

Impacts of Corporate Network Building and Strategic Learning for Environmental Management on Business Performance

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Abstract

This study discovered the effects of strategic learning and network building on a company's environmental management performance. According to the results, the environmental awareness of the company and competition threats within the industry did not significantly affect the establishment of environmental strategy, whereas the consumer's sensitivity to the environment and the environmental regulation of the government did. The environmental awareness of the company and the consumer's sensitivity to the environment were found to greatly impact a company's network building, which is closely related with the utilization of multimedia system and technology. In addition, it was found that the establishment of corporate environmental strategy had a significant effect on network building and strategic learning, but network building did not significantly affect strategic learning, indicating a difference. Finally, corporate strategic learning affected environmental management performance, suggesting an importance in accumulating strategic learning capabilities to increase environmental management performance.

Key Words: Environmental Regulation of Government, Network Building, Strategic Learning, Environmental Management Performance.

I. INTRODUCTION

According to the "Global Risks Report 2020" by the World Economic Forum, experts from various fields mentioned climate change failures, biodiversity losses, and human-induced environmental disasters as the greatest environmental threats [1]. The growing global awareness on environmental issues, is acting as an opportunity to increase consumers' interest in sustainable household items and eco-friendly products, as well as to make society recognize the importance of environmental issues [2]. In 1997 an international treaty, the Kyoto Protocol, was signed to mandate the reduction of greenhouse gas emissions such as carbon dioxide and methane, which were the main factors of global warming. And following this, new technologies to replace existing fossil fuels were developed, alternative energy sources were found, and innovative ideas poured out [3].

Environmental protection and pollution problems have become very important factors for companies when engaging in management activities and have greatly influenced the sustainable development of corporate activities[4]. As well as addressing environmental issues,

contributing to society, and establishing clean and transparent governance structures have also become major aspects and tasks of environmental management. There is a growing social demand which prevents companies from becoming global without being "green". The UN announces the sustainable development goal report annually, and Morgan Stanley Capital International (MSCI), a global investment information provider, annually announces the Environment, Social and Governance (ESG) evaluation. Annually in Korea, the Korea Corporate Governance Service announces the "ESG evaluation of listed companies", and the Ministry of Industry awards the "Government Sustainable Management Award". In particular, the government is pushing for strong policies related to the climate environment and social responsibility investment (SRI) to shift the negative perception that Korea is the largest carbon emitter [5].

Due to increasing interest in the environment, related research is also emerging as a new research area [6], [7]. Recent research is mainly focused on how corporate environmental management activities affect corporate performance [8]. Some studies suggested that the determining factors for environmental management were the motivations of the managers such as their responses

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to environment issues, the degree of environmental policy regulation and their ethical motives [9], [10], [11].

However, previous studies have shown limitations when identifying the factors affecting companies' development following the realization of eco-friendly management. This study aims to find out what the relative influences are on establishing corporate environmental strategy and network building by comparing existing factors, such as the motivational factors of the company's environmental management activities, as well as situational motives of consumers and competitors.

The key to the sustainable growth of a company through eco-friendly efforts is to efficiently combine and learn about the internal and external resources and environments within the company, and to accumulate network management capabilities for cooperative partners [12]. However, previous studies overlook this. Most of the studies related to environmental management imply that the external or internal environmental factors only affect green marketing or environmental management activities and that they are simply a structure for business performance through mediation. This study aims to disclose how to strategically learn to establish internal environmental strategies and build networks with external partners, overlooked in previous studies, to strengthen capabilities and lead to good results. In addition, we used the LISREL statistical methods to ascertain the causal relationships mentioned above theoretical research constructs. The advantages of these data analyses were to perspectives of the provide the as well as validity and reliability of the measurements.

