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This is a Final draft version of a publication
published by Emerald Publishing
in International Journal of Logistics Management

DOI: 10.1108/IJLM-05-2016-0134

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Please cite the publication as follows:

Multaharju, S., Lintukangas, K., Hallikas, J. Kähkönen, A.-K. (2017). Sustainability-related risk management in buying logistics services: An exploratory cross-case analysis. *International Journal of Logistics Management*, vol. 28, no. 4. pp. 1351-1367. DOI: 10.1108/IJLM-05-2016-0134

**This is a parallel published version of an original publication.
This version can differ from the original published article.**

Sustainability-related risk management in buying logistics services – An exploratory cross-case analysis

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Purpose Sustainability-related risk management of logistics service providers (LSPs) is an essential part of sustainability performance of focal companies, as logistics services touch the entire supply chain (SC) from raw material sources to end-customers. This study draws on resource-based view and stakeholder theory in exploring how companies can manage environmental and social sustainability-related risks from logistics service suppliers. This kind of capability is essential in order to maintain the reputation in the eyes of stakeholders, and to maintain long-term financial performance.

Methodology The data of this multiple-case study was collected from semi-structured interviews in eight case-companies in Finland. Five of the cases are primary logistics buyers and three represent LSP companies.

Findings The cross-case analysis showed that primary buyers of logistics services use their sustainability criteria as a prerequisite for LSP candidates, and when the level is adequate and equal, other factors, e.g. price and capacity, are decisive. Based on the analysis, large LSPs are preparing for the future competition, and act in a more sustainable manner than their customers (buyers) expect at the moment, while small LSPs strictly comply with the regulation. However, buyers' requirements for sustainable logistics services are increasing as the stakeholder expectations for comprehensively sustainable SCs are growing.

Originality Only little research has been conducted on sustainable logistics from the buyer company's risk management perspective. This paper adds the knowledge of sustainability-related risk management in buying of logistics services, and in the logistics industry.

Keywords Logistics buying, Selection of logistics service provider, Sustainability-related risk management.

Paper type Research paper

1. Introduction

The sustainability-related risk management of logistics services is an essential part of the risk management portfolio of a focal company of a supply chain (SC). Stakeholders expect more and more comprehensively sustainable products and services. At the same time, outsourced functions are making SC sustainability increasingly challenging to manage. The environmental and social sustainability-related risk management of transportation and other logistics services can be seen as the backbone of sustainability performance of focal companies as they relate to the entire supply chain, from raw material sources to end customers. Nevertheless, little work has been done to understand the importance of the logistics function in the sustainability strategy of a company (Dey et al., 2011; Gunasekaran and Spalanzani, 2012). Hence, given companies' sustainability performance as a coherent whole, the assurance of the sustainable processes of logistics service providers (LSPs) is extremely important for the reputation and long-term economic performance of focal companies (Carter and Rogers, 2008).

Apart from the economic aspect, sustainable SCs are measured through their environmental and social performance (Beske, 2012). In adopting sustainability in their SCs, companies establish environmental and social standards for supplier practices based on their own sustainability values and strategies and/or stakeholder requirements that go beyond legislative requirements. Because stakeholders may react critically if their requirements are not fulfilled, the corporate capability of controlling supplier compliance with sustainability is important (Foerstl et al., 2010; Beske, 2012). Moreover, supplier sustainability-related risk management is essential (Hofmann et al., 2014; Giannakis and Papadopoulos, 2016).

The significance of transportation and other logistics services in enhancing sustainability in SCs has been identified in several studies (e.g., Lieb and Lieb, 2010; Kudla and Klaas-Wissing, 2012; Colicchia et al., 2013). However, Gunasekaran and Spalanzani (2012) argue that, even though logistics sustainability is critical throughout the SC, it has not received sufficient attention in research, and thus, they call for more suitable strategic frameworks and models for developing the field. Based on the literature, it has been identified that the research on SC sustainability is still mainly focused on the environmental aspects of SCs (Seuring and Muller, 2008) and the logistics industry (Björklund and Forslund, 2013). However, the social dimension has remained largely unaddressed (Ciliberti et al., 2008; Wolf and Seuring, 2010). Nevertheless, social sustainability indicates potential economic advantages, accumulated through reduced health and safety costs, and lower labor turnover costs originating from safer warehousing and transportation (Carter and Rogers, 2008).

