Turning motivation into action: A strategic orientation model for green supply chain management

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Abstract

This study examines the key motivations for a firm to adopt a green supply chain management (GSCM) strategic orientation, and the mechanisms that subsequently influence GSCM practices. Three components of GSCM orientation were examined, i.e. strategic emphasis, management support, and resource commitment. Data were collected from a sample of 296 manufacturing firms in China. The results indicate that the most important motivation is environmental concern, followed by customer requirements, cost saving and competitive pressure, while legal requirements were not a significant factor. The results confirm that strategic orientation plays a mediating role between motivations and the actual practices. Within the three components of strategic orientation, resource commitment and strategic emphasis have a stronger direct impact on practices, whereas the effect of management support on GSCM practices is indirect through resource commitment. This study contributes to the literature by clarifying the key role of strategic orientation in turning GSCM motivations into actions.

Key words: Green supply chain management; Motivation; Strategic orientation; Strategic emphasis; Management support; Resource commitment.

1. Introduction

Manufacturing processes are often energy-intensive and consume a significant amount of natural resources (Schrettle, Hinz, Scherrer-Rathje, & Friedli, 2014). Globally, environmental sustainability has been a major concern for consumers, governments, non-governmental organizations and businesses. Many manufacturing firms implementing green supply chain management (GSCM) practices are driven by the pressure from governmental regulations (Sarkis, Zhu, & Lai, 2011) or customer requirements (Jira & Toffel, 2013), while others may genuinely be concerned about the environment or see the opportunity for cost saving from implementing GSCM practices (Sharma, 2000). However, firms have to overcome many barriers to implement GSCM practices. For instance, the required technology can be very expensive and substantial investment is needed, with no immediate short-term benefits (Sharma & Henriques, 2005). Moreover, GSCM can be complicated, requiring collaboration from partners across the supply chain (Vachon & Klassen, 2006). Furthermore, environmental issues are usually seen as peripheral, and may be in conflict with firms' other priorities. As a result, many firms only pay lip service to GSCM and fail to develop a strategic orientation that translates GSCM motivations into actions (Kirchoff, Tate, & Mollenkopf, 2016). Several previous studies have suggested that the motivations for implementing GSCM may not effectually lead to actual actions (Babutsidze & Chai, 2018; Chai, Bradley, Lo, & Reser, 2015). Scholars have therefore urged firms to develop proactive strategic orientations towards GSCM, rather than simply reacting to the external pressures or requirements (Kirchoff et al., 2016).

A strategic orientation is a strategic direction that leads firms to take appropriate measures for persistent improvement of their business performance (Gatignon & Xuereb, 1997). Essentially, it is "an important long-term business commitment" (Hong, Kwon, & Roh, 2009, p.525). Strategic orientation provides guidance for decision-making both within and across the firm's boundaries (Kirchoff et al., 2016). A particular strategic orientation reflects the strategic

emphaisis or prority of the firm (Jansson, Nilsson, Modig, & Hed Vall, 2017). A firm with strategic emphasis on environmental sustainability will make efforts to achieve its goal (Ardito & Dangelico, 2018), for example by providing management support for and committing resources to implementing GSCM practices. Such practices include sustainable business actions both within the firm and across the supply chain.

Previous studies have examined firms' environmental sustainability-related orientations (Roxas & Coetzer, 2012), business practices (Kirchoff et al., 2016; Mariadoss, Chi, Tansuhaj, & Pomirleanu, 2016) and environmental performance (Ardito & Dangelico, 2018; Hong et al., 2009), but few studies have examined the key motivating factors for a firm to adopt a strategic orientation toward GSCM and the role played by strategic orientation in linking a firm's GSCM motivation to the practices of GSCM. Understanding the motivations for developing a strategic orientation towards GSCM is critical because it could help us predict a firm's actions, particularly the GSCM practices, for example, if a firm's GSCM orientation is driven out of managers' environmental concern, then the firm is more likely to undertake GSCM practices beyond merely complying with the regulations or saving costs. As such, this understanding could help us to reveal the mechanisms that turn GSCM motivations into actions (Bansal & Roth, 2000).

In this study, we therefore aim to fill the above gap in the literature by developing and testing a theoretical framework that links GSCM motivational factors and strategic orientation to practice implementation. We first examine the relative importance of both the external and internal motivations of GSCM strategic orientation, and then test the relationships between GSCM motivations, the three components of strategic orientation (strategic emphasis, management support, resource commitment) and ultimately GSCM practices. Data were collected from a sample of manufacturing firms in China and the model was tested using structural equation modelling. By doing so, this study makes two major contributions to the

literature. First, this study extends the GSCM literature by identifying the key motivational factors that influence a firm to develop a strategic orientation which will then have an impact on the eventual GSCM practices. Second, this study reveals the mediating role of the strategic orientation in the relationship between motivations and GSCM practices. This study, therefore, provides a model depicting the mechanisms of the key GSCM motivations, in driving the development of a strategic orientation, which ultimately affect practice implementation.

2. Literature review

2.1. GSCM strategic orientation

A strategic orientation is critical for the success of a firm's strategy either directly or indirectly (Adams, Freitas, & Fontana, 2019; Li, Ye, Sheu, & Yang, 2018). Firms may have various strategic orientations, for example market orientation (Kohli & Jaworski, 1990), innovation orientation (Greenley, 1995), internal or external orientation (Wright, Kroll, Pray, & Lado, 1995), and long-term or short-term financial performance orientation (Doyle & Hooley, 1992). Strategy, according to Chandler (1990), can be defined as the formulation of a firm's ultimate goals, the way that resources are allocated and the sequence of actions that the firm takes to achieve those goals. The operational definition of strategic orientation in previous studies is largely based on a firm's values and beliefs, resource allocation, and behaviour (Hynes, 2009). In the case of GSCM orientation, it is believed that a firm with a GSCM orientation will have strategic emphasis on GSCM, so that the management is committed to supporting GSCM with resources allocated to implementing GSCM (Liu & Chang, 2017).

