

2008

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Recommended Citation

Cai, Shun; de Souza, Robert; Goh, Mark; Li, Wenkai; Lu, Qing; and Sundarakani, Balan: The adoption of green supply chain strategy: An institutional perspective 2008.
<https://ro.uow.edu.au/dubaipapers/330>

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The Adoption of Green Supply Chain Strategy: An Institutional Perspective

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Abstract -- Green supply chain has emerged as an important organizational strategy in modern business environment. While most of the current literature look at the green supply chain strategy adoption from economic and political perspective, we investigate the green supply chain strategy adoption from an institutional perspective because supply chain management involves cooperation and interactions among multiple stakeholders, and the decision to adopt this strategy may have more to do with the institutional environment in which a firm is situated. In this study, we identify key institutional determinants of green supply chain strategy adoption. A structured survey was designed to investigate critical driving forces of adoption of green supply chain strategy.

Keywords – Green Supply Chain, Institutional Influences, Mimetic Pressures, Coercive Pressures, Normative Pressures

I. INTRODUCTION

Increasingly organizations have realized that environmental management is an important strategic issue to comply with mounting environmental regulations, to address the environmental concerns of their customers, and to enhance their competitiveness [1, 2]. In supply chain management, one of the most important corporate strategies related to environmental improvement is the adoption of green supply chain (GSC).

The Green supply chain (GSC) has emerged as a strategy for many leading companies, including Dell, HP, IBM, Motorola, Sony, etc [3]. “Much of the opportunity to address CO₂ emissions rests on the supply chain, compelling companies to look for new approaches to managing carbon effectively – from sourcing and production, to distribution and product afterlife (p.1)” [4]. The increasing interests on GSC have also drawn research interests from various regions around the world. In Europe, a study surveyed 186 medium and large Spanish

companies and identified two dimensions of pressures, namely, governmental and non-governmental pressures to explain the implementation of environmental practices in logistics [5]. Another study which investigated UK supermarket retailers and its suppliers over a four-year period, suggested that firms invest in environmental supply-chain innovation because suppliers with poor environmental practices can expose the customer firm to high levels of environmental risk [6]. In Canada, using four-year’s panel data across the oil and gas, mining, and forestry industries, researchers reported that both resource-based and institutional factors influence corporate sustainable development [7]. The green supply chain has also received strong research interests from researchers in Asia. Researchers found that greening the different phases of the supply chain leads to an integrated green supply chain, which ultimately leads to competitiveness and economic performance [8]. Most recently, a survey study in China, with data collected from four typical manufacturing industrial sectors, suggested that different manufacturing industry types display different levels of green supply chain management implementation and outcomes [9].

The GSC strategy has become one of the most important initiatives for many organizations to achieve competitive advantages [8] and corporate sustainable development [7]. Much of the literature assumed that the GSC strategy adoption is only driven by rationalistic and deterministic orientation guided by economic and political goals. However, because supply chain management involves the cooperation and interaction among multiple stakeholders [10], the decision to adopt the GSC strategy may have more to do with the institutional environment in which a firm is situated. Since this initiative could be influenced by the need for legitimacy, as well as social and economic fitness in a wider social structure, this study draws upon institutional theory to identify and examine key institutional determinants of GSC strategy adoption. It has been argued that

organizations within an organizational field may conform to these rules and requirements, not necessarily for reasons of efficiency, but rather for increasing their legitimacy, resources, and survival capabilities [11, 12]. Investigating the GSC strategy adoption from an institutional theory lens would contribute to the current understanding of the key drivers for GSC strategy adoption.

A survey was designed to investigate the decisions to adopt GSC strategy among firms operating in Singapore. The empirical findings will be of interests to managers and public policy officials.

