

Does Financial Performance Enhance the Transfer of Environmental Management Practices to Overseas Subsidiaries?

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This paper analyzes the relationship between the financial performance of multinational enterprises and the international transfer of environmental management practices. The data used are obtained from two sources: Nihon Keizai Shimbun's NEEDS for financial data and transfer data from a questionnaire survey conducted in Vietnam. The ordinary least square method is used for analysis. We examine the hypothesis that higher performance of a firm is positively related to higher transfer of environmental management practices to the overseas subsidiary. We found that the environmental management system is significantly related to financial performance (ROS). The different results suggest meaningful implications.

JEL Codes: M16 and Q56

Keywords: Transfer, Environmental Management, Vietnam, Subsidiary, Japanese Firm

1. Introduction

All actors need to contribute to achieve sustainable development, which is especially required for multinational enterprises (MNEs) that operate globally. A number of MNEs have started to develop a global supply chain management and environmental management system. Although not so long ago these firms addressed environmental management in domestic operations, firms now have to address environmental management in their overseas operations. The Corporate Value Chain (SCOPE3) Accounting and Reporting Standard published in 2011 asks firms to be responsible for greenhouse gas emission in the whole supply chain.

This study examines the relationship between financial performance and the international transfer of environmental practices. This issue can be expressed by asking whether economy and environment are achieved simultaneously in MNEs overseas operations. Some MNEs have already developed a global environmental management system, but the majority do not yet have a system in place. When firms tend to think that these systems are costly, the diffusion of practices will be slow.

The study of the relationship between the financial performance of parent firms and environmental transfer to overseas operations is a new research question. Environmental management includes a variety of aspects, but research is minimal in environmental

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management such as environmental innovation (Popp 2006). The study of the international transfer of environmental practices has started in the end of last century (Hansen 2002). We intend to provide new evidence for theoretical development and policy in this field.

Before examining the international transfer with our data, we briefly review previous underlying studies in the second section. The third section discusses our data and explains the methodology of analysis. The fourth section presents the results of analysis. The fifth section discusses our findings, and the last section summarizes the conclusions.

2. Literature Review

There are, as far as we know, few researches that directly analyze the determinants and process of the international transfer of environmental management practices. Instead, we find field reports or research on specific practices such as ISO14001 or green purchasing. Analysis of environmental management in overseas operations is sometimes done as one of a number of environmental engineering issues. To understand the theoretical basis of the topic, we briefly review studies related to the transfer of environmental management.

There are two groups of studies. One is a study analyzing whether economy and environment are attained at the same time. This study provides the foundation for the analysis of the relationship between economy and environment in overseas operations. Second is a study on supply chain management. It is concerned with a question how environmental management of multinational corporations diffuse in a global supply chain and how the transfer is implemented.

First, a number of studies examine whether economy, in a broad sense, and environment preservation can be pursued at the same time. This is the underlying study of the compatibility of parent firm financial performance and environmental performance in international operations. The preceding study of the relationship between economy and environment began in the 1990s (Porter & v.d. Linde 1995; Palmer et al. 1995; Hart & Ahuja 1996; Russo & Fouts 1997; Corderio & Sarkis 1997; Wagner et al. 2001). These studies suggest two contrasting conclusions. The first group argues that there is the trade-off between economic performance and environmental performance because investment for environmental preservation incurs increasing cost. Therefore, the increased cost for compliance means a disadvantage in cost competition. The second group argues that improved environmental performance enhances competitive advantage and, in turn, economic performance (Hart & Ahuja 1996; Wagner et al. 2001). This performance is possible because the improvement of environmental performance often brings efficient production, higher productivity and low compliance cost.

