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How Are a Firm's Strategic Motives for Environmental Innovation Impeded? The Negative Influences of Institutional Pressures

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Abstract: In recent years, firms are intensively being asked to build up the capabilities of dealing with environmental issues. While most firms are proactively inspired by their strategic motives for the environmental innovations, they are also exposed to the external pressures for environmental innovations that are institutionally established. This study is an early attempt to theoretically examine how firms' strategic motives for environmental innovation are affected by the institutional pressures of environmental issues in a single empirical setting. Based on the institutional theory, this study suggests two types of institutional pressures — regulative and normative pressures— and proposes the conflicting effects of the strategic motive and the institutional pressures in the firms' activities concerning environmental innovation. In addition to the test of the interrelated effects of strategic motives and institutional pressures, this study also investigates how small and medium-sized enterprises (SMEs) differ in their efforts to realize the strategic motives for environmental innovation, in contrast to large companies. The Korean Innovation Survey was used to test the proposed hypotheses. The findings of the analysis support all the hypotheses about the negative influences of institutional pressures on the effect of strategic motives on environmental innovation actions. Finally, the theoretical contributions and managerial implications are discussed.

Keywords: environmental innovation; strategic motives; institutional theory; institutional pressures; compliance; Republic of Korea; SMEs

Citation: Ra, K.; Hong, S.; Yang, D. How Are a Firm's Strategic Motives for Environmental Innovation Impeded? The Negative Influences of Institutional Pressures. *Systems* **2023**, *11*, 79. https://doi.org/10.3390/systems11020079

Academic Editors: Varun Gupta, Leandro Ferreira Pereira, Lawrence Peters, Chetna Gupta, Thomas Hanne and Antonio Ferreras

Received: 26 December 2022
Revised: 29 January 2023
Accepted: 2 February 2023
Published: 3 February 2023

1. Introduction

For decades, firms have been increasingly required to respond to external pressures to address societal issues. In addition to the commercial values that have traditionally been pursued for a long time, firms now must deal with "business-in-society issues", which do not simply create opportunities, but entail taking risks in corporate activities [1]. Regarding the social responsibility of business firms, strategy and management scholars have paid particular attention to environmental management practices to address issues such as sustainability (e.g., [2,3]). The scholars in this research spectrum highlight that environmental management is not only as means of responding to social pressures, but is also a distinctive way to bring competitive advantages to the firms in the market.

The idea of environmental innovation has also been emphasized as a managerial practice to effectively carry out environmental management. Environmental innovation refers to the innovation of green products or processes, which involves developing new methods of reducing or treating air emission, recycling or reusing waste, and finding cleaner energy sources, etc. [4,5]. The concept of environmental innovation thus encompasses all innovations that enables a firm to decrease its negative environmental impacts through new products, services, and processes [6]. Environmental innovation is a particularly important topic for both scholars and practitioners because it integrates environmental management practice with innovation, leading to sustainable growth and the survival of the firms. As environmental innovation can prompt effective practices of environmental management,

firms can benefit effectively from environmental innovation by gaining social legitimacy and competitive advantage [7]. Such an aspect of environmental innovation indicates that the firms' pursuit for environmental innovation can be categorized into two different aspects: either the compliance to institutional pressures or strategic motives [8,9]. That is, while some existing studies have emphasized institutional pressures at the main drive for environmental innovations [7,10], other have paid great attention to the strategic motives of the competitive advantages that may be obtained from environmental innovations [11,12].

Given these two distinctive reasons why firms pursue environmental innovation, previous works have focused solely on one single aspect, without considering the other aspect, in terms of the environmental innovation actions. Some scholars argue that firms tend to engage in environmental innovations by reactively responding to the institutional pressures for environmental contributions [7,13], but others emphasize that firms' strategic motive to proactively develop the environmental innovations for market competitiveness tends to function as the main drive [14,15]. Despite the growing scholarly interest in the factors of environmental innovations, little has been reported about how these two different reasons, compliance to institutional pressures and strategic proactivity, may be interrelated in their effects on environmental innovation actions.

To fill in this gap in the recent works, this study attempts to investigate the interrelated effects of the compliance to institutional pressures and the proactive strategic motive on the environmental innovation activities in a single empirical setting. Given that the two different drives for environmental innovation coexist in the era of "business-in-society", it is crucial to examine how a firm's efforts to proactively produce environmental innovation may be influenced by the salient presence of institutional pressures for environmental innovation. Drawing on the existing literature about both the institutional theory and strategic choice theory, this study suggests conflicting effects between the firm's strategic motive for environmental innovation and their response to the institutional pressures on the consequential effectiveness of environmental innovation activities.

