between tax risk and the implied cost of capital was weakened in companies with excellent ESG performance. Our findings provide the first empirical evidence that ESG performance influences the relationship between tax risk and implied cost of capital. Companies with good ESG performance will prefer a stable tax strategy in order to invest after-tax cash flows into sustainable management. Therefore, it is interpreted that the negative effect of tax-related risks perceived by investors is reduced. The results of the empirical analysis of this study are expected to provide useful information to corporate stakeholders.

The composition of this paper is as follows. In Chapter II, previous studies are reviewed and hypotheses are established. Chapter III designs a research model to test the hypothesis and describes the main variables. In Chapter IV, the results of empirical analysis are presented, and finally in Chapter V, the study results are summarized, and the contribution points and limitations of this study are presented.

2. Literature Review and Hypothesis Development

Tax avoidance reduces the resources that have to be transferred from shareholders to the government. Thus, it could be argued that this could significantly increase firm value. There are significant costs and benefits associated with corporate tax avoidance. The relative

difference between the costs and benefits of corporate tax avoidance has an impact on the relationship between corporate tax avoidance and firm value (Slemrod 2009).

Hanlon and Slemrod (2009) examined the market reaction to company news about tax shelter involvement. They reported that news on the tax shelter had a negative impact on stock price. Kim et al. (2011) provided evidence that there was a positive relationship between tax avoidance and stock price crash risk. They argued that tax avoidance was used as a means to cover up bad news in order to prevent managers from liquidating or fixing insolvent projects prematurely, and that negative information accumulated over a long period of time caused a sharp decline in stock prices. Balakrishnan et al. (2019) found that there was a conflicting relationship between the transparency of financial information and aggressive tax avoidance.

There are direct and indirect impacts of tax avoidance on the cost of capital. Since tax avoidance increases after-tax cash flows, it has a positive effect on corporate value, and reduces the cost of capital by reducing the shareholder's required rate of return on corporate risk. On the other hand, if tax avoidance increases, corporate transparency decreases, and if the quality of accounting information decreases, investor predictions of the company's future cash flows are uncertain, and the required return to the company by shareholders increases. Goh et al. (2016) reported that tax avoidance and a firm's cost of capital have a negative relationship. It was interpreted that the required rate of return decreased as a result of the effect of the future increase in after-tax cash flows as a result of tax avoidance. Cook et al. (2017) reported that the cost of capital increases, according to the deviation between investors' expected tax avoidance and corporate tax avoidance. Therefore, investors have different perceptions depending on how much tax avoidance is expected.

Previous studies on tax risk and firm risk are as follows. Hutchens and Rego (2015) defined tax risk as all uncertainties related to taxation (business transactions, operational and financial reporting decisions, and corporate reputation). They examined the relationship between tax risk and firm risk using total unrecognized tax benefits (UTB), discretionary permanent book-tax differences (DTAX), and volatility in cash effective tax rates as a proxy for tax risk. As a result, the relation between tax risk and firm risk showed a positive relationship. It is interpreted that as tax risk increases, the firm risk acknowledged by the capital market participant increases. Guenther et al. (2017) examined the relationship between tax risk and firm risk. They used the volatility of CASH ETR as the proxy of tax risk, and the volatility of future stock returns as the proxy of firm risk. They reported that there was a positive relationship between tax risk and firm risk. Saavedra (2015) defined firms that paid many taxes, such as additive taxes, as tax spike firms. He argued that these firms had very volatile tax-related future cash flows, limited debt contracts, and high borrowing. Drake et al. (2015) examined the effects of tax avoidance and tax risk to investors. Following the results, investors provided a positive assessment of tax avoidance and a negative assessment of tax risk. Furthermore, it was found that the positive impact of tax avoidance on firm value decreased as tax risk increased.

Tax risks incur additional costs for a firm. For example, due to the uncertainty of the expected tax planning, there are costs of purchasing additional external tax-related services and costs to comply with tax authorities or financial accounting regulations. There are also costs associated with evaluating the tax-related internal control system or disclosing tax-related items in financial statements. Aggressive tax strategies can result in reputational costs to the company. As corporate tax uncertainty increases, tax risk increases, and corporate risk,

which reflects tax uncertainty, increases. (Hutchens and Rego 2015). As such, tax risk is a potential risk that can have different results than the expected results of tax planning (Guenther et al. 2017).

Management can operate the firm with a focus on future performance stability and sustainable taxation strategy. By maintaining a long-term sustainable tax strategy, it is possible to improve the stability of future cash flows by minimizing the volatility of taxes paid. They are expected to exhibit less information asymmetry with respect to earnings and future cash flow stability to investors. As such, it is expected that the cost of capital will be lower. On the other hand, firms with high tax risks are expected to have high information asymmetry by providing investors with information on high tax uncertainties related to future cash flows due to high tax fluctuations. As a consequence, the cost of capital is expected to be high.

Tax risk could create information asymmetry related to the volatility of future cash flow, which has a negative impact on the cost of capital. Higher tax risk increases tax payment uncertainty, leading to asymmetrical tax-related information among investors (Hutchens and Rego 2015). This information asymmetry results in high transaction cost and increases the cost of capital. This leads to our first hypothesis.

H1: Tax risk is positively associated with the implied cost of capital.

