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Does a Pro-Environmental Firm Attract Future Cash Flow? With an Impact of Sustainable Advertisement on Firms' Financial Performance

Jaehong Lee [1] and Suyon Kim [2,*]

[1] Division of Accounting/Tax and Management Information Systems, Kyonggi University, Suwon 16227, Korea; jhong@kgu.ac.kr
[2] Department of Accounting, Jeonbuk National University, Jeonju 54896, Korea
* Correspondence: sykim309@jbnu.ac.kr

Abstract: This study investigates the future existence of firms that are engaged in environment-oriented activities. Recently, strategic activities for firms' sustainable growth has been critical for the environment. We use regression analysis to examine the relationship using firms listed in the Korea Stock Exchange market from 2014 to 2018. We use five aspects of environment-oriented activities: organization, management, strategy, performance, and shareholders, provided by the Korea Corporate Governance Service. The empirical results indicate that the firms participating in environment-oriented activities are likely to predict future cash flow, implying firms' sustainability. We also claim that firms engaged in environment-oriented activities are likely to advertise their pro-environmental engagements, resulting in firms' sustainable existence in the future. These findings are robust when we use the aggregate value as an alternative measurement. Our finding provides useful information for corporate practice. Active involvement in environmental activities can be used as a strategy that leads to superior performance. These efforts will contribute to enhancing the public image and improving green competitiveness. From the perspective of regulators, the non-financial information assessment supports the government's eco-friendly policy that emphasizes environment-oriented activities. The results indicate that transparent information for external investors seeking to invest in firms are engaged in environment-oriented activities.

Keywords: environment-oriented activities; advertising; predictability of future cash flows

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1. Introduction

In UN news on 5 April, 2020, Inger Andersen, the Executive Director of the United Nations Environment Programme (UNEP), announced that the post-COVID-19 era requires a profound and systematic transition to a more sustainable economy that works for both people and the planet. Some might say COVID-19 has brought us visible and positive impacts, for example, the clear and blue sky, but it is only temporary, resulting from the tragic economic slowdown. She emphasized two keywords in the post-COVID-19 era: environment and sustainability.

There are many attempts worldwide to revitalize the environment. For example, there are government-level efforts such as OneNYC 2050 in New York, NY, USA; the Sustainable City pLAn 2019 in Los Angeles, CA, USA; and the Green Deal in Europe. Those are environmentally friendly policies to overcome environmental issues such as reducing greenhouse gases. The South Korean government announced the Green New Deal through the National Report Conference in July 2020 to create growth forces in the green environment sector, developing into a low-carbon economy.

In line with the Sustainable Development Goals (SDGs), firms strive to solve the environmental crisis as a means of surviving. As the pandemic of COVID-19 continues, firms' sustainability issues have never been more emphasized. Sustainable development has

become an academic focus and an essential part of corporate development [1]. Dyllick and Muff [2] viewed sustainability by understanding how it can positively impact the important relevant areas in society and the planet to minimize negative impacts. In the past, when predicting firms' sustainability, the focus was mainly on economic outcomes. However, now it is argued that coexistence with a society can improve firms' sustainability. In other words, in the process of achieving business results, it is necessary to grasp the impact of firms on society through non-financial results. The most commonly used when assessing non-financial performance is the ESG (environment, social, and governance) framework.

ESG is a prolongation of the concepts of the green economy, and follows the critical standards for measuring the level of a firm's sustainability [3]. Managers, institutional investors, financial institutions, and other interested parties pay closer attention to ESG reports to estimate and measure firms' sustainable performance [4]. Evidence also shows a growing market interest in corporate ESG performance and practices [5]. Investors are also confident that the long-term benefits can be fully realized by combining ESG and the investment process. Kocmanova and Simberova [6] suggested that good corporate governance and sustainable development are beneficial to shareholders.

Among ESG, we focus on the environment in this study. BlackRock, the world's largest asset management company, announced in an annual letter to the CEOs of major companies that E (environment) was its core criterion when making investment decisions. They also declared that companies that have not participated in the crisis response caused by climate change or that earn more than 25% of their total revenue from coal-fired production will be excluded from investment by mid-2020 [7].

Environment-concerned management is defined as management that is penetrated by environmental awareness in all procedures of the firm, such as purchasing, manufacturing, logistics, and sales to financing, investment, and marketing. That is, as the firms focus on the environment, firms are expected to be sustainable.

Harmonizing environmental sustainability and profitability is firms' ultimate goal—that is, re-evaluating the existing management paradigm in the view of the environmental perspective.