In addition to the main arguments, the empirical analysis in this study also attempts to examine how small and medium-sized enterprises (SMEs) would differ in their efforts to realize their strategic motives for environmental innovation by contrasting the efforts of their counterparts, large companies. This study conjectures that there is a structural difference between SMEs and large companies in their capacity to mobilize the resources required for effective environmental innovation, additionally testing this conjecture with the analysis of the interaction effect. As empirical research, this study uses the Korean Innovation Survey 2010: Manufacturing Industry, which specifically aims to collect data regarding firms' environmental innovation activities.

This study is structured as follows. In the following sections, the theoretical groundworks on which the hypotheses are developed are first introduced. Next, three hypotheses, in which the moderating effects of the strategic motive and other factors are theoretically developed, are presented. In the method section and the result section, the findings from our analysis with the KIS 2010 data are reported. Finally, the discussion and conclusion section discusses the contributions of this study, along with the managerial implications, and suggests directions for future studies.

2. Theory and Hypotheses

2.1. Literature Review

Faced with the current environmental issues that have never existed before, firms are given two choices: either they must properly show some reactions to the requests, or they can find some opportunities in the market situations changed by the requests for environmental issues [8,13]. That is, there may be two different strategies to deal with the environmental issues in front of the firms: a "reactive" environmental strategy, in which they show actions that confirm to the requests, and a "proactive" environmental strategy, in which they find ways to gain benefits by taking environmental innovation initiatives [16]. To better understand these strategic choices that a firm may take to deal

with the environmental issues, this study pays attention to two theoretical groundworks: institutional theory [17,18] and strategic choice theory [8,14,15].

This study first pays attention to institutional theory in order to understand the reactive environmental strategies that a firm may choose. According to institutional theory, firms are located in broader external domains, in which various stakeholders ask the firms to accept socially emerging issues that may not be directly relevant to the firms' profit-seeking activities. Once the newly emerging issues are institutionalized in the broader external domains, firms must properly respond to such institutional pressures so that they may obtain legitimacy, through which they may prolong their survival [17]. The current environmental issues are considered as the institutional pressures, so the firms cannot easily avoid the pressures but react to the pressures properly. Even though the institutional pressures derived from environmental issues are not directly related to the economic benefits, compliance with the pressures helps the firms gain social legitimacy, which contributes to their survival.

The significance of institutional pressures has been well emphasized in the environmental management literature. In his book, which refines the concepts of institutions from a view of organization theory, Scott suggested three basic pillars of institutions: regulatory, normative, and cognitive [19]. Among these pillars of institutions, Scott particularly emphasized the roles of regulatory and normative pressures to understand the institutional pressures that may emerge in the external domains, while he considered the remaining cognitive pillar as that which emerges inside [20,21]. Based on this, the institutional theory may be understood as a relatively deterministic view that underscores external forces, such as environmental norms, to explain organizational actions [14,15].

Regulatory pressures usually stem from governmental policies, such as regulations or incentives [17,19]. Compliance with regulatory pressures is triggered because it is very costly for firms to resist to the regulations enforced by governmental authorities. Furthermore, conforming to the rules and policies imposed by the governmental institutions enables the firms to obtain legitimacy, which significantly reduces the costs related to governmental pressures. Recent studies examining firms' environmental management highlight that regulatory pressures, derived from governmental regulations, concerning the environment have a great impact on adopting environmental management [21–23]. For example, Farrukh et al. showed that the environmental regulation enforced by the government effectively forced firms to adapt the environmental practices in their efforts to enhance the environmental innovation in the EU, New Zealand, and Pakistan [22]. Although regulatory pressure forces the firms to reactively engage in environmental issues at the beginning, it also drives the firms to undertake initiatives in environmental innovation [24].

Normative pressures stem from professional organizations or other social focal actors, who define the appropriate behaviors and standards for the group members [20]. In this case, firms usually seek legitimacy by behaving congruently with other firms or organizations in the industry [7]. Whereas regulatory pressures involve relatively more direct sanctions or incentives from the government, normative pressures usually involve social values and norms in the given institutional field [20]. Normative pressures also involve the firms in the environmental innovation. Given the circumstances that environmental issues have entered almost every business sector to a significant extent, firms are now given sufficient reasons why they must engage in compliance with the socially emerging norms concerning environmental issues.

