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Firms' environmental management activities, organizational capability and performance:

An evidence from firms manufacturing and exporting goods

기업의 환경관리 활동, 조직능력 및 성과 간 관계: 제조수출기업을 중심으로

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목 차

Abstract

This article investigates the impacts of firms' regulatory compliance and voluntary innovation activities in environmental management on the development of their organizational capabilities and the enhancement of their performance, within the Korean context. The study invokes a structural equation analysis. The results indicate that voluntary innovation activity in response to market pressures makes a significant contribution to the development of firm-specific organizational capability and the enhancement of firms' performance, but regulatory compliance activity does not significantly affect either organizational capability or performance. This capability was also seen to have implications for firm's performance. This article also suggests several policy implications related to the research.

Key words : Regulatory compliance activity, voluntary innovation activity, organizational green capability, performance

Ⅰ. Introduction

The various environmental pressures exerted on firms spring from both institutional and task environments(Oliver, 1997). Institutional environments require organizations to seek legitimacy and social approval by complying with institutional rules and norms(DiMaggio, 1988; Zucker, 1987). According to several studies(e.g., Delmas and Toffel, 2004 Henrique and Sadorsky, 1996 Lindell and Karagozoglu, 2001; Oliver, 1977; Del Río González, 2005), from the perspective of an institutional environment, the entity that has had a great deal of influence on firms' environmental management activities is government, which promulgates and enforces regulations. The perception of pressures from governments does not usually depend on the predisposition of managers; instead, such pressures are directly communicated to the industry and translated into unavoidable guidelines and requirements in the form of directives and laws that firms have no choice but to implement(González-Benito and González-Benito, 2008), which is a form of coercive pressure. From the perspective of a task environment, organizations are assumed to be motivated by economic considerations(Scott, 1992). Environmental concerns, as a social issue, are somewhat unique in terms of how strongly they appear to be manifested in the marketplace, which means that environmental issues correlate strongly with great potential profits for firms. If such firms are to survive and grow, their business must depend on creating and improving economic performance by focusing on environmentally-friendly activities and responding to pressures from the served market. As mentioned above, the two types of environments impose fundamentally different and potentially opposing requirements on the organization(Zucker, 1987). There is a conceptual distinction between the institutional and task environment that impose these two types of requirements on organizations(Scott and Meyer, 1983). Firms actually operate, however, in environmental contexts that impose both institutional and task environment pressures on them simultaneously, because few environments are purely competitive or exclusively institutionalized(Powell, 1992).

Many studies have defined firms' management strategies regarding the natural environment as patterns based on combinations of different practices and have assumed that firms conduct only one type of environmental strategy at any given point in time(e.g., Aragón-Correa, 1998; Henriques and Sardorsky, 1996; Room, 1992). This means that a firm conducts not merely one of

the two aforementioned activities, but one of various modes based on a combination of the two activities, such as a tendency toward compliance or prevention mode in environmental management(Russo and Fouts, 1997). Some empirical evidences from the existing literatures, such as Céspedes-Lorente et al.(2003) and Aragón-Correa(1998), support this conceptualization that firms tend toward the regulatory compliance mode or the voluntary innovation mode, which means firms actually conduct regulatory compliance and voluntary innovation activity simultaneously.

Notwithstanding the situation in which firms commonly conduct these two activities to meet the green challenge of regulatory and market pressures, no studies have yet tried to investigate the effects of the two activities on organizational capabilities and firm performance. The aim of this article is to analyze empirically the impacts of firms' regulatory compliance and voluntary innovation activity on the development of their organizational capabilities and the enhancement of their performance in the Korean context. We first present hypotheses that suggest a specific relationship among firms' regulatory compliance, voluntary innovation activity, organizational capability, and performance, based on a review of relevant literature. We then describe the research methodology of the empirical analysis, present the results, and finally discuss those results and my main conclusions.

Ⅱ. Theoretical framework and hypotheses

1. Regulatory compliance activity

Institutional sectors are characterized by the requirements to which individual organizations have to conform if they are to receive legitimacy from their environment(Scott and Meyer, 1983). In this case, legitimacy, according to Suchman(1995), is described as "a generalized perception or assumption that the actions of an entity are desirable, proper, or appropriate within some socially constructed systems of norms, values, beliefs, and definition." The requirements of the institutional environment specify the organizational activities that are publicly or collectively viewed as appropriate or socially acceptable, which may influence firms' managerial interpretation(DiMaggio and Powell, 1983), goals, and performance(Pfeffer and Salansik, 1978).