Recently, studies on CSR have been ongoing, and as global interest in ESG activities has increased since COVID-19, massive funds are being invested in socially responsible investment (SRI). CSR activities can increase the interests of stakeholders, but can also reduce the interests of shareholders. Previous studies on the effect of CSR on tax avoidance are as follows.

Lanis and Richardson (2012) found a negative association between CSR disclosure levels and effective tax rates based on a sample of listed Australian corporations. They argued that their findings may indicate that CSR activities are related to tax avoidance decisions. Hoi et al. (2013) examined aggressive tax avoidance and irresponsible CSR activities from two perspectives. According to corporate culture theories, aggressive tax avoidance and irresponsible CSR activities were expected to have a positive relationship. On the other hand, according to a risk-management strategy, it was expected that aggressive tax avoidance and irresponsible CSR activities would have a negative relationship. The empirical results support corporate culture theories, indicating that there is a positive relationship between aggressive tax avoidance and irresponsible CSR activities.

Godfrey et al. (2009) found evidence on the negative association between CSR and tax avoidance. A positive CSR reputation can potentially mitigate the risk of adverse business events. Wei et al. (2019) noted that CSR engagement can provide insurance-like protection for firm value by reducing the reputation risk of tax avoidance. Yoon et al. (2021) reported that ESG score and tax avoidance had a negative relationship for Korean listed companies. These results are interpreted as reducing aggressive tax avoidance by companies with excellent CSR performance consistent with corporate culture theories. Gallemore and Labro (2015) found that tax risk was reduced when the information environment of the firm was higher. If aggressive tax avoidance decreases due to an increase in CSR activities, the volatility of cash flows related to future tax payments will decrease.

There are studies on the cost of capital of companies that voluntarily conduct CSR activities. Dhaliwal et al. (2011) reported that firms that voluntarily initiate the disclosure of

CSR activities reduce the cost of equity capital. In addition, firms that disclosed superior CSR performance received more attention from institutional investors and analysts than non-disclosure firms, and were able to raise more equity among firms raising funds. Cui et al. (2018) reported that CSR activities and information asymmetry have an inverse relationship. In addition, it was found that the relationship between CSR and information asymmetry was strengthened for high-risk firms to maintain a good reputation. These results interpret that CSR activities are employed to maintain corporate reputation, and through this, the information environment is improved. Cho et al. (2013) argued that CSR performance played a positive role for investors by alleviating information asymmetry.

Ng and Rezaee (2015) reported that ESG had a negative relationship with the cost of equity capital. The environmental, social, and governance components of sustainability affect the cost of equity, respectively. Ould, (2020) tested the relationship between ESG and cost of capital for listed companies in the UAE, and reported a negative relationship. It was interpreted that ESG disclosure played an important role in reducing the cost of capital. Cornell (2020) suggested that investors that prefer companies with high ESG ratings can lower their cost of capital, and at the same time, have lower expected returns. It was argued that ESG is a risk factor, and that it lowers the expected return on investment in companies with high ESG ratings. Siew et al. (2016) suggested a negative relationship between ESG disclosures and bid-ask spread, and found that institutional investors mitigate market information asymmetry.

Companies with excellent ESG performance seek stable tax plans because they invest in corporate sustainability by securing stable after-tax cash flows. A highly sustainable tax strategy reduces the uncertainty of tax payment and lowers the tax risk associated with the volatility of future cash flows. If companies with excellent ESG performance provide low-risk tax information to investors, it is expected that the positive relationship between tax risk and embedded capital cost will be alleviated. ESG is expected to lower tax risk by reducing aggressive tax avoidance, and ESG is expected to alleviate the impact of the tax risk of the cost of capital by alleviating information asymmetry. This leads to our second hypothesis.

H2: The relationship between tax risk and the implied cost of capital is weakened for firms with good ESG performance.

3. Research Design

3.1. Variable Measurement

3.1.1. ESG performance

The ESG rating measures a company's performance when it comes to environmental, social, and corporate governance practices. ESG scores released by external rating agencies such as KLD Research & Analytics, Bloomberg, and Thomson Reuters Eikon were widely used in previous studies. However, most of these concentrate primarily on the US market and do not provide financial data for a particular country. Therefore, we use the ESG rating of the Korea Corporate Governance Service (KCGS) as a proxy of sustainable management. The ESG ratings of the KCGS are disclosed in four categories: ESG integration sector, environment sector, social sector, and governance sector. In the main analysis, we examine the tests

using ESG integration. Each component of the ESG (environmental, social, and governance) is considered in additional analysis. KCGS assigns A+, A, B+, B, C+, and C as ESG grades for firms. We classify firms with an A+ or A rating as active ESG firms in order to distinguish between firms that are active in ESG and those that are not. We examine the hypotheses with an indicator variable that is 1 if it is a firm that is active in ESG (A+ or A), and 0 otherwise.

3.1.2. Tax Risk

Traditional finance studies measure risk as a variance that reflects future uncertainty (Brealey et al. 2011). Guenther et al. (2017) defined tax risk as the uncertainty of future tax burdens associated with current tax strategies. Neuman et al. (2016) defined tax risk as a potential risk with current or future tax plans that have different results than expected. This study applied this concept and used the standard deviation of CASH ETR commonly used in Guenther et al. (2017), Drake et al. (2019), and Huthcne and Rego (2015) as a measure of tax risk. These tax risk measures capture not only the volatility of temporary and non-recurring tax strategies but also tax strategies that fluctuate over a tax period due to the possibility of being caught by tax authorities (Guenther et al., 2017). The CASH ETR (Dyreg et al., 2008), which is the sum of cash taxes paid for years $t-4$ through year t , divided by the sum of pretax income for years $t-4$ through year t . CASH ETR is winsorized at values of zero and one. The standard deviation of the annual CASH ETR for year $t-4$ through year t , consistent with Guenther et al. (2017).