Porter is regarded as a pioneer researcher in the field of environmental management study. He suggested the Porter Hypothesis based on anecdotal evidence (Porter 1991; Porter & v.d. Linde 1995). Using empirical research rather than anecdotal evidence, Hart and Ahuja (1996) show a new finding. They used, as the explaining variable, the change rate of emission of toxic chemicals in 1988-89 based on Toxic Release Inventory (TRI) data. They used return on sales (ROS), return on assets (ROA) and return on equity (ROE) as explained variables. Control variables are R&D intensity, advertising cost ratio to sales, capital intensity, debt ratio, and growth rate of industry. Their analysis shows that pollution prevention is positively related to financial performance with a one- or two-year time lag.

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Russo and Fouts (1997) analyzed the relationship by using the indicator of environmental rating as the environmental performance and ROA as economic performance. Their analysis revealed that the relationship between the two performances is statistically significant and positive.

Then, an analysis of the Japanese manufacturing industry found a statistically significant positive relationship between economy and environment (Kimbara et al. 2011). This study used CO₂ and PRTR emission as environmental performance and ROA /ROS as financial performance.

As such, preceding studies tend to support the compatible relationship between economy and environment. This may reflect the fact that large firms make greater environmental management efforts to respond to the requirement of social responsibility. Therefore, when it is expected that firms achieve better financial performance caused by improving environmental performance, environmental management may disseminate in overseas operations. We expect when firms attain competitive advantage by environmental investment that they will be more proactive in transferring environmental management to overseas operations.

Second, there are studies on the transfer of management system and production system (Abo 1988, 1994; Yamaguchi 2006; Florida & Kennedy 1991). In the 1950s and 1960s, US firms strengthened competitive advantage in the world economy and intensively increased direct investment in Europe. The reasons for this foreign direct investment were analyzed by Hymer (1976), Buckley and Casson (1976) and Dunning (1988). The validity of a US management system in overseas conditions was also argued (Koontz 1969). In the 1980s, Japanese firms increased their competitive advantage in the electric, automobile and iron and steel industries. After the Plaza Accord of G5 in 1985, drastic yen appreciation was triggered. Under the circumstances, there was a rapid increase of Japanese foreign direct investment and the transfer of its management system to overseas operations.

For example, Florida and Kennedy investigated whether Japanese transplants in the US successfully transfer the production system and inter-organizational network to US operations. The results of analysis indicate that the US transplant of Japanese firms, team based work organization and close assembler-supplier relationship are transferred to the subsidiary. Florida and Kennedy point out that in the US transplants, a specific production system is transferred within the organization of MNEs and within the inter-organization. It is also recognized that the end-user and supplier relation works as determinants of the adoption and diffusion of innovative production practices (Florida et al. 1997).

One study about the mother factory system implies that the domestic factory becomes a mother factory for the overseas factory (Yamaguchi 2006). The mother factory is the source of skills and practices for subsidiary firms in terms of technology, skill and practices. Practices, skills, procedures and knowledge are transferred from the MNE mother factory to the overseas subsidiary. The mother factory system presumes organizational capability that enables the transfer of organizational routine from the main factory at the headquarters to subsidiary firms. Combined with the organizational capability concept, the model of the mother factory system explains the transfer of capabilities from MNEs to subsidiary operations.

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The limitation in the model of the mother factory system is that MNEs have to expect self-reliance of the subsidiary firms in the long term. MNEs have limited resources that they can provide to all operations spreading globally. However, the mother factory model is effective as far as environmental management is concerned because the capability of subsidiary firms in environmental technology substantially depends on the capability and practices of parent firms when their capability is limited.

In addition, we recognize the importance of studies of assembler-supplier relations in the production system (Asanuma 1989; Dyer 1996; Dyer & Nobeoka 2000). This relational view showed that the close relationship between assembler and supplier improves the competitiveness of the supplier and group firms in the automobile industry. Dyer (1996) and Dyer and Nobeoka (2000) point out that the improvement of supplier capability in terms of productivity, product quality and cost. Particularly, suppliers in the network are superior in learning through information sharing, face to face communication and the guest engineer system so that these suppliers have a better opportunity to enhance their organizational capability.