In this study, we focus on future cash flow prediction. Managing and planning cash flow is vital to enable growth and sustainability. Firms may be enjoying high revenue, but still, they can go bankrupt. In other words, if firms fail to obtain physical cash from high revenues, they will not have enough cash to pay off operating expenses such as labor and leases, resulting in liquidity [8]. Failure to repay debts is the most common cause of going bankrupt [9]. Therefore, firms' sustainability is acquired when inflow exceeds outflows in the end. In other words, firms can survive when they generate positive long-term cash flow, satisfying the standard required of enough cash to meet their needs. Effective and successful cash flow management is about preventing bankruptcy and enhancing the financial outlook for firms' sustainability [10]. We examined the relationship between environment-oriented activities and future cash flow prediction with Korean-listed companies. Although there are predominant empirical findings to show the positive effect of the overall environment on future cash flow prediction, there is a lack of detailed analysis of environment-oriented activities. Specifically, we tested the detailed environment-oriented activities in organization, management, strategy, performance, and shareholders.

We found that advertising positively impacts the relationship between environment-related activities and future cash flow prediction. It is important to note that we conducted our analysis in the Korean context, because the majority of research dealing with the intangibles has been conducted in developed countries.

There were several contributions to our research. Using detailed assessment criteria of environment-oriented activities provided by KCGS (Korea Corporate Governance Service), we obtained the precise result of each environment-oriented activity. In addition, by considering advertising as a mediator when examining the relationship between environment-oriented activities and future cash flow prediction, we inferred that firms can

advertise involvement in environment-oriented activities as a strategy to earn a reputation in a competitive market.

We also took into account the mediating effect of advertising on the relationship between environment-oriented activities and future cash flow prediction. We inferred that firms can use environment-oriented activities as a strategy for transparent financial reporting.

The second contribution was the precise data provided by KCGS. In most studies, the researchers give numerical scores of environment-oriented activities at their discretion based on the letter grade. Therefore, our study was based on the accurate scores of each environment-oriented activity, yielding a relatively accurate result.

Our findings provide useful information for corporate practice. Active involvement in environmental activities can be used as a strategy that leads to superior performance. These efforts contribute to enhancing the public image and improving green competitiveness. From the perspective of regulators, the assessment of non-financial information supports the government's eco-friendly policy that emphasizes environment-oriented activities. The results indicate that transparent information for external investors seeking to invest in firms are engaged in environment-oriented activities.

Our study had a limitation in that our sample was based on the firms in South Korea. Due to capital and cultural background, the definition of environment-related activities may differ in other countries. Therefore, it may be challenging to generalize empirical results to other countries. The effect of advertising environment-related activities can be examined internationally in the future.

2. Backgrounds and Hypotheses

2.1. Environment-Oriented Activities

Air and water pollution, global warming stemming from climate change, and the development of industrialization and urbanization are environmental crises that many countries confront and have a major negative impact on the economy. Those environmental threats resulted in the pandemic of COVID-19, threatening human survival in the present and the future.

There have been vigorous efforts in favor of the world's sustainability. For example, the World Commission on Environment and Development (WCED) [11] introduced sustainable development as a new paradigm in the 21st century. It is defined as the ability to satisfy the needs of the present generation without impairing the next generations' ability to meet their demands. Later, the World Summit on Sustainable Development in 2002 emphasized today's vital role, and the World Summit United Nations General Assembly in 2005 subdivided sustainability into the environment, social, and economy.

Along with the worldwide trend, the Korea Corporate Governance Service (KCGS) provides data on ESG scores and suggests the codes of practice for desirable corporate governance and socially responsible management in South Korea. Among ESG, this study focused on the environmental evaluation criteria. Environment-oriented activities encourage overall environmental management, such as efficient natural resource usage and waste management [12]. Environmental evaluation criteria suggest that the firms should be transparent with investors in reporting environment-related issues, expecting the positive effect of improving corporate performance and value on firms' sustainable operation.

Jang et al. [13] suggested that ESG implies a risk in small-sized firms. They also suggested that only the environmental score of the three ESG criteria shows a significant impact on bond returns.

Kim and Kim [14] suggested that the negative relationship between a firm's profitability, return on asset (ROA), and R&D capability moderates their investment in the environment. It is because to reduce pollution emissions, innovative capability should be enhanced.

However, ESG does not always work positively in the market. Miralles-Quiros et al. [15] studied ESG activities to enhance firm value using the information listed in the Sao Paulo

Stock Exchange from 2010 to 2015. The results indicated that the market does not significantly value ESG in Brazil.

2.2. Prior Research on Cash Flow Prediction

Managing and planning cash flow is essential for a firm's growth and sustainability. Even if the firm experiences high profits, it can still go bankrupt. In other words, if the firm fails to obtain actual cash from the business over environment-oriented activities in the designated period of time, it will not have enough cash to clear debts, interest expenses, and labor expenses. Therefore, a positive net cash flow, that is, inflows exceeding outflows, is critical in determining a firm's sound finances and sustainability.