The purchasing and supply management function plays an important role in managing the sustainability-related risks from suppliers (Foerstl et al., 2010; Reuter et al., 2012). The extant literature suggests that buyers should begin to assess their suppliers' sustainability as early as possible to accumulate sustainability-related capabilities so as to outperform their competitors (Reuter et al., 2010). However, the literature also shows that, in buying logistics services, the traditional supplier selection criteria, such as price, quality and timely delivery are still preferred (Wolf and Seuring, 2010). Even proactive buyers rarely integrate logistics services within their sustainability strategies (Kudla and Klaas-Wissing (2012). Vieira et al. (2016) observed that—contrary to companies' claims considering environmental and social aspects in selecting LSPs—the higher costs of sustainable practices, in comparison with traditional ones, are the main barriers to reducing negative environmental impacts from transportation. Moreover, stakeholder requirements may change rapidly and in an unexpected manner (Beske, 2012). Thus, in addition to supplier selection procedures, logistics buyer companies need the capabilities

of identifying, assessing and treating supplier sustainability-related risks in established supply relations (Foerstl et al., 2010; Giannakis and Papadopoulos, 2016).

This paper uses the theoretical approaches of the resource-based view and stakeholder theory to examine both the selection criteria for LSPs and sustainability-related risk mitigation tools. Buyers of logistics services apply these approaches to manage sustainability-related risks from LSPs or sub-contractors. The purpose of this multiple-case study is to add an understanding of environmental and social sustainability-related risk management in the buyer-LSP relationship. Thus, the study addresses the following research question:

How can companies mitigate sustainability-related risks in buying logistics services?

Empirical data were collected by interviewing eight case companies from different industries in Finland. The main findings from the cross-case analysis showed that, at the moment, sustainability-related criteria are used as qualifiers for LSPs in the tender process. Large LSPs act in a more responsible manner than their customers expect now, whereas small LSPs seem to comply tightly with the minimum sustainability requirements of legislation. However, primary logistics buyers will have more sustainability-related requirements for their LSPs in the near future.

2. Sustainability-related risk management

Fundamentally, sustainable SC refers to the paradigm that all of its members act in an environmentally and socially sustainable manner and achieve economic efficiency at the same time (Beske and Seuring, 2014). Accordingly, all involved LSPs should adopt sustainability into their processes. Albeit no truly sustainable SC exists at the moment, some of them act more responsibly than others do (Pagell and Wu, 2009). To be successful in sustainability performance achievement, the values of a company, the corporate strategy and the top management's commitment to sustainable business are crucial, as sustainability efforts demand financial investments and resource allocation (Dey et al., 2011; Hung Lau, 2011). Such investments are costs incurred in the short term but can lead to improved financial performance in the long term (Carter and Rogers, 2008).

2.1 Drivers to adopt sustainability into supply chains and logistics

Sustainability is driven into SCs through several factors, such as legislation and regulation, customer and other stakeholder requirements, competitiveness, the reputational risks of focal companies and corporate strategy (Seuring and Muller, 2008; Carter and Rogers, 2008; Hofmann et al., 2014). A minimum requirement for SC sustainability is compliance with legislation (Seuring and Muller, 2008). Nevertheless, for long-term successful performance, it is essential that key stakeholders find a company's business legitimate, which the company can achieve by meeting their expectations for sustainability (Carter and Rogers, 2008; Hofmann et al., 2014; Meixell and Luoma, 2015). Stakeholder theory introduces the relationships between a company and its stakeholders, and it presents how a business interacts with different stakeholders in society. Stakeholders give a company the legitimacy to do business, and through their expectations, the stakeholders also shape the sustainability activities that affect the reputation of the company and its SC (Freeman et al., 2010).

