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Article

Impact of Sustainable Tax Strategy Development on Investment Scale and Corporate Value: Evidence from Korea

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Abstract

This study examines the impact of corporate sustainable tax strategies on investment scale and firm value using signaling theory. Following McGuire et al. [7], we measure tax strategy sustainability through the coefficient of variation of cash effective tax rates over a five-year period. Using 3,121 firm-year observations of Korean listed companies from 2010 to 2023, we employ Two-Stage Least Squares regression to address endogeneity concerns. Our findings support two main hypotheses. First, firms pursuing sustainable tax strategies engage in significantly larger capital investments, suggesting that consistent tax policies signal effective risk management capabilities and enable systematic long-term investment planning. Second, the interaction effect between sustainable tax strategies and capital expenditures positively influences firm value, indicating that sustainable tax planning enhances investment efficiency. The results demonstrate that firms with lower tax rate volatility send positive signals to external stakeholders about their predictable cash flows, superior internal control systems, and strategic management capabilities. This study contributes to the literature by applying signaling theory to tax strategy research and provides practical insights for corporate managers regarding the importance of long-term tax planning over short-term tax minimization. The findings also support UN Sustainable Development Goals 8, 9, and 12 by demonstrating how sustainable financial practices promote responsible corporate decision-making.

Keywords: sustainable tax strategy; signaling theory; investment efficiency; firm value

I. Introduction

1.1. Research Background

Since the advent of the 21st century, there has been a marked increase in the level of interest in the field of corporate sustainability. This has resulted in a significant increase in the attention being paid to the management of Environmental, Social and Governance factors (ESG) by companies. In the aftermath of the United Nations' Sustainable Development Goals (SDGs) being adopted in 2015, companies have been confronted with the challenge of pursuing social responsibility and environmental sustainability in a manner that transcends the mere generation of profit.

Empirical studies on the relationship between ESG performance and corporate financial performance are currently underway. Fu & Li [1] empirically demonstrated that ESG performance exerts a significant positive impact on corporate financial performance, in a study of 2,256 Chinese A-share listed companies. Zhang's research yielded a significant finding: an analysis of A-share listed companies in Shanghai and Shenzhen, China, from 2009 to 2022, revealed that ESG performance had a substantial impact on corporate financial performance. Aydoğmuş et al. [3] presented empirical evidence that ESG performance has a positive impact on firm value and profitability. They argued that investing in high ESG performance promises financial returns for companies. Li [4] reported, in

a study of Chinese A-share listed companies, that ESG performance enhances corporate investment efficiency, achieved through reduced agency costs and eased financial constraints.

Research on the relationship between ESG and investment efficiency is also increasing. Desai & Dave [5] presented empirical evidence that statutory ESG reporting has a positive effect on corporate investment efficiency. The extant literature suggests that ESG performance is a strategic factor that directly impacts core business performance, extending beyond mere social responsibility. This paradigm shift necessitates fundamental changes in corporate financial strategy, particularly in the context of tax strategy.

Conventional corporate tax strategies have centred on minimising corporate tax obligations. However, stakeholders have recently demonstrated a heightened interest in the formulation of sustainable tax strategies that will facilitate the corporation's ongoing, sustainable growth. The theoretical foundation for the manner in which tax and accounting policies are perceived by the market was provided by McGuire et al. [6]. In their working paper, McGuire et al. [7] introduced the concept of a sustainable tax strategy, arguing that the maintenance of consistent and predictable tax policies is of crucial importance for the long-term creation of corporate value. This finding indicates that the sustainability and transparency of tax strategies, rather than merely reducing the tax burden, enhance corporate credibility. This approach has the potential to engender stakeholder trust and enhance corporate value.

From the perspective of signalling theory, a company's sustainable tax strategy can be regarded as a significant signal conveyed by management to the market. In accordance with the signalling theory proposed by Michael Spence [8], in circumstances of information asymmetry, the party in possession of information emits signals to inform the market of their superiority. Ross [9] and Myers & Majluf [10] conducted empirical analyses on the applicability of signalling theory in the field of corporate finance. Subsequently, Myers [11] emphasised the importance of signalling theory in determining capital structure.

The application of signalling theory is expanding in the tax field as well. Desai & Dharmapala [12] advanced the argument that corporate tax avoidance behaviour is closely related to corporate governance. In contrast, Hanlon & Heitzman [13] presented the effective tax rate (ETR) and book-tax difference (BTD) as important indicators reflecting a firm's tax strategy. Furthermore, Xu, Jiang, and Ming Yang [14] argued that corporate tax strategies signal to investors the capabilities of management and the future growth potential of the firm.

Recent studies have provided empirical evidence to support the notion that sustainable tax strategies can positively impact corporate performance. As posited by Jacob et al. [15], sustainable tax strategies have been demonstrated to enhance investment efficiency and improve long-term performance. In addition, Neumann et al. [16] have presented findings that companies with higher tax transparency exhibit lower capital costs. Furthermore, Drake et al. [17] demonstrated empirically that firms with lower tax risk exhibit higher firm value. Nevertheless, there is a paucity of research that has examined the specific pathways through which sustainable tax strategies positively influence firm value growth.