II. THEORETICAL BACKGROUND

2.1. Environmental Management Factors and Establishing Corporate Environmental Strategies

A company's environmental awareness refers to a company recognizing the seriousness of environmental issues and enhancing the need to improve its constitution [13]. Consumers' sensitivity to the environment is about how much consumers value environmentally friendly qualities when choosing a product [14]. The eco-friendliness of a product, such that it does not emit environmental pollutants nor harm the consumer, is important for the consumers' perception of the safety of the product [15]. The threat of competition within the industry refers to the environmental management activities of neighboring companies within the same industry to acquire market opportunities, which act as pressures for a company's growth and survival [16].

The threat of competition within the industry specifically encompasses phenomena such as competitors

of the same industry actively developing eco-friendly products, or a company feeling severe pressure and competition due to the aggressiveness of development [17]. The government's environmental regulation is imposed to set an environmental standard for corporations. This puts pressure on companies to meet these standards and engage in suitable environmental activities that meet regulatory requirements [18]. The establishment of corporate environmental strategy refers to a series of processes in which a company sets specific goals for environmental management and builds a system for environmental management [13]. When a company truly understands the seriousness of environmental issues as well as the necessity for environmental management, it is reflected in the company's management strategy [19]. Corporate activities related to environmental issues are also closely related to consumer interest [20]. Recently, consumers have shown patterns of considering how safe a product is for the environment and how eco-friendly it is when purchasing products [21]. Therefore, as consumers make eco-friendly demands or demand eco-friendly products, it is expected that companies, stimulated to meet these expectations, will carry out the appropriate strategic activities.

When competitiveness within the industry is high, competitors gain advantages and can survive under the pressure through carrying out environmental management activities. Companies which fail to carry out environmental management activities end up in a crisis as they fall behind their competitors, hence why environmental management activities are liked by companies [11]. Recently, most highly competitive industries believed that recycling materials or conducting green marketing activities are of high market value [17]. As well as creating deliberate pressure, companies are expected to find creative strategies to differentiate themselves from others.

The government wants to use regulations, which establish environmental standards, to protect the environment and enforce compliance from companies [6]. However, setting standards for environmental protection plays a role in inducing companies to be more innovative and environment-orientated, consequently serving as a catalyst for environmental innovation [22]. Therefore, companies will strategize to create systems which can both meet government regulations and achieve good results through environmental management activities. Accordingly, we hypothesized the following:

H1-1: The environmental awareness of the company will have a positive(+) effect on the establishment of corporate environmental strategy.

H1-2: The consumer's sensitivity to the environment will have a positive(+) effect on the establishment of corporate environmental strategy.

H1-3: Competition threats within the industry will have a positive(+) effect on the establishment of corporate environmental strategy.

H1-4: The environmental regulation of the government will have a positive(+) effect on the establishment of corporate environmental strategy.

2.2. Environmental Management Factors and Company Network Building

Companies that are aware of the seriousness of environmental issues, choose strategies that can compensate for insufficient resources while fulfilling environmental strategies or programs [23]. And want to create synergistic value during this process [24]. Furthermore, awareness of environmental problems means companies are aware of the need for environmental management, which cannot be done with small corporate resources and capabilities; hence companies voluntarily make the effort to build networks [24]. So, to make up for the lack of financial resources it is expected that companies will obtain information through their networks and gain capability and resources through partnerships.

On the other hand, the greater the consumer's sensitivity to the environment, the more companies will want to know what eco-friendly things consumers require. Companies need to find out what it means for a product to be eco-friendly and to what standard consumers want them. Khanna and Anton (2002) reveal that when establishing environmental management systems, companies are strengthening cooperative relationships with neighboring partners to further reflect the needs of consumers [25]. Therefore, it can be suggested that the sensitivity of consumers is highly correlated with the building of networks with partners.

When a company feels threatened by competing companies within the industry, it intuitively gets a feel for the most threatening factor to the company [17]. In such cases, the company will have to decide whether to minimize the relative weaknesses or to offset the weaknesses with external financial resources. Alternatively, it will choose a strategy to further expand its relative potential strengths. To this end, it is expected that companies will utilize their networks built with partners who can strengthen their capabilities at relatively low costs.