The corporate social responsibility (CSR) framework, which Carroll (1999) introduced, combines environmental, social and economic sustainability dimensions as well as the ethical rules, transparency and voluntariness aspects of doing business. CSR has been heavily connected to corporate reputation (Leppelt, 2013). Suppliers' non-

sustainable actions and neglect of sustainability can cause reputational damage and broad financial losses for a focal company (buyer of logistics services). Such consequences can be, for example, non-compliance fines, negative media visibility, strikes and pressure group attacks (Hofmann et al., 2014). In this study, the definition of SC risk management by Carter and Rogers (2008, p. 366) has been adopted and is: “The ability of a firm to understand and manage its economic, environmental, and social risks in the supply chain.”

The higher costs of sustainable practices compared with traditional (non-sustainability oriented) practices are the main barrier to adopting sustainability (Seuring and Muller, 2008), in addition to challenging coordination and insufficient communication between buyers and suppliers. Similarly, Vieira et al. (2016) showed that, in the logistics industry, to reduce the negative environmental impact of transportation, both logistics buyers and LSPs have emphasized high costs and the lack of training of their partners as major challenges. According to Seuring and Muller (2008), factors that can enhance SC sustainability are communication, monitoring, evaluation, reporting and sanctions. Despite the challenges, logistics buyer companies do need to mitigate sustainability risks from their LSPs and other suppliers to respond to stakeholder expectations (Foerstl et al., 2010). Pressure from stakeholders, on the other hand, seems to stimulate sustainability-related risk mitigation activities in companies (Cantor et al., 2014).

2.2 Sustainability as selection criterion for logistics services

Foerstl et al. (2010) identified supplier selection procedures and supplier assessment capabilities as the main means for effectively managing suppliers’ sustainability and related corporate reputation. Based on the criteria of the resource-based view (RBV) for specific resources and capabilities as sources of competitive advantage (Barney, 1991), such supplier assessment capability can contribute to the mitigation of sustainability-related risks. This approach prevents high-risk suppliers (e.g., LSPs) from entering the supplier base. Such a selection process is referred to as a resource-picking mechanism (Makadok 2001; Foerstl et al., 2010). Furthermore, as Foerstl et al. (2010) noted, supplier assessment capability enables companies to categorize established supplier relationships according to their sustainability capabilities.

The research has shown that responsible purchasing and supply management are the key functions for preventing reputational damage from suppliers (Foerstl et al., 2010; Dai and Blackhurst, 2012). SC sustainability can be improved through a transparent supplier selection process with defined supplier selection criteria, where environmental and social sustainability can be compared with plain economic criteria (Reuter et al., 2012). A buyer company can demonstrate its commitment to responsible business, especially to customers and other stakeholders—for example, by establishing transparent guidelines for the supplier selection process (Reuter et al., 2012).

Even though stakeholder pressure toward a company’s sustainability performance has been identified in the extant literature (Meixell and Luoma, 2015), stakeholder requirements have not been taken into account in supplier selection criteria (Dai and Blackhurst, 2012).

Several scholars in the logistics research field have observed that buyer companies still prefer the traditional selection criteria of LSPs, such as price, quality and timely delivery, contrary to their claims that they incorporate environmental aspects into selection requirements (Wolf and Seuring, 2009). Also, Large et al. (2013) state that logistics buyers argue that they place high value on the environmental and social aspects of logistics services, but this importance cannot be perceived in their contribution to LSPs’

sustainable practices. Accordingly, environmental sustainability is incorporated into the LSP selection criterion as a minimum requirement (Wolf and Seuring, 2009).

According to Evangelista et al. (2013), buyer companies can improve their environmental performance by supplier selection and logistical choices, for example, LSPs using cleaner transport technologies that reduce the emissions of carbon dioxide (CO₂), as well as the total carbon footprint. Also, route and freight load optimization, monitoring pollution emitted by vehicles, and monitoring fuel consumption have been found to be important in selecting environmentally friendly logistics services. Such activities not only reduce emissions but also transportation costs and environmental risks (Ciliberti et al., 2008; Kengpol et al., 2014).