1.2. Research Objective

This study aims to empirically analyse the impact of sustainable tax strategies on investment scale and firm value, based on signalling theory. Specifically, utilising the concept of sustainable tax strategy proposed by McGuire et al. [7], we measure the sustainability of tax strategy through the Cash Effective Tax Rate Coefficient of Variation. We then examine whether this sustainability affects the firm's capital expenditure scale and corporate value. If it does affect corporate value, we analyse the pathways through which this influence occurs.

The main research hypotheses of this study are as follows. First, companies pursuing sustainable tax strategies will execute more investments. Second, the interaction effect between sustainable tax strategy and capital expenditures will positively influence corporate value. This hypothesis is established and will be empirically analysed. This is because companies that establish and implement

consistent tax policies are likely to pay significant attention not only to tax risk, but also to managing financial and non-financial risks. Furthermore, it can signal to external information users that the company can establish systematic investment plans and stably execute large-scale, long-term investments at the right time, due to its high predictability of cash flows. This implies that sustainable tax strategies enhance investment efficiency and thereby contribute to increasing corporate value.

This study conducts an empirical analysis using 3,121 firm-year observations from Korean listed companies from 2010 to 2023. To address endogeneity issues, the Two-Stage Least Squares (2SLS) method is applied to derive more reliable results.

This study is expected to contribute academically and practically in several ways. Academically, it will expand existing literature by applying signalling theory to tax strategy research and strengthen the theoretical foundation of tax accounting by empirically identifying the economic effects of sustainable tax strategies. Practically, it will raise awareness among corporate executives about the importance of sustainable tax strategies, and suggest the need for establishing tax strategies from a long-term perspective rather than merely minimizing short-term tax burdens.

In particular, this study is expected to contribute to achieving the United Nations Sustainable Development Goals (SDGs). Regarding SDG 8 (Decent Work and Economic Growth), it can contribute by demonstrating how integrated financial–tax governance promotes long-term investment and corporate resilience. From the perspective of SDG 9 (Industry, Innovation, and Infrastructure), it can demonstrate how sustainable financial practices enhance a company's ability to reinvest in innovative and capital-intensive projects. Finally, regarding SDG 12 (Responsible Consumption and Production), it can contribute by highlighting how efficient resource allocation and responsible financial strategies ensure sustainability in corporate decision-making.

II. Literature Review

2.1. Theoretical Background

Signalling Theory is a theory that explains the mechanism by which a party with an information advantage conveys their type or intentions to market participants in situations of information asymmetry. Michael Spence [8] was the first to systematically define signalling theory through empirical analysis. He demonstrated that, in the labor market, where employers face information asymmetry and cannot know a job seeker's productivity in advance, observable characteristics like education can signal the job seeker's productivity to the employer. Subsequently, Ross [9] established the concept that debt levels serve as signals regarding management quality and firm prospects. Myers & Majluf [10] expanded signaling theory into the field of corporate finance by providing a comprehensive theoretical framework explaining how financial structure choices signal to the market under information asymmetry..

Previous studies on tax accounting have empirically analysed its relevance to traditional accounting topics such as corporate value by examining how positive or negative signals conveyed through agency theory, information asymmetry theory, and efficient market theory provide information to external stakeholders. Myers [11] proposed a signaling model demonstrating that accounting information design mitigates investment—reducing signal distortion, thereby improving real investment, proving that accounting rules and disclosures reduce information asymmetry. Desai & Dharmapala [12] demonstrated that, when information asymmetry exists between managers and shareholders, tax planning can promote managers' pursuit of private interests, potentially creating a negative relationship with firm value. Hanlon & Heitzman [13] summarized the informational role conveyed to investors by tax disclosures and tax metrics, such as effective tax rate (ETR) and book-tax differences (BTD), and other tax metrics convey information to investors. They demonstrated that, from a signaling theory and information asymmetry perspective, a low effective tax rate (ETR), among other factors, can be interpreted in two ways: as a positive or negative risk signal regarding capability, depending on the cost–reliability structure. Xu, Jiang & Ming, Yang [14] theoretically demonstrated that, under information asymmetry, accounting rules are endogenously optimized to

promote investor learning, and regulatory changes determine the signaling equilibrium. They argued that tax-related accounting policy choices, such as deferred tax liability, tax credits, and tax uncertainty disclosures, can serve as signaling vehicles. This provided direct theoretical grounding for empirical research, establishing a benchmark for analyzing the signaling effects of accounting policy choices involving tax topics. Hanlon [18] empirically analysed that signaling private information through accounting system design affects capital market valuation, and that choices of accounting policies—such as tax policies like R&D tax credits and deferred income taxes, and reporting systems including tax disclosures—can function as signaling vehicles.

2.2. Sustainable Tax Strategy

According to signalling theory, a firm's sustainable tax strategy significantly influences investment decisions. A stable tax environment enhances the predictability of investment returns, enabling management to make more aggressive investment decisions. Jacob et al. [15] reported that firms with high tax volatility tend to delay major capital investments and exhibit lower overall investment levels.

The signals conveyed by management through consistent tax strategies are likely to reflect not only information about the sustainability of current profits, but also expectations regarding future profits. Companies pursuing sustainable tax strategies send positive signals to external information users. These signals indicate the company's ability to generate stable and predictable cash flows, its efficient internal control systems and risk management capabilities, and its capacity for strategic thinking and execution from a long-term perspective. Such signals can serve as important information for external users in making investment decisions.