Environmental regulation by government, as a representative institutional pressure, is usually considered by empirical studies to be the most important factor in the encouragement of firms' environmental activities(Del Río González, 2005). Legislation, in general, authorizes agencies to promulgate and enforce regulations, and is a form of coercive power(Delmas and Toffel, 2004). To regulatory authorities, the protection of society from environmental damage caused by firms' and industries' activities is a matter of concern. In this context, regulatory agencies act as a coercive force by sending a clear signal of their endorsement of environmental practice, and facilitate adoption by reducing information and search costs linked to the adoption of the standard by providing technical assistance(Delmas, 2002). Recognizing its primal importance, many researchers have subsequently studied the influence of enforced legislation and regulations on firms' environmental practice(e.g., Delmas and Toffel, 2004; Schwartz, 2009). According to Porter and Van der Linde(1995), firms' compliance with properly designed environmental standards can contribute to the enhancement of their performance. Properly designed environmental standards can trigger innovations that lower the total cost of a product or improve its value. Such innovations allow companies to use a range of inputs more productively－from raw materials to energy to labor－thus offsetting the costs of improving environmental impact and ending the stalemate. Ultimately, this enhanced resource productivity makes companies more competitive, not less. This means that environmental regulations need to be innovation-friendly.

However, environmental regulations in most countries around the world seem not to be innovation-friendly. Notwithstanding the situations in which US corporations appear to concentrate on pollution prevention, significant cost advantages can be achieved at the production stage(Hart, 1995). Yet, the US regulations did not give companies enough opportunities to explore their creativity through innovation(Shrivastava, 1995). US managers found that regulations gave firms little flexibility to adapt products and process technologies, provided little incentive for innovative measures, and did not allow for risk-taking and experimentation in the complying process(Lindell and Karagozoglu, 2001). From this perspective, environmental regulation by governments cannot encourage firms to carry out innovative activities at all stages of the value chain. Environmental regulation in Korea also appears not to be innovation-friendly because the Korean government's environmental policies have largely relied on command and control measures(such as emission standards focusing on end-of-pipe solutions) with only a small number of economic incentive

instruments(such as pollution taxes or charges). This designed regulatory system discourages risk-taking and experimentation(Porter and Van der Linde, 1995). Regulatory certainty can help to ensure that environmental management becomes more integrated into long-term business strategies(Revell et al., 2010). For instance, if the government's new climate change bill has outlined binding fifteen-year carbon budgets in order to reach its carbon reduction target, this gives a clear indication of future public policy and thus gives business the certitude it needs to make consistent environmental investments. Nevertheless, as Drake et al.(2004) highlight, "environmental legislation does not guarantee subsequent innovation." Liability exposure and the government's inflexibility in enforcement, among other things, contribute to the problem(Porter and Van der Linde, 1995). For example, a company that innovates and achieves 95% of emission reduction target while also registering substantial offsetting cost reductions is still 5% out of compliance and subject to liability. On the other hand, regulators would reward it for adopting safe but expensive secondary treatment. The Korean government, regardless of firm- and industry-specific characteristics, sets environmental standards mainly focused on end-of-pipe solutions, checks whether or not firms comply with the standards, and takes corrective measures with firms that do not comply with the standards(Ministry of Environment, 2010). In this regulatory climate, minimum compliance with government regulations, without conducting any beyond-regulatory-compliance activity, is the best and most rational choice for Korean firms.

For that reason, compliance is achieved primarily by the addition of pollution-removing or filtering devices to the existing assets of a firm and does not require the firm to develop expertise or skills in managing new environmental technologies and processes(Russo and Fouts, 1997), which means that the firm complies with environmental regulations by relying on expensive end-of-pipe pollution-control technology. Such technology is essentially self-contained, off-the-shelf hardware. Once such hardware is installed, it does not fundamentally vary the operation processes. Thus, the implementation of this activity is straightforward and leaves a firm essentially in the same resource and capability situation that it was in before it installed the hardware(Kemp, 1993). In this regard, regulatory compliance can become an end unto itself, rather than marking a transition into ecological modernization(Drake et al., 2004), because regulation can encourage reactive rather than proactive behavior, along with antagonistic perceptions of environmental and commercial interests(Revell et al., 2010). Firm-specific organizational capabilities are argued to be

the outcomes of a process of organizational learning and innovation, which result from fundamental changes in organizational frames of reference as a result of the incorporation of environmental concerns into the decision-making process(Sharma and Vredenburg, 1998). From all of the aforementioned information it can be inferred that regulatory compliance activity may not have a significant positive influence on either the development of firm-specific organizational capability or the enhancement of firms' performance.