With such motivations to conform to the social norms, firms tend to turn their attentions to the external social actors, such as environmental non-governmental organizations (NGOs) functioning as the main entities to introduce standards about environmental protection [7,25]. By voluntarily abiding by the norms established by the non-governmental institutions, firms can possibly show their willingness to follow the social norms in terms of environmental concerns, consequently expecting to gain the legitimacy that they may not gain by only complying with the regulatory rules. Recent studies about environmental innovations clearly point out that normative pressures also function as the collective ex-

pectations from environmental innovations in the same business sectors, leading firms to adapt environmental practices [21–23]. From the normative perspective of environmental practices, Marcus and Fremeth emphasized that if a firm considers environmental innovations, the social expectations of environmental practices must be prioritized no matter what [26].

The next theoretical viewpoint to which this study first pays attention is the strategic choice perspective, which we utilize to understand how and why a firm may choose proactive environmental strategies. Rather than reactively responding to the institutional pressures concerning environmental innovation, firms may also consider the currently emerging calls for environmental management as competitive opportunities, so they choose environmental innovation as their strategic choice by themselves [14,15]. A proactive environmental strategy involves the development of competitively valuable organizational capabilities [8].

According to the strategic choice perspective, firms are willing to choose environmental innovation as their main strategic choice because they perceive environmental breakthroughs as opportunities by which they can achieve differentiation from the competitors [14,15]. That is, strategic motives for environmental innovation are clearly distinguished from the previously argued institutional pressures because the strategic motives for environmental innovation are strategically chosen as a means to proactively deal with the external issues. In this study, strategic motives for environmental innovation refers to the proactive strategic motives to create financial benefits or competitive advantages from the practices of environmental management. The strategic motive for environmental innovation also appears as strategic proactivity, by which a firm takes entrepreneurial positions in a market, actively introducing environmentally innovative products to the market [13]. Rather than reactively responding the external pressures, firms with proactive and voluntary environmental strategies would grasp the market opportunities presented by the requests for environmental management.

The existing literature about environmental management emphasizes that strategic choice theory is a well-received theoretical background to understand the strategic motives for environmental innovations (e.g., [27–30]). A consistent point in the literature is that many proof-seeking firms do not regard the environmental requests simply as an external pressure, but strategically attempt to transform the requests into their competencies. To them, environmental innovation is a valuable chance to generate competitive advantages through which they may reap economic benefits. For example, a main benefit of environmental actions that a firm can expect is differentiation. Differentiation from other competitors by proactively taking environmental actions enables the firms to build new competitive advantages in the market [2,31]. As Azzone and Bertele point out, green customers have risen as one of the leading market forces to decide which firms take market initiatives in terms of environmental management [32]. "Demand pull hypothesis", suggested by Horbach, particularly underscores the market demand for environmentally differentiated products as one of the main determinants of environmental innovation [6]. Firms' strategic motives for environmental innovations are highly correlated with the strongly emerging customers' focus on the environmental innovation in products [28]. Thus, in addition to the institutional pressures, strategic motives are also a crucial factor to drive firms to focus on environmental innovation [33–35].

Table 1 summarizes the two streams of the literature about why a firm attempts to take environmental innovation actions, on which the hypotheses of this study are developed in the following section.

Table 1. Summary of theoretical groundworks for environmental innovation.

Aspects	**Motivations of Environmental Innovation**	
Strategic positions	Reactive strategy	Proactive strategy
Theoretical foundations	Institutional theory [17–19]	Strategic choice theory [8,14,15]
Main forces	Regulations and Social norms	Market demands
Objectives	Social legitimacy	Competitive advantages
Recent studies	[21–23]	[33–35]

