

Corporate Environmental Performance Evaluation and Its effects on Economic Performance

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Aiming to stimulate and encourage the business companies to voluntarily devote themselves in protecting the environment, this doctoral thesis explores and provides academic guidance for impartially implementing feasible and meaningful corporate environmental performance (CEP) evaluation and empirically examines the effects of corporate environmental management (CEM) on economic performance in Japan and clarifies the mechanism of the effects.

Chapter 1 describes the evolution of environmental issues, the importance of CEM to the sustainable development of the world, the historical development of the CEM in the United States and Europe, and the current situation of the CEM in Japan. Subsequently, the above-mentioned overall objective of this thesis is identified.

To make clear the state of art and

identify the limitations existing in the pervious studies, in **Chapter 2**, I make an extensive review on the previous studies regarding CEM. The review reveals: 1) theoretically and context based environmental performance measurement (EPM) models should be developed, validated and compared with the existing models to clarify the foundation of EPM and the evaluation criteria should be standardized to make CEP evaluation comparable across the companies from different sectors; 2) it is necessary to examine the effects of CEM/CEP on economic performance in different context and clarify the mechanism that CEM invokes to affect economic performance.

In **Chapter 3**, I evaluate the environmental performance of a business office by applying the method of life cycle analysis and examine whether the feedback together with introductory prompts can lead to behavioural changes. The evaluation on the environmental performance in using copy paper indicates that the evaluated office has made some efforts in using the single-sided paper (SSP) but great improvement room has left for using the recycled paper and disposing the recyclable paper as resource waste. Setting up the SSP-boxes, as one of prompts, has led to the actions of always setting up the SSP-

boxes and using SSP, and the immediate feedback together with introductory prompts has led to the behavioural changes in saving electricity.

In order to impartially evaluate the environmental performance of a group of companies and provide the stakeholders with meaningful guidelines and a uniform basis for comparison, **Chapter 4** develops a theoretically based, standardized and aggregated EPM model and propose to use the environmental intensity change index (EICI) as a basic evaluation criterion of environmental operational performance. Based on the survey data collected from 58 companies operating in the electrical machinery and instrument manufacturing sector, I empirically test the comparability of the EICI across the companies from different sub-sectors and the construct reliability of the EPM model. The results confirm that the EICI and the evaluation based on it are comparable across the companies from different sub-sectors, even though the sub-sectors are different in resources/energy consumption. This implies that the EICI is prior to the criteria used by the previous studies in eliminating the influence of process type. The reliability of the management performance indicators and operational performance indicators constructed in the EPM model is also proved. Furthermore, it is found that CEP consists of environmental management performance and environmental operational performance.

In **chapter 5**, to fill up the gap that so far, the effects of CEM/CEP on economic performance have not been empirically

examined in the context of Japan, I make an empirical examination on the effects of CEM on economic performance by using the archive data of Japanese manufacturing companies. Based on a sample of 1538 company-year observations from the period of 2000 to 2002, and using the ordered probit regression taking sample selection bias into account, I found a positive relationship between the proactiveness of CEM (in terms of Nikkei's environmental management score) and economic performance (in terms of R&I's senior long-term credit rating) existing in the current context of Japan; this is consistent with most of the previous studies conducted in the United States and Europe. However, the results did not support the moderating effect of company size on this relationship; this is contrary to the theoretical proposition but a favorable implication for the smaller companies since it may be plausible for them to reduce the risk of being small by implementing environmental management.

Chapter 6 presents the empirical results of a further and deeper analysis on how the best CEM practices affect corporate competitive advantages. It distinguishes between process-focused pollution prevention practice (PROCESS PRACTICE) and product-focused pollution prevention practice (PRODUCT PRACTICE) and examines if they affect different competitive advantages through different paths. Results obtained with the survey data collected from 256 manufacturing companies publicly traded in the first section of Tokyo Stock Exchange and by using the structural equation modelling suggest that PROCESS PRACTICE

affect cost advantage through enhancing the development of organizational capability for continuous process innovation, whereas PRODUCT PRACTICE affect market advantage through enhancing the development of organizational capabilities for continuous product innovation and higher-order learning. These results provide empirical evidence for the theoretical argument that different CEM practices have effects on different competitive advantages through different paths.

In **chapter 7**, I conclude this thesis by summarizing the main findings and identifying the theoretical and practical implications. The limitations of this study and the directions of future studies are also discussed. Even though, there are certain important limitations, this thesis is a constructive move to provide theoretical guidance for evaluating CEP and examining the "win-win" hypothesis.