II. THEORETICAL BACKGROUND & HYPOTHESES

A. The Institutional Approach on Green Supply Chain Strategy

The institutional approach to the study of organizations has led to significant insights regarding the importance of institutional environments to organizational structure and actions [7, 11-14]. Institutional theory posits that organizational environments "... are characterized by the elaboration of rules and requirements to which individual organizations must conform if they are to receive support and legitimacy (p.149)" [15]. In particular, institutional theory emphasizes the social context within which firms operate, although firms have discretion to operate within institutional constraints, failure to conform to critical, institutionalized norms of acceptability can threaten the firms' legitimacy, resources, and its survival [11]. Institutions can include the government, professional associations, and public opinion, etc. Three types of pressures were differentiated: coercive, mimetic, and normative, which influence the rate at which sustainable development practices diffuse among firms [11].

The institutional theory is relevant to adoption of the GSC strategy among firms for at least two reasons. First, the GSC strategy could be influenced by the need for legitimacy, for social and economic fitness in a wider social structure. Second, elements of GSC practice are becoming institutionalized through regulations and international agreements. "As the issues of safety and environmental pollution arise, and as relevant professions and programs become institutionalized in laws, union ideologies and public opinion, organizations incorporate these

programs and professions (p.345)" [12]. Hence, we seek to enhance the current understanding of GSC strategy adoption through institutional lens. The research model is presented in Figure 1. A summary of all hypotheses is presented in Table 1.

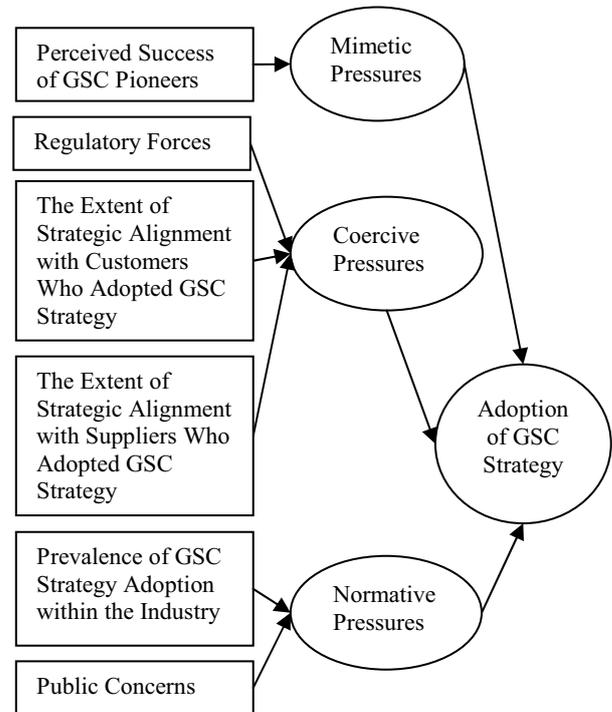


Fig. 1. Research Model & Hypotheses.

Mimetic Pressures

Institutional theory provides risk aversion as an explanation on why organizations participate in activities which does not improve performance immediately. It posits that, because of risk aversion, what appears to be non-efficient behavior can be actually an optimal or efficient strategy in the long term. Accordingly, to reduce the level of risk, firms will imitate the structures and activities of similar firms [11].

Adoption of the GSC strategy is marked by considerable uncertainty because of relative high investment and unclear economic and political paid-offs. Through imitation, firms may capitalize on the successes of the pioneers. Specifically, firms will likely mimic the visible and well-defined activities of others, especially when there activities have been regarded as success stories. Firms can learn vicariously, copying or avoiding certain organizational

practices according to their perceived impact or outcomes. Copying fruitful practices for second-mover advantage may allow an organization to unwittingly acquire some unexpected or unsought unique advantages [16]. Hence, it is highly possible that the mimetic pressures are positively related to a firm's GSC strategy adoption.

H1: Mimetic pressures will be positively related to GSC strategy adoption.

H1a: Perceived success of pioneers who adopted GSC strategy will be positively related to GSC strategy adoption.

Coercive Pressures

Institutional processes can work through coercive pressures imposed by institutions that directly influence firms. Coercive pressures are thus defined as formal or informal pressures exerted on organizations by other organizations upon which they are dependent [11]. Failing to comply with these pressures, particularly those imposed by urgent and powerful stakeholders (such as regulation), can result in loss of earning, a damaged reputation, or even loss of the license to operate [7]. Organizations characterized by an institutionalized dependency pattern are likely to exhibit similar structural features such as formal policies, organizational models, and programs. Hence, we hypothesize that:

H2: Coercive pressures will be positively related to GSC strategy adoption.