2.2. Hypotheses

2.2.1. Strategic Motives for Environmental Innovation and Institutional Compliance

Although both strategic motives and institutional pressures could independently lead to environmental actions, we expect that those two factors interdependently affect each other in the process of strategy implementation. We define regulatory compliance as a firm's compliance with regulatory pressures related to environmental innovation. Despite the importance of strategic motive, this motive does not always appeal to the firms [29]. Institutional theorists have been aware of the potential conflicts between interest-driven behavior and institutional change [36]. As Berrone et al. highlight, institutional theory does not stress the effects of efficiency issues or strategic choices on a firm's performance, because financial consideration is not the main purpose of compliant management practices [7]. Hence, firms with institutional compliance motives engage in environmental management practices to gain legitimacy, rather than for strategic purposes, such as pursuing competitive advantages and reacting the market demands. Therefore, we expect that, even though compliance with institutional pressures does lead to more environmental innovation, the underlying nature of it is different from strategic motives. Accordingly, firms might experience inefficiency when different motives underlie actions for the environmental innovation because of dispersed focus. This argument indicates that these two different motives could cause conflicts in the process of implementing environmental innovation. The different logics of isomorphism and differentiation can also explain the potential conflicts. Institutional pressures result in isomorphism, whereas strategic motive is intended to bring competitive advantages that differentiates the firm from others. Therefore, although these two motives could be pursued together, we expect that they create conflicts in the strategic decision-making process for environmental innovation.

Hypothesis 1. *Compliance with regulatory pressures on environmental innovation weakens the positive association between the strategic motives for environmental innovation and the environmental innovation actions.*

As another type of institutional pressure, normative pressure also creates isomorphism behavior in firms [17]. Compliance with normative pressures can also potentially cause conflicts with strategic motive because strategic motive is a relatively autonomous motive. Among the various normative pressures, we focus on industry norms in this context. Normative pressures could stem from the norms among the members in the same industry [7]. These pressures trigger compliance behavior in companies who aim for social legitimization. It is similar to regulatory pressure in a broad sense, but clearly different in that it deals with social norms rather than direct regulations. Thus, also as one of the main pillars of institutional forces, we expect that normative pressures can weaken the strategic motive as seeking profitability could be hindered by accommodating the norms of the industry, rather than strategically seeking competitive advantages in the market.

Hypothesis 2. *Compliance with normative pressures on environmental innovation weakens the positive association between the strategic motives for environmental innovation and the environmental innovation actions.*

2.2.2. Strategic Motive for Environmental Innovation and SMEs

In addition to motives regarding institutional compliance, we argue that the company type, in terms of size, could affect the influence of strategic motive on environmental innovation. Small businesses are usually distinguished from large enterprises, not simply by its number of employees, but also by such criteria as sales, assets, market share, and ownership structure. It is generally considered that it is more difficult for SMEs to engage in environmental management because they are less likely to achieve financial benefits from environmental innovation. SMEs have fewer resources and capabilities than large enterprises, with less voluntary financial incentives regarding environmental management [37]. Thus, we expect that SMEs' strategic motives for environmental innovation will turn into actual environmental actions less frequently than large enterprises. Accordingly, there might be different social expectations regarding these companies. Thus, company type, according to size, could represent the complex characteristics, both in terms of social and economic aspects, that can restrict proactive motives regarding environmental innovation actions.

Hypothesis 3. *The positive association between the strategic motives for environmental innovation and the environmental innovation actions is weaker for SMEs than for large companies.*

3. Methods

3.1. Data

The "Korean Innovation Survey (KIS) 2010: Manufacturing Industry" was used as the primary data source to test the hypotheses [38]. This is a biannual national survey conducted by the Science and Technology Policy Institute (STEPI), a representative research institute run by the Korean government in Seoul, Korea. The survey design of the KIS is developed mainly based on the European Statistical Office (EUROSTAT)'s "Community Innovation Survey (CIS)", which systematically follows the guideline of the Organization for Economic Cooperation and Development (OECD)'s Oslo Manual. As the CIS is uses as an official data source for the European Union (EU) to shape the policies regarding companies' innovation activities, the KIS is also used by the Korean government as a crucial data source to formulate its national policies supporting the innovation-related activities of Korean companies. Due to the reliable features of the KIS, a growing number of recent studies investigating innovation-related studies have used it as an important empirical data source [37,39–42].

Among the KIS datasets that have been biannually collected by the STEPI since 1996, the KIS 2010 data is very special and valuable for the studies aiming to examine companies' environmental innovations because it specifically includes a special section for green and environmental innovations [39]. Therefore, while one may raise a recency problem of using the KIS 2010 dataset, it is still the most suitable among the KIS datasets for testing the hypotheses concerning companies' environmental innovations. For this reason, it has been chosen as the empirical dataset in recent studies about environmental innovations despite the concerns about the data recency problems (e.g., [37,39,40]). Therefore, in this study, the KIS 2010 was chosen among the KIS datasets that have been accumulated up to the present, as it also investigates some factors that may influence companies' environmental innovation activities. The number of sample companies in the original KIS 2010 dataset is 3925. After excluding 378 companies that had some missing values, the number of observations used in our analysis was 3547.