Noting this, McGuire et al. [7] pointed out the limitations of existing tax avoidance research, which primarily focused solely on the level of the effective tax rate, and introduced the new concept of tax strategy sustainability. They defined sustainable tax strategy as maintaining a consistent effective tax rate over the medium to long term, and used the coefficient of variation of the cash effective tax rate over five years to measure it. This study predicted that companies pursuing sustainable tax strategies exhibit higher profit persistence, leading to the hypothesis that “Firms with low effective tax rate volatility signal superior predictability and stability of future earnings to the market.” It then conducted an empirical analysis. The results interpreted lower effective tax rate volatility as an indication that firms pursue more sustainable tax strategies, proving that the consistency of such tax strategies can carry greater signalling value than simple tax rate minimization.

Sustainable tax strategies are also closely related to corporate transparency. Hope & Thomas [19] analysed the impact of tax disclosure transparency on corporate tax avoidance behavior, demonstrating how accounting policies signal private information to the market and thereby clarifying the relationship between transparency and tax avoidance. Fields & Vincent [20] conducted a literature review study to establish a theoretical foundation for signaling theory, by examining the primary motivations behind accounting policy choices and their economic outcomes. Neuman et al. [16] working paper reported that higher corporate information transparency correlates with greater sustainability in the tax strategies firms choose. It also found that governance quality and transparency are interrelated, and firms with superior governance select more sustainable tax strategies. This demonstrates the link between corporate transparency, governance, and sustainable tax strategies, proving that firms with transparent information environments and high governance quality tend to choose more sustainable tax strategies. This can be interpreted as a signal that companies with low effective tax rate volatility can positively impact corporate value by establishing efficient tax planning based on predictable tax outcomes.

Corporate sustainable tax strategies also serve as a proxy for tax risk. High tax volatility can act as a negative signal, as it indicates inefficient tax planning or the potential for unpredictable, high tax burdens. Conversely, low tax volatility can signal a positive commitment to stable and predictable tax strategies. Furthermore, low volatility in the effective tax rate contributes to corporate value enhancement through multiple channels. First, stable tax performance increases the predictability of

future cash flows, lowering investors' required rates of return. Second, consistent tax strategies convey positive signals about a company's internal control systems and management capabilities, enhancing market trust. Drake et al. [17] reported that, while investors positively evaluate tax avoidance activities, tax volatility moderates this positive evaluation. This implies investors value stable and sustainable tax strategies more highly than simple tax rate minimization.

Other prior studies also provide empirical evidence on the signalling effect of sustainable tax strategies. Kim & Ma [21] confirmed results similar to McGuire et al. [7] in their study of Korean listed companies. Furthermore, Park et al. [22] presented evidence that sustainable tax strategies have a positive relationship with accounting transparency.

Thus, signalling theory provides a robust theoretical framework for understanding the impact of firms' sustainable tax strategies on investment decisions and firm value. The concept of tax strategy sustainability, proposed by McGuire et al. [7], emphasizes the value of consistency and predictability beyond simple tax rate minimization, which can serve as an important signal to investors. Therefore, based on this theoretical background, this study aims to verify the signaling effect of sustainable tax strategies through empirical analysis using Korean corporate data, and to identify the specific pathways through which it affects investment decisions and firm value.

III. Research Methodology

3.1. Hypothesis Development

Michael Spence [8] systematised the theory, arguing that educational attainment in the labour market signals the productivity of job seekers. Extending this to corporate finance, Ross [9] viewed debt levels as signalling the quality of management and firm prospects, while Myers & Majluf [10] reported that, under information asymmetry, financial structure choices send signals to the market. Within this theoretical framework, Myers [11] argued that tax metrics like the effective tax rate can send positive or negative signals to external information users through agency theory and information asymmetry theory. He reported that accurate accounting information can mitigate signal distortion from underinvestment, thereby improving real investment. Desai & Dharmapala [12] argued that, when information asymmetry intensifies, cash increases through tax avoidance schemes can be used as a means to promote managers' pursuit of private interests, reporting that corporate tax minimization strategies may have a negative relationship with firm value. Hanlon & Heitzman [13] reported that tax-related signaling information, such as tax disclosures and low effective tax rates, can be interpreted as either positive or negative signals, depending on various factors. Xu, Jiang & Ming, Yang [14] theoretically demonstrated that accounting rules facilitate investor learning and that corporate tax policy choices, such as deferred income taxes and tax credits, can serve as signaling vehicles.

McGuire et al. [7] pointed out the limitations of existing tax avoidance studies and introduced the new concept of tax strategy sustainability. This is defined as maintaining a consistent effective tax rate over the medium to long term, measured by the coefficient of variation in the cash effective tax rate over a five-year period. This study demonstrated that firms with low volatility signal predictability and stability in future earnings, exhibiting higher profit persistence. Kim & Ma [21] also confirmed similar results in their analysis of companies listed on the Korea Exchange, arguing that establishing a consistent, sustainable tax strategy holds greater signaling value for external information users than a simple corporate tax minimization strategy. Jacob et al. [15] reported that companies with high tax volatility delay major capital investments and exhibit low investment levels. They argued that a stable tax environment enhances the predictability of investment returns, thereby inducing proactive investment decisions. Furthermore, they contend that establishing a sustainable tax strategy sends a positive signal to investors and creditors, indicating the company's ability to generate stable cash flows. Neuman et al. [16] reported that corporate transparency and governance have a positive relationship with sustainable tax strategy, suggesting transparent firms are more likely to adopt sustainable strategies. Park et al. [22] reported that sustainable tax strategy has a

positive relationship with accounting transparency. Drake et al. [17] reported that tax volatility moderates the positive evaluation of tax avoidance, indicating investors value stable strategies more highly.