Relating to logistics social responsibility (LSR), the research of Ciliberti et al. (2008) developed a taxonomy of the LSR practices adopted in Italian companies, based on the analysis of non-financial reports. The taxonomy introduces 47 practices from which social practices are, for instance, the training of suppliers as well as the monitoring of their compliance with social standards, organizing philanthropic and community-oriented initiatives, etc. However, none of the companies mentioned any social sustainability practices in the sustainable transportation context (Ciliberti et al., 2008). In the extant sustainable supply chain management (SSCM) literature, the practices that are improving social sustainability in SCs are fair labor practices, decent working conditions and reasonable wages. These practices also include social equity in terms of diversity and gender, and health and safety issues (Magnan et al., 2011). Similar to Ciliberti et al. (2008), the reviewed literature on the logistics services of this study did not identify any specific social selection criteria for the LSPs used in buyer companies.

2.3 Mitigation of sustainability-related risks from LSPs

Sustainability practices and measures derived from the CSR framework attempt to maintain sustainability in SCs. Environmental sustainability practices may include the reduction of energy consumption, air and water pollution control activities, and the recycling of waste (Seuring and Muller, 2008; Christopher and Gaudenzi, 2015). Nevertheless, logistics buyer companies do not seem to actively require sustainability efforts from their LSPs (Large et al., 2013). Even though buyer companies incorporate environmental performance in transport contracts, they possibly do not know how to measure environmental performance factually and to act in the case of non-compliance (Björklund and Forslund, 2013).

Rondinelli and Berry (2000) have called on the transportation industry to move from mere compliance with regulatory requirements toward more proactive sustainability management to reduce the negative environmental impacts of transportation. They expect more advanced activities and alternative methods for controlling emissions and environmental pollution, as well as for preventing the wasting of natural resources. Kudla and Klaas-Wissing (2012) observed that large LSPs are more intensively under buyers' sustainability pressures and that buyers expect them to apply sustainability practices. However, the authors argue that buyers do not control or monitor their LSPs' activities. The results of Björklund et al. (2016) also showed that the selection processes of transportation suppliers were not seen as environmental considerations amongst large retailers.

The activities and acceptable practices in SC can be controlled by sustainability standards—such as ¹ISO14001 (environmental), ISO26000 (social) or sustainability codes of conducts (CoC) (Organisation for Economic Co-operation and Development, OECD, 2001)—that buyer companies mandate for suppliers (Magnan et al., 2011;

¹ ISO = International Organization for Standardization (ISO, 2016)

Seuring and Muller, 2008). The research of Seuring and Muller (2008) also showed that environmental management systems play an important role in controlling SCs, whereas social systems and social CoC are used less. In sustainability-related risk management, collaboration between SC partners and the development of key suppliers have been identified as an effective means of maintaining SC sustainability. Furthermore, the monitoring and audits of suppliers are essential signals in demonstrating engagement with sustainability to stakeholders (Awaysheh and Klassen, 2010.)

As the stakeholder's voice is crucial for maintaining a company's reputation as a sustainable actor, reporting the company's sustainability efforts and initiatives to stakeholders is essential (Lam and Dai, 2015). A commonly applied standard has been put forward by Global Reporting Initiative (GRI), an independent international organization maintaining standards and guidelines to communicate and report their sustainability activities to stakeholders (Ciliberti et al., 2008; GRI, 2016). In practice, the study of Björklund et al. (2016) indicated that, in large retailers, environmental considerations in logistics activities—especially relating to logistics purchasing—were well described in the GRI format. In the logistics industry, Piecyk and Björklund (2015) identified that CSR is becoming increasingly important and that the LSPs applying the GRI format in their reporting are more mature in their sustainability practices and communication.

