

Internal Enablers for the Implementation of Sustainable Supply Chain Risk Management Systems

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Abstract Continuous globalization and requirements for sustainable products increases the risks for companies for reputation damages through sustainability violations in their supplier networks. Therefore effective management of sustainability risks is essential for companies. This paper aims at identifying factors that enable companies to implement an effective risk management system with regard to social, environmental and economic risks of their supply chain. A model is elaborated that represents the internal enablers that promote the development of an effective sustainability risk management system within the supplier network. Afterwards this model has been operationalized and validated by using semi-structured interviews with experts from one enterprise. It was determined that besides supply chain complexity the support of the top management is decisive for initiating and establishing necessary processes as well as for the provision of the necessary resources which in turn enables implementing an effective risk management system regarding sustainability risks from the supply chain.

1 Introduction

The continuing globalization of both goods and capital markets allows companies to build worldwide supply chains (SC). This provides tremendous benefits in terms of cost, flexibility, innovation and quality of products, so that the supplier network of a company is a decisive competitive factor. At the same time, companies are increasingly held accountable for any issues regarding environmental pollution or working conditions not only at their own production sites, but also at their suppliers'. Therefore, effective management of sustainability risks is essential for companies.

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In related literature several motivation factors are discussed that influence the efforts of a company to engage in sustainable supply chains (SSC). For instance, public and regulatory pressures are a key driver for sustainability within SCs (Lee and Klassen 2009). Furthermore, customer demands (Seuring and Müller 2008) are mentioned to play a role.

On the other side several measures taken by companies to ensure sustainability within their SCs are discussed. For example Code of Conducts are used by companies to ensure that their suppliers know their expectations regarding social and ecological factors within the manufacturing process and the consequences of not meeting them (Awaysheh and Klassen 2010). In order to make such expectations compulsory for suppliers purchasing conditions containing paragraphs relating to sustainability are used.

Thus, different motivating factors influence companies on their decision to strive towards SSCs. In response to these companies take measures. Still, motivating factors are not the only impact. If they were the only factors decisive for the implementation of measures related to sustainability in the SC, similar companies that operate within the same industry, the same region, and are similar in size, would take comparable intensive measures in terms of their SCs. Since this is not the case, internal factors within companies might also play a role. Therefore, the goal of this work is to identify such internal factors and investigate how they are linked among each other.

This work is organized as follows: Firstly, hypotheses are derived from the relevant literature and the developed model is presented in section two. Afterwards, the used methodology is described in section three, and discussed in section four, before a conclusion and a brief outlook are given in the last section.

2 Literature Review and Model Derivation

The following section will provide a basic definition of SSC and SC risk management. Then hypothesis will be derived based on the relevant literature. They form the basic of the model then developed.

2.1 Sustainable Supply Chain Management

Several definitions of SSC management exist. In an extended literature review Ahi and Searcy (2013) analyzed given definitions and developed a common understanding. For this work, their definition of SSCs shall be adopted. Ahi and Searcy (2013) defined SSCs as:

The creation of coordinated supply chains through the voluntary integration of economic, environmental, and social considerations with key inter-organizational business systems

designed to efficiently and effectively manage the material, information, and capital flows associated with the procurement, production, and distribution of products or services in order to meet stakeholder requirements and improve the profitability, competitiveness, and resilience of the organization over the short- and long-term.

2.2 Supply Chain Risk Management

SC management requires a complex flow of information, materials and funds for several functional areas within and between organizations (Faisal et al. 2006). Due to the complexity of SCs there is much potential for incidents. In general SC risks can be referred to as “the possibility and effect of a mismatch between supply and demand” (Jüttner et al. 2003, 200). Sustainability risks extend this definition. According to Hofmann et al. (2013) they focus not just on mismatches between demand and supply but are “a condition or potentially occurring event that may provoke a harmful stakeholder reactions”.

The special challenge of managing risks within SCs is, that in contrast to traditional risk management, not only risks from the own company have to be identified and reduced, but also across companies (Thun and Hoenig 2011). Still, purchasing organizations have the possibility to proactively try to assess the probability and impact of SC risks in advance (Zsidisin et al. 2004).

Consequently, the aim of SC risk management is first, to identify the potential sources of risk and second, to take measures to avoid or contain those risks (Jüttner et al. 2003).

Although there are different frameworks proposed in literature for achieving this goal, a systematic risk assessment process typically covers at least the following tasks (Kleindorfer and Saad 2005; Kern et al. 2012):

1. Identifying sources of relevant risks and vulnerabilities
2. Assessment of probability and impact of each identified risk
3. Risk mitigation

Based on the preceding discussion, the next section will show what promotes the emergence of an effective SC risk management system in companies.

2.3 Enablers of Sustainable Supply Chain Risk Management

Drivers and enablers are often used interchangeably. This work focuses only on enablers. Therefore the two terms need to be distinguished.