2.2. GSCM motivation

There is a general consensus among scholars that there could be various external or internal factors that motivate firms to adopt GSCM practices. In this study we explore three external motivational factors (regulations, customer requirements and competitive pressure) and two internal motivational factors (cost saving and environmental concern).

Regulators, customers and competitors are among the important external stakeholders that influence firms' environmental commitment. Institution theory posits that firms' actions are influenced by external forces, which could be coercive or normative (Hirsch, 1975). Government and regulatory bodies can exert coercive power over firms to comply with the laws, regulations and standards (He et al., 2019; Hsu, Choon Tan, Hanim Mohamad Zailani, & Jayaraman, 2013). Customer requirements for firms to adopt pro-environmental practices are a normative force. Firms have to comply with this force to gain legitimacy to operate in the market (Delmas & Montiel, 2009; Jira & Toffel, 2013; Sarkis et al., 2011). Competitive pressure is another normative force for firms to adopt environmentally friendly practices. When many competitors are committed to green practices, environmental sustainability becomes the industry norm, and other firms are impelled to follow the industry norm and put the strategic emphasis on practising environmental sustainability (Tang & Tang, 2012; Williamson, Lynch-Wood, & Ramsay, 2006).

Managers pay close attention to the cost-benefit analysis when adopting a new practice. Benefits from practising GSCM may include improved energy efficiency, better waste management, reduced resource consumption, and increased use of recycled materials which can be economically beneficial (Sarkis et al., 2011). In addition, there could also be benefits of improved stakeholder relations, reputation and brand value (Seles et al., 2018). When firms interpret tackling environmental issues as a business opportunity, they tend to take proactive

strategies (Sharma, 2000). Managers' attitudes towards and beliefs about environmental issues often shape a firm's strategic direction (Roome, 1992). Environmental concerns of a firm also reflect managers' environmental perceptions and beliefs, and thus influence the firm's environmental strategy and practices (Dunlap & Jones, 2002; Rivera, 2019).

Previous studies have explored both the internal and external drivers of GSCM practices (Sajjad, Eweje, & Tappin, 2019; Williamson et al., 2006; Wu, Ding, & Chen, 2012; Zhu, Sarkis, Cordeiro, & Lai, 2008), but there is still little knowledge about the relative importance of different drivers' influence on a firm's strategic orientation towards GSCM. Therefore, in this study, we attempt to assess the degree of importance for each of the major motivators of GSCM. We developed a formative construct of GSCM motivation using five potential drivers (regulation, customer requirement, competitive pressure, cost saving, and environmental concern) as indicators, and tested its effect on the three dimensions of GSCM strategic orientation. Therefore,

H_{1a}: GSCM motivation has a positive influence on the strategic emphasis on GSCM.

H_{1b}: GSCM motivation has a positive influence on the resource commitment to GSCM.

H_{1c}: GSCM motivation has a positive influence on the management support for GSCM.

2.3. Strategic emphasis, management support and resource commitment

GSCM requires substantial investment and resource commitment (Sharma & Henriques, 2005). Bower (2017) argued that the essence of strategy is resource allocation. Strategic goals are empty intentions unless necessary human and monetary resources are allocated to make things happen. In this vein, firms with a strategic emphasis on GSCM are more likely to allocate resources to enable the implementation of GSCM practices. Therefore,

H_{2a}: Strategic emphasis has a positive influence on resource commitment.

Resource allocation for strategy implementation requires approval and commitment from the top management (Banerjee, Iyer, & Kashyap, 2003). Drawing on the political-economic framework, Banerjee et al. (2003) argued that support from the top management is an internal political force that promotes an atmosphere conducive to environmental policy implementation. Committed and supportive managers will mobilize resources and empower employees to take necessary actions to achieve the firm's strategic goal. For example, top managers' support helps to integrate GSCM into the management systems through knowledge dissemination, employee training and reward initiatives. Middle managers' support encourages employee participation and cross-functional collaboration (Wu et al., 2012). Therefore,

H_{2b}: Management support has a positive influence on resource commitment.

2.4. Strategic orientation and GSCM practices

The effects of strategic orientation on GSCM practices and environmental performance have been examined in the literature. For example, Mariadoss et al. (2016) found that environmental orientations have a positive impact on sustainable purchasing practices and sustainable supply practices. Kirchoff et al. (2016) revealed that environmental orientation influences the implementation of GSCM practices. Ardito and Dangelico (2018) further found that GSCM orientation positively affects environmental performance such as waste and water productivity. Hong et al. (2009) revealed that the more a firm is committed to environmental sustainability, the more the firm engages in coordinating internal product development and collaborating with suppliers and customers for greening the supply chain. In addition, management support facilitates the implementation of environmental sustainability practices including internal coordination, supply chain coordination, eco-design and investment recovery initiatives (Wu et al., 2012; Zhu et al., 2008). Therefore,

H_{3a}: Strategic emphasis has a positive influence on the implementation of GSCM practices.

H_{3b}: Resource commitment has a positive influence on the implementation of GSCM practices.

H_{3c}: Management support has a positive influence on the implementation of GSCM practices.

The theoretical framework is shown in Figure 1.

[Figure 1. will be about here.]

3. Method

3.1 Sample and data collection

We employed an online questionnaire survey to collect data from a sample of companies in the manufacturing sector in China. The sampling frame was obtained based on the database of a Chinese national manufacturing trade association with over 2000 members. We randomly selected 1600 companies and emailed the hyperlink of the online questionnaire to the company's managers at the Strategic Business Unit level. We sent a reminder email one week after the initial one, and made a follow-up phone call to those managers who had not responded. Eventually, 296 responses were received, resulting in a response rate of 18.5%. The respondent sample includes various industries ranging from electrical and electronic (18%), food (15%), textile and apparel (10%), and machinery (10%) to petroleum (0.3%). In terms of company ownership, over half of the companies in the sample were privately owned (58%), about one-third of them were foreign-invested (30%), while 5% were state-owned. The informants have an average of 7 years of work experience. The average company size in terms of number of employees was 880, and the average age of companies is about 17 years.