Based on this theoretical background and prior research, low volatility in the effective tax rate (sustainable tax strategy) is expected to reduce tax risk, minimise negative signals, and convey a positive signal to external information users that the firm possesses stable cash flow generation capabilities. This positive signal, by enhancing the predictability of future cash flows, is expected to provide better investment opportunities for market investors in the company. It is anticipated that this positive signal will enhance market trust, creating a strong incentive for external information users to maintain larger investment scales.

Based on the investment delay effect proposed by Jacob et al. [15] and the persistence signal proposed by McGuire et al. [7], this paper establishes Hypothesis 1 to empirically verify that consistency in tax strategy provides a pathway for investment expansion within the signalling theory framework.

Hypothesis 1: Companies with lower effective tax rate volatility will likely have larger investment scales than those with higher volatility.

The theoretical background of this paper explains the signalling effect of sustainable tax strategies on corporate value through signalling theory, emphasising the link between investment and corporate value in prior research. Signalling theory originated from Michael Spence's [8] labour market model and was extended to corporate finance by Ross [9] and Myers & Majluf [10].

Following Myers [11]'s report that accounting information mitigates signaling distortions, thereby improving real investment and potentially leading to increased corporate value, prior studies have analysed the impact of tax indicators on investment scale and corporate value by applying signaling theory. Desai & Dharmapala [12] demonstrated that, as information asymmetry intensifies, tax minimization strategies can be used as a means for managers to pursue private interests, potentially creating a negative relationship with firm value. They also proved that, when information asymmetry is mitigated through transparent governance structures, these strategies can transform into positive signals. Hanlon & Heitzman [13] reported that a low effective corporate tax rate can be interpreted as an ambivalent signal, arguing that persistence is crucial for corporate value assessment. McGuire et al. [7] measured sustainable tax strategy using a five-year effective tax rate volatility coefficient. They argued that firms with low volatility signal future earnings stability and exhibit high profit persistence, reporting that consistency in tax strategy can act as a more positive value signal than tax minimization strategies. Neuman et al. [16] analysed the relationship between corporate governance and sustainable tax strategy, reporting that firms with strong governance adopt stable, sustainable tax strategies, positively impacting firm value. Jacob et al. [15] reported that high tax volatility delays corporate investment decision timing and lowers investment levels. Drake et al. [17] demonstrated that tax volatility can moderate tax savings levels, reporting that sustainable tax strategies can positively impact corporate value growth.

Hypothesis 2: Combining McGuire et al.'s [7] concept of persistence with Drake et al.'s [17] prior research on volatility moderation effects, we expect that investments by firms with low volatility act as more reliable signals, potentially exerting a more positive impact on firm value. Therefore, within the signalling theory framework, we hypothesize that low tax rate volatility can enhance predictability regarding cash expenditures and, through increased investment enabled by stable cash flows, further boost corporate value.

Hypothesis 2: Investments in companies with low corporate tax rate volatility will have a more positive impact on corporate value.

3.2. Methodology

Hypothesis 1 Research Model

$$\text{CapExit}_{it} = \alpha_0 + \alpha_1 \text{TSS}_{it} + \alpha_2 \text{SIZE}_{it} + \alpha_3 \text{LEV}_{it} + \alpha_4 \text{CFO}_{it} + \alpha_5 \text{ROA}_{it} + \alpha_6 \text{BIG4}_{it} + \alpha_7 \text{AGE}_{it} + \alpha_8 \text{Sales}_{it} + \alpha_9 \sum \text{ICODE}_{it} + \alpha_{10} \sum \text{YR}_{it} + \varepsilon_{it}$$

(1)

Hypothesis 2 Research Model

$$TQ_{it} = \alpha_0 + \alpha_1 \text{TSS}_{it} + \alpha_2 \text{CapExit}_{it} + \alpha_3 \text{TSS}_{it} \times \text{CapExit}_{it} + \alpha_4 \text{SIZE}_{it} + \alpha_5 \text{LEV}_{it} + \alpha_6 \text{CFO}_{it} + \alpha_7 \text{ROA}_{it} + \alpha_8 \text{BIG4}_{it} + \alpha_9 \text{AGE}_{it} + \alpha_{10} \text{Sales}_{it} + \alpha_{11} \sum \text{ICODE}_{it} + \alpha_{12} \sum \text{YR}_{it} + \varepsilon_{it}$$

(2)

3.3. Definition and Measurement of Key Variables

Hypothesis 1: The investment scale, used as the dependent variable, was measured by taking the logarithm of the sum of cash flows from the acquisition of tangible assets and intangible assets within the cash flows from investing activities in the statement of cash flows, as defined by Seo & Kim [23]. IFRS 10:16, Tangible Assets, paragraph 10:16 states that an asset is recognized as a tangible asset when it is probable that future economic benefits will flow to the entity and the cost of the asset can be measured reliably. However, companies initially record investments as assets under construction at the time of investment, and later reclassify them to the appropriate accounts (e.g., machinery and equipment, structures) when the assets become available for use. This creates a limitation where the actual investment amount cannot be measured at the point of investment. Therefore, this study aims to enhance research reliability by measuring CAPEX as the amount expended on tangible and intangible assets at the point of investment expenditure, not at the asset acquisition point.