H1: A firm's regulatory compliance activity will have a negative influence on the development of firm-specific organizational capabilities (a) and the enhancement of its performance (b).

2. Voluntary innovation activity

A task environment perspective considers the influence of economic considerations in the served market context(Scott, 1992). Task environment conceptions tend to focus on the pressures in an organization's environment which motivate that organization to enhance its economic efficiency. Hence, the economic environment in general implies present or prospective economic circumstances, including pressures demanding that firms improve economic performance. The economic benefit-seeking behaviors of firms, exhibited through the conduction of environmental management activities, are mainly due to the characteristics of the served market that primarily affect economic performance, namely market attractiveness. According to the various theoretical approaches to market attractiveness, the attractiveness of a product market is a function of the size and rate of market growth, as well as profitability(Menon and Menon, 1997). Firms in high-growth markets are likely to actively explore opportunities because high-growth markets are associated with higher profits, notwithstanding the entry of new competitors(Eliashberg and Chatterjee, 1985).

The ultimate goal of a firm, in general, is to create or enhance its competitive advantage in the served market. Hence, when determining business investments and market entry, market attractiveness is one of the most important criteria to a firm. The environmental concerns of consumers have been playing a key role in forming the tide of green consumerism, wherein consumers consider the environmentally-friendly aspects of the products that they plan to purchase.

Consumers do not regard environmental protection itself as the goal that they want to achieve. However, consumers are always willing to enjoy the benefits of purchasing more environmentally-friendly products and services that still satisfy their needs(Fineman and Clark, 1996). Consumers' commitment to sustainability issues has triggered a change in the purchase pattern of individuals and they have started to demand not only more environmentally friendly products but also a change in the sensitivity of economic agents toward environmental problems(Geng et al., 2007).

Firms regard consumers as more strategically important reference points than other external stakeholders. As such, firms always try to respond to consumer requirements by conducting environmental innovation activities aimed at the environmentally friendly consumer segment. This means that consumer demands may stimulate coercive isomorphism. In addition, competitor actions may lead to mimetic isomorphism. Many researchers have argued that firms are more likely to mimicthe environmentally responsive behavior of their competitors who are successful(e.g., González-Benito and González-Benito, 2008; Jannings and Zandbergen, 1995; Menon and Menon, 1997). Firms will regard environmental management activities that meet market pressures as desirable when the attractiveness of the environmentally-friendly product market, and thereby their potential profit, is perceived to be high. There is substantial evidence to support that environmentally friendly products constitute a considerable market. In this market climate, firms perceive the probability of creating market opportunity to be high and interpret environmentally-friendly activity as an opportunity for their own business. Such positive evaluation is likely to competitively lead to various environmental activities aimed at capturing the profit potential among firms. Activities that appear to have market value, in competitive environments, are quickly imitated or adopted(Jennings and Zandbergen, 1995), which means that firms can take a more active and competitive posture in conducting environmentally-friendly activities in order to meet market pressures and to stay ahead of the competition. For that reason, competition among firms to conduct environmentally-friendly activities in order to meet market pressures, including voluntary innovation activities, becomes intense when firms perceive that environmentally-friendly products provide them with sufficient economic benefits. Accordingly, market attractiveness is considered instrumental in inducing corporate voluntary innovation activities. All of the above mentioned information leads to the following hypothesis.

H2: A firm's voluntary innovation activity will have a positive influence on the development of firm-specific organizational capabilities (a) and the enhancement of its performance (b).