To test non-response bias, we compared the responses of early (n=180) and late (n=116) waves of responses received. The results of t-tests showed that there are no significant differences between the two groups. Because we used a one-off cross-sectional survey, there was the potential for common method bias (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). To address this, we randomized the questionnaire questions. Second, we conducted Harman's single-factor test on the collected data. We entered all the construct indicators into an exploratory factor analysis. The result indicated that no single factor accounted for over 50% of the variance, thus common method bias is not a concern.

3.2 Measures

All the construct measures were based on existing literature (e.g. Liu & Chang, 2017; Zhu & Sarkis, 2004) and anchored on a 5-point Likert scale, where 1=strongly disagree and 5=strongly agree. The questionnaire was initially developed in English. A translation-back-translation procedure was followed to develop the Chinese version of the questionnaire. The Chinese questionnaire was sent for pilot testing and consultation to a panel of Chinese industry experts to ensure face validity of the measurement items.

The GSCM motivation was treated as a formative construct because it consists of different motivational factors. Respondents were asked to what extent the following five motivators drove their firm's GSCM: "a) to save costs; b) to satisfy customer requirements; c) to satisfy legal requirements; d) to respond to competition pressure; f) to resolve environmental concerns". These five items were developed based on a review of the literature as presented in the previous section.

Three components of strategic orientation towards greening the supply chain – strategic emphasis, resource commitment, and management support – were treated as three separate sub-constructs because they are distinct from each other according to the literature. All measures

of the three sub-constructs were based on the study of Liu and Chang (2017). Strategic emphasis was measured by 6 items, for example "Recovery of end-of-life products is one of the key performance measures in our firm", "Material recycling is an important goal", and "We check product recyclability as an important quality indicator". Resource commitment was measured by 7 items, for example "We invested in technologies for processing used materials", "We have specialists to manage end-of-life products", and "We established an environmental management system". Management support was measured by 3 items, for example "Our top/middle management appreciates the importance of the recovery of waste materials".

We measured GSCM practices using a scale modified from that of Zhu and Sarkis (2004), which includes four dimensions – internal environmental management, external GSCM, eco-design, and investment recovery. Internal environmental management was measured by 5 items, such as "adoption of total quality environmental management"; "adoption of environmental compliance and auditing programmes", and "cross-functional collaboration for environmental management". External supply chain coordination consists of 6 items, for example "cooperation with suppliers/customers for environmental objectives", "audit suppliers' environmental performance", and "cooperation with customers for eco-design/cleaner production". Eco-design consists of 3 items: "designed for reduced consumption of material/energy", "designed for reuse, recycle, and recovery of material", and "design production process to avoid or reduce hazards to the environment". Investment recovery consists of 3 items, for example "recovery of excess inventories/materials" and "sale of used materials/equipment".

4. Results

We used partial least squares structural equation modelling (PLS-SEM) based on SmartPLS 3.0 to test our research model. According to Hair, Ringle, and Sarstedt (2011), using SmartPLS

to run PLS-SEM is particularly suitable for testing models that consist of both formative and reflective indicators, whereas most other SEM techniques are unable to test such models. PLS-SEM applies predictive measures and has the capability to test causal mechanisms of theoretical hypotheses. Moreover, PLS-SEM is variance-based and has the advantages of not relying on normally-distributed data. It has the capacity to estimate the underlying relationship between indicators and the constructs, which is important for the current study that requires testing the significance of each of five motivational factors of GSCM, and the influence of the GSCM motivation as a single construct on GSCM practices. The data analysis consisted of two steps: the measurement model assessment followed by the structural model.

4.1. Measurement model

In the measurement model assessment, we conducted reliability and validity tests including composite reliability, convergent validity and discriminant validity. The results are shown in Table 1. According to Hair et al. (2011), for an indicator to be reliable, its loading to its construct should be higher than 0.7 and significant ($p<0.001$). All our indicators loaded higher than 0.7 on their construct and were significant. To establish convergent validity and internal consistency reliability, the recommended level of the average variance extracted (AVE) for each construct should be above 0.50, and the recommended level of composite reliability (CR) for each construct is 0.70 or higher. The results show that all the values of AVE and CR of all constructs meet the criteria, except GSCM practices (AVE=0.604; CR=0.958), which indicates it is appropriate to treat GSCM practices as a second-order construct. The item cross-loadings show that all items load higher on their respective constructs than the remaining constructs, thus showing good discriminant validity.

[Table 1. will be about here.]

Discriminant validity was further tested using the Fornell–Larcker criterion and Heterotrait-Monotrait Ratio of Correlations (HTMT) criterion. In the Fornell–Larcker criterion test, discriminant validity is confirmed if all the inter-construct correlations are smaller than the square root of the AVE of each reflective construct. The results shown in Table 2 indicate that is the case with our study.

[Table 2. will be about here.]

For the HTMT criterion, discriminant validity can be established if the ratios between the average correlations of indicators across constructs and the average correlations of indicators within the same construct are smaller than 0.90 (Henseler, Ringle, & Sarstedt, 2015). The results in Table 3 show that the highest ratio is 0.878, between strategic emphasis and resource commitment, indicating good discriminant validity.

[Table 3. will be about here.]

4.2. Structural model

To assess the model fit in PLS, we examined two major criteria: R^2 values for testing the model's predictive accuracy, and Q^2 values for testing the model's predictive relevance. Following Hair et al. (2011), we used a bootstrapping procedure of 5,000 subsamples to obtain the significance of the parameter estimates, and a blindfolding procedure to obtain the Q^2 values (using the SmartPLS default omission distance value of 7). The R^2 values vary from 39.3% (management support) to 75.6% (resource commitment), and that for the target construct, GSCM practices, is 41.5%, indicating moderate predictive power (Hair et al., 2011).

The test results of the hypotheses are shown in Figure 2. The majority of our hypotheses were supported, except for the direct influence of GSCM motivation on resource commitment (H_{1b}) and the direct impact of management support on GSCM practices (H_{3c}).

[Figure 2. will be about here.]

