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Why Do Firms Adopt/Implement Green Practices? – An Institutional Theory Perspective

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Abstract

Green supply chain management (GSCM) has emerged as an important organizational strategy in modern business environment. It has been touted as an efficient approach to enhancing manufacturing sustainability. However, how to develop and stimulate green partnerships among supply chain partners remains a challenge. This study examines how institutional theory influences GSCM practices and supply chain performance by examining whether firms submit to institutional pressures in their adoption of green practices in addition to seeking economic efficiency. Two research questions are addressed: (1) Are GSCM practices motivated by institutional variables (external pressures), and (2) what are those "institutional variables" and how are they contributing to the diffusion of GSCM practices? Based on the data collected from the U.S. and Taiwan manufacturing plants in the electric and electronics industry using survey method, structural equation modelling (SEM) was performed to examine theoretical relationships among various institutional variables, green supply chain practices, and manufacturing performance. The findings prove that pressures from institutional actors have a significantly positive impact on GSCM practices adoption, which in turns improve organizational performance. This study provides managers with valuable implications and guidelines in enhancing their efficiency and performance through meeting standards from institutional pressures.

Keywords: Green supply chain management, institutional theory, green collaboration, Environmental management

1. Introduction

Environmental management (EM) aims at improving manufacturing sustainability and, in recent years, it has become a mainstream issue for all organizations. Responding to this trend, managers have developed a diverse set of EM initiatives (e.g., green purchasing, green logistics, green design, waste reduction) to improve sustainability of their products and service. While some EM initiatives focused on efforts within organizations, many entail collaborating with supply chain partners. Specific examples of supply chain green collaboration include screening suppliers for environmental performance, providing training to build supplier capability, and developing reverse logistics systems with logistics service providers. Much of the potential for improving the environmental performance of products lies in the supply chain (Zhu et al., 2007; Vachon and Klassen, 2008). Firms must closely work with their suppliers and other trade partners when forming and implementing their EM strategies, which inspired the development and popularity of a new management concept, Green Supply Chain Management (GSCM) (Geffen and Rothenberg, 2000; Rao 2004, Yang and Sheu, 2007). The significance of GSCM is evident judging from the increase of academic and industry publications.

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The extant GSCM research has predominantly focused on individual dyads when developing theory for business-to-business relationships within the supply chain, with an assumption of *ceteris paribus* for all other chain relationships (Wathne and Heide 2004). Although a dyadic focus is important in the process of theory development, the limitation of taking a *purely* dyadic focus is that critical factors within the system or network in which organizations operate are not considered. Zhu and Sarkis (2007) and Yang et al. (2010) noted implementation of GSCM practices are not always driven by efficiency. Instead, firms often seek social legitimacy and submit to pressure of business sustainability. Namely, their green practices could be embedded within institutions and interconnected organizational networks including competitors, suppliers, customers, professional associations, and government. Several studies (e.g., Anderson et al., 1999; Ketokivi and Schroeder, 2004; Prajogo, 2011) found that the motives of implementing certain management practices such as TQM and ISO9000 could actually influence the performance of those practices. For instance, internal motives encourage firms to exploit ISO 9000 as an "organizational resource" to improve operations due to the precise application of explicit, rational, and proven rules. In contrast, external motives drive firms to seek legitimacy. When organizations implemented TQM due to external pressures (from customers or peers), the implementation failed to lead to significant performance improvement. In other words, the motives matter. It is imperative to find out whether implementation of GSCM practices can be explained by Institutional Theory and understand how the implementation relies on the adoption by supply chain partners and the diffusion of such practices. Accordingly, this project would address the following two questions.

(1) The motives of GSCM practices. Why do firms adopt certain EM/green practices? Is the implementation motivated by institutional variables (external pressures) such as social norms and customer pressures?

(2) Effects of institutional variables. What are those "institutional variables" and how are they contributing to the diffusion of GSCM practices? Moreover, what are their differential effects on the diffusion of such practices?