The Financial Accounting Standards Board (FASB) suggested that financial reporting is useful in forecasting future cash flow [16]. The main purpose of financial statements is to forecast future cash flow to interest groups of firms. In compliance with FASB, Dechow [17] and Dechow et al. [18] asserted that accrual-based accounting plays a significant role in predicting future cash flow. In both studies, earnings are superior to cash flow in examining the short-term performance since cash flows have timing and matching problems. Later, Barth et al. [19] researched accrual's role in predicting future cash flows. They found that the information about the current period of accruals of changes in accounts payable, changes in accounts receivables, and depreciation are integrated.

However, there are studies on the opposite side. Senana [20] concluded that earnings are superior to cash flow, predicting future cash flow using data from 2006 to 2015. Park et al. [21] found that earnings were predictable when forecasting future cash flows in the 1980s, but the relationship has reversed since the 1990s.

Regardless of whether cash flow prediction is still debatable, it is an important implication for investors and creditors that are in continuous need of accurate cash flow prediction. In addition, though arguable, what is clear is that predicting future cash flow is critical and relates to firms' sustainability in the future.

Oh and Shin [22] analyzed the correlation between future cash flow prediction and accounting information. They asserted that the sustainability of a firm is closely linked to future cash flows. Without enough cash in the future, the firm's sustainability will be significantly deteriorated. This study suggested that analysts' cash flow projections provide essential evidence in the capital market. In other words, information on cash flow forecasting is likely to be utilized by capital market participants when economic decisions are made.

Wadesango and Wadesango [23] reported that 70% of startup firms survive for two years, and 51% survive for five years. They showed that 50% of firms fail in the first year, and 95% of firms fail in five years. The reason for these failures is mostly due to poor cash flow management.

Wadesango et al. [24] suggested that managing the cash of small and medium-sized firms affects profitability and sustainability. Small- and medium-sized firms are often confused by high revenue, thinking it means that they will survive. However, if they fail to plan for the cash flows, they are likely to be liquidated no matter what the profit is.

2.3. Hypothesis Development

The vital role of financial statements is to assist in predicting firms' future cash flow. Managing and planning cash flows is essential for firms' sustainable growth. Although a firm may experience high revenues, having insufficient cash to pay off operating expenses will eventually liquidate the firm.

Financial reporting is useful in forecasting future cash flow [16]. One of the major purposes of financial statements is to provide information to interest groups of firms regarding future cash flow. When the accounting information is reliable and accurate, forecasting future cash flow is possible, increasing the firms' viability. According to Oh and Shin [22], when future cash flows are predicted, the information asymmetry lies between

the company and the investors. It is expected to be decreased. This means that ability to forecast cash flow results in a transparent and sustainable firm.

Regulations and laws required environment-oriented activities in the past. However, a comprehensive concept has been presented that is the interaction between business and society and recently used as the same concept as sustainability. Sustainability is also a concept of accounting for environment-oriented activities, which can be done through accounting transparency. In other words, accounting transparency is a prerequisite for performing environment-oriented activities [25].

Environment-oriented activities are a set of firms' practices to improve the environment or alleviate the negative impact of their business on the environment. It also improves the relationship between the firm and major shareholder groups, improving performance and ultimately increasing corporate value [26]. Environment-oriented activities promote innovation and the efficient use of resources, and improve the overall reputation of the firm. In addition, environment-oriented activities enforce sustainable management and reduce uncertainty in future cash flow prediction [27].

In this study, we tried to examine the effect of environment-oriented activities when forecasting future cash flows. We assumed that environment-oriented activities would directly be related to accurate future cash flows, and the hypothesis is as follows.

Hypothesis 1. *There is a positive correlation between environment-oriented activities and future cash flow prediction.*

In the competitive market, when firms are actively involved in good deeds, such as taking care of the environment, they likely release information regarding their positive activities. By advertising their good deeds as much as possible, firms can obtain a positive social image and gaining customers' awareness [28]. Thus, advertising is used to secure firms' status among other competitors [29].

Recently, stakeholders have had their eyes on firms' sustainability [30], not to mention financial performance. Disclosing sustainable information is not mandated or regulated, whereas the achievement of financial performance in creating shareholder value is disclosed through traditional reporting, governed by accounting regulation.

If firms choose to advertise that they are involved in environment-oriented activities, it signals shareholders and give firms a reputation as sustainable firms, which in turn is likely to forecast positive future cash flow.

Hypothesis 2. *The degree of advertising expenditures influences the relationship between environment-oriented activities and future cash flow prediction.*

3. Research Design and Sample Description

3.1. Environment-Oriented Activities

This study focused on environment-oriented activities that describe firms' overall environmental efforts for sustainable existence. The KCGS encourages firms' engagement for continuous existence by providing scores for environmentally responsible obligation. In this study, we considered each of the environmental-oriented activity indicators based on the highly detailed data provided by the KCGS. Each index of environment-oriented activities is based on the criteria given the guidelines.