3.1.3. Implied Cost of Capital

Implied cost of capital refers to the required rate of return on the level of risk recognized by investors, and refers to the cost of pre-capitalized capital as measured by future earnings at the current price. As a method for measuring the cost of intrinsic capital, two capital cost estimates (PEG model and MPEG model) presented by Easton (2004) and a capital cost estimate (GM model) suggested by Gode and Mohanram (2003) were used. Additionally, the average value of the three measurements was used.

The PEG model was measured based on the growth potential of stock returns without considering dividends based on the abnormal profit growth valuation model. The PEG model is an estimate of the cost of capital, given the assumption that the non-expected growth rate of accounting income is 0 and dividend per share is 0 after period 1, as shown in Equation (1).

$$COC_{peg} = \sqrt{\frac{(FEPS_{t+2} - FEPS_{t+1})}{P_t}} \quad (1)$$

where $FEPS_{t+1}$ and $FEPS_{t+2}$ indicate estimated earnings per share after 1 and 2 years, respectively. P_t is Price per share at the present time.

The MPEG model is a special form of the Ohlson and Juettner-Nauroth (2005) model, and the PEG model is modified by considering dividends as shown in Equation (2) below.

$$COC_{mpeg} = \frac{DPS_{t+1} + \sqrt{DPS_{t+1}^2 + 4 \times P_t \times (FEPS_{t+2} - FEPS_{t+1})}}{2P_t} \quad (2)$$

where DPS_{t+1} is the stock dividend forecast after one year.

The GM model is based on the excess profit growth model proposed by Ohlson and Juettner-Nauroth (2005), and estimates the cost of equity capital as shown in the Equation (3).

$$COC_{GM} = A + \sqrt{A^2 + \left(\frac{FEPS_1}{P_1}\right) \times (g_2 - (r_f - 0.03))} \quad (3)$$

$$A = \frac{(r_f - 0.03)}{2} + \frac{DPS_{t+1}}{2P_t} \quad (4)$$

$$g_2 = \frac{FEPS_{t+2}}{FEPS_{t+1}} - 1 \quad (5)$$

where r_f is the risk-free interest rate.

3.2. Research Model

Our first hypothesis predicts a positive relation between tax risk and implied cost of capital. To test this, we estimate the following ordinary least squares (OLS) regression model at the firm-year level. We test Hypothesis 1 with the model's tax risk coefficient, β_1 .

$$COC_{i,t} = \beta_0 + \beta_1 TAXRISK_{i,t} + \beta_2 TAXAVOID_{i,t} + \beta_3 SIZE_{i,t} + \beta_4 LEV_{i,t} + \beta_5 ROA_{i,t} + \beta_6 MTB_{i,t} + \beta_7 BETA_{i,t} + \beta_8 FORN_{i,t} + \sum YEAR + \sum IND + \varepsilon_{i,t} \quad (6)$$

where,

COC:

COC_{PEG}: the implied cost of capital estimated using the PEG model.

COC_{MPEG}: the implied cost of capital estimated using the MPEG model.

COC_{GM}: the implied cost of capital estimated using the GM model.

COC_{AVG}: the average of the implied cost of capital estimated using the PEG, MPEG, and GM models.

TAXRISK: the standard deviation of CASH ETR over the past 5 years.

TAXAVOID: the cash effective tax rate (Dyreng et al. 2008), which is the sum of cash taxes paid for years $t-4$ through year t , divided by the sum of pretax income for years $t-4$ through year t .

SIZE: the firm size (log value of total assets).

LEV: the financial leverage (total liabilities/total assets).

ROA: the return on assets (pretax income/total assets).

MTB: the ratio of market value to book value.

BETA: the beta estimated by applying market model.

FORN: the share of foreign investment.

In addition to our explanatory variable of interest, TAXRISK, we include a battery of control variables in our regression model. SIZE is included to control the overall risk of the firm. The larger the size of the firm, the lower the risk of information asymmetry because more information comes to the market (Gode and Mohanram, 2003; Botosan and Plumlee, 2011). The larger the firm size, the lower the financing cost and the risk of bankruptcy, which directly affects the implied cost of capital (Sharpe, 1964). LEV is a variable that represents financial risk. The higher the debt ratio, the greater the financial risk. Increased financial risk increases the cost of capital perceived by investors (Francis et al., 2005). We include it in our model to control the impact of return on assets (ROA) on the implied cost of capital. A higher MTB means a better growth potential of the investment, so it is included in the model to control for its impact on the implied cost of capital. Lintner (1975) suggested that beta has a precedent relationship with stock returns, as it captures the systematic risk of a firm. We include FORN in our model to control governance related to foreign investors. Finally, we include industry fixed effect and year fixed effect.