In summary, the reviewed literature shows that the selection criteria of LSPs still remain traditional factors, whereas environmental and, in particular, social criteria for LSPs are rare and are relatively little explored. In addition, the concrete tools and practices that buyer companies use to mitigate sustainability-related risks from LSPs are not sufficiently explored and reported. Hence, this study addresses these topics and conducts a multiple-case study in purchasing logistics services in Finland.

3. Research method, the case companies and data collection

Case study is a research method that explores contemporary events or phenomena in real-life contexts. It enables a deeper understanding of a complex problem containing many variables that are not possible to comprehend through quantitative methods (Yin, 2003). The purpose of this study is to examine the contemporary phenomenon of how companies that buy logistics services can ensure the environmentally and socially sustainable processes of their LSPs. Some earlier literature exists on the topic, but the characteristics of sustainability-related risk management addressed in this study are still relatively little investigated. Even though focal companies (buyers) primarily select their LSPs, the LSPs may use sub-contractors, thus placing themselves in the roles of buyer companies. Hence, decisions about LSPs are made at several points in the SC.

The multiple case study method is sufficient when a research aims to extend prior theories. In contrast to a single case, the main interest of multiple case study is in exploring a phenomenon, not in the cases themselves. The research is assumed to be able to add something new to the extant theory or conceptual basis (Eisenhardt, 1989; Yin, 2003). Multiple case study was selected for the research method here, as it fits the research problem, data collection and data analysis techniques of this study. It aims to extend the developing SCM theory by adding an understanding of sustainability-related risk management in purchasing logistics services.

No particular rules exist relating to the number of cases that should be selected for certain multiple-case projects, but it depends on the research problems (Eisenhardt, 1989). Eisenhardt (1998) suggests limiting the number of cases to between four and 10, or to the point where the incremental contribution of extra cases is only marginal. Hence, each case company has to be carefully chosen with the goal that it will either predict similar results

or predict contrasting results but for predictable reasons. In this study, empirical data were collected through semi-structured interviews conducted with eight companies from various industries in Finland. The informants were directors and managers who participate in decision-making regarding strategic issues and/or are responsible for the selection of LSPs. These companies comprised five primary logistics buyers from different industries, and three LSPs that the buyer companies suggested.

Buyer A is a large domestic property owner and maintenance company that purchases waste transport and waste management services at several locations. *Buyer B* is a global, ²small/medium-sized manufacturer of industrial equipment and a supplier of technological solutions that purchases transportation services around the world. *Buyer C* is a large global manufacturer and supplier in the food industry that buys various transportation services both in developing and developed countries. *Buyer D* is a large international company in the construction industry. The business unit of Buyer D, which was interviewed for this study, purchases transportation services mainly for heavy and/or large goods in Finland. The suppliers of building materials arrange most of Buyer D's transportation, but this buyer strives to influence the drivers and suppliers in terms of transport planning and work safety. *Buyer E* is a large producer and supplier in the food industry that buys temperature-controlled transportation services globally. *LSP F* and *LSP G* are both world-class large LSPs that produce various transportation and other logistics services comprehensively. *LSP H* is a national small/medium-sized LSP focusing specially on food logistics. It does not own a transport fleet itself but rather purchases all transport services from transport operators.

All of the interviews were conducted between December 2015 and April 2016. The saturation was achieved in these eight cases, as significantly different observations were not detected; the information began to be repetitive. Two researchers conducted six of the eight interviews, and one researcher conducted two interviews. The interviews were recorded and transcribed. These recordings comprise 461 minutes; 112 pages of data were in text form. The data were put into the Atlas.ti program, which is a computer-assisted qualitative data analysis software. The data were coded using a qualitative content analysis method that strives to quantify content in terms of predetermined categories in a systematic manner (Yin, 2003; Seuring, 2008). The concepts originating from the literature were the basis of coding. However, the codes for the emerging issues were developed step by step when the analysis proceeded. The findings from the analyzed data were examined through cross-case analysis by searching for similarities and dissimilarities between both within-groups and intergroups, as Eisenhardt (1989, p. 540) suggested. This case study has been qualified by a thoroughly described research process. In addition, as Yin (2003) recommended, it used several triangulation types for validation, such as semi-structured interviews and annual reports as data sources (triangulation of data). Two researchers conducted six out of the eight interviews (triangulation of researchers), and two theoretical perspectives were used—RBV and stakeholder theory—to explore the phenomenon. Thus, the study incorporated the triangulation of theories as well.