First, environment-oriented organizational activities assess how the firms are equipped with an organizational system to apply environmental systems and activities. The primary evaluation criteria were as follows. First, environment-oriented organizational activities assessed corporate culture on whether the firm's board of directors monitored environmental activities, whether the firm followed the environmental decisions, and whether the firm's environmental education system was in place.

Second, environment-oriented managerial activities evaluated the precautionary environment-related actions in relation to the environment. In other words, environment-

oriented managerial activities watched over the firms' overall environmental system, such as environmentally managing supply chain operations as prevention and treatment of environmental accidents. The evaluation criteria for the firms were (1) the application of environmental procedures, such as eco-friendly supply chain management; (2) a clean production system, such as greenhouse gas emission and harmful chemical substance control; (3) an environmentally friendly purchase policy and supplier selection; and (4) investment in the facility for the past five years that considers the environment.

Third, environment-oriented strategic activities assessed goal achievement in the environment suggested by the management. The external environment continues to change rapidly, and the firm should keep in line with the sequential changes to sustain itself in the market. The evaluation criteria focused on the eco-friendly countermeasures to achieve goals and to operate the business.

Fourth, environmental-oriented performance activity was the actual index of how the firm accomplished environmental action. For example, the firm was evaluated on whether there was any environmental violation, the level of actual environmental-related investment, and environmental disclosures.

Lastly, environment-oriented shareholder activities assessed the scope of the environmental-related information on shareholders. The major criteria were whether the firm had programs or a system to disclose or communicate with stakeholders, supported local environment conservation in cooperation with the community, or belonged to an environmental organization.

3.2. Empirical Models

To test hypothesis 1, we analyzed the correlation between environment-related activities and future cash flow predictions. We used a regression model to predict future cash flows. Model 1 assumes that operating cash flow one year ahead is affected by each environment-related activity, testing hypothesis 1. Then, model (1) was modified by incorporating advertising expenses to make interaction variables with each environment-related activity. The following were used to examine the hypotheses:

$$Fcfo_{t+1} = \beta_0 + \beta_1 EA1 \sim 5_t + \beta_2 Size_t + \beta_3 Roa_t + \beta_4 Lev_t + \beta_5 Loss_t + \beta_6 Majority_t + \beta_7 Foreign_t + IND\ dummy + YR\ dummy + \varepsilon \quad (1)$$

$$Fcfo_{t+1} = \beta_0 + \beta_1 EA1 \sim 5_t + \beta_2 Advertise_t + \beta_3 EA1 \sim 5 \times Advertise_t + \beta_4 Size_t + \beta_5 Roa_t + \beta_6 Lev_t + \beta_7 Loss_t + \beta_8 Majority_t + \beta_9 Foreign_t + IND\ dummy + YR\ dummy + \varepsilon \quad (2)$$

where *Fcfo* = future operating cash flow, *EA1* = scores of environment-oriented organizational activities, *EA2* = scores of environment-oriented managerial score, *EA3* = scores of environment-oriented strategic score, *EA4* = scores of environment-oriented performance score, *EA5* = scores of environment-oriented shareholder score, *Advertise* = advertising expenses from income statement divided by total assets, *Size* = natural logarithm of total assets, *Roa* = net income divided by total assets, *Lev* = total debt divided by total assets, *Loss* = 1 for a company with loss and 0 otherwise, *Majority* = percentage of shares held by the largest shareholder, *Foreign* = percentage of shares held by foreign investors, IND dummy = industry dummies, and *YR dummy* = year dummies.

Based on prior research, we included firm size and financial leverage as control variables to minimize the possible bias. *Size*, as a proxy for firm size, was measured as the natural log of total assets. For measuring firm performance and risk, *Roa* and *Loss* were included, respectively. For controlling volatility within a particular year arising from a specific economic situation, year dummies were included in the model. To control the effect of a specific industry, industry dummies were included in the model.

3.3. Sample Selection

Table 1 describes the procedures to get the final sample to test the hypotheses. We used the FnGuide database, one of the trusted financial data providers in South Korea. Information on environment-oriented activities was purchased from the Korea Corporate

Governance Service (KCGS). First, we included all the firms listed in the Korea Stock Exchange with December year-end from 2014 to 2018. We eliminated the firms in the financial industry. Firms with no or incomplete financial data were removed. All the data were winsorized at the top and bottom 1% of dependent and independent variables, minimizing the outlier effect. After the selection process, we obtained a total of 3650 firm year observations.

Table 1. The data description.