Hypothesis 2 of this study examines the effect of ESG rating on the relationship between tax risk and implied cost of capital. To examine whether ESG activity decreases the positive effect of tax risk on implied cost of capital, we estimate the following OLS regression model at the firm-year level. For tests of the relative role of ESG activity (H2), we add the main effects of ESG variable as well as interaction effects with tax risk measures. We predict a negative coefficient on tax risk and ESG interaction. Consistent with H2, we expect a negative coefficient β_3 in Model (7). This result is consistent with ESG activity weakening the positive association between tax risk and implied cost of capital. The control variables used in the model are the same as in Equation (6).

$$COC_{i,t} = \beta_0 + \beta_1 TAXRISK_{i,t} + \beta_2 ESG_{i,t} + \beta_3 TAXRISK \times ESG_{i,t} + \beta_4 TAXAVOID_{i,t} + \beta_5 SIZE_{i,t} + \beta_6 LEV_{i,t} + \beta_7 ROA_{i,t} + \beta_8 MTB_{i,t} + \beta_9 BETA_{i,t} + \beta_{10} FORN_{i,t} + \sum YEAR + \sum IND + \varepsilon_{i,t} \quad (7)$$

where,

ESG: an indicator variable equal to 1 if ESG grade is A+ or A, and 0 otherwise.

3.3. Sample Selection

We start our sample construction with all Korean listed firms from 2007 to 2019 in the KISVALUE database. Multinational corporations were selected among Korean listed companies that have entered at least one foreign direct investment market. Foreign direct investment was collected using the disclosure data of the electronic disclosure system (DART). We target firms with a December settlement of accounts and exclude the financial industry. Financial firms are excluded because financial information is different from the general manufacturing industry, making it difficult to compare and analyze with other industries. In order to secure the homogeneity of the firm, according to the settlement month, it was limited to the settlement firm in December. This study targets firms that can use financial statement data and financial analyst profit forecasts. This study was conducted for firms that could obtain the standard deviation of CASH ETR and CASH ETR in the previous

5 years. Firms with negative pre-tax income were excluded from the analysis. This results in a final sample of 722 firm-year observations from 2011 to 2017. In order to minimize problems caused by outliers, excluding indicator variables, values corresponding to the upper and lower 1% were winsorized.

4. Results

4.1. Descriptive Statistics

Table 1 shows the descriptive statistics of the main variables. The mean (median) of the implied costs of capital estimated using the PEG, MPEG, and GM models was 10.6% (10.0%), 11.4% (10.8%), and 11.3% (10.8%), respectively. The mean (median) of the implied cost of capital was 11.1% (10.4%), measured using the average of the three models. The firms used in the analysis had a capital cost of about 11.1%, which means that the required rate of return for capital market participants is about 11.1%. The mean (median) of TAX RISK is 0.088 (0.061). This is relatively lower than the mean (median) 0.202 (0.105) suggested by Hutchens and Rego (2015), which was examined for US firms. Among firms analyzed, 15.2% of firms were active in ESG. This means that 15.8% of the firms used in the analysis received ESG ratings of A or A+. We measure tax avoidance as CASH ETR. The average (median) cash effective tax rate was 21.5% (22.4%). This means that, on average, Korean listed firms pay about 21.5% of their pre-tax income as corporate tax. It was found that the descriptive statistics of the control variables used in the analysis did not differ largely from the previous studies in Korea.

Table 1. Descriptive Statistics

Variables	Mean	Std. Dev.	Min	Q1	Median	Q3	Max
<i>COC_{PEG}</i>	0.106	0.039	0.038	0.078	0.100	0.127	0.280
<i>COC_{MPEG}</i>	0.114	0.041	0.044	0.086	0.108	0.134	0.320
<i>COC_{GM}</i>	0.113	0.040	0.043	0.085	0.108	0.133	0.321
<i>COC_{AVG}</i>	0.111	0.040	0.043	0.083	0.104	0.131	0.317
<i>TAX RISK</i>	0.088	0.082	0.009	0.035	0.061	0.107	0.412
<i>ESG</i>	0.152	0.360	0.000	0.000	0.000	0.000	1.000
<i>TAXAVOID</i>	0.215	0.072	0.020	0.178	0.224	0.258	0.391
<i>SIZE</i>	21.388	1.415	18.755	20.315	21.268	22.334	24.973
<i>LEV</i>	0.362	0.171	0.032	0.225	0.365	0.502	0.728
<i>ROA</i>	0.081	0.060	0.007	0.037	0.065	0.107	0.302
<i>MTB</i>	1.949	1.719	0.347	0.946	1.372	2.189	9.580
<i>BETA</i>	0.767	0.408	-0.046	0.454	0.737	1.055	1.762
<i>FORN</i>	0.216	0.153	0.005	0.093	0.185	0.292	0.665

Notes: Refer to Eq (6) for variable definitions.

4.2. Correlation

Table 2 shows the Pearson correlations among the main variables used in the analysis. In Table 2, the correlation between TAX RISK and four measures of implied cost of capital (COC_{PEG} , COC_{MPEG} , COC_{GM} , COC_{AVG}) was found to be significantly positive. Increases in tax risks are associated with increases in the implied cost of capital. The correlation between ESG and four measures of implied cost of capital (COC_{PEG} , COC_{MPEG} , COC_{GM} , COC_{AVG}) was found not to be significant. We examined the effect of ESG on the relationship between tax risk and implied cost of capital. Therefore, Hypothesis 2 was examined through the interaction term between tax risk and ESG in the regression analysis.

The correlations between COC_{AVG} and the control variables are as follows. ROA, MTB, and FORN showed a significant negative relationship with COC_{AVG} . On the other hand, LEV and BETA showed a significant positive relationship with COC_{AVG} . The correlation between implied cost of equity and other control variables is consistent with prior literature in Korea.