Empirical evidence suggests that coercive pressures on organizations may stem from a variety of sources or stakeholders, including regulatory, investors, and partners which have dominating positions in the market. In the context of GSC strategy adoption, we suggest that coercive pressures stem mainly from regulatory forces, and dominant partners (suppliers/customers).

Regulators are important stakeholders that exert external political and economic forces on the firm. They generally exert a strong influence on firms' environmental approach, because the regulatory environment can have a profound impact on growth and profitability [10, 17]. For example, under the European Union Emissions Trading Scheme (EUETS), capping greenhouse gas emissions and putting a price tag on them is

already in effect for certain industries. Hence, we proposed that:

H2a: Regulatory forces will be positively related to GSC strategy adoption.

A firm's position within an industry plays a role in determining its environmental performance [18]. Environmentally proactive firms attempt to erect barriers to competition to ensure that the additional costs they incur in pursuit of environmental initiatives do not undermine their competitive position [19]. This can be achieved by forcing competitors to follow suit, presumably at greater cost than that incurred by the first mover, through influencing regulators to make regulations more stringent [18]. Further, a typical supply chain usually consists of several partners in the network and a greener supply chain can only be achieved with joint efforts from multiple players in the same network. To gain better outcome from adoption of the GSC strategy, dominant plays may often urge their partners (suppliers/customers) to act accordingly. Hence, we proposed that:

H2b: The extent of strategic alignment with suppliers who have adopted GSC Strategy will be positively related to GSC strategy adoption.

H2c: The extent of strategic alignment with customers who have adopted GSC Strategy will be positively related to GSC strategy adoption.

Normative Pressures

An individual firm in the logistics industry would have direct or indirect ties to other firms which have adopted certain innovation, and thus is able to learn about the adopted innovation and its associated benefits and costs. For the GSC strategy, the information on benefits and costs of applying this environmental protection strategy are likely to be shared within the same industry. The higher prevalence this strategy is adopted in an industry, the higher possibility that other firms would be persuaded to behave similarly. Moreover, sharing these norms through relationship channels among members of a network facilitates consensus which in turn increases the strength of these norms as well as their potential influence on organization behavior [11].

In the context of GSC management, the greater the extent of adoption in the same industry, the more likely the potential adopters in

that industry would adopt the innovation to avoid being perceived as being less aware of environmental issues, which would probably lead to weak brand image. Hence, we propose that:

H3: Normative pressures will be positively related to GSC strategy adoption.

These normative pressures manifest themselves through the norms built in a specific industry as well as external stakeholders of public concerns [17]. In the context of green supply strategy adoption, normative pressures faced by an organization are likely to be increased by a higher prevalence of adoption of the GSC strategy among players in the same industry. Hence, we hypothesize:

H3a: Perceived prevalence of GSC strategy adoption will be positively related to GSC strategy adoption.

Several surveys of the North American public indicate that concern for the environment remains high on the public agenda and has been so since the late 1980s [20]. Public concern for the environment is partly an external political force exerted by community stakeholders, such as environmental activists. It can influence logistics service providers in adopting the GSC strategy: first, firms may present a green image to indicate their responsiveness to public concern, and second, firms could develop environmental strategies to target green customers and consumers. Therefore, we expect public concern for the environment to vary with people's perceptions of environmental problems prevalent in that industry [21]. We can also expect the increased public concern to influence the decisions on adopting the GSC strategy.

H3b: Public concerns will be positively related to GSC strategy adoption.

III. RESEARCH METHODOLOGY

A mail survey to reach logistics service providers in Singapore will be conducted. This survey will be part of our continuous efforts in investigating current situation and future trends of the supply chain practice in Singapore. We are seeking for samples from the database of logistics companies in Singapore from government agency, Singapore Trade Logistics Services Directory,

Aircargo Agents Association Members' Directory, and Singapore Logistics Association (SLA). Collectively, these cover almost all the significant players in the industry. A structured questionnaire has been prepared for the survey. The instrument for all variables is summarized in Table 2.