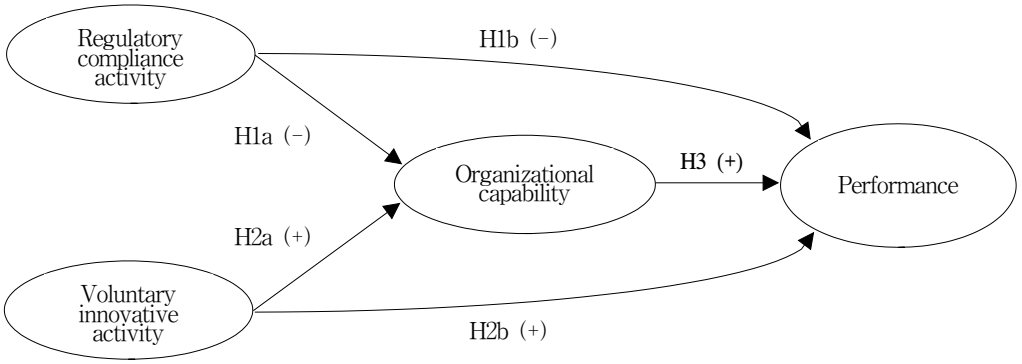
3. Organizational capabilities

According to Sharma and Vredenburg(1997), firms' voluntary innovation activities start from changes made to their organizational philosophy in order to accommodate concerns about environmental issues. This brings about fundamental ideological changes regarding the way in which business operations should be conducted these include changes in thinking from linear processing to cyclical processes with closed-loop material use as an ideal, as well as the efficiency and sustainability of material use, the minimization of sales of non-sustainable and environmentally-damaging products, and the education of consumers about conserving resources and curbing wasteful consumption. These fundamental changes require a questioning of conventional wisdom and can spark a higher-order learning process if fostered by the organizational factors that influence managerial interpretations of environmental issues as opportunities. These learning processes can lead to the accumulation of collective organizational experiences in handling environmental issues and in finding a solution that fits the highly heterogeneous nature of individual business contexts. This can lead to the development of firm-specific capabilities that can be sources of competitive advantage(Hart, 1995) due to their being more in the nature of tacit knowledge along with invisible assets that are difficult to identify by competitors, hence not easy to imitate. The capabilities associated with the environmental innovations and knowledge can contribute to firm productivity by both cost reduction and product differentiation(Shrivastava, 1995). This leads to the following hypothesis.

H3: Firm-specific organizational capabilities will have a positive influence on firms' performance.

Figure 1 shows the theoretical model proposed in this study.

<Figure 1> Theoretical model



Ⅲ. Measures

The hypothesized relationships in this article were tested through an e-mail survey that was conducted within the Korean manufacturing industry from January 10 through February 28, 2007. The research instrument was a fixed-response questionnaire using a five-point Likert scale(1 = strongly disagree, 5 = strongly agree). In order to minimize sampling error, 700 firms were randomly selected from the manufacturing firms listed in the 2006 Korean Business Directory. We reconfirmed that the information related to the sample for this study was correct before conducting the e-mail survey. We received 162 completed, usable questionnaires for the firms engaged in manufacturing and exporting in the food/beverage, compounds/chemicals, fiber, pulp/paper, assembling metal, transport equipment, communication equipment, machinery and equipment sectors, furniture, electric machinery and transformer solution, and clock, medical and optical device, resulting in a 23.1 percent response rate. A total of 23 questionnaires were either incomplete or incorrectly completed. The measures used in the study are presented Table 1.

〈Table 1〉 Measurements

Variable	Definition	Items	References
Regulatory compliance activity (CA)	Firm's actions for complying with the environmental standards set by the governmen	(CA1) Actions for complying with wastewater effluent standards. (CA2) Actions for complying with emission standards for air pollutants. (CA3) Actions for complying with standards for waste material treatment. (CA4) Actions for complying with toxic chemical treatment standards. (CA5) Installation and operation ofend-of-pipe technologies to meet the required level of environmental standards. (CA6) Overall compliance with normal regulations.	Buchholz(1993) Denton(1994) Evan(1988) Henriques & Sadorsky(1999) Hunt & Auster(1990) Roome(1992)
Voluntary innovation activity (IA)	Firm's proactive action undertaken on a its own initiative, as a result of a growing awareness of the perception of business opportunities and advantages	(IA1) Actions for developing new environmentally-friendly products and technologies. (IA2) Actions for adding environmentally-friendly traits to existing products, such as the use of renewable materials, eco-packaging and labeling, eco-design, and so forth. (IA3) Actions for reducing the use of traditional fuel through the substitution of renewable energy sources. (IA4) Actions for the enhancement of environmentally-friendly traits in production processes and methods, such as fundamental changes in the design of processes to reduce hazardous waste, the implementation of new processes, technology to reduce wastes, and so forth. (IA5) Actions for reducing the use of raw materials and energies. (IA6) Actions for promoting organizational learning related to environmental issues at all stages of the value chain.	Buchholz(1993) Hart(1995) Sharma & Vredenburg(1998)
Organizatonal capability (OC)	Firm's proactive action undertaken on its own initiative, as a result of a growing awareness of the perception of business opportunities and advantages	(OC1) Line-staff cooperation and integration around environmental information exchange. (OC2) Continuous expansion of knowledge about the business/natural environment interface. (OC3) Ability to look for solutions to environmental problems from fresh angles. (OC4) Ability to experiment with the business/natural environment domain. (OC5) Ability to balance environmental objectives with ecological goals. (OC6) Ability to spot opportunities amidst changes in social expectations and environmental regulations. (OC7) Ability to innovate and continuously improve operations while reducing their environmental impact.	Hart(1995) Sharma & Vredenburg(1998)