But, we find no research directly analyzing the international transfer of environmental management as a whole except Hansen (2002). Hansen conducted intensive case studies in three countries during 1998-2001.

We believe that this paper is the first to analyze the relationship between financial performance and the international transfer of environmental management. Even though there are studies about the international transfer of individual environmental practices such as innovation (Beise & Rennings 2005; Rennings et al. 2006; Popp 2006, 2011; Phene & Almeida 2008), environmental management practices (Florida & Kenney 1991; Szulanski 1996), or knowledge (Gupta & Govindarajan 2000; Pérez-Nordtvedt et al. 2008; Ockwell et al. 2010), we find no research on the relationship between financial performance and the international transfer of environmental practices. It is significant to reveal the effect that financial performance has on the international transfer of practices, and how to transfer and diffuse practices to the host country through foreign direct investment.

3. The Methodology

3.1 Data

A questionnaire survey was used for collecting the data on the transfer of environmental practices in the subsidiary. Our focus is Japanese manufacturing subsidiaries in Vietnam. We prepared a structured questionnaire. Research assistants visited firms in early 2011 and interviewed managers responsible for environmental matters. We obtained 96 effective responses from 400 firms we listed. We used a Likert type 5 point scale to measure the behavior of the firm. The higher the score, the stronger the proactiveness. For the indicators of ISO 14001 and environmental report, the original score was measured by a 3 point scale as 3 for implemented, 2 for preparing, and 1 for no implementation. Then, the scores of ISO14001 and environmental report were summed up to create the environmental management system (MANA) with a maximum 6 points. Environmental report means the data will be provided for the environmental report by parent firms. Formal publication of an environmental report by an individual subsidiary firm is quite rare. The ownership ratio (JOWN) by the Japanese parent firms is shown in the percentage of the ownership.

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Financial data was obtained from Nihon Keizai Shinbunsha's NEEDS data. Nihon Keizai Shinbunsha is the largest economic newspaper in Japan. The two datasets were then matched to obtain 39 effective samples for analysis.

3.2 Analytical Framework

How firms transfer environmental management to overseas operations and what relations exist between financial performance and the transfer of environmental practices are the issues to be analyzed. For the determinants of environmental management, Schaltegger and Synnestvedt (2002) point out that the environmental management of a firm depends on the state of management, environmental interest of society and government. These are the important determinants of the transfer.

In this paper, we develop an analytical framework of environmental management transfer based on the organizational capabilities of the resource-based view (Barney 1991; Hart 1995; Aragón-Correa & Sharma 2003). Based on the preceding studies in environmental management and strategic management, we developed a framework that consists of external factors, environmental strategy, organizational practices and environmental performance of the subsidiary. With this framework, we examined the relationship among variables and the influence of individual factors on the transfer.

We examined the following hypothesis on the international transfer of environmental practices in Japanese subsidiaries in Vietnam.

Hypothesis: Firms with higher financial performance are likely to transfer environmental practices to overseas operations.

The basis of this hypothesis is that when a firm's financial performance is better, the firm has more resources to invest into environment preservation so that it is likely to transfer related practices. In contrast, a firm that regards environmental investment as a cost increase is reluctant to invest in the environment and slow to transfer practices since the firm perceives the practices as incurred additional costs.

This hypothesis assumes the influence of economic performance with environmental performance. Most previous studies on the relationship between economy and environment use economic performance as an explained variable and environmental performance as an explaining variable. However, the interaction between economy and environment actually exists in two ways. Typically, the causal relation from economy to environment is assumed in the Environmental Kuznets Curve. Large firms with large financial resources can afford to conduct environmental investment as compared to firms with fewer financial resources.