Specifically, GSCM motivation has a direct positive impact on strategic emphasis (β=0.713, $p<0.01$) and management support for greening the supply chain (β=0.627, $p<0.01$), thus H1a and H1c were supported, but their indirect impact on resource commitment was not significant (β=0.0.091, $p>0.05$), hence H1b was not supported. This suggests that GSCM motivation's impact on resource commitment might be indirect through both strategic emphasis and management support. An examination of the different motivational factors that form the construct of GSCM motivation indicates that environmental concern is the most significant motivator (0.441, $p<0.01$), followed by customer requirements (0.326, $p<0.01$), cost saving (0.230, $p<0.01$), and competitive pressure (0.213, $p<0.01$), while legal requirements was not significant (0.052, $p>0.05$).

Strategic emphasis and management support have a significant, positive effect on resource commitment (β=0.563, $p<0.01$ and β=0.311, $p<0.01$ respectively), supporting H2a and H2b.

Moreover, strategic emphasis and resource commitment have a significant, positive effect on the implementation of GSCM practices (β=0.430, $p<0.01$ and β=0.187, $p<0.01$ respectively), thus H3a and H3b were supported. Management support's effect on GSCM practices is not significant (0.069, $p>0.05$), thus H3c was not supported. This suggests that the effect of management support on GSCM practices might be indirect through the mediation of resource commitment.

Our bootstrapping procedure yielded the results of mediation tests, which are presented in Table 4. As expected, except for the two paths of "Motivation → Management support → GSCM practices" and "Motivation → Resource commitment → GSCM practices" that were not significant, the remaining paths were all significant. Overall, we can confirm the mediation role of strategic orientation between GSCM motivations and implementation of GSCM practices as actions.

[Table 4. will be about here.]

Specifically, it is confirmed that motivation's impact on resource commitment was indirect through both strategic emphasis and management support: a) "Motivation → Strategic emphasis → Resource commitment": Indirect effect=0.401, t=10.15, p<0.000, 95% confidence interval between 0.327 and 0.481; b) "Motivation → Management support → Resource commitment": Indirect effect=0.195, t=5.354, p<0.000, and 95% confidence interval between 0.125 and 0.271.

It is also confirmed that the effect of management support on GSCM practices was indirect through the mediation of resource commitment, i.e. the path of "Management support → Resource commitment → GSCM practices" was significant (Indirect effect=0.060, t=2.078, p=0.038, 95% confidence interval between 0.005 and 0.119).

Table 5 summarizes the overall hypothesis test results.

[Table 5. will be about here.]

5. Discussion and conclusion

This paper develops and tests a strategic model of GSCM orientation through examining the relationship between GSCM motivation, strategic orientation and the implementation of GSCM practices by firms. The evidence gained from the sample of Chinese manufacturers suggests that there is a clear path between motivations and the implementation of GSCM practice, through the mediation of strategic orientation. The findings of this study highlight the important role played by strategic orientation in converting GSCM motivations into actions (Mariadoss et al., 2016). Although previous studies have examined how management attitudes affect firms' environmental decision-making (Jansson et al., 2017; Kirchoff et al., 2016; Li et al., 2018; Roxas & Coetzer, 2012), few studies have investigated the strategic process linking firms' motivations to the implementation of GSCM practices.

5.1. Theoretical implications

The empirical results suggest that firms' strategic GSCM orientation is motivated by managers' environmental concerns, customers' requirements, competitor actions, and opportunities to save costs. Environmental concern is the most significant motivator while regulatory pressure was not a significant motivator. This finding suggests that the adoption of a strategic GSCM orientation is primarily voluntary rather than passive compliance with the regulations. There are two possible reasons why legal requirements do not appear to be a significant motivator for adopting a strategic GSCM orientation. Firstly, managers may voluntarily develop their firm's GSCM strategies beyond simple legal compliance (Sharma, 2000). For example, the study by Ramanathan, He, Black, Ghobadian, and Gallear (2017) indicates that manufacturers in China tend to adopt green standards higher than the current governmental regulations to pre-empt future requirements. Environmental regulations may drive the defensive behaviour of firms, but are ineffective for proactive environmental strategy

(Quang Le Van et al., 2019). Secondly, GSCM practices extend beyond the focal firm's boundary as they require green practices to be adopted by partner firms across the supply chain. Currently, most environmental regulations are imposed at the firm level, whereas there is a lack of regulations at supply chain level. As such, coercive pressures exercised on the focal firm may not be sufficient to drive the focal firm to adopt inter-firm GSCM practices.

The results show that customer requirements are a significant motivator for firms to adopt a strategic GSCM orientation, which is consistent with the earlier finding that customers can have an influence on the firm's adoption of environmental practices (Sharma & Henriques, 2005). In the context of our empirical study, it is important to point out that US and EU clients are among the most important customers of Chinese manufacturers (Christmann & Taylor, 2001), hence the increasingly stringent environmental standards required by the customer are serving as an important motivator for adopting a strategic GSCM orientation.

Cost-saving is also an important motivator of strategic GSCM orientation. Previous studies have suggested that the implementation of a waste management system, reduction in the consumption of virgin resources and increased use of recycled materials can be economically beneficial (Sarkis et al., 2011), confirming that there are opportunities to reduce costs while achieving pro-environmental objectives through calculative cost-benefit analysis (Schrettle et al., 2014; Williamson et al., 2006). Moreover, this study provides evidence to support the argument that firms' strategic GSCM orientation may be influenced by normative pressures resulting from their competitors' green practices, indicating that adopting GSCM practices which are regarded as the industry norm helps to enhance firms' legitimacy in the market (Tang & Tang, 2012; Williamson et al., 2006).

Interestingly, this study shows that GSCM motivation does not directly lead to resource commitment. This suggests that there are more important intermediate factors that drive firms'

GSCM practices. What we found in this study is that the strategic emphasis on GSCM and managers' commitment to providing support for GSCM are the preconditions of adequate allocation of organizational resources to facilitate the GSCM practices (Schrettle et al., 2014; Sharma, 2000). The results of mediation effect tests confirm such impacts and indicate the indirect paths between GSCM motivations, strategic emphasis, management support, and resource commitment.

Nevertheless, unlike management support, firms' strategic emphasis on GSCM has a direct impact on both resource commitment and the implementation of GSCM practices, demonstrating the key role of strategic emphasis in turning motivations into actions. Moreover, the results indicate that resource commitment plays a central role in the successful implementation of GSCM practices, thus confirming our argument that resource commitment is the foundation of GSCM.