Hypothesis 2: Firm value, used as the dependent variable, was measured by dividing the sum of common equity market value and book debt by total assets, following the method defined by Chung and Pruitt [24]. Tobin's Q indicates how efficiently a company creates value with its current assets. A high Q value is interpreted as a signal that management is operating in a direction that enhances shareholder value, while a low Q value is judged as inefficient capital use. This makes it suitable for this paper based on signalling theory.

The variable of interest, sustainable tax strategy, uses Tax Strategy Sustainability, as defined by McGuire et al. [7]. Tax Strategy Sustainability was measured by multiplying the coefficient of variation of the cash effective tax rate over the five-year period from year T-4 to year T by (-1). Multiplying the coefficient of variation by (-1) allows for an intuitive confirmation of the impact on investment, scale, and firm value, as the volatility of the effective corporate tax rate decreases.

3.4. Data

This study obtained financial data from companies listed on the KOSPI market, using massive data provided by ValueSearch. The sample comprised 4,188 companies listed on the KOSPI from 2010 to 2023 that had no accumulated losses and operated on a December fiscal year-end. From this group, 382 companies classified under the Korean Standard Industrial Classification (KSIC) medium-level categories of “Financial Services” and “Financial and Insurance Services” were excluded, along with 46 companies belonging to industries with fewer than 10 companies per year, based on the annual medium-level classification. Finally, 639 corporations lacking five consecutive years of cash payment data were excluded, finalising the sample at 3,121 corporations. <Table 1> shows the overall sample selection criteria, and <Table 2> details the sample distribution by year and industry.

Table 1. The detailed sample selection process.

Panel A: Criteria for Selecting the Entire Sample	units
Companies with no accumulated losses listed on the KOSPI market from 2010 to 2023 with a	4,188

December fiscal year-end	
Korean Standard Industrial Classification (KSIC) Mid-Level Classification: Financial Services, Financial and Insurance Services Corporations	(382)
Corporations lacking five consecutive years of cash payment records	(639)
Industries with fewer than 10 subcategories under the Korean Standard Industrial Classification	(46)
Final Analysis Target Entity	3,121

Table 2. The detailed sample selection process(Distribution by Year and Industry).

Panel B: Distribution by Year and Industry (N=3,121)		
Year	units	Weighting (%)
2012	213	6.82%
2013	245	7.85%
2014	246	7.88%
2015	273	8.75%
2016	293	9.39%
2017	284	9.10%
2018	267	8.55%
2019	259	8.30%
2020	263	8.43%
2021	257	8.23%
2022	253	8.11%
2023	268	8.59%
Total	3,121	100.00%
Industry	units	Weighting (%)
Food manufacturing industry	163	5.22%
Beverage Manufacturing Industry	29	0.93%
Tobacco manufacturing	12	0.38%
Textile manufacturing industry	14	0.45%
Clothing, clothing accessories, and furs	75	2.40%
Leather, bag, and shoe manufacturing	21	0.67%
Wood and Wood Product Manufacturing	14	0.45%
Manufacture of pulp, paper, and paper products	84	2.69%
Coke, briquettes, and petroleum products	47	1.51%

Chemical Substances Manufacturing	403	12.91%
Manufacture of medical substances	231	7.40%
Rubber and Plastic Products Manufacturing	149	4.77%
Non-metallic mineral products manufacturing	98	3.14%
Primary metal manufacturing	260	8.33%
Metalworking Products Manufacturing	38	1.22%
Electronic components, computers, video,	142	4.55%
Medical, precision, and optical instruments	22	0.70%
Electrical Equipment Manufacturing Industry	86	2.76%
Other Machinery and EquipmentManufacturing	114	3.65%
Automobile and Trailer Manufacturing	232	7.43%
Manufacture of other transport equipment	13	0.42%
Furniture manufacturing	28	0.90%
Electricity, gas, steam, and air	43	1.38%
General Construction Industry	43	1.38%
Construction by Trade	33	1.06%
Wholesale and Commodity Brokerage	163	5.22%
Retail	107	3.43%
Land transportation and pipeline transportation	54	1.73%
Water transportation industry	11	0.35%
Air transportation industry	14	0.45%
Warehousing and Transportation Services	29	0.93%
Publishing industry	45	1.44%
Broadcasting	16	0.51%
Postal and Telecommunications Services	37	1.19%
Computer Programming, Systems	36	1.15%
Information Services Industry	67	2.15%
Professional Services	29	0.93%
Architectural technology, engineering	50	1.60%
Business Support Services	30	0.96%
Sports and Entertainment Services	27	0.87%
Other Personal Services	12	0.38%
Total	3,121	100.00%

3.5. Descriptive Statistics and Correlation Analysis

Table 3 presents the descriptive statistics for the variables used in the Ordinary Least Squares (OLS) multiple regression analysis and the Two-Stage Least Squares (2SLS) regression, to test the hypotheses of this study. The total sample size is 3,121. To control for the influence of extreme values, Winsorization was applied to the top and bottom 1% of all continuous probability variables, excluding dummy variables. Hypothesis 1: The dependent variable, investment scale, was measured using CapEx (Capital Expenditure) as a proxy. CapEx is defined as the actual amount spent on investments, and was calculated by taking the log of the sum of cash outflows for the acquisition of tangible assets and intangible assets from the cash flow statement's investing activities. The mean value of CapEx is 23.34, the standard deviation is 2.09, the minimum value and lower 1% are 17.82, the lower 25% is 21.98, the median is 23.26, the upper 75% is 24.60, and the upper 99% and maximum value are 28.75. Hypothesis 2: Tobin's Q, used as a proxy for the dependent variable of firm value, was measured by dividing the sum of market capitalization and the firm's book value of debt by total assets. The mean value of Tobin's Q is 1.25, the standard deviation is 0.85, the minimum value and the 1st percentile are 0.42, the 25th percentile is 0.78, the median is 0.98, the 75th percentile is 1.38, the 99th percentile and the maximum value are 5.62.