Table 2. Pearson Correlation

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
(1) COC_{PEG}												
(2) COC_{MPEG}	0.969											
(3) COC_{GM}	0.966	0.999										
(4) COC_{AVG}	0.975	0.999	0.998									
(5) TAX RISK	0.157	0.132	0.129	0.136								
(6) ESG	-0.024	-0.013	-0.015	-0.019	0.030							
(7) TAXAVOID	-0.104	-0.132	-0.139	-0.132	0.233	-0.125						
(8) SIZE	-0.112	-0.106	-0.099	-0.105	0.056	0.472	-0.092					
(9) LEV	0.253	0.237	0.234	0.240	0.180	0.048	0.120	0.170				
(10) ROA	-0.213	-0.186	-0.193	-0.194	-0.236	0.088	0.117	-0.043	-0.208			
(11) MTB	-0.201	-0.228	-0.246	-0.226	-0.164	0.045	0.047	-0.137	0.065	0.520		
(12) BETA	0.096	0.082	0.081	0.086	0.140	0.192	-0.067	0.360	0.187	-0.056	-0.042	
(13) FORN	-0.224	-0.209	-0.207	-0.215	-0.193	0.299	0.045	0.463	-0.190	0.357	0.250	-0.008

Notes: 1. Refer to Eq (6) for variable definitions.

2. Coefficients shown in bold are significant at $p < 0.05$ (two-tailed test).

4.3. Empirical Results

4.3.1. Tax Risk and Implied Cost of Capital

Table 3 shows the results of the relationship between tax risk and the implied cost of capital. We tested Hypothesis 1 through the TAX RISK coefficient β_1 . Hypothesis 1 is supported if β_1 represents a significant positive value.

In Table 3, TAX RISK is shown to be significantly positively related to the implied cost of

capital measures (t-statistics 2.23, 2.05, 1.96, and 2.06 for COC_{PEG} , COC_{MPEG} , COC_{GM} , and COC_{AVG} , respectively). These results support Hypothesis 1. It is interpreted that information asymmetry occurs due to tax uncertainty among investors, and the uncertainty of future cash flows according to the tax strategy is taken as corporate risk, which translates into an increase in the required return on risk. This indicates that a firm's sustainable tax strategy is useful for investor decision-making, and that the firm needs to use a sustainable tax strategy to reduce the cost of raising capital.

Looking at the control variables, SIZE and MTB showed a significant negative relationship with the implied cost of capital. This means that the larger the firm size, the greater the market to book ratio, and the lower the implied cost of capital. LEV and BETA showed a significant positive correlation with the implied cost of capital. This means that the higher the debt ratio, the larger the beta, and the higher the implied cost of capital.

Table 3. The Relationship between Tax Risk and Implied Cost of Capital (H1)

Variable	COC_{PEG}	COC_{MPEG}	COC_{GM}	COC_{AVG}
<i>Intercept</i>	0.228*** (9.58)	0.278*** (9.80)	0.276*** (9.85)	0.271*** (9.69)
TAX RISK	0.038** (2.23)	0.037** (2.05)	0.035** (1.96)	0.036** (2.06)
<i>TAXAVOID</i>	-0.061*** (-3.05)	-0.089*** (-4.19)	-0.089*** (4.27)	-0.085*** (-4.07)
<i>SIZE</i>	-0.008*** (-6.20)	-0.008*** (-6.19)	-0.008*** (-6.18)	-0.008*** (-6.13)
<i>LEV</i>	0.053*** (5.78)	0.062*** (6.45)	0.062*** (6.50)	0.059*** (6.30)
<i>ROA</i>	-0.029 (-1.04)	0.012 (0.44)	0.012 (0.43)	0.004 (0.15)
<i>MTB</i>	-0.005*** (-4.90)	-0.007*** (-6.45)	-0.007*** (-6.94)	-0.006*** (6.17)
<i>BETA</i>	0.011*** (2.72)	0.010** (2.35)	0.009** (2.26)	0.009*** (2.43)
<i>FORN</i>	-0.002 (-0.22)	0.003 (0.25)	0.004 (0.35)	0.01 (0.04)
Fixed Effect	Industry and Year			
Adj R2	0.263	0.246	0.256	0.252
N	722	722	722	722

Notes: 1. Refer to Eq (6) for variable definitions.

2. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.001$.

4.3.2. The Effect of ESG Performance on the Relationship between Tax Risk and Implied Cost of Capital

Table 4 shows the results of examining the effect of ESG performance on the relationship between tax risk and implied cost of capital. Hypothesis 2 was examined through the coefficient β_3 , which is the interaction term between TAX RISK and ESG. If β_3 represents a

significant negative value, it means that the positive relationship between tax risk and the implied cost of capital is weakened in active ESG firms.

Table 4 shows that the interaction term between TAX RISK and ESG is negatively related to the implied cost of capital (t-statistics -2.10 , -1.91 , -2.00 , and -2.00 for COC_{PEG} , COC_{MPEG} , COC_{GM} , and COC_{AVG} , respectively). These results support Hypothesis 2. It was interpreted that the ESG active firms have a better tax risk-related information environment than the ESG inactive firms, thus reducing information asymmetry related to tax risk among investors and reducing capital costs. Investors perceive the tax risks of ESG active firms and ESG inactive firms differently. It is expected that information asymmetry related to tax risk can be reduced if the overall ESG of the firm is improved.