5.2. *Implications for practice*

The findings of this study have important implications for policy makers and practitioners of GSCM. First, policy makers need to understand that GSCM motivations could derive from internal sources, such as management's pro-environmental attitude and their trade-off analysis of the cost and benefit of GSCM practices, or from external sources, such as customer pressures and industry norms. Therefore, to encourage firms to adopt a strategic orientation towards GSCM, it is important for policy makers to understand the firm's specific motivations rather than only strengthening regulations.

Second, sufficient motivation can be an important driving force for the adoption of GSCM orientation by firms. In this sense, policy makers could create optimal policy environments to encourage GSCM, for example by creating targeted tax levies to encourage cost advantages of pro-environmental activities along the supply chain. Policy makers could also raise consumer

awareness through better information dissemination. In addition, policy makers could create pro-environmental industry norms by facilitating and encouraging knowledge sharing between firms in the sector regarding GSCM-related issues. Although policy makers usually tend to focus on regulations as the most important policy tools, they need to realize that as GSCM extends beyond single firm boundaries, environmental regulation may not sufficiently promote GSCM orientation, unless such regulations include the inter-firm level .

Third, company managers need to realize that good intentions and management support are not sufficient for the implementation of GSCM. Adequate resource commitment is essential for implementing GSCM practices. Managers also need to realize that both clear and dedicated strategic emphasis and adequate management support are pre-conditions for sufficient resource commitment and investment in GSCM by companies.

Overall, as the competition shifts from an inter-firm to an inter-supply chain level, strategic collaboration on a supply chain basis becomes a crucial source of competitive advantage (Gold, Seuring, & Beske, 2010). Adoption of GSCM based on supply chain collaborative relationships can be a good source of competitive advantage, which not only enhances environmental performance of focal firms but also can help firms to share risks and leverage the resources and knowledge of their suppliers and customers (Cao & Zhang, 2011). Development of strategic GSCM orientation during this trend will be an important agenda item for manufacturing firms.

5.3. Limitations and future research

Like all studies, there are several limitations to this study which suggest future research. First, our study relies on self-reported data by a single respondent from each responding company; although this approach is commonly used in the field, future research could employ multiple information sources to verify the results or to conduct multiple-informant surveys. Second, the sample of this study is limited to manufacturing companies included in a well-

known Chinese national trade association, thus non-member companies and companies in other sectors were not included in the sample, which could restrict the generalization of the study's findings. Future studies could test the strategic orientation model developed in this study using different samples or samples from other sectors from either China or other countries.

References

Adams, P., Freitas, I. M. B., & Fontana, R. (2019). Strategic orientation, innovation performance and the moderating influence of marketing management. *Journal of Business Research, 97*, 129-140. https://doi.org/10.1016/j.jbusres.2018.12.071

Ardito, L., & Dangelico, R. M. (2018). Firm Environmental Performance under Scrutiny: The Role of Strategic and Organizational Orientations. *Corporate Social Responsibility and Environmental Management, 25*(4), 426-440. https://doi.org/10.1002/csr.1470

Babutsidze, Z., & Chai, A. (2018). Look at me saving the planet! The imitation of visible green behavior and its impact on the climate value-action gap. *Ecological Economics, 146*, 290-303. https://doi.org/10.1016/j.ecolecon.2017.10.017

Banerjee, S. B., Iyer, E. S., & Kashyap, R. K. (2003). Corporate Environmentalism: Antecedents and Influence of Industry Type. *Journal of Marketing, 67*(2), 106-122. https://doi.org/10.1509/jmkg.67.2.106.18604

Bansal, P., & Roth, K. (2000). Why companies go green: A model of ecological responsiveness. *Academy of management Journal, 43*(4), 717-736. https://doi.org/10.5465/1556363

Bower, J. L. (2017). Managing Resource Allocation: Personal Reflections From a Managerial Perspective. *Journal of Management, 43*(8), 2421-2429. https://doi.org/10.1177/0149206316675929

Cao, M., & Zhang, Q. (2011). Supply chain collaboration: Impact on collaborative advantage and firm performance. *Journal of Operations Management, 29*(3), 163-180. https://doi.org/10.1016/j.jom.2010.12.008

Chai, A., Bradley, G., Lo, A., & Reser, J. (2015). What time to adapt? The role of discretionary time in sustaining the climate change value–action gap. *Ecological Economics, 116*, 95-107. https://doi.org/10.1016/j.ecolecon.2015.04.013

Chandler, A. D. (1990). *Strategy and structure: Chapters in the history of the industrial enterprise*. Cambridge, MA: MIT Press.

Christmann, P., & Taylor, G. (2001). Globalization and the environment: Determinants of firm self-regulation in China. *Journal of International Business Studies, 32*(3), 439-458. https://doi.org/10.1057/palgrave.jibs.8490976

Delmas, M., & Montiel, I. (2009). Greening the supply chain: when is customer pressure effective? *Journal of Economics & Management Strategy, 18*(1), 171-201. https://doi.org/10.1111/j.1530-9134.2009.00211.x

Doyle, P., & Hooley, G. J. (1992). Strategic orientation and corporate performance. *International Journal of Research in Marketing, 9*(1), 59-73. https://doi.org/10.1016/0167-8116(92)90029-K

Dunlap, R., & Jones, R. (2002). Environmental Concern: Conceptual and Measurement Issues.[ed.] R. Dunlap and W. Michelson. In R. E. Dunlap & W. Michelson (Eds.), *Handbook of Environmental Sociology* (pp. 482-524). Westport, CT: Greenwood Publishing Group.