Network building strategies can also be used as voluntary choices for companies to break through various government regulations. Porter et al. (1995) reports that the government's environmental regulation rather

stimulates the creation of new ideas and creative thinking which can help to distinguish inefficient and efficient resources[26]. Therefore, it is predicted that the higher the government regulation, the more companies will identify internal resources they do not have and absorb creative external resources. Accordingly, we hypothesized the following:

H2-1: The environmental awareness of the company will have a positive(+) effect on network building.

H2-2: The consumer's sensitivity to the environment will have a positive(+) effect on network building.

H2-3: Competition threats within the industry will have a positive(+) effect on network building.

H2-4: The environmental regulation of the government will have a positive(+) effect on network building.

2.3. Establishing Corporate Environmental Strategies, Network Building and Environmental Management Performance

Strategic learning is when companies voluntarily focus on future environmental management activities and make efforts to strengthen their capabilities. It also refers to the process of preparing for future situations through preparatory learning for a period. The establishment of corporate environmental strategy is the company's internal plan to accumulate core competencies and lead the competition. Therefore, it is inferred that companies will strategically cultivate new knowledge and abilities through discussions on what parts are insufficient and how environmental changes will develop in the future. And even if the established environmental management strategy is difficult to pursue, if the field is considered profitable, the company becomes immersed in learning [27].

Meanwhile, network building enables long-term communication between companies and partners [28]. In this information age, information has been digitalized and turned to complex-media with diverse information sources. The changes have made it necessary for companies to build multi-media systems based on software as well as hardware technologies in order to connect a lot of digital information to inside and outside network, which leads to two-way communication network building among various partners and interest groups. Based on this long-term communication, companies go through a process of internal absorption and accumulation to strategically transfer new knowledge from their partners [29]. The reason why companies have networks with partners is because of strategic capability building and continuous corporate development, so companies will try to gain as many capabilities and

resources from other parties as possible. In addition, according to many studies, voluntary goals, and efforts to strengthen their capabilities lead to increased sales, cost reduction, and market preoccupation effects [30]. Companies' environmental management activities and the resulting development know-hows become sources of product quality improvement and corporate image improvement, ultimately leading to the creation of products customers want [31]. Specifically, these sources result in new environmental technology development to create products customers want, transformations of disposal facilities, and/or the addition of environmental creativity to product development. In the end, it can be inferred that strategic learning for environmental management activities will strengthen potential internal capabilities and eventually have a positive effect on corporate performance. Accordingly, we hypothesized the following:

- H3: The establishment of corporate environmental strategy will have a positive(+) effect on network building.*
- H4: The establishment of corporate environmental strategy will have a positive(+) effect on strategic learning.*
- H5: Network building will have a positive(+) effect on strategic learning.*
- H6: The company's strategic learning will have a positive(+) effect on the environmental management performance.*

III. RESEARCH METHODOLOGY

3.1. Research Model

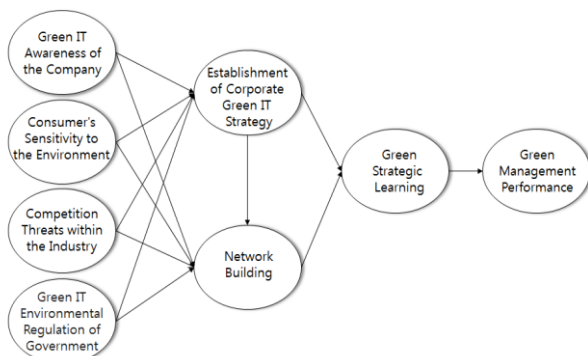


Fig. 1. Research Model.

Figure 1 shows the research model to test the hypotheses. This study verifies the effects of environmental awareness of the company, consumers' sensitivity to the environment, and competition threats within the industry on the establishment of corporate environmental strategy and network building. Subsequently, after verifying the effect of the

establishment of corporate environmental strategy on network building, we intend to verify how these two variables affect strategic learning. In addition, we aim to verify the effect of strategic learning on companies' environmental management performance.