Panel A. Sample Selecting Process	
Firm year observations from 2014 to 2018 with December closing fiscal year	6899
Less:	
No data for control variables	1183
Environmental index missing data	2066
Final observation	3650

4. Empirical Results

4.1. Descriptive Statistics

Table 2 contains the descriptive statistics for the variables used in this study. The mean (median) values for *Fcfo*, *EA1*, *EA2*, *EA3*, *EA4*, and *EA5* were 0.057 (0.051), 1.445 (1.792), 2.216 (2.708), 1.763 (2.485), 0.947 (1.099), and 0.941 (0.643), respectively.

Table 2. Descriptive statistics.

Variables	Mean	Std	Q1	Median	Q3
Fcfo	0.057	0.195	0.000	0.051	0.109
EA1	1.445	0.910	0.000	1.792	2.079
EA2	2.216	1.205	1.609	2.708	3.135
EA3	1.763	1.117	0.000	2.485	2.565
EA4	0.947	0.850	0.000	1.099	1.609
EA5	0.941	0.845	0.000	0.693	1.792
Advertise	0.017	0.195	0.000	0.002	0.010

Notes: Variable definition: *Fcfo* = operating cash flow, defined as net cash flow from operating activities obtained from the cash flow statement adjusted for extraordinary items and discontinued operation; *EA1* = scores of environment-oriented organizational activities; *EA2* = scores of environment-oriented managerial score; *EA3* = scores of environment-oriented strategic score; *EA4* = scores of environment-oriented performance score; *EA5* = scores of environment-oriented shareholder score; and *Advertise* = advertising expenses from the income statement divided by total assets.

The Pearson correlation matrix for the significant variables used in this study is in Table 3. *EA1*, environment-oriented organizational activities; *EA2*, environment-oriented managerial activities; *EA3*, environment-oriented strategic activities; *EA4*, environment-oriented performance activities; and *EA5*, environment-oriented shareholder activities, were positively related to future cash flow prediction (*Fcfo*), indicating that those variables are useful in forecasting future cash flow. We could confirm a significant positive correlation between future cash flow and advertising expenses. It shows that each environment-oriented activity and advertising expense is useful when predicting future operating cash flow.

Table 3. Correlation matrix.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1) *Fcfo*	1.000	0.084 <0.0001	0.086 <0.0001	0.079 <0.0001	0.096 <0.0001	0.122 <0.0001	0.040 <0.0001
(2) *EA1*		1.000	0.896 <0.0001	0.872 <0.0001	0.551 <0.0001	0.536 <0.0001	−0.037 0.026
(3) *EA2*			1.000	0.826 <0.0001	0.649 <0.0001	0.589 <0.0001	−0.040 0.016
(4) *EA3*				1.000	0.500 <0.0001	0.504 <0.0001	−0.038 0.023
(5) *EA4*					1.000	0.562 <0.0001	−0.019 0.246
(6) *EA5*						1.000	−0.021 0.220
(7) *Advertise*							1.000

4.2. Regression Results and Discussion

Table 4 reports the results of the regression analysis examining our first hypothesis using Equation (1). Panels A, B, C, D, and E of Table 4 display the regression results using environment-oriented organizational (*EA1*), managerial (*EA2*), strategic (*EA3*), performance (*EA4*), and shareholder (*EA5*) activities, respectively, as independent variables. Column (1) of Table 4 shows the results using future cash flow prediction as the dependent variable. The results show that the coefficient of *EA1* was 0.005, which was positive and statistically significant at the 1% level, as predicted. This implies that *EA1* has the power of explanation in forecasting future cash flow. Each coefficient of *EA2*, *EA3*, *EA4*, and *EA5* was 0.003, 0.003, 0.006, and 0.003, respectively, each showing significant values at the 1% significance level and supporting hypothesis 1. To confirm the multicollinearity problems that can occur in multiple regression analysis, we identified variance inflation factors (VIFs). The VIFs of *EA1*, *EA2*, *EA3*, *EA4*, and *EA5* were 1.324, 1.625, 1.353, 1.471, and 1.487, respectively, confirming no multicollinearity problems.

Specifically, the results show that *EA2*, *EA3*, and *EA5* had a similar impact on predicting future cash flow. The firms with management ready for environmental events that may occur were likely to forecast future cash flow. The firms aiming at eco-friendly goal accomplishment, keeping pace with changes in the environment, and with programs or systems to disclose or communicate with stakeholders, were likely to forecast future cash flow. *EA1* and *EA4* had more impact on forecasting future cash flow than *EA2*, *EA3*, or *EA5*. This indicates that firms are prepared for the environmental system within an organization and are ready to accomplish environmental actions to predict future cash flow. This result is supported by Deng and Cheng's study [31] in that protecting the environment is the primary key to consistent business operation.