Gatignon, H., & Xuereb, J. M. (1997). Strategic orientation of the firm and new product performance. *Journal of Marketing Research, 34*(1), 77-90. https://doi.org/10.2307/3152066

Gold, S., Seuring, S., & Beske, P. (2010). Sustainable supply chain management and inter-organizational resources: a literature review. *Corporate Social Responsibility and Environmental Management, 17*(4), 230-245. https://doi.org/10.1002/csr.207

Greenley, G. E. (1995). Market Orientation and Company Performance: Empirical Evidence From UK Companies. *British Journal of Management, 6*(1), 1-13. https://doi.org/10.1111/j.1467-8551.1995.tb00082.x

Hair, J. F., Ringle, C. M., & Sarstedt, M. (2011). PLS-SEM: Indeed a silver bullet. *The Journal of Marketing Theory and Practice, 19*(2), 139-152. https://doi.org/10.2753/MTP1069-6679190202

He, Z.X., Xu, S.C., Shen, W.X., Wang, M.L., & Li, C.F. (2019). Exploring external and internal pressures on the environmental behavior of paper enterprises in China: A qualitative study. *Business Strategy and the Environment, 28*(6), 951-969. https://doi.org/10.1002/bse.2294

Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science, 43*(1), 115-135. https://doi.org/10.1007/s11747-014-0403-8

Hirsch, P. M. (1975). Organizational Effectiveness and the Institutional Environment. *Administrative science quarterly, 20*(3), 327-344. https://doi.org/10.2307/2391994

Hong, P., Kwon, H. B., & Roh, J. J. (2009). Implementation of strategic green orientation in supply chain: An empirical study of manufacturing firms. *European Journal of Innovation Management, 12*(4), 512-532. https://doi.org/10.1108/14601060910996945

Hsu, C.-C., Choon Tan, K., Hanim Mohamad Zailani, S., & Jayaraman, V. (2013). Supply chain drivers that foster the development of green initiatives in an emerging economy. *International Journal of Operations & Production Management, 33*(6), 656-688. https://doi.org/10.1108/IJOPM-10-2011-0401

Hynes, N. (2009). Corporate culture, strategic orientation, and business performance: New approaches to modeling complex relationships. *Technological Forecasting and Social Change, 76*(5), 644-651. https://doi.org/10.1016/j.techfore.2008.08.014

Jansson, J., Nilsson, J., Modig, F., & Hed Vall, G. (2017). Commitment to Sustainability in Small and Medium-Sized Enterprises: The Influence of Strategic Orientations and Management Values. *Business Strategy and the Environment, 26*(1), 69-83. https://doi.org/10.1002/bse.1901

Jira, C., & Toffel, M. W. (2013). Engaging supply chains in climate change. *Manufacturing & Service Operations Management, 15*(4), 559-577. https://doi.org/10.1287/msom.1120.0420

Kirchoff, J. F., Tate, W. L., & Mollenkopf, D. A. (2016). The impact of strategic organizational orientations on green supply chain management and firm performance. *International Journal of Physical Distribution & Logistics Management, 46*(3), 269-292. https://doi.org/10.1108/IJPDLM-03-2015-0055

Kohli, A. K., & Jaworski, B. J. (1990). Market orientation: The construct, research propositions, and managerial implications. *Journal of Marketing, 54*(2), 1-18. https://doi.org/10.2307/1251866

Li, Y., Ye, F., Sheu, C., & Yang, Q. (2018). Linking green market orientation and performance: Antecedents and processes. *Journal of Cleaner Production, 192*, 924-931. https://doi.org/10.1016/j.jclepro.2018.05.052

Liu, S., & Chang, Y.-T. (2017). Manufacturers' closed-loop orientation for green supply chain management. *Sustainability, 9*(2), 222. https://doi.org/10.3390/su9020222

Mariadoss, B. J., Chi, T., Tansuhaj, P., & Pomirleanu, N. (2016). Influences of Firm Orientations on Sustainable Supply Chain Management. *Journal of Business Research, 69*(9), 3406-3414. https://doi.org/10.1016/j.jbusres.2016.02.003

Podsakoff, P. M., MacKenzie, S. B., Lee, J.-Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: a critical review of the literature and recommended remedies. *Journal of Applied Psychology, 88*(5), 879-903. https://doi.org/10.1037/0021-9010.88.5.879

Quang Le Van, Thanh Viet Nguyen, & Manh Hung Nguyen (2019). Sustainable development

and environmental policy: The engagement of stakeholders in green products in Vietnam. *Business Strategy and the Environment, 28*(5), 675-687.

Ramanathan, R., He, Q., Black, A., Ghobadian, A., & Gallear, D. (2017). Environmental regulations, innovation and firm performance: A revisit of the Porter hypothesis. *Journal of Cleaner Production, 155*, 79-92.

Rivera, J. (2019) An integral model for the implementation of environmental policy strategy. *Business Strategy and the Environment, 28*(5), 909-920.

Roome, N. (1992). Developing environmental management strategies. *Business Strategy and the Environment, 1*(1), 11-24. https://doi.org/10.1002/bse.3280010104

Roxas, B., & Coetzer, A. (2012). Institutional Environment, Managerial Attitudes and Environmental Sustainability Orientation of Small Firms. *Journal of Business Ethics, 111*(4), 461-476. https://doi.org/10.1007/s10551-012-1211-z

Sajjad, A., Eweje, G., & Tappin, D: 2019: Managerial perspectives on drivers for and barriers to sustainable supply chain management implementation: Evidence from New Zealand. *Business Strategy and the Environment*. https://doi.org/10.1002/bse.2389

Sarkis, J., Zhu, Q., & Lai, K.-h. (2011). An organizational theoretic review of green supply chain management literature. *International Journal of Production Economics, 130*(1), 1-15. https://doi.org/10.1016/j.ijpe.2010.11.010

Schrettle, S., Hinz, A., Scherrer-Rathje, M., & Friedli, T. (2014). Turning sustainability into action: Explaining firms' sustainability efforts and their impact on firm performance. *International Journal of Production Economics, 147*, 73-84. https://doi.org/10.1016/j.ijpe.2013.02.030

Seles, B. M. R. P., de Sousa Jabbour, A. B. L., Jabbour, C. J. C., de Camargo Fiorini, P., Mohd-Yusoff, Y., & Thomé, A. M. T. (2018). Business opportunities and challenges as the two sides of the climate change: corporate responses and potential implications for big data management towards a low carbon society. *Journal of Cleaner Production, 189*, 763-774. https://doi.org/10.1016/j.jclepro.2018.04.113