As a proxy for the sustainability tax strategy measure, used as a variable of interest, Tax Strategy Sustainability, as defined by McGuire et al. [7], was employed. Tax Strategy Sustainability was measured as the coefficient of variation of the cash effective tax rate over the five-year period from year T-4 to year T, multiplied by (-1). The mean value of Tax Strategy Sustainability is -0.60, the standard deviation is 0.33, the minimum value and the 1st percentile are -1.49, the 25th percentile is -0.81, the median is -0.55, the 75th percentile is -0.35, and the 99th percentile and maximum value are -0.05.

Among the control variables, company size (Size) was measured using the log of assets. The mean value for firm size (Size) is 27.20, the standard deviation is 1.45, the minimum value and lower 1% is 24.56, the lower 25% is 26.16, the median is 26.88, the upper 75% is 27.96, and the upper 99% and maximum value is 31.58. The debt ratio (LEV) was measured by dividing total debt book value by total assets. The average value of the debt ratio (LEV) is 0.35, the standard deviation is 0.17, the minimum value and lower 1% is 0.05, the lower 25% is 0.21, the median is 0.35, the upper 75% is 0.48, and the upper 99% and maximum value is 0.74. The cash flow from operations (CFO) was measured by dividing the cash flow from operations shown on the cash flow statement by total assets. The average value of the Cash Flow From Operations (CFO) is 0.08, the standard deviation is 0.05, the minimum value and lower 1% is 0.00, the lower 25% is 0.04, the median is 0.07, the upper 75% is 0.11, and the upper 99% and maximum value is 0.25. Return on Assets (ROA) was measured by dividing net income from the income statement by total assets. The mean value of ROA is 0.06, the standard deviation is 0.04, the minimum value and lower 1% are 0.00, the lower 25% is 0.03, the median is 0.05, the upper 75% is 0.07, and the upper 99% and maximum value are 0.21. The dummy variable for whether the company was audited by a Big Four accounting firm (BIG4) was measured as 1 if the company received an external audit from PwC, KPMG, Deloitte, or Ernst & Young, and 0 otherwise. The mean value of the Big Four Audit Dummy Variable (BIG4) is 0.67, the standard deviation is 0.47, the minimum value, lower 1%, and lower 25% are 0.00, the median, upper 75%, upper 99%, and maximum value are 1.00. Listing duration (AGE) was measured as the log value of the period a company has been listed on the stock exchange. The mean value of the listing period (AGE) is 3.28, the standard deviation is 0.58, the minimum value and lower 1% are 0.68, the lower 25% is 2.94, the median is 3.37, the upper 75% is 3.64, and the upper 99% and maximum value are 4.08. Sales were measured using the log value of company sales. The mean value of Sales is 26.97, the standard deviation is 1.52, the minimum value and lower 1% is 23.62, the lower 25% is 25.96, the median is 26.73, the upper 75% is 27.84, and the upper 99% and maximum value is 31.17.

Table 3. Descriptive statistics.

Full Sample(N=3,121)								
Variable	Obser vations	Mean	Std.Dev.	Min	1st Qnt.	Median	3rd Qnt.	Max
TQ	3,121	1.25	0.85	0.42	0.78	0.98	1.38	5.62
CapEx	3,121	23.34	2.09	17.82	21.98	23.26	24.60	28.75
TSS	3,121	-0.60	0.33	-1.49	-0.81	-0.55	-0.35	-0.05
Size	3,121	27.20	1.45	24.56	26.16	26.88	27.96	31.58
LEV	3,121	0.35	0.17	0.05	0.21	0.35	0.48	0.74
CFO	3,121	0.08	0.05	0.00	0.04	0.07	0.11	0.25
ROA	3,121	0.06	0.04	0.00	0.03	0.05	0.07	0.21
BIG4	3,121	0.67	0.47	0.00	0.00	1.00	1.00	1.00
AGE	3,121	3.28	0.58	0.69	2.94	3.37	3.64	4.08
Sales	3,121	26.97	1.52	23.62	25.96	26.73	27.84	31.17

Table 4 presents the Pearson coefficients between variables. Analysis results indicate a statistically significant positive (+) correlation at the 1% level between the dependent variable in Hypothesis 1—capital expenditures (CapEx), a proxy for investment scale—and the variable of interest, Tax Strategy Sustainability. Variables mentioned in prior research as influencing CapEx—firm size (Size), debt ratio (LEV), operating cash flow ratio (OFC), return on assets (ROA), the Big Four audit dummy variable (BIG4), and sales (Sales)—showed statistically significant positive (+) correlations at the 1% level.