In column (2) of Table 4, we confirmed the positive coefficient of interaction term of advertising expenditures and environment-oriented activities. The coefficient of interaction variable between *EA1* (*EA2*, *EA3*, *EA4*, and *EA5*) and Advertise was 0.094 (0.092, 0.112, 0.236, 0.413), supporting the second hypothesis. The VIFs of each variable were under 2, implying no multicollinearity problems.

Table 4. Results from the corporate environmental index on future cash flow prediction.

Panel A. EA1—Scores for environment-oriented organizational activities				
	(1)		**(2)**	
Variables	**Coeff.**	**t-stat.**	**Coeff.**	**t-stat.**
Intercept	−0.147	−4.810 ***	−0.149	−4.240 ***
EA1	*0.005*	*2.800* ***	*0.004*	*1.610*
Advertise			−0.008	−1.350
EA1 × Advertise			0.094	2.870 ***
Size	0.007	5.770 ***	0.007	5.210 ***
Lev	0.000	−0.360	0.000	−0.130
Roa	0.100	8.420 ***	0.128	8.700 ***
Loss	−0.030	−7.800 ***	−0.031	−6.750 ***
Majority	0.025	2.900 ***	0.027	2.760 ***
Foreign	0.093	6.910 ***	0.094	6.200 ***
Industry Dummy	Included		Included	
Year Dummy	Included		Included	
F-value	33.12 ***		27.90 ***	
Adj. R^2	0.162		0.179	
Observations	3650		3650	
Panel B. EA2—Scores for environment-oriented managerial activities				
Variables	**Coeff.**	**t-stat.**	**Coeff.**	**t-stat.**
Intercept	−0.163	−5.210 ***	−0.165	-4.560 ***
EA2	0.003	1.710 *	0.001	0.430
Advertise			−0.008	−1.440
EA2 × Advertise			0.092	4.190 ***
Size	0.007	5.970 ***	0.007	5.340 ***
Lev	0.000	−0.310	0.000	−0.080
Roa	0.101	8.490 ***	0.128	8.680 ***
Loss	−0.030	−7.790 ***	−0.031	−6.780 ***
Majority	0.027	3.060 ***	0.030	2.970 ***
Foreign	0.092	6.860 ***	0.091	6.050 ***
Industry Dummy	Included		Included	
Year Dummy	Included		Included	
F-value	32.12		27.73	
Adj. R^2	0.16		0.18	
Observations	3650		3650	
Panel C. EA3—Scores for environment-oriented strategic activities				
Variables	**Coeff.**	**t-stat.**	**Coeff.**	**t-stat.**
Intercept	−0.166	−5.340 ***	−0.165	−4.610 ***
EA3	0.003	1.650 *	0.002	0.900
Advertise			0.243	2.010 **
EA3 × Advertise			0.112	1.760 *
Size	0.007	6.190 ***	0.007	5.340 ***
Lev	0.000	−0.270	−0.001	−0.960
Roa	0.102	8.530 ***	0.128	8.730 ***
Loss	−0.030	−7.730 ***	−0.030	−6.520 ***
Majority	0.026	2.920 ***	0.030	3.060 ***
Foreign	0.092	6.870 ***	0.089	5.910 ***
Industry Dummy	Included		Included	
Year Dummy	Included		Included	
F-value	32.10 ***		28.54 ***	
Adj. R^2	0.164		0.188	
Observations	3650		3650	

Table 4. *Cont.*

Panel D. EA4—Scores for environment-oriented performance activities				
Variables	**Coeff.**	**t-stat.**	**Coeff.**	**t-stat.**
Intercept	−0.132	−4.190 ***	−0.130	−3.620 ***
EA4	0.006	3.020 ***	0.004	1.800 *
Advertise			0.172	1.490
EA4 × Advertise			0.236	2.710 ***
Size	0.006	5.100 ***	0.006	4.430 ***
Lev	0.000	−0.380	−0.001	−0.990
Roa	0.101	8.460 ***	0.126	8.650 ***
Loss	−0.030	−7.900 ***	−0.030	−6.670 ***
Majority	0.025	2.900 ***	0.030	3.060 ***
Foreign	0.093	6.950 ***	0.089	5.930 ***
Industry Dummy	Included		Included	
Year Dummy	Included		Included	
F-value	33.18 ***		29.52 ***	
Adj. R^2	0.162		0.187	
Observations	3650		3650	
Panel E. EA5—Scores for environment-oriented shareholder activities				
Variables	**Coeff.**	**t-stat.**	**Coeff.**	**t-stat.**
Intercept	−0.132	−3.980 ***	−0.135	−3.560 ***
EA5	0.003	1.700 **	0.000	−0.090
Advertise			−0.002	−0.020
EA5 × Advertise			0.413	4.460 ***
Size	0.006	4.960 ***	0.006	4.480 ***
Lev	0.000	−0.340	−0.001	−0.720
Roa	0.100	8.360 ***	0.124	8.470 ***
Loss	−0.030	−7.860 ***	−0.031	−6.720 ***
Majority	0.025	2.810 ***	0.031	3.070 ***
Foreign	0.094	6.980 ***	0.090	6.000 ***
Industry Dummy	Included		Included	
Year Dummy	Included		Included	
F-value	32.85 ***		29.84 ***	
Adj. R^2	0.161		0.189	
Observations	3650		3650	

*, ** and *** indicate significance at the 10%, 5%, and 1% levels, respectively. See Table 2 for definitions of other variables.