Table 4. The Effect of ESG Rating on the Relationship between Tax Risk and Implied Cost of Capital (H2)

Variable	COC_{PEG}	COC_{MPEG}	COC_{GM}	COC_{AVG}
<i>Intercept</i>	0.269*** (9.39)	0.291*** (9.66)	0.288*** (9.67)	0.281*** (9.50)
<i>TAX RISK</i>	0.053*** (2.84)	0.051*** (2.59)	0.049** (2.55)	0.051*** (2.64)
<i>ESG</i>	0.012** (2.09)	0.012** (2.12)	0.012** (2.09)	0.012** (2.04)
<i>TAXRISK*ESG</i>	-0.084** (-2.10)	-0.080* (-1.91)	-0.083** (-2.00)	-0.083** (-2.00)
<i>TAXAVOID</i>	-0.067*** (-3.23)	-0.092*** (-4.30)	-0.093*** (-4.40)	-0.089*** (-4.21)
<i>SIZE</i>	-0.008*** (-6.16)	-0.009*** (-6.22)	-0.009*** (-6.17)	-0.008*** (-6.10)
<i>LEV</i>	0.053*** (5.78)	0.062*** (6.45)	0.062*** (6.50)	0.059*** (6.29)
<i>ROA</i>	-0.027 (-0.97)	0.014 (0.49)	0.014 (0.48)	0.006 (0.20)
<i>MTB</i>	-0.005*** (-5.04)	-0.007*** (-6.59)	-0.007*** (-7.07)	-0.006*** (-6.30)
<i>BETA</i>	0.011*** (2.81)	0.014** (2.44)	0.010** (2.35)	0.010** (2.52)
<i>FORN</i>	-0.004 (-0.35)	0.001 (0.11)	0.003 (0.21)	-0.001 (-0.09)
Fixed Effect	Industry and Year			
Adj R2	0.267	0.249	0.259	0.255
N	722	722	722	722

Notes: 1. Refer to Eq (6) for variable definitions.

2. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.001$.

4.3.3. Additional Analyses

This section presents additional empirical results. We use additional tax risk variables for the robustness of the results. GAAP ETR was measured by dividing income tax expense by earnings before tax. GAAP ETR is used as an additional measure of tax avoidance for CASH ETR in prior literature. As a measure of tax risk, GAAP ETR's 5-year standard deviation was used to examine the relationship between tax risk and the implied cost of capital. It was found that the tax risk measured by GAAP ETR volatility and implied cost of capital were significantly positively related (t-statistics of 2.62, 2.61, 2.48, and 2.58 for COC_{PEG} , COC_{MPEG} , COC_{GM} , and COC_{AVG} , respectively). Even if GAAP ETR volatility was used as a tax risk, there was no difference in research results. However, in the Hypothesis 2 test, there was no significant result.

Table 5. Robustness Tests 1: GAAP ETR

Variable	COC_{PEG}	COC_{MPEG}	COC_{GM}	COC_{AVG}
<i>Intercept</i>	0.249***	0.265***	0.264***	0.259***
	9.44	9.81	9.90	9.75
<i>TAX RISK</i>	0.059***	0.060***	0.056**	0.058**
	2.62	2.61	2.48	2.58
Controls			Include	
Fixed Effect			Industry and Year	
Adj R2	0.269	0.260	0.270	0.267
N	729	729	729	729

Notes: 1. Refer to Eq (6) for variable definitions.

2. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.001$.

ESG refers to criteria for identifying a firm in consideration of its non-financial performance, such as the environment, society, and governance. The overall ESG rating was used when examining Hypothesis 2 in 4.2.2. Additional analysis was performed on Hypothesis 2 by considering the grades of each of the environmental, social, and governance components of ESG. We re-examine the relationship between tax risk and implied cost of capital by separating ESG into environmental (E), social (S), and governance (G).

As a result of performing additional analysis on Hypothesis 2 using environment variables (E), the interaction terms between TAX RISK and ESG had a negative relationship with the four implied costs of capital (t-statistics of -1.20, -1.38, -1.48, and -1.49 for COC_{PEG} , COC_{MPEG} , COC_{GM} , and COC_{AVG} , respectively). However, there was no statistical significance. Among ESG factors, environmental-related corporate sustainability had an insignificant effect on the relationship between tax risk and cost of capital. Using the social factor (S), the interaction terms between TAX RISK and ESG had a significant negative relationship with the four implied costs of capital (t-statistics of -2.01, -1.80, -1.87, and -1.85 COC_{PEG} , COC_{MPEG} , COC_{GM} , and COC_{AVG} , respectively). Social-related corporate sustainability had a significant impact on the relationship between tax risk and cost of capital. Using the governance factor (G), the interaction terms between TAX RISK and ESG had a significant negative relationship with the four implied costs of capital (t-statistics of -2.20, -2.10, -2.18, and -2.19 for COC_{PEG} , COC_{MPEG} , COC_{GM} , and COC_{AVG} , respectively). The governance-related factor has a significant impact on the relationship between tax risk and cost of capital.