3.2. Sample of the Study and Data Collection

The analysis unit of this study included some companies in Chungcheong Province, Gyeongsang Province, and Jeonnam Province, mainly focusing on Seoul and the Seoul Metropolitan area. In addition, it was mostly targeted at companies located in industrial complexes. Respondents were executives, managers, or technological development management staff who were well aware of their company's circumstances. And to reduce measurement errors, measured the companies' performance based on corporate standards instead of the individual's subjective perception. The survey was limited to one survey per company, and most of the data was collected through surveys conducted in person. Areas or companies that were difficult to visit in person were contacted in advance to ask and data was collected via e-mail or fax. The data collected totalled 183 completed surveys, 9 of which were excluded due to the answers being unfaithful or unusable as data, resulting in a total of 174 responses used for the final analysis.

3.3. Sample Characteristics

The age group of the respondents were: 9 people in their 20s (5.2%), 11 people in their 30s (6.4%), 76 people in their 40s (44.2%), 72 people in their 50s (41.9%), and 4 people in their 60s (2.3%). Considering the respondents were executives, managers, and technological development management staff, it can be indirectly confirmed that their position correlates to the fact that most respondents being of a higher age group. The educational background of the respondents was found to be: 15 people were high school graduates (8.7%), 125 people were college graduates (72.7%), and 32 were either graduate students or had graduated graduate school (18.6%).

As of characteristic of the company, we found that: 108(63.9%) companies had fewer than 50 employees, 21(12.4%) companies had between 50-100 employees, 13(7.7%) companies had between 101-200 employees, 18(10.7%) companies had between 201-300 employees, 2(1.2%) companies had between 301-400 employees, 1(0.6%) company had between 401-500 employees, and 6(3.6%) companies had over 501 employees. Of the 169 companies excluding missing values, the 108 companies which had fewer than 50 employees, can be indirectly seen as smaller companies. In addition, 8 (4.7%)

companies were established in the 60s, 16(9.5%) companies were established in the 70s, 23(13.6%) companies were established in the 80s, 69(40.8%) companies were established in the 90s, and 53(31.4%) companies were established in the 2000s. Companies established after the 90s accounted for 72.2% of the total, indicating that most of them are new small and medium-sized enterprises (SMEs).

3.4. Measurement of Variables

The variables were properly modified for the study. A 5-point Likert-type scale was used to measure the variables, 5 being "Strongly Agree" and 1 being "Strongly Disagree."

Environmental awareness of the company was measured using revised research items of DiMaggio and Powell (1983) in 5 categories: the degree of overall understanding of environmental issues around the company, decisions made regarding environmental management, efforts for environmental management, overall awareness of environmental management, and willingness to practice management based on recognition of the seriousness of environmental problems [18]. Consumers' sensitivity to the environment was measured in 4 categories according to Dresden (1999): the degree of importance of eco-friendliness and safety to consumers when purchasing products, recognition of price increases due to green products, the extent consumers desire green products, and the degree of reliability of green products to consumers [32]. Competition threats within the industry were measured using the research items of Delmas and Toffel (2004), in 4 categories: the aggressiveness of the company's green product development within the industry, the increase in the number of green products in the industry, the intensity of competition for differentiation through environmental management activities, and the overall fierceness of environmental competition [17].

Environmental regulations of the government were measured using research items of Delmas and Toffel(2004), in 4 categories: the overall strictness of the government's environmental regulations, large expenditures spent in accordance with environmental regulations, restrictions on profitable activities due to environmental regulations, and the effect of not complying with environmental regulations on management activities [17]. Establishment of environmental strategies was measured using measurement items of Hunt and Auster (1990), in 4 categories: establishment of sustainable management strategies, establishment of promotional organizations, efforts to establish strategies for sustainable management,

and use of environmental management tools [33]. Network building was measured using revised measurement items of Cui, Griffith and Cavusgil (2005), in 3 categories: conduction of joint research with academia, network building with industry people, and network building with other foreign companies [16].