According to Gimenez and Tachizawa factors that motivates companies to adopt SSCs are drivers, while factors assisting companies to achieve this are enablers (Gimenez and Tachizawa 2012). Therefore the existence of an enabler is not enough to develop SSCs but their lack may hinder it (Lee and Klassen 2009).

Examples for drivers are legal regulation, customer demands and stakeholder pressures (Seuring and Müller 2008).

As the scope of this work are enablers, the following section presents enablers discussed within literature more in detail.

2.3.1 Top Management Support

Particularly in case companies are not exposed to external pressure by stakeholders or regulatory requirements, the orientation of management is crucial for a company's commitment to go towards SSCs (Lee and Klassen 2009). Especially the extent to which companies go towards implementing sustainability within their SCs heavily depends on the extent of managers perceiving it as opportunity or threat (Giunipero et al. 2012).

To establish sustainability in SCs effectively, it is not sufficient to occasionally incorporate sustainability in decisions. It must be included consistently in both the corporate culture and the company's goals (Pagell and Wu 2009). This in turn is only possible if the top management supports such initiatives and actions. Top management must ensure the implementation of processes, which consider sustainability throughout the entire procurement processes.

Therefore this leads to the first hypotheses:

- H1a Top management support regarding SSCs ensures that the necessary SC sustainability risk management processes get implemented.
- H1b Top management support regarding SSCs ensures that sufficient resources get provided to implement an effective supply chain sustainability risk management.

2.3.2 Supply Chain Complexity

For the creation of SSCs, in particular the complexity of the supply chain plays a role.

According to Vachon and Klassen (2006) the likelihood to have suppliers that do not comply with social or ecological expectations increases with the size of the supplier base.

Therefore a particularly complex SC requires an effective risk management and correspondingly also more effort. This can only be met through appropriate processes and with the corresponding resources.

In consequence, the next two hypotheses regard to the assets of the company:

- H2a The complexity of the supply chain influences the provision of the necessary SSC management processes.
- H2b The complexity of the supply chain influences the necessary resources to implement an effective supply chain sustainability risk management.

2.3.3 SSC Management Processes Established

Strong processes that provide guidance to employees are essential when buying companies implement SSCs (Hoejmose et al. 2013). Moreover formalized processes instruct not just suppliers but also managers in the focal company how to achieve sustainability within SCs (Awaysheh and Klassen 2010).

Based on this argument, this study postulates that:

- H3a SSC management processes ensure effective social risk management within the SC of a company.
- H3b SSC management processes ensure effective ecologic risk management within the SC of a company.
- H3c SSC management processes ensure effective economic risk management within the SC of a company.

2.3.4 Provided Resources

In the short term the establishment of SSCs requires an investment (Giunipero et al. 2012). The buying company needs to implement new processes to ensure transparency within the SC and maybe certify them.

In addition, employees need to enhance their knowledge about implementing sustainability in the SC (Andersen and Skjoett-Larsen 2009). To achieve this, training is necessary, which in turn is also tied to financial and human resources.

Therefore, it is essential that the company provide the necessary financial and personnel resources to establish the appropriate processes for the achievement of SSCs and put them into practice.

Based on these findings, it is hypothesized that:

- H4a Provided resources ensure effective social risk management within the SC of a company.
- H4b Provided resources ensure effective ecologic risk management within the SC of a company.
- H4c Provided resources ensure effective economic risk management within the SC of a company.

2.4 Development of the Conceptual Model

As a result of the literature review the four enabling constructs “top management support”, “supply chain complexity”, “processes established” and “financial and personal resources” have been identified. The relationships between these constructs have been hypothesized. The expert interviews provide two additional relationships (Sect. 3.3).

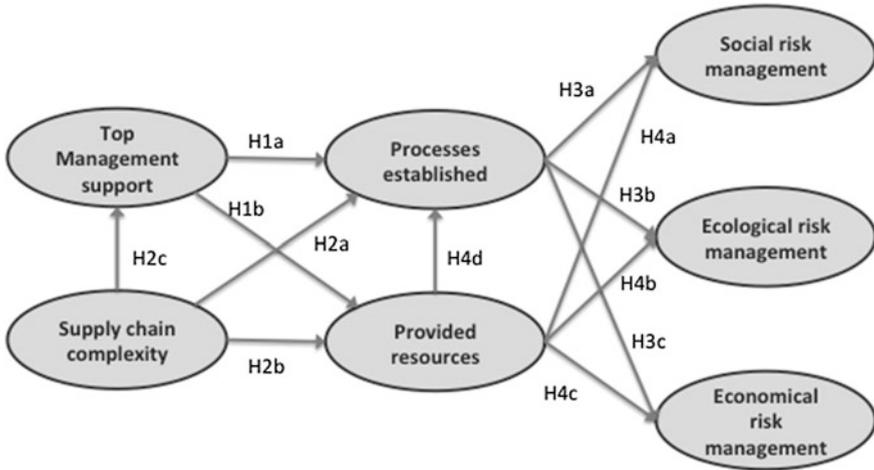


Fig. 1 Proposed conceptual model of internal enablers of effective SSC risk management

Combining the results of the literature review and the expert interviews, the model as shown in Fig. 1 is proposed.