On the reasons for international investment, internalization by Buckley and Casson (1976) argued that firms get advantageous transaction cost from internalization. A resource-based view points out that organizational capabilities are the basis of growth, and cumulative and path dependent (Barney 1991; Hart 1995). When we apply these theories to environmental management, we believe that MNEs transfer their organizational capabilities, which the parent firms own, to their overseas operations to strengthen the competitive advantage of their overseas operations. Therefore, subsidiary firms with new environmental capabilities have the possibility of improving competitive advantage. We analyze the transfer of environmental management using the following models.

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$$GREN = \alpha + \beta_{g1} GOV + \beta_{g2} COM + \beta_{g3} CUS + \beta_{g4} LDS (GOAL) + \beta_{g5} JOWN + \beta_{g6} ROA (ROS) + \beta_{g7} D_scale \quad (1)$$

$$MANA = \alpha + \beta_{m1} GOV + \beta_{m2} COM + \beta_{m3} CUS + \beta_{m4} LDS (GOAL) + \beta_{m5} JOWN + \beta_{m6} ROA (ROS) + \beta_{m7} D_scale \quad (2)$$

3.3 Variables

The explained variables are the environmental management system (MANA) and green procurement (GREN). The hypothesis is divided into 2 sub-hypotheses. One uses MANA and the other uses GREN as the explained variable, as shown in models 1, 2 and models 3, 4. The explaining variables in the models are the return on assets (ROA) or return on sales (ROS). The control variables are external factor, environmental strategy, ownership ratio by parent firm and firm size of subsidiary (Table 1, Table 2). We recognize that return on equity (ROE) is often used as significant performance indicator in the preceding studies. On the relationship between economy and environment, it is asked, in this paper, whether financial resources enhance environmental practices. In this respect, ROA and ROS reflect our interest rather than ROE that is an indicator of shareholder value.

Table 1: Basic statistics

Variable			Mean	SD
External factor	GOV	Strict government environmental mandates and regulation	3.667	(0.838)
	COM	Strong community demand for environmental performance	3.026	(1.203)
	CUS	Strong customer demand for environmental performance	3.947	(0.899)
Organization of parent firm	ROA	Parent company ROA (average for 2001 – 2009)	17.930	(11.316)
	ROS	Parent company ROS (average for 2001 – 2009)	20.182	(10.814)
	JOWN	Ownership ratio of Japanese firms	94.436	(14.158)
Environmental strategy	LDS	Strong top management leadership on environmental issues	4.139	(0.723)
	GOAL	Specific company goals for reducing environmental burden	4.103	(0.788)
Management system	ISO	Obtained ISO 14001 certification	2.658	(0.669)
	REP	Emission data reflected in parent company environmental report	2.949	(0.320)
	GREN	Green procurement equal to that of firms in Japan	3.222	(0.989)

Note: The items are measured in a Likert type 5 points scale, except for ISO and REP, which are measured at 3 points.

Table 2: Correlations among variables

	1	2	3	4	5	6	7	8	9	10
1 GOV	1.00									
2 COM	0.56 **	1.00								
3 CUS	0.01	0.17	1.00							
4 ROA	0.19	0.19	-0.21	1.00						
5 ROS	-0.07	0.13	-0.10	0.74 **	1.00					
6 JOWN	-0.40 *	-0.25	0.14	-0.24	-0.03	1.00				
7 LDS	0.31	0.33	-0.03	0.35 *	0.47 **	-0.38 *	1.00			
8 GOAL	0.45 **	0.30	0.01	0.25	0.30	-0.35 *	0.66 **	1.00		
9 MANA	0.31	0.31	-0.08	0.17	0.19	-0.23	0.26	0.59 **	1.00	
10 GREN	0.04	0.33 *	0.18	0.05	0.07	0.14	0.42 *	0.30	0.15	1.00

Note: ISO and REP are combined and summed up as MANA.