Strategic learning was measured using the measurement items of Selnes and Sallis (2003), in 5 categories: questioning basic assumptions about the environment and seeking change, establishment of new corporate strategies following knowledge accumulation, implementation of learning activities to change the direction of corporate strategies, establishment and activation of separate learning organizations, and generation of knowledge of new strategies through efforts to share knowledge [34]. Environmental management performance was measured using the measurement items of Selnes and Sallis (2003) and Matsuno, Nentzer, and Ozsomer (2002), in 5 categories: sales increases, building corporate reliability, product loss and processing costs reduction, profit increases, and flexible production results [34], [35].

IV. DATA ANALYSIS

4.1. Data Analysis

4.1.1. Validity and Reliability Test

Confirmatory factory analysis was conducted to guarantee the validity and reliability of variable. The result showed the follow indexes $\chi^2=604.88$ $df=224(p=.00)$, GFI=.92, AGFI=.90, NFI=.94, NNFI=.96, RMR=.058, implying that all variable had convergent and discriminant validity [36].

Testing reliability with Cronbach's coefficients, all the coefficients were within the range of .882~.937. Showing the reliability of the construct variables. In addition, representativeness of the constructs was verified from the composite reliabilities ranging .934~.984 which were higher than the commonly accepted level of .7 [37].

4.1.2. Results of Discriminant Validity Analysis

Discriminant validity was assessed with the analysis of correlation matrix (Φ matrix) that checks the measured difference as among the theoretical different constructs. The results are value of "1" [calculated with correlation \pm (2 \times standard error)] out of range correlative coefficient among all the variables. Other method of testing discriminant validity was employed with average variance extract (AVE). The AVE's value was .852~.935, establishing the reliability at an acceptable level [38].

Table 1. Result of Confirmatory Factor Analyses.

Variables	Standard Factor Loding	Measur- ement error	T-value	Composite Reliability
Environmental Awareness of the Company (α = .894)	.83	.06	13.26***	.984
	.97	.06	17.19***	
	.92	.06	15.60***	
	.79	.06	12.27***	
	.82	.06	13.02***	
Consumer's Sensitivity to the Environment (α = .927)	.92	.06	15.17***	.966
	.94	.06	15.80***	
Competition Threats within the Industry (α = .921)	.90	.06	15.10***	.981
	.95	.06	16.58***	
	.80	.06	12.45***	
	.87	.06	14.31***	
Environmental Regulation of Government (α = .896)	.76	.08	9.17***	.934
	.75	.08	9.08***	
Establishment of Corporate Environmental Strategy (α = .882)	.89	.07	13.60***	.948
	.71	.07	10.16***	
Network Building (α = .895)	.84	.06	13.19***	.964
	.94	.06	15.67***	
Strategic Learning (α = .911)	.78	.07	11.32***	.944
	.55	.07	7.45***	
	.55	.07	7.49***	
Environmental Management Performance (α = .937)	.83	.06	13.31***	.981
	.89	.06	14.77***	
	.94	.06	16.12***	
	.90	.06	14.92***	
Degree of fitness	χ^2 =604.88, df=224(p=.000), GFI=.92, AGFI=.90, NFI=.94, NNFI=.96, RMR=.058			

* Estimated values are statistically significant at the level of .001

4.2. Results of Hypotheses Testing

The analysis of the goodness of fit indexes of the research model showed $\chi^2=588.19$, $df=258$ ($p=.000$), $GFI=.89$, $AGFI=.87$, $NFI=.92$, $CFI=.95$, $RMR=.054$ suggesting the superiority of the research model. The results of the analysis of causal relationships among the variables are shown in Table 2.

Table 2. Result of Analyses on the Research Model.