TABLE I
SUMMARY OF HYPOTHESES

Hypot thesis	Independent Variable	Dependent Variable
H1	Mimetic Pressures	Adoption of the GSC Strategy
H1a	Perceived Success of GSC Pioneers	
H2	Coercive Pressures	
H2a	Regulatory Forces	The Extent of Strategic Alignment with Customers Who Adopted GSC Strategy
H2b	The Extent of Strategic Alignment with Customers Who Adopted GSC Strategy	
H2c	The Extent of Strategic Alignment with Suppliers Who Adopted GSC Strategy	
H3	Normative Pressures	Prevalence of GSC Strategy Adoption within the Industry
H3a	Prevalence of GSC Strategy Adoption within the Industry	
H3b	Public Concerns	

IV. CONCLUSIONS

While most of the studies on the GSC management focused on the economic and political drivers of the GSC strategy, this research tackles this complicated issue from the lens of institutional theory, which explains that although the GSC strategy involves a large investment but probably less clear economic paid-offs in the short term, organizations would be willing to adopt the GSC strategy for development in the long term. Accordingly, we propose a research model incorporating critical drivers which would lead to mimetic, coercive, and normative pressures on the GSC strategy adoption in this paper. In particular, we identified six key drivers of GSC strategy adoption based on the institutional theory. These factors are believed to affect a firm's GSC strategy adoption through three types of pressures suggested by the institutional theory. Future survey study was also briefly introduced.

TABLE II
SUMMARY OF VARIABLES & INSTRUMENT

Variable & Instrument

1 Perceived Success of GSC Pioneers (Adapted from [13])

The pioneers in my industry that have adopted GSC strategy:

- Have benefited greatly;
- Are perceived favorably by others in the same industry;
- Are perceived favorably by suppliers;
- Are perceived favorably by customers.

2 Regulatory Forces (Adapted from [10])

Regulation by government agencies has greatly influenced our firm's supply chain strategy;

Environmental legislation can affect the continued growth of our firm;

Stricter environmental regulation is a major reason why our firm is concerned about its impact on the natural environment;

Our firm's environmental efforts can help shape future

environmental legislation in our industry;

Our industry is faced with strict environmental regulation.

3 The Extent of Strategic Alignment with Customers that have adopted GSC Strategy (Adapted from [22, 23])

With regard to my main customers that have adopted GSC strategy:

- My firm successfully integrates operations with them by developing interlocking programs and activities.
- My firm believes that the strategic direction, role and performance of them are critical to achieving our success.
- My firm has facilitated a strong supply network fostering cooperation with them.
- My firm is willing to enter into long-terms agreements with them.
- My firm has a track record of allowing them to participate in the strategic decisions.
- My firm clearly defines specific roles and responsibilities jointly with them.

4 The Extent of Strategic Alignment with Suppliers that have adopted GSC Strategy (Adapted from [22, 23])

Refer to variable 3: The Extent of Strategic Alignment with Customers that have adopted GSC Strategy.

Replace "customer" with "supplier".

5 The Prevalence of GSC Strategy Adoption within the Industry (Self-developed)

What is the extent of GSC strategy adoption among the firms in the industry?

6 Public Concerns (Adapted from [10])

The public feel that environmental protection is a critically important issue facing the world today.

The Asian Public is very concerned about environmental destruction.

The public are increasingly demanding environmentally friendly products and services.

The public is more worried about the economy than about environmental protection.

The public expect our firm to be environmentally friendly.

7 Adoption of Green Supply Chain Strategy (Adapted from [10])

Our firm has integrated environmental issues into our strategic supply chain decisions.

In our firm, quality includes reducing the environmental impact in supply chain practices

At our firm we make every effort to link environmental objectives with our other corporate goals.

Our firm is engaged in developing supply chain network that minimize environmental Impact.

Environmental protection is the driving force behind our firm's supply chain strategies.

Environmental issues are always considered when we design our supply chain.

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