Specifically, the positive coefficients of the interaction term were interpreted as firms involved in environment-oriented activities being likely to spend their advertising expenditures, yielding future cash flow forecast. This finding confirms that advertising expenditures as a driving force for intangible assets are considered valuable assets of a firm [32], yielding superior future performance. That is, advertising helps the firm with environment-oriented activities by reinforcing the firm. The result is supported by the study by Boujelben and Fedhila [32] in that firms' intangible assets positively affect future cash flow. They showed that advertising costs help induce the future cash flow from operations and, as a result, contribute to maintaining the viability of the firm.

Our study was distinct from recent studies on ESG and firm performance. The research by Bing and Li [1], Huber and Comstock [4], Jang et al. [13], Miralles-Quiros et al. [15], and Deng and Cheng [31] examined ESG score as a whole, whereas we solely focused on the environmental aspect. When the scores for environment (E), social (S), and governance (G) are added together, there might be possibilities of hidden information embedded in the score. Our study was the first to examine the relationship between detailed areas such as organization, management, strategy, performance, and shareholders of environment-

oriented activities and firms' future sustainability. Indeed, firms concerned with the environment are committed to reducing the risk of environmental breaches and litigation, thus building their reputation.

Second, our study differed from recent research regarding advertising [14,32,33]. Unlike Boujelben and Fedhial [32], we found that the positive effect of advertising enhances the predictability of generating future cash flow. Oh et al. [33] found that advertising plays a great role only in sinful industry but no significant relation in forecasting future predictability. However, we found that the firms that make proactive efforts in the environment are likely to stand out in the competitive market, and advertising accelerates their competitiveness, leading to firm sustainability.

Third, we found the advertising effect on the relationship between environment-related activities and future cash flow prediction. Our study confirmed the effect of advertising only, whereas previous research studies incorporated R&D expenditures and advertising [34,35]. According to McWilliams and Siegel [34], advertising is categorized as either persuasive or informative. Persuasive advertising appeals to feelings, creating a psychological approach. Informative advertising provides the facts about the firm's characteristics and managerial practices. We interpreted advertising as an informative strategy.

4.3. Additional Analysis—Aggregate Measure of Environment-Oriented Activities

Table 5 shows the additional analysis, using an aggregate measure of environment-oriented activities as an alternative variable provided by KCGS. Panel A of Table 5 provides the relationship between the total scores of environment-oriented activities and forecasting future cash flow. Panel B of Table 5 shows the mediating effect of advertising on the relationship between environment-oriented activities and future cash flow prediction.

Table 5. The regression result on the association between alternative measure of environment-oriented activities and cash flow prediction.

Panel A. H1		
Variables	**Coeff.**	**t-stat.**
Intercept	−0.161	−5.000 ***
TEA	0.004	2.270 **
Control Variables	Included	
Ind Dummy	Included	
Year Dummy	Included	
F−value	28.31 ***	
Adj. R^2	0.158	
Observations	3650	
Panel B. H2		
Variables	**Coeff.**	**t-stat.**
Intercept	−0.159	−4.310 ***
TEA	0.003	1.400
Advertise	−0.264	−0.950
TEA × *Advertise*	0.228	2.620 ***
Control Variables	Included	
Ind Dummy	Included	
Year Dummy	Included	
F−value	26.14 ***	
Adj. R^2	0.188	
Observations	3650	

*, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively. See Table 2 for definitions of other variables.

The coefficient of TEA (Aggregate measure of environment-oriented activities) in panel A was significantly positive at the 5% level with a VIF of 1.343, supporting the first hypothesis. The coefficient of interaction variable between advertising and environment-oriented activities was 0.228 and significant at the 1% level with a VIF of 1.154. Both the results support the hypotheses and are in line with the main findings. We can conclude that investment in intangible assets by firms that are involved in environment-oriented activities leads to superior future cash flow prediction.

5. Conclusions

The main objective of this study was to examine the relationship between firms with environment-oriented activities and forecasting future cash flow. We also tested advertising as a driving force in intangible assets, which affected the relationship.