3.2. Variables

3.2.1. Dependent Variable

Our dependent variable is environmental innovation action at the firm level. To measure the dependent variable, we used the KIS 2010 question, "During the three years 2007 to 2009, did your enterprise introduce an innovation with any of the following environmental benefits?" The categories provided under this question are as follows: (1) Reduced material use per unit of output; (2) Reduced energy use per unit of output; (3) Reduced

CO2 'footprint' (total CO2 production); (4) Replaced materials with less polluting or hazardous substitutes; (5) Reduced soil, water, noise, or air pollution in the production stage; (6) Recycled waste, water, or materials; (7) Reduced energy use by the end user; (8) Reduced air, water, soil or noise pollution by the end user; and (9) Improved recycling of product after use. We constructed our dependent variable as a count variable that ranges between 0 and 9.

3.2.2. Independent Variable

To measure our independent variable, strategic motive, we used the KIS 2010 questions, "During the past three years 2007 to 2009, was the response to current or expected market demand from customers one of the motivations that your enterprise to pursue environmental innovations?" We used this question to identify whether the firm builds its strategic motive aiming for environmental innovation because the strategic motive related to market demand can serve as a salient exemplary motive of this kind. Based on the response "yes" or "no", we constructed a binary variable that indicates whether a firm has established its strategic motive particularly for environmental innovations.

3.2.3. Moderating Variables

Regulatory compliance. To measure regulatory compliance, we used the KIS 2010 questions that asks for the reasons why the respondent firm was engaged in environmental innovation activities. Among the specific categories given under this question, we considered the following three categories as the firm's compliance to regulatory pressures: (a) to respond to existing environmental regulations or taxes on pollution; (b) to respond to environmental regulations or taxes expected to be introduced in the future; and (c) to access to availability of government grants, subsidies or other financial incentives for environmental innovation. Based on the responses, we constructed the regulatory compliance variable as a count variable that ranges between 0 and 3.

Normative compliance. As mentioned above, a firm's normative compliance is to deal with the pressures that stem from social norms prevailing in the industry. We consider that the respondent firm is engaged in normative compliance when it positively responded to the KIS 2010 question asking whether the firm attempts an environmental innovation because the firm considers it as "voluntary codes or agreements for environmental good practice within the sector". Based on the responses, we constructed this variable as a binary variable.

Small and medium-sized Enterprises (SMEs). To measure whether the respondent firms are classified as a small and medium-sized enterprise, we constructed a binary variable indicating that the firm is officially classified as an SME based on the Korean legal system. In the Korean legal system, the Small and Medium Enterprises Promotion Act is currently enforced, and the legal standards specifying what constitutes SMEs are based on their total assets and average sales over the last three years. To be officially registered as a SME in Korea, the total assets must not exceed KRW 500 billion and the standards of the three-year average sales vary between KRW 80 billion and 150 billion, according to the industry category. The SMEs in our sample are identified based on this legal rule, and approximately 79% of the firms were identified as SMEs. That is, the measurement of SMEs in this study is clearly distinguished from that which is based on the firm size based on the number of employees, which we included as a control variable.

3.2.4. Control Variables

We controlled for other factors that may affect a firm's environmental innovation actions in our analysis. First, firm size was included as the total number of employees [37,42–45]. To relieve the skewedness problem, we used the logarithm of the number of employees. Second, firm age was included in the analysis as elapsed years from the year of foundation, based on the literature [7,37,41,42]. Third, annual sales were included as the logarithm of the average annual sales between 2007 and 2009. Forth, we included the industry dummies

by considering the fact that the extent to which a firm achieves product innovation may vary in different industrial contexts. According to the Korean Standard Industry Code (KSIC), we included 24 industry dummy variables, based on the 2-digit KSIC categories (KSIC 11 to 34). Finally, we controlled for the geographical location of the firm by considering whether the firm is located in a metropolitan area [37,41,42]. We did so because, in Korea, the metropolitan areas, including Seoul, Gyeonggi, and Incheon, are usually considered to be advantageous for firms, with an abundance of economic resources and high quality human resources. Therefore, we constructed a binary variable indicating whether the firm is located in a metropolitan area.

3.3. Model Specification

To test the hypotheses, we employed negative binomial regression because the dependent variable 'environmental innovation action' is a count variable that takes only non-negative integer values with a variance much greater than the mean. When such overdispersion exists, negative binomial regression is considered appropriate compared with OLS regression or Poisson regressions [45,46].