Table 6. Robustness Tests 2: Environmental (E), Social (S) and Governance (G) Factor of ESG

Panel A. Environmental Factor				
Variable	COC _{PEG}	COC _{MPEG}	COC _{GM}	COC _{AVG}
<i>Intercept</i>	0.269***	0.295***	0.291***	0.287***
	9.23	9.64	9.64	9.52
<i>TAX RISK</i>	0.047**	0.047**	0.046**	0.047**
	2.44	2.33	2.31	2.39
<i>ESG</i>	0.008	0.011**	0.011**	0.011**
	1.57	2.07	2.05	2.11
<i>TAXRISK*ESG</i>	-0.042	-0.051	-0.054	-0.054
	-1.20	-1.38	-1.48	-1.49
Panel B. Social Factor				
<i>Intercept</i>	0.277***	0.297***	0.293***	0.288***
	9.58	9.75	9.73	9.62
<i>TAX RISK</i>	0.053***	0.051**	0.050**	0.051**
	2.78	2.53	2.50	2.57
<i>ESG</i>	0.012***	0.012**	0.012**	0.012**
	2.60	2.40	2.33	2.36
<i>TAXRISK*ESG</i>	-0.070**	-0.066*	-0.068*	-0.067**
	-2.01	-1.80	-1.87	-1.85
Panel C. Governance Factor				
<i>Intercept</i>	0.260***	0.282***	0.279***	0.274***
	9.40	9.68	9.69	9.53
<i>TAX RISK</i>	0.050***	0.049***	0.047**	0.049***
	2.81	2.60	2.55	2.64
<i>ESG</i>	0.011*	0.012*	0.012*	0.012**
	1.67	1.80	1.75	1.73
<i>TAXRISK*ESG</i>	-0.115**	-0.115**	-0.118**	-0.119**
	-2.20	-2.10	-2.18	-2.19

Notes: 1. Refer to Eq (6) for variable definitions.

2. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.001$.

Unlike the environment factor (E), social variables (S) and governance variables (G) have significant effects with the relationship between tax risk and the implied cost of capital. As a result of additional analysis by dividing ESG into each component, it was found that society (S) and governance (G) significantly weaken the negative relationship between tax risk and implied cost of capital.

5. Conclusions

This study examined the relationship between tax risk and the implied cost of capital, and the effect of ESG performance on these relationships. As a result, first, tax risk and the implied cost of capital were positively related. It is interpreted that information asymmetry occurs due to tax uncertainty between investors, and the uncertainty of future cash flows according to the tax strategy is taken as corporate risk, which translates into an increase in the required

return on risk. Second, in the case of firms with good ESG performance, the positive relationship between tax risk and the implied cost of capital was weakened. It was interpreted that active ESG firms have a better information environment than inactive ESG firms, thus reducing information asymmetry related to tax risk among investors, and reducing capital costs. In additional analyses, we found that among the components of ESG, social factors (S) and governance factors (G) significantly weaken the positive relationship between tax risk and implied cost of capital. On the other hand, environmental factors (E) do not have a significant effect on the relationship between tax risk and embedded costs.

Our findings are that sustainable tax planning impacts financing costs, which provides useful information to investors and management. We provide important evidence to corporate stakeholders by empirically showing that investors evaluate tax risks differently depending on firm ESG performance. Our study differs from previous studies by showing that investors evaluate the tax risk of firms with good ESG performance differently.

The relationship between tax risk and the implied cost of capital depends on the information asymmetry of tax risk. If a firm has a good information environment that can reduce information asymmetry, the relationship between tax risk and the implied cost of capital is different. It is expected that examining the relationship between tax risk and implied cost of capital by using firm information environment variables will be a good research topic.

It is important to note this study has a few limitations. First, we relied on earnings forecasting data to identify the implied cost of capital, so firms without financial analyst forecasts were not included. Second, we assumed that firms with excellent ESG performance had effective tax planning for sustainable management. Depending on the firm, this assumption may not be correct. Finally, we note that our sample is limited, and this may limit the generalizability of our results.

References

- Amihud, Y. and H. Mendelson (1986), "Asset pricing and the bid-ask spread", *Journal of Financial Economics*, 17(2), 223-249.
- Austin, C. and R. Wilson (2017), "An examination of reputational costs and tax avoidance: Evidence from firms with valuable consumer brands", *The Journal of the American Taxation Association*, 39(1), 67-93.
- Balakrishnan, K., J. Blouin, and W. Guay (2018) "Tax Aggressiveness and Corporate Transparency", *The Accounting Review*, 94(1), 45-69.
- Botosan, C., M. Plumlee, and H. Wen (2011), "The relation between expected returns, realized returns, and firm risk characteristics", *Contemporary Accounting Research*, 28(4), 1085-1122.
- Brealey, R., M. Myers, and F. Allen (2011), *Principles of Corporate Finance*. 10th Edition. McGraw Hill-Irwin.
- Cho, S. Y., C. Lee, and R. J. Pfeiffer (2013), "Corporate social responsibility performance and information asymmetry" *Journal of Accounting and Public Policy*, 32(1), 71-83.
- Cook, K. A., W. J. Moser, T. C. Omer (2017), "Tax avoidance and ex ante cost of capital", *Journal of Business Finance & Accounting*, 44, 1109 – 1136.
- Cornell, B. (2021), "ESG preferences, risk and return", *European Financial Management* 27, 12–19.
- Cui, J., H. Jo, and H. Na (2018), "Does Corporate Social Responsibility Affect Information Asymmetry?", *Journal of Business Ethics* 148, 549–572.
- Dhaliwal, D. S., O. Z. Li, A. Tsang, and Y. G. Yong (2011), "Voluntary nonfinancial disclosure and the cost of equity capital: The initiation of corporate social responsibility reporting", *The*