* p < 0.05, ** p < 0.01

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The external factors have three indicators: GOV means the host government environmental regulation is strict; COM means the community has strong demands on the environment; and CUS means the customer requirements in the market are strong. The environmental strategy of the subsidiary is measured by the priority of the environmental goal (GOAL) and top leadership for environment (LDS). Strategy has been examined in previous studies as an important determinant of management transfer (Hart and Ahuja 1996) and integrates various activities and resources, and directs decision-making. Strategy works as a framework integrating a series of organizational activities toward the organizational goal. When the strategy is clear to organization members, the goal to be achieved and issues to be solved become clear. Strategy is then useful for motivating organizational members to work for the organizational goal.

We estimate the relationship by using the ordinary least square (OLS) method. As the correlation between LDS and GOAL is high ($r=0.527$, $p<0.001$), we estimate models with a separate strategic indicator. Dummy variable means that the number of employees less than 300 is 0, and more than 300 is 1.

4. The Findings

Based on the model, we analyzed the data using OLS. The results are shown in Table 3 and Table 4.

Table 3: Result of analysis (ROS)

	Model 1 (MANA)				Model 2 (GREN)			
	Coefficient	t-value	Coefficient	t-value	Coefficient	t-value	Coefficient	t-value
GOV	-0.090	-0.453	-0.208	-1.229	-0.372	-2.115 *	-0.390	-1.836
COM	0.290	1.539	0.331	2.117 *	0.526	3.019 **	0.549	2.725 *
CUS	-0.171	-1.063	-0.175	-1.306	0.062	0.439	0.084	0.514
ROS	0.352	2.148 *	0.199	1.442	-0.212	-1.376	-0.020	-0.123
JOWN	-0.068	-0.390	0.029	0.204	0.427	2.775 *	0.286	1.688
LDS	0.126	0.673			0.679	4.102 **		
GOAL			0.519	3.329 **			0.378	2.012
D_scale	0.302	1.934	0.243	1.868	0.019	0.140	-0.046	-0.286
Constant	4.818	3.642 **	3.776	3.825 **	-2.867	-1.721	-0.384	-0.222
Adj R ²		0.263		0.450		0.438		0.207
F value		2.681 *		5.214 **		4.563 **		2.268
DW		1.418		2.248		1.808		1.868

Note: *p <0.05, **p <0.01

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Table 4: Result of analysis (ROA)

	Model 3 (MANA)				Model 4 (GREN)			
	Coefficient	t-value	Coefficient	t-value	Coefficient	t-value	Coefficient	t-value
GOV	-0.106	-0.491	-0.228	-1.304	-0.322	-1.826	-0.383	-1.864
COM	0.319	1.574	0.351	2.182 *	0.502	2.805 **	0.543	2.697 *
CUS	-0.192	-1.094	-0.190	-1.355	0.068	0.465	0.086	0.526
ROA	0.113	0.641	0.067	0.478	-0.095	-0.651	0.004	0.024
JOWN	-0.019	-0.102	0.051	0.350	0.388	2.495 *	0.284	1.683
LDS	0.242	1.254			0.595	3.849 **		
GOAL			0.596	3.971 **			0.370	2.071 *
D_scale	0.307	1.827	0.232	1.736	0.004	0.031	-0.046	-0.288
Constant	4.589	3.214 **	3.717	3.603 **	-2.563	-1.500	-0.406	-0.232
Adj R ²		0.145		0.416		0.406		0.207
F value		1.802		4.657 **		4.118 **		2.265
DW		1.482		2.337		1.955		1.882

Note: * p <0.05, **p <0.01

From the analysis, several findings are emphasized. First, the transfer of green procurement (GREN) is not significantly related with return on sales (ROS). The relation is negative even though it is not significant. The relation of ROS to GREN showed same direction in both variables of LDS or GOAL.

Second, however, GOV, COM and JOWN have significant relation with GREN when we used ROS and LDS variables. GOV showed negative significant relation to GREN. COM had significant positive relations to GREN. GOV and JOWN, however, did not show significant relation when we use ROS and GOAL as independent variables.