4. Results

Table 2 presents the descriptive statistics and correlations for the variables in our analysis. The correlation coefficients between the independent variables and the dependent variable are positive and high, which is interpreted to mean that both strategic motives and institutional pressures lead to the environmental innovation action, as expected in the earlier sections. However, because some correlation coefficients between the variables included in the models are high, we performed a variance inflation factor (VIF) test to investigate whether there were serious multicollinearity problems. The VIF scores for each variables range between 1.03 and 6.97, all of which fell below the threshold of serious multicollinearity (typically 10) [47].

Table 2. Descriptive statistics and correlations.

Variables	Mean	S.D.	1.	2.	3.	4.	5.	6.	7.	8.
1. Environmental innovation actions	1.92	2.83								
2. Strategic motives	0.24	0.43	0.55							
3. Regulatory compliance	0.31	0.60	0.53	0.17						
4. Normative compliance	0.13	0.33	0.38	0.20	0.11					
5. SMEs	0.89	0.31	−0.30	−0.18	−0.19	−0.12				
6. Firm age	2.65	0.67	0.17	0.11	0.15	0.05	−0.33			
7. Firm size	4.03	1.36	0.33	0.22	0.23	0.16	−0.63	0.44		
8. Firm sales	9.33	1.89	0.35	0.23	0.24	0.17	−0.62	0.45	0.88	
9. Metropolitan area	0.52	0.50	0.02	0.02	0.02	−0.01	−0.02	0.08	−0.03	−0.01

Notes: N = 3547; industry dummies are not reported due to the space limitations.

Table 3 presents the results of the negative binomial regression analysis. Model 1 shows the base line model, which only includes the control variables and the strategic motive, which is the main independent variable. The findings in Model 1 demonstrate that there is a strong and positive association between the strategic motive for environmental innovation and the environmental innovation actions, as expected in the Section 2.2.

In Model 2, the regulatory compliance and the interaction terms of the strategic motive and the regulatory compliance were added to test Hypothesis 1. As the coefficient of the interaction term is negative at a significant level ($p < 0.001$), Hypothesis 1 supported the idea that the positive association between the strategic motive and the environmental innovation actions are likely to be weakened when the firm is under more regulatory pressures. To test Hypothesis 2, Model 3 added the normative compliance variable and its interaction term with the strategic motive to the base line model. As the findings show, the coefficient of the interaction term between the strategic motive and the normative compliance is negative

and significant ($p < 0.001$). That is, the prediction that the positive association between the strategic motive and the environmental innovation actions tends to be weakened if a firm shows more compliance to normative pressures is confirmed by the analysis.

Table 3. Results of Negative binomial regression analysis (dependent variable = environmental innovation action).

Variables	Model 1	Model 2	Model 3	Model 4
Firm age	0.0114	−0.0569	0.0737	0.161 ***
	(0.25)	(−1.51)	(1.76)	(3.87)
Firm size	0.0737	0.0383	0.105 *	
	(1.59)	(1.00)	(2.42)	
Firm sales	0.138 ***	0.0931 ***	0.0887 **	
	(4.17)	(3.38)	(2.87)	
Metropolitan area	0.0147	−0.0864	0.0559	0.0167
	(0.26)	(−1.87)	(1.07)	(0.30)
Strategic motives	1.408 ***	2.329 ***	1.723 ***	0.801 ***
	(24.42)	(40.21)	(29.24)	(5.65)
Regulatory compliance		1.703 ***		
		(34.47)		
(Strategic motives) X (Regulatory compliance)		−1.567 ***		
		(−23.58)		
Normative compliance			1.681 ***	
			(19.58)	
(Strategic motives) X (Normative compliance)			−1.630 ***	
			(−12.72)	
SMEs				−0.915 ***
				(−8.33)
(Strategic motives) X (SME)				0.781 ***
				(5.03)
Psuedo-R^2	0.073	0.184	0.107	0.070

Notes: $N = 3547$; industry dummies are not reported due to the space limitations; Model 4 excludes firm size and firm sales because of multicollinearity issue.; t statistics in parentheses; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

In Model 4, the SME variable and the interaction term of the SME and environmental innovation action were added to test Hypothesis 3. In this model, two control variables, firm size and firm sales, which are systematically correlated with the SME variable by definition of a SME, were excluded because these control variables may cause multicollinearity problems. Contrary to our prediction, the findings show that the positive association between the strategic motives and the environmental innovation actions tends to be strengthened for SMEs, as the coefficient of the interaction term is positive and significant ($p < 0.001$). Figure 1 presents the visual illustration of the moderating effects of SMEs on the positive association between the strategic motive for environmental innovation and the environmental innovation actions. The slope of the solid line (SMEs) is steeper than that of the dashed line (larger companies), which shows that the moderating effect of SMEs is stronger than large companies.