Sharma, S. (2000). Managerial interpretations and organizational context as predictors of corporate choice of environmental strategy. *Academy of management Journal, 43*(4), 681-697. https://doi.org/10.5465/1556361

Sharma, S., & Henriques, I. (2005). Stakeholder influences on sustainability practices in the Canadian forest products industry. *Strategic Management Journal, 26*(2), 159-180. https://doi.org/10.1002/smj.439

Tang, Z., & Tang, J. (2012). Stakeholder-firm power difference, stakeholders' CSR orientation, and SMEs' environmental performance in China. *Journal of business venturing, 27*(4), 436-455. https://doi.org/10.1016/j.jbusvent.2011.11.007

Vachon, S., & Klassen, R. D. (2006). Extending green practices across the supply chain. *International Journal of Operations & Production Management, 26*(7), 795-821. https://doi.org/10.1108/01443570610672248

Williamson, D., Lynch-Wood, G., & Ramsay, J. (2006). Drivers of environmental behaviour in manufacturing SMEs and the implications for CSR. *Journal of Business Ethics, 67*(3), 317-330. https://doi.org/10.1007/s10551-006-9187-1

Wright, P., Kroll, M., Pray, B., & Lado, A. (1995). Strategic orientations, competitive advantage, and business performance. *Journal of Business Research, 33*(2), 143-151. https://doi.org/10.1016/0148-2963(94)00064-L

Wu, G.-C., Ding, J.-H., & Chen, P.-S. (2012). The effects of GSCM drivers and institutional pressures on GSCM practices in Taiwan's textile and apparel industry. *International Journal of Production Economics, 135*(2), 618-636. https://doi.org/10.1016/j.ijpe.2011.05.023

Zhu, Q., & Sarkis, J. (2004). Relationships between operational practices and performance

among early adopters of green supply chain management practices in Chinese manufacturing enterprises. *Journal of Operations Management, 22*(3), 265-289. https://doi.org/10.1016/j.jom.2004.01.005

Zhu, Q., Sarkis, J., Cordeiro, J. J., & Lai, K.-H. (2008). Firm-level correlates of emergent green supply chain management practices in the Chinese context. *Omega, 36*(4), 577-591. https://doi.org/10.1016/j.omega.2006.11.009

Table 1. Construct reliability and validity

	Strategic orientation			GSCM practices (2^{nd} order construct, AVE=0.604; CR=0.958)			
	Management support (3 items)	Resource commitment (7 items)	Strategic emphasis (6 items)	Internal coordination (5 items)	Supply chain coordination (6 items)	Eco-design (3 items)	Investment recovery (3 items)
AVE	***0.805***	***0.696***	***0.817***	***0.779***	***0.757***	***0.873***	***0.751***
CR	***0.878***	***0.927***	***0.955***	***0.929***	***0.935***	***0.927***	***0.835***
SO1	**0.909**	0.596	0.511	0.407	0.284	0.377	0.390
SO2	**0.932**	0.657	0.556	0.410	0.320	0.381	0.406
SO3	**0.848**	0.702	0.650	0.394	0.427	0.413	0.389
SO4	0.616	**0.807**	0.645	0.408	0.477	0.365	0.374
SO5	0.629	**0.847**	0.700	0.484	0.453	0.414	0.328
SO6	0.646	**0.884**	0.733	0.481	0.477	0.401	0.303
SO7	0.653	**0.846**	0.749	0.521	0.478	0.435	0.366
SO8	0.625	**0.799**	0.595	0.414	0.394	0.381	0.315
SO9	0.530	**0.823**	0.684	0.433	0.498	0.390	0.303
SO10	0.563	**0.830**	0.716	0.560	0.488	0.437	0.334
SO14	0.606	0.781	**0.864**	0.525	0.513	0.459	0.382
SO15	0.597	0.765	**0.910**	0.512	0.479	0.444	0.356
SO16	0.601	0.761	**0.920**	0.544	0.508	0.466	0.378
SO17	0.566	0.756	**0.928**	0.577	0.565	0.494	0.439
SO18	0.559	0.734	**0.917**	0.536	0.539	0.465	0.425
SO19	0.558	0.694	**0.882**	0.542	0.552	0.500	0.436
GSCM1	0.414	0.485	0.503	**0.884**	0.620	0.591	0.460
GSCM2	0.411	0.495	0.517	**0.893**	0.631	0.613	0.441
GSCM3	0.397	0.536	0.561	**0.895**	0.666	0.580	0.466
GSCM4	0.408	0.515	0.526	**0.890**	0.684	0.592	0.442
GSCM5	0.360	0.472	0.527	**0.851**	0.664	0.601	0.482
GSCM10	0.300	0.476	0.486	0.665	**0.869**	0.627	0.490
GSCM11	0.285	0.427	0.433	0.550	**0.816**	0.571	0.463
GSCM12	0.274	0.462	0.491	0.634	**0.909**	0.676	0.503
GSCM13	0.379	0.521	0.566	0.662	**0.916**	0.723	0.514
GSCM14	0.349	0.531	0.519	0.676	**0.872**	0.716	0.511
GSCM15	0.424	0.497	0.533	0.665	**0.835**	0.825	0.617
GSCM16	0.419	0.435	0.474	0.630	0.753	**0.950**	0.658
GSCM17	0.415	0.477	0.555	0.672	0.762	**0.948**	0.630
GSCM18	0.389	0.446	0.431	0.587	0.718	**0.904**	0.655
GSCM19	0.387	0.382	0.424	0.518	0.582	0.662	**0.884**
GSCM20	0.380	0.311	0.337	0.430	0.445	0.573	**0.862**
GSCM21	0.381	0.336	0.393	0.392	0.511	0.557	**0.855**

Table 2. Fornell–Larcker criterion test (inter-construct correlations)

	Eco-design	Internal coordination	Investment recovery	Management support	Motivation	Resource commitment	Strategic emphasis	Supply chain coordination
Eco-design	**0.935**							
Internal coordination	0.675	**0.883**						
Investment recovery	0.692	0.519	**0.867**					
Management support	0.437	0.451	0.441	**0.897**				
Motivation	0.494	0.563	0.417	0.627	**NA**			
Resource commitment	0.484	0.568	0.398	0.730	0.688	**0.834**		
Strategic emphasis	0.522	0.597	0.446	0.643	0.713	0.828	**0.904**	
Supply chain coordination	0.797	0.740	0.596	0.387	0.515	0.560	0.582	**0.870**

Note: The bold numbers at diagonal are the square roots of AVE.