2. Literature Review and Theoretical Development

Institution theory suggests that organizations operate within a social network and their behaviors are not confined to dyadic relationship. It implies that a strong motivating force behind firm behavior is socially based and that it is embedded within institutions and interconnected organizational networks (Anderson et al. 1994; Iacobucci and Hopkins 1992; Meyer and Rowan, 1977; Scott, 1987). Extensive non-economic motivations can shape the form and behavior of firms (such as culture, laws, and regulations).

Organizational researchers have used institutional arguments to explain patterns of innovation diffusion (Cole, 1989; Davis and Greve, 1997; Palmer et al., 1993), the professionalization of managerial practice (Dobbin et al., 1993; Espeland and Hirsch, 1990), preferences for functional backgrounds of CEO candidates (Ocasio and Kim, 1999), effects of the state on organizational form (Dobbin et al., 1988; Ingram and Simmons, 2000), patterns of industry evolution (Biggart and Guille´n, 1999; Haveman and Rao, 1997), and other effects. Most of the applications of Institutional Theory in marketing are related to channel member behaviors, processes, and structures (Grewal and Dharwadkar, 2002; Homburg et al., 1999; Pandya and Dholakia, 1992).

With respect to the applications of Institutional Theory on the area of OM, a few researchers have examined institutional influences on the adoption of total quality management (TQM) (Bates and Hollingworth, 2004; Ismail, 2007; Westphal et al., 1997; Zbaracki, 1998), quality circles (Abrahamson, 1996), and business continuity planning (Zsidisin et al., 2005). For instance, Westphal et al. (1997) found that TQM implementation diffused through mimetic. Dean and Snell (1996) argued that managers often feel considerable pressure to "do something" about quality and JIT whether this makes sense strategically nor not. Choi and Eboch (1998) suggested that TQM has weak influence on performance but can lead to high customer satisfaction, possibly due to the fact that customers perceive TQM implementation as legitimate. Ketokivi and Schroeder (2004) found that institutional legitimacy explanations accounted for considerably more variance in the adoption of several manufacturing practices (JIT, TQM, supply chain relationship) than strategic or structural contingency theories. Roger et al. (2007) examined how operations managers reconcile potential conflicts between externally imposed institutional demands and internal operational efficiency constraints. Premkumar et al. (1997) verified the diffusion process of information systems due to social pressures.

In summary, organizations may "imitate" the behaviours of other organizations, which can be referred to as *isomorphism*. Isomorphism is a "constraining" process that forces an organization to resemble other organizations under the same environmental conditions. Imitation or isomorphism can

occur consciously or unconsciously and has a socially transmissible quality (DiMaggio and Powell 1983; Oliver 1991). Therefore, firms in the same organizational environment (supply chain network) may display similar behaviours in their interactions at the firm level. This project plans to verify the effects of internal and external pressures on GSCM practices implementation and, in turn, address the research questions. Figure 1 displays the conceptual framework to be used for developing research hypotheses.

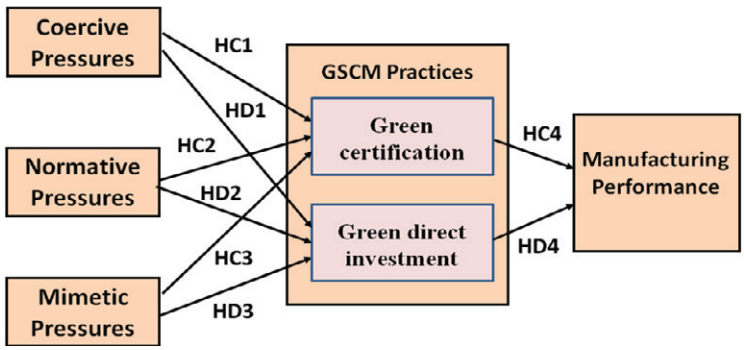

Fig. 1. Research model

3. Research Hypotheses

Institutional isomorphism provides the theoretical rationale for developing the research hypotheses in this study. First, coercive isomorphism occurs from both formal and informal pressures exerted on organizations by other organizations upon which they are dependent (DiMaggio and Powell 1983, p. 150). In practice, coercive isomorphism can result from pressures exerted by firms' legal and regulatory stakeholders, it can also result from dependencies between firms.