Hypothesis	Path	Coefficient	Measurement error	t-value
H1-1	Environmental Awareness of the Company -> Establishment of Corporate Environmental Strategy	.03	.07	.45 ^{n/s}
H1-2	Consumer's Sensitivity to the Environment -> Establishment of Corporate Environmental Strategy	.60	.08	7.32***
H1-3	Competition Threats within the Industry -> Establishment of Corporate Environmental Strategy	.06	.08	.85 ^{n/s}
H1-4	Environmental Regulation of Government -> Establishment of Corporate Environmental Strategy	.28	.09	3.27***
H2-1	Environmental Awareness of the Company -> Network Building	.16	.06	2.53**
H2-2	Consumer's Sensitivity to the Environment -> Network Building	.34	.10	3.36***
H2-3	Competition Threats within the Industry -> Network Building	.09	.06	1.38 ^{n/s}
H2-4	Environmental Regulation of Government -> Network Building	.02	.08	.27 ^{n/s}
H3	Establishment of Corporate Environmental Strategy -> Network Building	.58	.13	4.49***
H4	Establishment of Corporate Environmental Strategy -> Strategic Learning	1.00	.19	5.11***
H5	Network Building -> Strategic Learning	.05	.16	.32 ^{n/s}
H6	Strategic Learning -> Environmental Management Performance	.75	.10	7.43***
Degree of fitness	$\chi^2=588.19$, $df=258$ ($p=.000$), $GFI=.89$, $AGFI=.87$, $NFI=.92$, $NNFI=.94$, $CFI=.95$, $RMR=.054$			

1. *: $p<.05$, ***: $p<.001$, 2. Not Supported

V. CONCLUSION AND IMPLICATIONS

5.1. Summary of Findings and Implications

The summary of findings in this study and their implications are as follows:

First, it was found that the consumer's sensitivity to the environment and the government's environmental regulations had significant effects on the establishment of corporate environmental strategies. Among the preceding motivational factors, consumers' sensitivity to the environment had the greatest influence on the establishment of a corporate environmental strategy, because the overall performance of a company depends on the consumers' response. At this point, the government's environmental regulations will not induce passive participation in companies, but the government's rational regulatory activities will induce new perspectives, understanding, and active environmental management activities.

Second, it was found that the environmental awareness of the company and the consumers' sensitivity to the environment had significant effects on network building. As a company's environmental awareness increases, the company's sense of responsibility for the environment grows and builds networks to gain strategic advantages from environmental management activities. As for the companies with limited resources and capabilities, building network voluntarily means a way of efforts to obtain a variety of information from outside partners and interest groups. In particular, the fact that consumers' sensitivity to the environment affects both the establishment of a corporate environmental strategy and network building implies that the final goal of corporate activities is the desire for products consumers want. In the end, it is suggested that companies establish friendly, cooperative relationships with partners to build the capabilities necessary for manufacturing eco-friendly products and environmental management activities.

Third, it was found that the establishment of corporate environmental strategies had a significant effect on both network building and strategic learning. A company establishing an environmental strategy is a basic step for designing how a company should conduct business activities now and in the future regarding environmental management. Therefore, it was confirmed that companies are currently aware of the importance of environmental management activities and are reviewing their strategic planning, network building to strengthen necessary capabilities, and strategic learning to accumulate internal capabilities.

Fourth, it was confirmed that strategic learning had a significant effect on a company's environmental

management performance. This is a result which has not been confirmed in existing studies, proving that overall strategic learning of environmental management activities, which is a process of strengthening a company's capabilities, can be a useful task to increase a company's actual sales and growth share.

5.2. Limitation and implications for future studies

The hypothesis on the causal relationship related to the acquisition of market knowledge was not supported in this study.

A limitation of this study is that it did not consider the different types of industries when choosing target companies for the survey. As part of the government's green growth strategy industry, groups from the alternative energy industry can engage in environmental management activities to strengthen awareness and capacity, which are different from those of the general industry. Also, the degree of importance of environmental management activities for product manufacturing and product disposal may be different for groups from the IT industry to pure manufacturers. So, it is necessary to consider the specific processes for enhancing capabilities through comparative studies classifying corporate groups. In addition, the only means of corporate capability building presented in this study was strategic learning. However, capability building can also be achieved through processes of cooperation between internal departments and sharing information with external partners. Also, strategic learning may also have a series of processes or steps to enhance capabilities. Therefore, it is necessary to provide a multiplicity of business insights to companies through identifying more specific research conceptual frameworks and processes.

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