Performanc e (PER)	The enhancement of the financial and strategic performance of a firm's environmental activities	(PER1)	Sales growth.	Porter & Van der Linde(1995) Maxwell et al.(1997) Sharma & Vredenburg(1998) Shrivastava(1995)
		(PER2)	Reduction of costs by reducing material, energy, process, and production costs, and by improving operations.	
		(PER3)	Growth in profit margins.	
		(PER4)	Enhancement of the business image.	
		(PER5)	Quality improvement of the product.	
		(PER6)	Iincrease of its market share.	
		(PER7)	New product and market development relative to a firm's main competitor in the industry.	
		(PER8)	Increase in customer satisfaction.	

Ⅳ. Data analysis

The study analyzed the data using the structural equating modeling(SEM) approach. This was chosen because of its ability to test relationships between constructs with multiple measurement items(Joreskog and Sorbom, 1996). This study used a two-stage model-building process in accordance with the recommendation of Hair et al.(1998) and Hoyle(1995) to analyze the data using the SEM approach. Confirmatory factor analysis(CFA) was used to examine the reliability and validity of the measurement model, and the structural model was analyzed to test the associations' hypotheses.

1. Measurement model

Exploratory factor analysis(EFA) first conducted to check whether the proposed factor structures are indeed consistent with the actual data reduced all 27 items to a four-factor solution, accounting for 76.15% of the variance(see Table 2).

<Table 2> Result of exploratory factor analysis

Items	Communality	OC (factor 1)	PER (factor 2)	CA (factor 3)	IA (factor 4)
CA1	.785	.199	.112	**.812**	.272
CA2	.888	.161	.078	**.905**	.194
CA3	.757	.117	.160	**.817**	.224
CA4	.745	.204	.144	**.754**	.337
CA5	.766	.060	.117	**.845**	.187

CA6	.834	.069	.190	**.859**	.236
IA1	.736	.360	.163	.367	**.667**
IA2	.611	.116	.263	.338	**.643**
IA3	.790	.296	.131	.312	**.718**
IA4	.739	.118	.284	.204	**.777**
IA5	.643	.185	.247	.250	**.697**
IA6	.731	.254	.184	.323	**.727**
OC1	.812	**.798**	.274	.165	.136
OC2	.670	**.788**	.269	.006	.327
OC3	.852	**.753**	.308	.145	.244
OC4	.735	**.835**	.269	.062	.200
OC5	.774	**.737**	.214	.228	.252
OC6	.858	**.738**	.400	.151	.150
OC7	.744	**.773**	.341	.211	.019
PER1	.766	.400	**.771**	.119	.208
PER2	.757	.121	**.755**	.112	.270
PER3	.900	.343	**.778**	.096	.222
PER4	.742	.359	**.646**	.270	.183
PER5	.813	.340	**.718**	.238	.091
PER6	.705	.332	**.826**	.133	.217
PER7	.750	.353	**.731**	.154	.248
PER8	.759	.399	**.698**	.135	.177
Eigenvalue		13.858	3.799	1.501	1.403
Percent of total variance		51.326	14.071	5.559	5.196
Kaise-Meyer-Olkin		.912			
Bartlett's Test of Sphericity		4468.616 (p=.000)			
Scale reliability analysis(Cronbach's alpha of emboldened variables)		0.9434	0.9551	0.9439	0.8296

All four factor solutions produced an eigenvalue greater than 1. The associated item factor loadings(> 0.6) and reliability alphas satisfied the criteria established by Nunnally(1978). The data obtained were tested for reliability and validity using CFA. The measurement model includes 27 items describing four latent constructs. The initial test of the measurement model using CFA indicated that some construct revisions were needed. After re-specifying the instruments, 15 items were retained.