- Accounting Review*, 86(1), 59–100.
- Drake, K., S. Lusch, and J. Stekelberg (2019), “Does tax risk affect investor valuation of tax avoidance?”, *Journal of Accounting, Auditing & Finance*, 34(1), 151-176.
- Dyreng, S., Hanlon, M. and E. Maydew (2008), “Long-run corporate tax avoidance” *The Accounting Review*, 83(1), 61-82.
- Easton, P. (2004), “PE ratios, PEG ratios, and estimating the implied expected rate of return on equity capital”, *The Accounting Review*, 79(1), 73-95.
- Francis, J., R. LaFond, P. Olsson, and K. Shipper (2005), “The market pricing of accruals quality”, *Journal of Accounting and Economics*, 39, 295-327.
- Gallemore, J., and E. Labro (2015), “The importance of the internal information environment for tax avoidance”, *Journal of Accounting and Economics*, 60, 149–167.
- Gode, D. and P. Mohanram (2003), “Inferring the cost of capital using the Ohlson-Juettner model”, *Review of Accounting Studies*, 8, 399-431.
- Godfrey, P. C., C. B. Merrill, and J. M. Hansen (2009), “The relationship between corporate social responsibility and shareholder value: An empirical test of the risk management hypothesis”, *Strategic Management Journal*, 30(4), 425–445
- Goh, B. W., J. Lee, C. Y. Lim, and T. Shevlin (2016), “The effect of corporate tax avoidance on the cost of equity”, *The Accounting Review*, 91(6), 1647-1670.
- Guenther, D. A., Matsunaga, S. R., and B. M. Williams (2017), “Is tax avoidance related to firm risk?” *The Accounting Review*, 92(1), 115-136.
- Hanlon, M. and J. Slemrod (2009), “What does tax aggressiveness signal? Evidence from stock price reactions to news about tax shelter involvement”, *Journal of Public Economics*, 93, Issues 1–2, 126-141.
- Hoi, C. K., Q. Wu, H. Zhang (2013), “Is Corporate Social Responsibility (CSR) Associated with Tax Avoidance? Evidence from Irresponsible CSR Activities”, *The Accounting Review*, 88(6), 2025–2059.
- Hope, O., M. Ma, and W. Thomas (2013), “Tax avoidance and geographic earnings disclosure”, *Journal of Accounting and Economics*, 56, 170-189.
- Hutchens, M., and S. Rego (2015), “Does greater tax risk lead to increased firm risk?”, *Working paper*, Indiana University.
- Kim, J. B., Y. Li, and L. Zhang (2011), “Corporate tax avoidance and stock price crash risk: Firm-level analysis”, *Journal of Financial Economics*, 100(3), 639-662.
- Kubick, T., D. Lynch, M. Mayberry, and T. Omer (2015), “Product Market Power and Tax Avoidance: Market Leaders, Mimicking Strategies, and Stock Returns”, *The Accounting Review*, 90(2), 675-702.
- Lanis, R., and G. Richardson (2012), “Corporate social responsibility and tax aggressiveness: An empirical analysis”, *Journal of Accounting and Public Policy*, 31(1), 86–108.
- Lintner, J. (1975), “The valuation of risk assets and the selection of risky investments in stock portfolios and capital budgets. Stochastic optimization models in finance”, *Academic Press*, 131-155.
- McGuire Sean T., Omer Thomas C., and Wang Dechun (2012), “Tax Avoidance: Does Tax-Specific Industry Expertise Make a Difference?”, *The Accounting Review*, 87(3), 975-1003.
- Neuman, S. S., Omer, T. C., and A. P. Schmidt (2020), “Assessing tax risk: Practitioner perspectives”, *Contemporary Accounting Research*, 37(3), 1788-1827
- Ng, A. C., and Z. Rezaee (2015), “Business sustainability performance and cost of equity capital”, *Journal of Corporate Finance*, 34, 128-149.
- Ohlson, J. and B. Juettner-Nauroth (2005), “Expected EPS and EPS growth as determinants of value”, *Review of Accounting Studies*, 10, 349-365.
- Ould Daoud Ellili, N. (2020), “Environmental, Social, and Governance Disclosure, Ownership

- Structure and Cost of Capital: Evidence from the UAE”, *Sustainability*, 12(18), 7706.
- Saavedra, D. (2015), “Tax Spike Firms”, *Working paper*, UCLA Anderson School of Management.
- Sharpe, W. (1964), “Capital asset price : A theory of market equilibrium under conditions of risk”, *Journal of Finance*, 19, 425-442.
- Siew R. Y. J., M. C. A. Balatbat, and D. G. Carmichael (2016) “The impact of ESG disclosures and institutional ownership on market information asymmetry”, *Asia-Pacific Journal of Accounting & Economics* 23(4), 432-448.
- Slemrod, J. (2004), “The Economics of corporate tax selfishness”, *National Tax Journal*, 57(4), 877-899.
- Wei, L., Y. Lu, and W. Li (2019), “Does CSR Action Provide Insurance-Like Protection to Tax-Avoiding Firms? Evidence from China”, *Sustainability*, 11(19): 5297.
- Yoon, B. H., J. H. Lee, and J. H. Cho (2021), “The Effect of ESG Performance on Tax Avoidance—Evidence from Korea”, *Sustainability* 13(12): 6729.