This finding may be interpreted in two possible ways. First, large companies may be more sensitive to institutional pressures than SMEs, therefore showing a tendency to pay less attention to the strategic motives for environmental innovation as a main force for the actions of environmental strategies. In particular, such a finding can be more understandable when considering South Korea's specific context. In a highly collectivistic society, such as South Korea, large companies, such as Chaebols, are exposed to greater social pressures. Various stakeholders in the social domains ask large companies to take a leading role in doing the right thing, which constitutes "moral legitimacy", to which large companies are more vulnerable [48]. Thus, large companies in South Korea tend to be more concerned with the issue of repetitional crisis and public visibility, and coping with external pressures is prioritized over strategic motives in terms of environmental issues [49,50]. In this regard, contrary to the larger companies, SMEs seem to have less problems with institutional

pressures, so they can focus on the internal motives for environmental innovation more effectively [51].

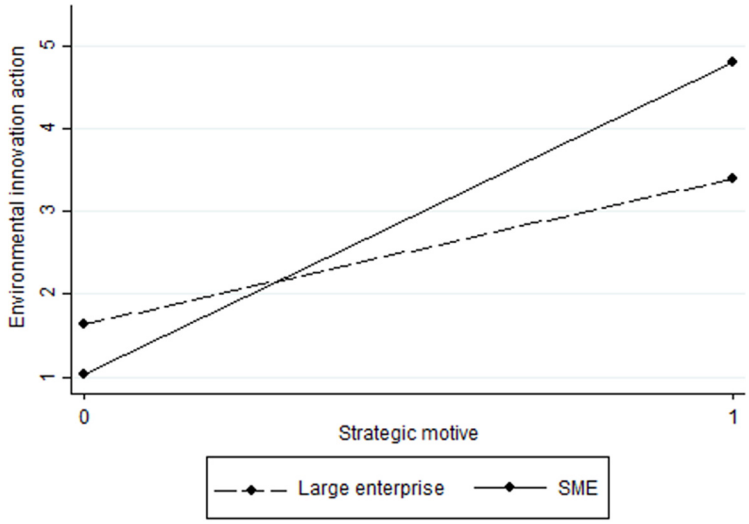

Figure 1. Moderating effects of company type by size.

Next, it seems that SMEs are more flexible to proactively implement the strategic plans to pursue the environmental breakthroughs in terms of their organizational structure. SMEs are known to be quicker to react to the rapidly changing business environment, and such structural features of SMEs also enable them to realize their strategic plans for environmental innovations [13]. It is noteworthy that even though SMEs may have disadvantages in utilizing their slack resources to effectively react to environmental requests, this condition of limited resources paradoxically enables a more effective response, particularly in terms of environmental innovation [52,53]. That is, given the rapidly emerging requests to deal with environmental issues, SMEs may have more compelling reasons to implement proactive environmental strategies than their counterparts.

5. Discussion and Conclusions

Multiple reasons exist when firms take action regarding environmental innovation, which can be an effective method of environmental management practice. In particular, those reasons include compliance with institutional pressures, aiming towards a gain in social legitimacy, and strategic motives, by which the firms seek competitive advantages. While the existing literature highlights how each reason works for environmental innovation, we focused on how institutional pressures and strategic motives affect each other in the decision-making process for actual action. In this study, we proposed that potential conflicts might exist among the reasons why firms aim for environmental innovation action, particularly between strategic motives and compliance with institutional pressures. Moreover, we argued that the strength of the strategic motives will be stronger for SMEs than for larger enterprises.

5.1. Contributions and Practical Implications

This study contributes to the literature of environmental innovations as it proposes a new viewpoint to understand the reasons why firms pursue environmental innovation practices. By exploring the potential interrelated effects of the externally imposed institutional pressures and the internally developed strategic motives in a single empirical setting, this study shows that rather than generating synergetic effects, a firm's efforts to simultaneously address the external pressures and the internal motives may generate unexpected conflicting effects. Furthermore, this study also points out that in the efforts to realize strategic motives for environmental innovation, SMEs are clearly distinguished from large companies.