HC1. A firm's perceived coercive pressure is positively related to its green certification implementation.

HD1. A firm's perceived coercive pressure is positively related to its green direct investment.

Normative isomorphism stems from the high degree of socialization and interaction that often occurs between members of the same organizational environment; when these members interact, they reinforce and spread norms of behaviour among themselves (Scott 1983). Accordingly, the following hypotheses are developed.

HC2. A firm's perceived normative pressure is positively related to its green certification implementation.

HD2. A firm's perceived normative pressure is positively related to its green direct investment.

Mimetic isomorphism is a firm's standard response to environmental uncertainty. When faced with environmental uncertainty, firms may model their behavior on that of other firms (DiMaggio and Powell, 1983). Organizations and individuals may also mimic similar organizations or individuals to enhance their own legitimacy. This study considers two GSC practices: green certification and green direct investment.

HC3. A firm's perceived mimetic pressure is positively related to its green certification implementation.

HD3. A firm's perceived mimetic pressure is positively related to its green direct investment.

The existence and response to internal motives and external pressures are likely to cause the relationships between GSCM practices and performance to vary (Choi and Eboch, 1998; Prajogo, 2011; Zhu and Sarkis, 2007). Underlying internal or economic motives holds the belief that GSCM would develop manufacturing capabilities and competitive advantage.

External or institutional (social and environmental) factors could play an important role in influencing firm's decisions to implement GSCM practices. It is one thing to meet the external requirements and another to exploit GSCM practices as a "resource" for improving organizational

performance. We are interested in the contribution of GSCM practices on enhancing operational performance. The following hypotheses are proposed.

HC4. Green vendor certification implementation is positively related to manufacturing performance.

HD4. Green direct investment is positively related to manufacturing performance.

4. Research Methodology

A total of 400 surveys were sent out to manufacturing plants from the electronic and electric industries (SIC 35 & 36) in Taiwan. Additionally, 200 surveys were mailed to the members of Council of Supply Chain Management Professionals (CSCMP – cscmp.org), Kansas City Chapter. We first phoned the companies to solicit their participation and identified managers within the company who were familiar with the manufacturing sustainability and supply chain management and able to answer the questionnaire. In most cases, two respondents (manufacturing and purchasing managers) from each company addressed plant performance and the external/competitive environments. The inter-rater reliability of these responses was addressed using criteria set forth in Boyer and Verhma (2000), and all items have high levels of inter-rater reliability (all coefficients greater than .2 and significant). This finding is important as it indicates both managers perceive plant performance in similar ways, reducing significantly the risk that the results are due only to the biases of a single respondent.

146 questionnaires were returned and 112 usable samples (Taiwan = 79, US = 33) were used in the subsequent analysis. To assess non-response bias, we compared the firm size (sales and number of employees) of the respondent companies and the population as suggested by Malhotra and Grover (1998). The average number of employees is 739.

4.1 Measurement: constructs of interest

Table 1 lists the measurement items, item reliabilities and factor reliabilities. We examine three institutional pressures for each green supply chain practice, Coercive (2 items), Normative (2 items), and Mimetic (2 items), that measure the influence of institutional forces on green supply chain practices. The scales were extracted from previous studies (Teo et al., 2003; Khalifa and Davison, 2006; Liu et al., 2010). Two green supply chain management practices, Green vendor certification (2 items) and Green direct investment (2 items) are examined. The scales for manufacturing competitiveness have respondents rate their competitiveness as compared to their major industry competitors (Ketokivi and Schroeder, 2004). We capture the four main dimensions of manufacturing competitiveness cost, quality, delivery, and flexibility.