<Table 3> Result of measurement model's confirmatory factor analysis

Latent Construct	Item	Factor Loading	t-Value	Composite reliabilitya	Average variance extractedb
CA	CA1	0.86	13.30	0.92	0.79
	CA2	0.96	16.18		
	CA5	0.84	12.95		
IA	IA2	0.72	9.70	0.79	0.56
	IA5	0.74	10.18		
	IA6	0.78	10.88		

OC	OC1	0.86	13.45	0.93	0.74
	OC2	0.89	14.21		
	OC3	0.85	13.16		
	OC6	0.85	13.30		
	OC7	0.83	12.85		
PER	PER1	0.91	14.56	0.91	0.71
	PER2	0.76	11.16		
	PER4	0.81	12.10		
	PER6	0.88	13.92		

Fit indices: chi-square = 133.29 (p = 0.00), d.f. = 84, chi-square/d.f. = 1.59, GFI = 0.90, AGFI = 0.86, CFI = 0.97, NNFI = 0.96, RMSEA = 0.060.

a Composite reliability: (square of the summation of the factor loadings)/{square of the summation of the factor loadings} + (summation of error variances). b Average variance extracted (AVE) = (sum of squared standardized loadings)/(sum of squared standardized loadings) + (sum of indicator measurement error).

The test of the final measurement model demonstrated good fit between the data and the proposed measurement model. From Table 1, the observed normed chi-square for this model was 133.29(chi-square/d.f. = 1.59 d.f. = 84), which is smaller than the 3 recommended by Bagozzi and Yi(1988). Other fit indexes include the goodness-of-fit index(GFI) and comparative fit index(CFI): they exceeded the recommended cut-off level of 0.9(Bagozzi and Yi, 1988). The adjusted goodness-of-fit index(AGFI) also exceeded the recommended cut-off level of 0.8(Chau and Hu, 2001). The root mean square error of approximation(RMSEA) was below the cut-off level of 0.08 recommended by Browne and Cudeck(1993). Therefore, the measurement model demonstrated good fit of the data(see Table 3).

Table 3 summarized the results of convergent validity－the degree to which multiple attempts to measure the same concept are in agreement－for constructs by examining the factor loading within each construct and its composite reliability(Anderson and Gerbing, 1988). The factor loading for all items exceeds the recommended level of 0.6. All composite reliability measures of constructs exceed the recommended level of 0.7(Bagozzi and Yi, 1988). Along with the coefficients of composite reliability, the coefficients of average variance extracted are also displayed. The average variance extracted indicates what percentage of the variance of the construct is explained by any individual item. The great majority of the constructs have average variance extracted higher than the benchmark of 0.5 recommended by Bagozzi and Yi(1988).

Discriminant validity tests are presented in Table 4. The correlations of potentially overlapping

constructs were used to assess discriminant validity. No pair of measures had correlations exceeding the criterion(0.9 and above), suggested by Hair et al.(1998). The results of the tests for reliability and convergent validity and discriminant validity provide evidence of the internal and external validity of the scales used in the study.

<Table 4> Latent construct correlations

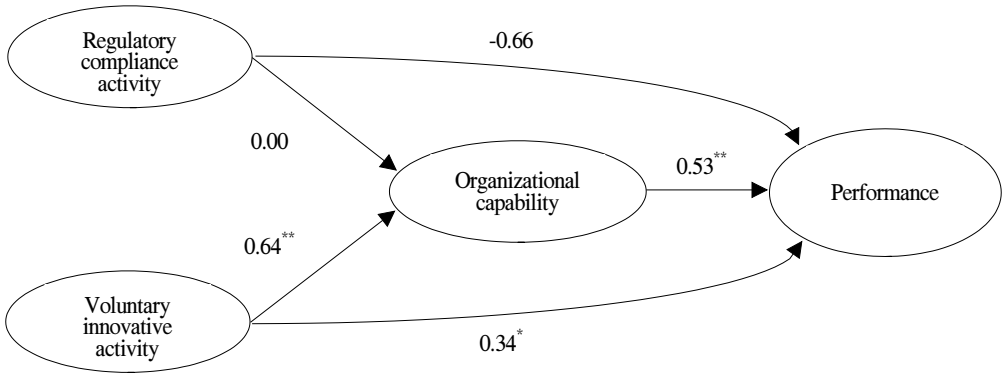
	1	2	3	4
1. CA	1.00			
2. IA	0.45** (0.04)	1.00		
3. OC	0.36 ** (0.07)	0.42 * (0.07)	1.00	
4. PER	0.60 ** (0.06)	0.66 ** (0.06)	0.65** (0.06)	1.00

Note. *p < 0.05; **p < 0.01. Parentheses denote the standard errors.