Third, when we used MANA as an explained variable, ROS had positive significant relation to MANA under LDS as an indicator of strategy. It is thus shown that financial performance in terms of ROS is significantly related with the transfer of environmental management system (MANA). Although the relation of financial performance to environmental performance is limited and not significant except in the case above mentioned, the relation of ROS to MANA indicates the same positive impact.

Fourth, when we used ROA in place of ROS, we did not find a significant relationship between green procurement (GREN) and ROA. In addition, the environmental management system (MANA) was not significantly related to ROA.

In the model with ROA as an explaining variable, MANA was significantly related with COM under the GOAL variable, but there was not a significant relation to MANA under LDS. Thus, when we used MANA as an explained variable, the result showed a weak relationship with ROA, depending on the indicator of strategy.

In summary, financial performance in terms of ROA and ROS has a negative relation to GREN. ROS to MANA is significantly positive, but the relation of ROA to MANA is not significant. These results point out that financial performance is not strongly related with the transfer of environmental practices. Financial performance is related with MANA when we use ROS. In this sense, our hypothesis is partially supported.

5. Discussion

From the analysis, we find that financial performance has no clear relation to GREN. This is assuming that green procurement is often compulsory for transactions regardless of the financial performance of firms. Green procurement practice is mandatory by law or by corporate social responsibility. Green procurement is done to respond to external pressure or assessment rather than determined by the financial performance.

In contrast, the relation of financial performance to environmental management system (MANA) is positive even though the significant relation is limited. Thus, financial performance shows a higher possibility of transfer of environmental management system (MANA). The environmental management system without a clear emission standard is discretionary and dependent on financial performance. Environmental practices are intensified depending on conditions such as legitimate regulation or discretionary conduct.

However, both ROA and ROS are financial performance indicators. We need to clarify the meaning of their results in that they are different in the transfer. Our results show that ROA and ROS have a common direction of influence on MANA. We do not suppose a fundamentally different influence of ROA and ROS on MANA. From the results, we find two logical paths to the transfer. Our analysis provides specific conditions relative to the transfer. The stage model of environmental management development suggests that environmental management proceeds forward according to the resource accumulation of the organization (Hart 1995; Kolk & Mauser 2002). Large firms with large resources show relatively advanced environmental management system.

There seem to be two different paths to an environmental management system and green procurement. In terms of resource size, the analysis indicates that the environmental management system has a positive relation with financial performance, but green procurement does not have a clear positive relation with financial performance because green procurement is more responsive to regulation and must be guaranteed as a prerequisite of transaction with the customer.

The analysis in this paper points to the following implications. First, awareness of social responsibility promotes the establishment of an environmental management system and leads to voluntary efforts. Second, policy that intensifies direct regulation, such as the RoHS directive, functions as a necessary condition of a business transaction and becomes a prerequisite. Firms must comply with the regulation. Third, the reduction of greenhouse gas emission, for which clear emission standards or strict regulation is difficult to set, increasingly depends on the discretionary effort of the firm. In this sense, it is important to foster the consciousness of corporate social responsibility. This implies that the role of infrastructure for environment becomes fundamental.

6. Conclusions

As an advanced research issue of the relationship between economy and environment, this paper analyzed the relation of financial performance of MNEs to the international transfer of environmental management practices. The results of the analysis partially supported our hypothesis. The financial performance of parent firms enhances the environmental management system of subsidiary firms under certain conditions. We cannot, however, conclude that financial performance always enhances the establishment of environmental management system. The relation of financial performance to green

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procurement is not significant. This result is consistent with empirical observation that larger firms strongly recognize their corporate social responsibility and tend to show the transfer of environmental practices in overseas operations.

Although our research suggests meaningful findings about the transfer of environmental management practices, the study has limitations. The analysis used a small number of samples, and the samples were collected from one country at a specific economic stage of development. Although these limitations require further study, our research suggests a useful, logical relationship between financial performance and the transfer of environmental management practices to overseas operations.

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