4.2 Psychometric properties

Due to the sample size, two confirmation factor analyses (CFA) are performed to review reliability and validity, one for green certification and one for green direct investment. First, each latent construct was tested for internal consistency using Cronbach's alpha and construct reliability. For the green certification model, the alpha coefficients were between 0.77 and 0.89, which are above the benchmark of 0.70 suggested by Nunnally (1978), and construct reliabilities were between 0.69 and 0.84, which are above the benchmark of 0.60 suggested by Bagozzi and Yi (1988). Reliability of each construct was ensured.

The standardized factor loadings range from 0.71 to 0.92 (at $p<0.05$) (Table 1), and convergent validity of the measurement indicators was supported. Discriminant validity is tested by comparing the correlation coefficients between latent constructs with the variance-extracted percentages for each construct (Table 2). The results indicate the variance-extracted percentages for constructs were higher than the correlation coefficients between latent constructs. The variance inflation factors (VIF) of two latent constructs were below the recommended value of 10, implying the lack of multicollinearity and the discriminant validity is supported. Measurement items were extracted from the previous literature, which ensures content validity. Finally, all the model-fit indices met acceptable levels: GFI = .89, AGFI = .90, RMSEA = .062, NFI = .88 and CFI = .91. Evidently, the measurement model exhibited a fairly good fit with the data collected. The CFA analysis for green direct investment yields similar results regarding the reliability and validity tests.

Table 1. CFA results: (N=112)

Construct/Items	*Factor Loading*	*Cronbach' α*	*Construct Reliability*
Green Certification			
Coercive pressures: Certification (CPC)			
1. Our main customers expect that we should implement green certification.	.76	.84	.72
2. Our main suppliers believe that we should use green certification.	.87		
Normative pressures: Certification (NPC)			
1. Green vendor certification has been widely adopted by our suppliers currently.	.78	.81	.83
2. Green vendor certification has been widely adopted by our customers currently.	.88		
Mimetic pressures: Certification (MPC)			
1. Our main competitors that have adopted green vendor certification benefited greatly.	.92	.89	.86
2. Our main competitors that have adopted green vendor certification are perceived favourably by customers.	.89		
Green certification (GC)			
1. We currently implement green vendor certification program.	.93	.78	.67
2. The extent of investment in environmental management.	.71		
Manufacturing performance (MNF)			
1. Cost performance	.76	.77	.79
2. Quality performance	.87		
3. Delivery performance	.78		
4. Flexibility performance	.74		
Green Direct Investment			
Coercive pressures: Direct investment (CPD)			
1. Our main customers expect us to make direct investment in our suppliers.	.81	.82	.79
2. Our main suppliers believe that we should make green direct investment in their plants.	.84		
Normative pressures: Direct investment (NPD)			
1. Our main customers make direct investment in our suppliers.	.91	.90	.88
2. Green direct investments has been widely adopted by our customers currently.	.88		
Mimetic pressures: Direct investment (MPD)			
1. Our main competitors that have made green direct investment benefited greatly.	.90	.87	.88
2. Our main competitors that have made green direct investment are perceived favorably by customers.	.86		
Green direct investment (GD)			
1. We currently make direct investment in main suppliers' green activities.	.91	.85	.78
2. The extent of investment in environmental management.	.79		

*$p \leq .05$

Table 2. Descriptive statistics and correlation matrix

	(1)	(2)	(3)	(4)	(5)
(1) CP	(0.521)				
(2) NP	0.501	(0.514)			
(3) MP	0.475	0.503	(0.604)		
(4) GC	0.508	0.511	0.365	(0.472)	
(5) MNF	0.460	0.478	0.426	0.433	(0.563)
Mean	5.49	4.68	5.87	5.95	5.24
Std. dev.	.85	.94	1.03	1.24	1.37