We believe that top management is at the core of influencing SC in the model: Given certain supply chain complexity, the top management has the greatest internal lever to promote risk management regarding SSCs. It can ensure the necessary resources and initiate the processes. This allows identifying SC risks early on and mitigating them accordingly.

3 Methodology/Data Collection

For the validation of the proposed model, and for gaining further input, an expert study was performed. The methodology will be explained in the following section.

3.1 Target Group for Interviews

The automotive industry is particularly suitable for such interviews as it has a complex SC structure. The interviews were performed in a large, international company that has a strong reputation for sustainability related action.

The experts interviewed work in following divisions of the company:

- two experts were from corporate social responsibility strategy responsible for SC,
- two experts from SC management strategy responsible for sustainability,
- one expert form the product life cycle analysis and
- one chief purchasing director.

Considering different views from one single company allows for gathering a more differentiated insight into the company. Previous studies on SSC risk management have focused on cross-company data (e.g. Vachon and Klassen 2006). Therefore, the perspective in this study aims at complementing previous research by approaching one company in detail.

3.2 Research Design

The study consists of semi-structured interviews with two parts. First the experts have been asked what they believe are potential enablers for SSCs.

In a second step, the developed model and hypotheses were presented to them. They have been asked to evaluate the model whether it fits to their previously described enablers. Further they were asked to assess to what extent the proposed model is consistent with their practical observations and experiences.

Since the study refers to only one company, the number of potential interviewees was limited. Each of these interviewees had, according to their area of competence, a slightly different view of SSCs and how to ensure them. As for the particular study strategists were selected, therefore those who decide on the design of the measures in the SC, this approach allows a differentiated assessment of the main influencing views in this company. Still, this view could be different in other companies.

To ensure high content validity the constructs of the model were anchored in the literature and discussed with the experts.

3.3 Interview Findings

All presented hypotheses and the developed model were consistent with the practical experience of experts. They confirmed that the enablers and the relationships between these are suitable.

Additionally to the literature based hypotheses, the experts have stated two new hypotheses during the interviews.

Firstly, they proclaimed that the complexity of the supply chain does not only influence the processes and the financial and personnel resources provided, but also the top management. One expert argued that a higher complexity increases also the sustainability risks and therefore necessity for transparency. This in turn increases the obvious for the management that their support is necessary.

In consequence, it was concluded from the expert input:

H2c The complexity of the supply chain influence top management support for implementing SSCs

Secondly, the experts stated that the processes highly depend on the financial and personnel resources available. This leads to following hypothesis:

H4d Financial and personnel resources ensure that the necessary processes are developed and performed

Further the first draft of H1a and H1b stated that top management motivation is decisive for SSCs. Here one of the experts argued that it depends less on the motivation but rather the recognition of the necessity. Therefore H1a and H1b have been changed into “Top Management support”.

4 Discussion

The developed model is in line with previous research as all identified constructs were derived from the literature. Further the result of this study, that especially top management support is an important enabler, is often mentioned in literature (e.g. Faisal 2010).

Yet, the proposed conceptual model extends previous research by considering effects of risk management in SSCs.

Previous research addressed the issues of sustainability and risk management in SCs as separate areas.

Until now three models were developed for enablers in SSCs in the literature. Lee and Klassen (2009) suggested a model that considers motivators and enablers in small and medium enterprises. Gimenez and Tachizawa (2012) deduced from the literature a model of internal and external enablers. Faisal 2010 has developed a model of the interaction among the enablers in SSCs based on a study covering three companies. Therefore, the presented model in this paper is the only one that targets the internal enablers of effective risk management in SSCs.

Furthermore, thematically similar studies, examined by a study from Andersen and Skjoett-Larsen (2009), have taken different companies into account. In this work a different approach has been taken. Experts in various positions from a single company have been questioned. As a result different points of view have been considered. This approach allows a specifically deep insight into a company.

As a first step of validation, a preliminary expert study based on a small sample group from a single company was performed. The study uses a small sample from a single company and should be replicated in a larger group in different companies and industries. This way more enablers may emerge.

Nevertheless, the presented study helped to identify a basic set of relevant enablers regarding SSC risk management, as well as provided a valuable understanding of the relationships among those enablers.

We intent to further validate the existence and influence of those factors in a future, more extensive, large-scale study this work serves as preparation. The quantification of the impact of each factor is planned for this more extensive study,

providing the necessary amount of data for such quantification. Furthermore, structural equation modeling can be applied in future research to test the validity of this model.

5 Conclusions

This research proposes a conceptual model on internal enablers of a SSC risk management system.

It was determined that besides supply chain complexity the support of the top management is decisive for initiating and establishing necessary processes as well as for the provision of the necessary resources. These four enablers determine the deployment and implementation of a risk management system with regard to sustainability issues in the SC. Relationships between the enablers have been identified.

This research contributes to the understanding of the internal enablers of SSC risk management systems inside companies.

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