2. Structural model

The causal structure of the proposed research model was tested using SEM. The test demonstrated a reasonable fit between the data and the proposed structural model. The model had a good fit as shown by the indices(GFI = 0.90 CFI = 0.97; NNFI = 0.96, RMSEA = 0.060) and the significant chi-square index(chi-square/d.f. = 1.59 d.f. = 84). The resulting structural model, along with the path coefficients and their significance values, is shown in Fig. 2. All the hypothesized paths, with the exception of that linking CA and OC(H1a), and CA and PER(H1b), were significant at 1% or 5% level. H1a and H1b state that a firm's activity in response to governmental environmental regulations will have a negative effect on organizational capability and performance. The results show that regulatory compliance activity does not have a significant influence on either of the latent constructs. Hence, H1a and H1b were not supported by the data. H2a and H2b state that a firm's activity in response to environmental pressures from the served market(innovative activity) will have a positive effect on organizational capability and performance.

<Figure 2> Results of the structural model



The results show that voluntary innovation activity has a significant influence on both organizational capability at 1%(path coefficient = 0.64) and on performance at 5%(path coefficient = 0.34). Thus, H2a and H2b were supported by the data. H3 states that organizational capability derived from environmental activity, especially innovative activity undertaken on firms' own initiative, is the direct source of performance. This hypothesis was supported by the data(path coefficient = 0.53, $p < 0.01$).

Ⅴ. Discussion and conclusions

This study proposed a structural equation model of the effects of firms' regulatory compliance and voluntary innovation activity in environmental management on the development of firm-specific capabilities and the enhancement of firm performance, and tested it in the Korean context.

The distinction between regulatory compliance and voluntary innovation activity has been made in the EFA, which shows that the corporate response to environmental pressures in not unidimensional. The activities identified confirm the distinction between traditional and modern measures that have usually been accepted in the literature on the natural environment(e.g., Aragón-Correa, 1998; Buchholz, 1993; Russo and Fouts, 1997). Traditional measures, also known as end-of-pipe solutions, relate to the regulatory compliance activities－the regulated correction

approach. Modern measures relate to the voluntary innovation activities that are normally adopted on the firm's initiative as a result of a growing awareness of the problems and a perception of advantages－the voluntary prevention approach. This means that the research confirms Lindell and Karagozoglu's(2001) assertion that firms comply with environmental regulation in order to avoid the risk of liabilities and fines,not to increase competitiveness and profitability, and conducts their voluntary innovative activities in a way that create competitive advantages and financial performance in response to market pressure. The research also confirms Hart's(1995), Sharma and Vredenburg's(1998) and Shrivastava's(1995) assertion that a firm's voluntary innovation activity correlates strongly with its development of firm-specific capabilities and the enhancement of its performance, and such firm-specific capabilities can be sources of competitive advantage.

On the basis of the path coefficients, voluntary innovation activity has a significant positive impact on the development of firm-specific capabilities and the enhancement of a firm's performance, but regulatory compliance activity does not have a significant impact on either. In addition, the organizational capability of a firm's environmental activities has a significant positive effect on that firm's performance. The results of this study indicate that regulatory authorities should expend a great deal of effort to monitor policy measures and to find and improve the practices that do not encourage firms to carry out innovative activities. Innovation activity is proactive behavior defined as voluntary action adopted on a firm's own initiative, as a result of motivation by the expected economic advantages(Céspedes-Lorente et al., 2003). The ultimate goal of innovation in firms is generally to create and enhance competitive advantages in the served market by meeting consumer values and demands. Innovation activity related to environmental issues is also environmentally friendly activity in order to create and enhance competitive advantages in the served market by meeting their consumer needs for environmentally friendly products and services. This can be regarded as market-oriented activity in terms of the research done by Kohli and Jawarski(1990). Despite the fact that the power of stakeholders with regard to environmental issues is positively related to an extensive application of corporate environmental practices(Céspedes-Lorente et al., 2003), market-oriented activity related to environmental issues correlates more intensely with the environmental pressure exerted by nongovernmental stakeholders, but does not correlate with governmental pressure(González-Benito and González-Benito, 2008). However, governments remain the most important source of pressure on firms to improve their