This study also makes some theoretical contributions to the strategic management literature. It highlights that firms' efforts to incorporate multiple requests for environmental issues, that may arise both externally and internally, would not be very effective. The findings of this study suggest that the potentially conflicting features of institutional pressures and strategic motives for environmental innovation may hinder the effectiveness of environmental innovation actions if the firms fail to differentiate their environmental strategies in the implementing processes. As the ambiguous implementation of strategies to obtain social legitimacy along with strategies to enhance their competitive advantages tend to hinder firms from achieving the effectiveness of environmental innovation actions, the findings suggest that there must be a structural or timely distinctive strategic plan for addressing environmental issues.

Finally, this study provides meaningful insights for the environmental strategies of small and medium-sized enterprises (SMEs). The findings of this study show that a clear difference exists between SMEs and large companies in terms of their efforts to transform strategic motives for environmental innovation into concrete actions. Due to the fact that SMEs have different structures and different sets of resources from large companies, the motivations and strategic actions to proactively engage in environmental practices also differ. Therefore, the theoretical and managerial focuses should be distinctively made for the research area of SMEs' environmental strategies.

Based on the findings, this study also provides some crucial managerial implications for managers and policymakers who aim for environmental innovations. Practitioners should be advised that, while the firms are exposed to institutional pressures about environmental issues, such as legally imposed regulations or socially emerging norms, the simple reaction to such pressures must not be the main reason for their environmental actions if their firms really pursue the realization of their strategic motives for environmental innovation.

By paying attention to the conflicting effects that may be present between institutional pressures and strategic motives, the practitioners may design separate departments or units to respond to the external pressures and to develop environmental strategies through which environmental competencies can be guaranteed. Similarly, efforts to incorporate the external and internal motivations for environmental practices may be more effective if they are strategically spread over a long-term period, so that the conflicting effects can be minimized in the strategy implementation if they pay attention to the findings of this study.

This study also provides a slightly different perspective on environmental management practices of SMEs. While the relatively incompetent features of SMEs in the environmental innovations have been discussed, the finding of this study suggest that if SMEs build clear strategic motives for environmental innovation, they may be able to realize the motives more effectively than large companies. That is, under certain conditions, SMEs may find it easier to expand their capacities for environmental innovations.

5.2. Limitations and Direction for Future Studies

While this study makes several contributions to the literature, in terms of both theoretical improvements and practical implications, this paper also has some limitations, as many empirical studies do. The primary limitation of this study is in its methodology. The methodological limitations are mostly derived from the data used in the study. While the Korean Innovation Survey is certainly a reliable data source, from which governmental polices concerning innovation are developed, the cross-sectional features of the survey are an obstacle in predicting casual relationships between the independent and dependent variables. Therefore, using this cross-sectional data, this study has a limitation as it had to make any causal predictions methodologically. To overcome such a problem, it will be much more effective if future studies design a longitudinal data collection over a sufficient time period. Another limitation is that the survey is, by nature, based on self-reporting; therefore, some responses may be influenced by subjective or inaccurate information. Although many studies concerning firms' innovation activities have used survey data, and most innovation-related variables are collected from survey methods, objective measures

of innovation-related variables from systematically archived data are recommended in future studies.

The use of established secondary data in analysis guarantees the reliability of the analysis, but more nuanced aspects of environmental innovations are hard to include in a study. The institutional pressures may take more nuanced forms than those used in this study; therefore, in future studies, it is highly recommended to capture broader forms of institutional pressures, not only by methodological refinements, but also by contextual and timely relevant aspects of the changing environments. For example, the environmental regulations become more complex and broader in terms of the geographical scopes and the socio-economic contexts. Furthermore, the worldwide consensus regarding environmental issues is rapidly evolving to spread into realms that have never been included before. Under such expanding features of the global understanding of environmental issues, the strategies that firms may use are also rapidly being diversified. Future studies concerning firms' environmental innovation actions are recommended to include more comprehensive features in detail.

Author Contributions: Conceptualization, K.R. and D.Y.; methodology, K.R.; formal analysis, K.R., S.H. and D.Y.; writing—original draft preparation, K.R.; writing—review and editing, S.H. and D.Y.; supervision, D.Y. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Data Availability Statement: Korean Innovation Survey 2020: Manufacturing Industry can be obtained on request at https://www.stepi.re.kr/kis/service/sub02_data_application.do (accessed on 20 January 2023).

Conflicts of Interest: The authors declare no conflict of interest.

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