Hypothesis 2: A statistically significant positive (+) correlation at the 1% level was found between the dependent variable, Tobin's Q (a proxy for firm value), and the variables of interest: Capital Expenditures (CapEx) and Tax Strategy Sustainability. LEV, CFO, ROA, BIG4 audit dummy variable, and Sales showed statistically significant positive (+) correlations at the 1% level. The SIZE variable showed a statistically significant negative (-) correlation at the 1% level.

Table 4. presents the Pearson coefficients of the correlations between the variables.

Variable	TQ	CapEx	TSS	Size	LEV	CFO	ROA	BIG4	AGE	Sales
TQ	1									
CapEx	0.14 ***	1								
TSS	0.11 ***	0.14 ***	1							
Size	0.08 ***	0.78 ***	0.13 ***	1						
LEV	-0.01	0.23 ***	-0.18 ***	0.16 ***	1					

CFO	0.31 ***	0.23 ***	0.09 ***	0.09 ***	-0.01	1				
ROA	0.45 ***	0.10 ***	0.16 ***	0.02	-0.25 ***	0.52 ***	1			
BIG4	0.16 ***	0.34 ***	0.14 ***	0.39 ***	0.05 ***	0.09 ***	0.08 ***	1		
AGE	-0.21 ***	-0.02	-0.07 ***	0.03	-0.02	-0.18 ***	-0.17 ***	-0.16 ***	1	
Sales	0.09 ***	0.80 ***	0.14 ***	0.91 ***	0.31 ***	0.18 ***	0.06 ***	0.38 ***	-0.02	1

Significance levels represented by p-values in the correlation analysis are as follows: *** represents a 1% significance level, ** represents a 5% significance level, and * represents a 10% significance level.

IV. Empirical Analysis

4.1. Hypothesis 1 Empirical Analysis Results

Hypothesis 1 states that firms with lower effective tax rate volatility will have larger investment scales than those without such volatility. To test this hypothesis, capital expenditures (CapEx) were used as a proxy for the dependent variable, investment scale, and Tax Strategy Sustainability, as defined by McGuire et al. [7], was used as the variable of interest.

<Table 5> presents the empirical analysis results for Hypothesis 1. The regression coefficient value for A-1, Tax Strategy Sustainability, was 0.19, statistically significant at the 1% level. To test for endogeneity, a Two-Stage Least Squares Regression was conducted, yielding the A-2 result. The regression coefficient value for A-2 Tax Strategy Sustainability was 4.21, which was statistically significant at the 1% level. This implies that companies with low corporate tax rate volatility can experience a significantly greater increase in capital expenditures (CapEx) compared to those without such volatility. In other words, the high predictability of cash flow achieved through a sustainable tax strategy suggests it can facilitate companies' establishment of stable investment plans for the future.

Both Ordinary Least Squares Regression and Two-Stage Least Squares Regression results indicate a significant impact on investment expansion. This confirms that sustainable tax strategies can substantially influence real economic decisions, such as capital expenditures aimed at enhancing future corporate value, rather than merely increasing retained earnings within the company. These findings align with prior research, including Jacob et al. [15].

Table 5. Empirical analysis results for Hypothesis 1.

Variable	Dependent Variable = CapEx			
	A-1(OLS)		A-2(2SLS)	
	Coefficient	P-value	Coefficient	P-value
Intercept	-8.21	0.00	-2.39	0.22
TSS	0.19	0.00	4.21	0.00
Size	0.48	0.00	0.59	0.00
LEV	0.97	0.00	2.79	0.00
CFO	2.93	0.00	2.65	0.00

ROA	1.54	0.01	-0.82	0.48
BIG4	0.02	0.68	-0.07	0.38
AGE	-0.03	0.44	0.04	0.53
Sales	0.67	0.00	0.39	0.00
Fixed Effects	Year and Industry		Year and Industry	
Observations	3,121		3,121	
F statistics	170.69		72.46	
Adjusted R2	0.76		0.57	

Significance levels represented by p-values in the correlation analysis are as follows: *** represents a 1% significance level, ** represents a 5% significance level, and * represents a 10% significance level.

4.2. Hypothesis 2 Empirical Analysis Results

Hypothesis 2 aims to determine whether increased investment in firms with low corporate tax rate volatility has a more positive impact on firm value. To this end, Tobin's Q was used as a proxy for the dependent variable, firm value, and the interaction term Tax Strategy Sustainability × CapEx was employed as the variable of interest.

<Table 5> presents the empirical analysis results for Hypothesis 2. The regression coefficient value for B-1, Tax Strategy Sustainability × CapEx, was 0.02, statistically significant at the 1% level. B-2 shows the results from the Two-Stage Least Squares regression conducted for endogeneity testing. The regression coefficient value for B-2 Tax Strategy Sustainability × CapEx was 0.01, statistically significant at the 1% level, consistent with the B-1 result. This suggests that companies with low corporate tax rate volatility can accelerate corporate value growth more effectively by increasing investment through systematic investment planning.

Both Ordinary Least Squares regression and Two-Stage Least Squares regression indicate that expanding investment scale in companies with low effective tax rate volatility significantly impacts corporate value growth. This suggests that companies establishing sustainable tax strategies will implement high-level internal controls and risk management to proactively prepare not only for tax risks, but also for financial and non-financial risks. This signalling effect can enhance the trust of external information users in the company, potentially attracting more investment and serving as a driving force for corporate growth. These results align with those of prior studies, such as Neuman et al. [16] and Drake et al. [17].