environment by leading to actual pollution emissions(Doonan et al., 2005). In this context, the results of this study suggest that governments need to develop and implement environmental policy measures that are directed toward promoting voluntary market-oriented activity based on organizational learning on firms' own initiative, which is the best way to overcome the various trade-environment linkage barriers from other trading countries. To promote such activity, policy makers' understanding of Hart's(1995) argument that innovative activity and organizational capabilities may constitute an important emergent competitive domain to which firms should pay heed ought to get the highest priority. This should be followed by policies directed toward promoting market circumstances or market pressure that can be defined as a function of the size and rate of market growth and profitability, so that firms can take a more proactive and competitive posture in conducting environmentally-friendly activities in order to stay ahead of the competition.

The research also suggests that firms need to take a proactive stance on the environmental issues, and to make strong efforts trying to detect and anticipate opportunities and threats in the competitive environment. This means that the firm must make efforts to transmit the importance of environmental issues to the whole organization: collect and assess the information about consumers and markets, disseminate this information throughout the firm, and respond to the information by developing tailored strategies. Hence, firms need to incorporate the environmental issues into the strategic planning process and the development of products and processes that minimize environmental impact and that meet the environmentally friendly consumer segment. The adoption of environmental issues into the strategic planning process requires a prior change in the firm's culture in all functional areas. Thus, the firm's environmental culture may serve as a behavioral philosophy for the whole organization(Chamarro and Bañegil, 2006). Placing the environment as a central value can contribute to a better response of the firm against an environmental threat or opportunity, since it will improve the dissemination of information within the company and consequently, the company's response capacity(Fraj-Andrés et al., 2009).

This study has some limitations that may encourage further work. The first limitation is that, since the research design was cross-sectional, the study does not shed light on changes in firms' environmental activities, the development of firm-specific organizational capabilities, or the enhancement of firms' performance by those activities over time. To overcome this limitation,

yearly follow-up surveys that capture those changes should be conducted over an extended period. The second limitation is the sample size of 162 firms, which limited my ability to draw conclusions about each industry. Future researchers should investigate whether the relationships found here hold in larger samples and in each industry of the manufacturing sector. Finally, the model of this study considers the external stakeholders as a whole, despite the current situation in which firms operate in a setting that imposes multi-actor pressures on them from both institutional and task environments. According to a number of practitioner-focused studies highlight the advantages of considering the environmental demands of the stakeholders, a dialogue between firms and stakeholders that allows for the exchange fof information and concerns relating to environmental issues may generate a proactive approach that favors prevention and innovation measures over the correction of failures, which may also a positive impact on the financial performance of the firm in question. In this context, it might be interesting to distinguish between stakeholders on the basis of both types of environments, capture the pressure exerted by separate stakeholders, and analyze the pathway by which they influence firms' environmental activities.

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국문초록

기업의 환경관리 활동, 조직능력 및 성과 간 관계: 제조수출기업을 중심으로

송우용* · 성봉석**

본 논문은 설문조사 자료에 기초하여 제조기업의 환경관리활동 즉, 규범준수활동과 혁신지향활동이 환경대응능력의 창출과 성과의 제고에 미치는 영향에 관한 연구모형을 설정하고, 구조방정식 모델을 이용하여 실증분석을 수행하였다.

분석결과, 환경문제와 관련된 시장압력에 대응한 기업의 자발적인 혁신활동은 기업의 환경대응능력의 창출과 성과제고에 정의 영향을 미쳤다. 그렇지만, 규제압력 즉, 법적 요건에 순응하기 위한 목적의 규범준수활동은 환경대응능력의 창출과 성과제고에 기여하지 못하는 것으로 나타났다. 게다가 혁신활동을 통해 창출된 환경대응능력은 기업성과제고를 위한 중요한 원천이 되는 것으로 나타났다. 이러한 연구결과를 바탕으로 그 시사점과 향후 연구방향에 대해 토의하였다.

주제어 : 규범준수활동, 자발적 혁신관리활동, 환경대응능력, 성과

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