Our study was distinct from recent research with respect to ESG and advertising. Whereas other studies focused on overall ESG [1,4,13,15,31], we were the first to investigate five different areas of environment-oriented activities related to firms' future sustainability. We also examined the role of advertising. Unlike recent studies [14,32,33], we found that advertising is an effective means to signal firms' involvement in environment-oriented activities, leading to firms' sustainability.

We used regression analysis, using 3650 firm year data in South Korea from 2014 to 2018. For precise analysis, we used five detailed criteria of environment-related activities. Looking at the hypothesis verification results, all the environment-related activities improved future cash flow prediction. If firms advertise their environment-related activities, the more predictable their future cash flow is. Environment-oriented activities are the efforts by firms to relieve their negative impacts on the environment. Predictability holds useful information that reflects a company's inherent value in the capital markets.

Moreover, we found the effect of advertising expenses on the association between environment-oriented activities and future cash flow forecasting. The result shows that environmentally engaged firms enhance firm performance, and advertising mediates this relationship. That is, firms are to release the information that they are participating in environment-oriented activities.

Our study had several contributions. This study was the first study in Korea to analyze the association between subcategorized criteria of environment-oriented activities and future cash flow prediction. Using a more detailed assessment criteria of environment-oriented activities leads to a precise result of each environment-oriented activity.

We also took into account the mediating effect of advertising on the relationship between environment-oriented activities and future cash flow prediction. We inferred that firms can use environment-oriented activities as a strategy for transparent financial reporting.

The second contribution was the precise data provided by KCGS. In most of the studies, the researchers gave numerical scores of environment-oriented activities at their discretion based on the letter grade. Therefore, our study was based on the accurate scores of each environment-oriented activity, yielding a relatively accurate result.

There are theoretical implications in this study. We found a positive relationship between environment-oriented activities and future cash flow predictability, fully supporting the first hypothesis. This result supports Waddock and Graves [26], Ghoul et al. [27], and Deng and Cheng [31] in that firm performances are affected by proactive environmental strategy. Environmental strategy is non-financial information and is not regulated. However, our results help to explain that firms' voluntarily disclosure of environment-related activities informs the level of pro-environment participation in in the industry, leading to competitiveness relative to their peers.

Second, our study was distinct in that we used cash flow prediction to relate to firms' involvement in the environment. Previous studies used accrual-based accounting information, such as the share price [15], tobinQ [1,34], and earnings [35]. However, we used cash flow to predict firms' sustainable existence, and it was first to assess the effectiveness of environment-oriented activities. Predicting cash flow is less subjective than

accruals, resulting in a low possibility of managers' earnings management. In addition, forecasting cash flow is an intuitive way to measure firms' solvency and liquidity from the creditors' perspective.

Third, we found the role of advertising in analyzing environment-oriented activities and future cash flow prediction. Whereas previous studies focused on the effect of intangible assets such as R&D and advertising [35,36], we examined the sole effect of advertising on the relationship between environment-oriented activities and future cash flow predictability. McWilliams et al. [36] classified advertising as either persuasive or informative. Whereas persuasive advertising creates a psychological approach, informative advertising provides information about the focal firm's characteristics and managerial practices. We considered advertising an informational strategy and first measured the effectiveness of advertising as an informative strategy in the relationship between environment-oriented activities and future cash flow.

Our findings had managerial implications. First, investing in environment-oriented activities leads to possible future cash flow [13,14,31]. This encourages managers to continue investing in environment-oriented activities. Therefore, firms can provide stakeholders with the legitimacy of investing in a vast number of environment-oriented activities. The results suggest that managers with better ideas about where to allocate resources to maximize and expand the effects of environmental efforts for sustainable existence can improve future cash flow. Marketing professionals can also customize firms' involvement for more effective communication with stakeholders.

Second, firms can strategically advertise their involvement in environment-oriented activities to enhance sustainable existence. This means that firms need to maximize their communication with their stakeholders to maximize the positive impact of their environment-oriented activities. At the same time, marketing professionals can customize the message that firms are committed to good environmental deeds. Our study provides information on the five different aspects of environment, such as organization, management, strategy, performance, and shareholders. With the results given in this study, marketers have the option to publicize these subcategorized environment plan strategically.

Our study has a limitation in that our sample is based on the firms in South Korea. Due to capital and cultural background, the definition of environment-related activities may differ in other countries. Therefore, it may be challenging to generalize empirical results to other countries. For future study, it would be meaningful to internationally examine and compare the effect of advertising environment-related activities.

In addition, the effect of advertising on environment-oriented activities can be measured in the aspects of customers in the future. Advertising means frequent exposure to customers and it is clear that firms want to acquire a positive reputation. For future study, it would be meaningful to examine whether advertising environment-oriented firms have satisfied customers.

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