Table 6. Empirical analysis results for Hypothesis 2.

Variable	Dependent Variable = TQ			
	B-1(OLS)		B-2(2SLS)	
	Coefficient	P-value	Coefficient	P-value
Intercept	0.11	0.73	-0.53	0.41
TSS	0.03	0.49	-0.46	0.29
Capex	0.02	0.08	0.03	0.04
TSS_Capex	0.01	0.00	0.01	0.00
Size	0.14	<.0001	0.13	<.0001
LEV	0.77	<.0001	0.56	0.01
CFO	1.37	<.0001	1.39	<.0001

ROA	8.11	<.0001	8.46	<.0001
BIG4	0.07	0.02	0.08	0.01
AGE	-0.15	<.0001	-0.16	<.0001
Sales	-0.14	<.0001	-0.11	0.00
Fixed Effects	Year and Industry		Year and Industry	
Observations	3,121		3,121	
F statistics	30.07		28.80	
Adjusted R2	0.36		0.35	

Significance levels represented by p-values in the correlation analysis are as follows: *** represents a 1% significance level, ** represents a 5% significance level, and * represents a 10% significance level.

V. Conclusions

This study empirically analysed the impact of sustainable tax strategy on corporate investment scale, based on signalling theory, and examined the pathways through which it affects corporate value. Analysis of 3,121 firm-year observations from Korean listed companies between 2010 and 2023 confirmed that sustainable tax strategy has a significant, positive effect on both corporate investment scale and corporate value.

This study elucidates the mechanism shaping corporate strategy and performance from the perspective of sustainable tax strategy. Empirical analysis confirms a statistically significant positive (+) relationship at the 1% level. Notably, consistent and predictable tax policies can serve as a key mechanism by providing certainty regarding corporate investment plans, thereby enhancing the efficiency of capital allocation. This implies that a virtuous cycle mechanism can operate: management provides a positive signal to external information users that they systematically manage tax risk, as one method to enhance corporate sustainability, leading to increased corporate value through expanded investment scale.

This study specifically clarifies that elements of corporate sustainability management can be mitigated through establishing sustainable tax strategies, from a tax risk perspective. It was confirmed that companies with low cash effective tax rate volatility coefficients can effectively manage tax risks, thereby providing investors with more stable and predictable cash flow information. The results of the Tax Strategy × Sustainability × CapEx interaction variable confirm that, from a market valuation perspective, sustainable tax strategies enhance corporate investment efficiency, leading to premium valuation in the market. This indirectly suggests that, from a capital accessibility perspective, transparent and consistent tax policies can enhance trust in the company, thereby lowering capital costs, expanding investment scale, and contributing to increased corporate value.

This study provides important implications for the development and impact of a sustainable disclosure framework. Utilising McGuire et al.'s [7] sustainable tax strategy measurement method, we present a framework that objectively measures tax strategy sustainability through the coefficient of variation in the cash effective tax rate over five years. This measurement methodology can serve as a consistent and comparable indicator for assessing tax transparency and sustainability in ESG reporting, and its validity was verified through empirical analysis specifically targeting Korean listed companies. Furthermore, it suggests that companies should emphasize maintaining long-term, consistent tax policies rather than merely minimizing corporate tax rates in their disclosure strategies.

This study specifically analysed how ESG practices align with stakeholder expectations and contribute to achieving the Sustainable Development Goals (SDGs). Increasing investment scale and enhancing corporate value through sustainable tax strategies directly contribute to achieving the following SDGs: First, regarding SDG 8 (Decent Work and Economic Growth), sustainable tax

strategies promote long-term investment and corporate resilience through increased capital expenditure, thereby contributing to job creation and economic growth. Empirical results indicate that companies pursuing sustainable tax strategies are more likely to execute greater capital investments, contributing to expanded production capacity and job creation. Second, concerning SDG 9 (Industry, Innovation, and Infrastructure), sustainable financial practices demonstrate enhanced corporate capacity to reinvest in innovative and capital-intensive projects. Securing financial stability through consistent tax policies enables the stable acquisition of capital necessary for R&D investment and infrastructure development. Third, concerning SDG 12 (Responsible Consumption and Production), sustainable tax strategies act as a key mechanism to ensure sustainability in corporate decision-making, through efficient resource allocation and responsible financial strategies. This enables sustainable management focused on long-term value creation rather than short-term profit pursuit.

While this study is limited to Korean listed companies, thereby restricting the generalizability of its findings, it provides important practical implications for executives with a strong interest in corporate sustainability. Companies can build stakeholder trust and attract investment through consistent tax policies that send positive signals, thereby achieving sustainable growth. Additionally, policymakers should incorporate tax transparency and sustainability as core evaluation metrics in the process of mandating ESG disclosures for companies. This study contributes to developing a disclosure framework for corporate sustainable management, and expands the theoretical foundation in sustainable management research by demonstrating the practical impact of establishing sustainable tax strategies on achieving the SDGs. These findings are expected to provide important evidence for policy formulation aimed at helping companies achieve the Sustainable Development Goals.

Through this study, future research is anticipated to include comparative studies utilizing multinational data, analyses examining the relationship between ESG rating grades and sustainable tax strategies, and integrated studies analyzing the interactive effects between tax strategy, sustainability, and other ESG factors.

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