Note：Values in parentheses are variance extracted percentages. (*$p \leq .05$)

5. Statistical Results

Structural equation modeling (SEM) was applied to examine the proposed model using LISREL. Firm size and country are used as control variables. Table 3 displays the properties of the causal paths, including standardized path coefficients and t-values of the upstream and downstream SCI models respectively. The overall fit of the structural model (green certification) is acceptable: Chi-square = 284.67 (*df* = 59), RMSEA = 0.056, GFI = 0.87, CFI = 0.90, and NFI = 0.89. Coercive pressure induces green certification and HC1 is supported. Similarly, firms are motivated for adopting green certification when their competitors implement such practice. HC3 is supported. Meanwhile, the effect of normative pressure on green certification practice is non-significant. Thus, HC2 is not supported. Finally, green certification improves manufacturing performance and HC4 is supported.

Table 3. SEM results

(a) Green certification

Path (Hypothesis)	**Std. parameter estimate (*t*-value)**	**Significance**
CPC → GC (HC1)	.27 (6.03)	Supported **
NPC → GC (HC2)	.16 (1.67)	Not supported
MPC → GC (HC3)	.25 (3.21)	Supported *
GC → MNF (HC4)	.11 (3.06)	Supported **

*$p \leq .01$; **$p \leq .05$

(b) Green direct investment

Path (Hypothesis)	**Std. parameter estimate (*t*-value)**	**Significance**
CPD → GD (HD1)	.22 (4.16)	Supported *
NPD → GD (HD2)	.13 (1.58)	Not supported
MPD → GD (HD3)	.20 (3.07)	Not supported
GC → MNF (HD4)	.09 (1.85)	Supported *

**$p \leq .05$

For the direct investment model, the overall fit of the structural model (green certification) is acceptable: Chi-square = 217.33 (*df* = 59), RMSEA = 0.066, GFI = 0.86, CFI = 0.89, and NFI = 0.89. Coercive pressure induces green direct investment and HD1 is supported. The effects of normative and mimetic pressures on green investment practice are non-significant. Thus, HD2 and HD3 are not supported. Green direct investment has marginally significantly effect on manufacturing performance ($p \leq .10$). The statistical results suggest the following.

(1) We confirm that institutional forces influence the diffusion of green supply chain management practices. However, the effect is not universal and the source of pressures makes difference. Specifically, coercive pressures have the strongest effect on the convergence of green practices. Normative pressures fail to display any influence.

(2) The phenomenon of green supply chain practice diffusion may also depend on the type of activities. While our results support the effect of institutional factors on green certification, the influence on green direct investment is not significant. The future studies should examine additional factors that moderate the relationship.
(3) Both green supply chain practices, certification and direct investment, enhance manufacturing performance. This should be an encouraging finding for practitioners.

6. Conclusions

This study answers the call from previous studies to examine firm behavior in the supply chain due to institutional environmental effects. Our findings suggest that there are indeed institutional pressures that influence green supply chain practices, which further enhance manufacturing performance. Overall, this study breaks new ground in several areas and sheds light on a number of important topics.

The application of institutional theory in SCM is rather limited even though the literature in strategy and OB has examined institutional pressure for some time. John et al. (2001), Liu et al. (2010), and Rogers et al. (2007) urge researchers to examine SCM issues from the lens of institutional theory. Theoretically, this project extends our current understanding of the influence of external constituents on GSCM practices. We now understand how firms submit to institutional pressures to maintain their social legitimacy, in addition to seeking economic efficiency. The findings will offer practitioners guidelines to facilitate the diffusion of GSCM. Firms respond to different types of institutional pressure in differing manners and it is important for the managers to realize the differential effect of internal and external pressures. Moreover, managers must realize the existence and response to different types of pressures will cause the relationships between adopting practices and performance to vary. Understanding the internal and external pressures of adopting GSCM practices and performance implications are critical for manufacturing firms to strategically manage their environmental, economic, and operational performance.

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