Table 3. Heterotrait-Monotrait ratio of correlations

	Eco-design	Internal coordination	Investment recovery	Management support	Resource commitment	Strategic emphasis
Internal coordination	0.726					
Investment recovery	0.783	0.585				
Management support	0.482	0.499	0.514			
Resource commitment	0.522	0.609	0.450	0.805		
Strategic emphasis	0.553	0.634	0.497	0.697	0.878	
Supply chain coordination	0.852	0.792	0.667	0.421	0.600	0.614

Table 4. Mediation test results

	Indirect effect	t	p	LL 95%CI	UL 95%CI
Motivation -> Management support -> GSCM practices	0.039	0.938	0.348	-0.038	0.126
Management support -> Resource commitment -> GSCM practices	0.060	2.078	0.038	0.005	0.119
Motivation -> Management support -> Resource commitment -> GSCM practices	0.038	2.021	0.043	0.003	0.077
Motivation -> Resource commitment -> GSCM practices	0.018	1.109	0.267	-0.002	0.059
Strategic emphasis s -> Resource commitment -> GSCM practices	0.109	2.176	0.030	0.009	0.209
Motivation -> Strategic emphasis -> Resource commitment -> GSCM practices	0.078	2.140	0.032	0.007	0.152
Motivation -> Strategic emphasis -> GSCM practices	0.308	5.377	0.000	0.197	0.425
Motivation -> Management support -> Resource commitment	0.195	5.354	0.000	0.125	0.271
Motivation -> Strategic emphasis -> Resource commitment	0.401	10.15	0.000	0.327	0.481

Table 5. Hypotheses test results

	Path	Supported?
H1a	Motivation → Strategic emphasis	Yes
H1b	Motivation → Resource commitment	No (but significant indirect effect)
H1c	Motivation → Management support	Yes
H2a	Strategic emphasis → Resource commitment	Yes
H2b	Management support→ Resource commitment	Yes
H3a	Strategic emphasis → GSCM practices	Yes
H3b	Resource commitment → GSCM practices	Yes
H3c	Management support → GSCM practices	No (but significant indirect effect)

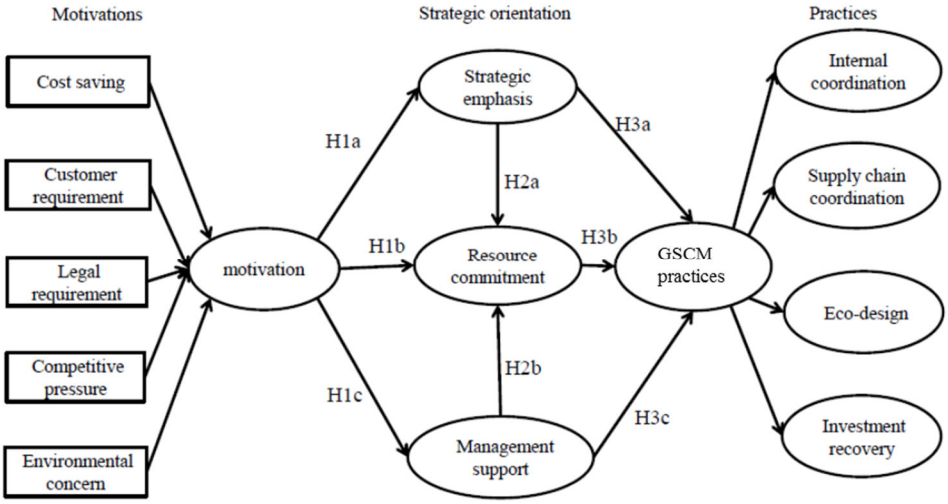

Figure 3. Theoretical framework

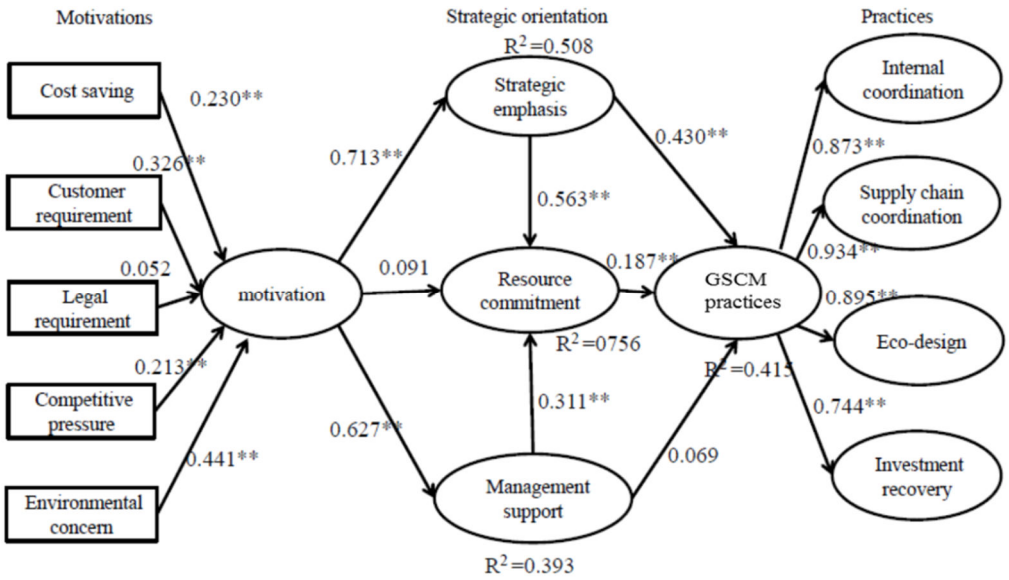

Figure 2. Structural equation model, path coefficients and significance level