4. Findings and cross-case analysis

The findings from this multiple-case study were divided into three categories: drivers for sustainability and the features of logistics purchasing; selection criteria and sustainability requirements for LSPs; and sustainability-related risk mitigation tools. The selection

² Small/medium-sized company means an employee headcount of 50-250, and a turnover of €10-50 million (OECD, 2005)

criteria for LSPs and sustainability-related risk mitigation tools in each case are presented in Table 1.

4.1 Drivers for sustainability and features of logistics purchasing

Overall, in addition to the traditional objectives of logistics purchasing, such as price, delivery time, high-quality documentation and shipment planning, this study demonstrates that both logistics buyers and LSP companies highlight operational reliability, transparency and LSPs' ability to interact effectively.

Values and drivers for sustainability. Buyer C and Buyer E stated that sustainable business is based on a corporate strategy (70%) and stakeholder requirements (30%), and it affects the corporate image. Buyer C also said that sustainable business is based on corporate values, a strategic decision and a marketing means for achieving growth. Instead, Buyer A, Buyer B and Buyer D see sustainability as being based mostly on legislation, where Buyer A referred to environmental legislation, and Buyer D referred to work safety issues. In contrast, Buyer B said that, even though sustainability itself is a value of the company, at the moment, sustainable logistics or even sustainable procurement itself is not included in the corporate strategy. They added that sustainability is not reflected in everyday logistics buying decisions but that the price is the most significant factor. This stems from the premise that customers are not interested in logistics-related sustainability and that they do not mention sustainability in negotiations relating to logistics. Nevertheless, Buyer B is aware that its LSP is able to provide a report on sustainability issues when/if needed.

LSP F and LSP G noted that sustainability is a corporate value that can be observed; for example, solar panels are a source of energy for their premises. Furthermore, they said that legislation is a strong driver of sustainability. Accordingly, LSP G asserted that sustainability is based on its corporate strategy and on the rules of society and stakeholders, in addition to statutory requirements. LSP G also said that employing sustainability in its processes is its strength, which it brings up in customer meetings. LSP H said that sustainability in its processes is based on the fulfilment of legislation; based on its experience in logistics purchasing, price is ultimately the decisive factor for customers. All LSPs argued that, at the moment, only a few customers, mostly international ones, require sustainability-related reporting. Thus, sustainability initiatives at big LSP companies appear to be based on strategy, whereas in small companies, they rest on legislative demands.

Features of logistics purchasing. Buyer C stated that it is aware that big LSPs act in a sustainable manner and hence seek to centralize their logistics service purchasing to big actors. Nevertheless, Buyer C also purchases services in developing countries where local conditions may be very challenging, guiding the use of services from small local actors. In practice, these actors have no sustainable processes, which calls for supplier development and support. Buyer E mentioned that it does not use online auctions to buy cheaper transportation because these kinds of procedures may generate questionable practices in the supply market and also at LSPs with good reputations. Buyer A and Buyer C (referring to logistics purchasing in Northern Europe) mentioned that they use sustainability criteria as qualifiers in the tender process.

LSP F noted that, in producing logistics services itself or in buying services from sub-contractors, LSPs have to achieve a balance between the expected sustainability levels of stakeholders and the higher costs of sustainability practices. This is necessary because customers usually do not accept extra costs.

In terms of stakeholders, Buyer A informed that it collaborates with environmental authorities intensively. Buyer D collaborates with authorities on social sustainability issues, such as occupational health care. Buyer C has identified that cultural factors significantly affect stakeholder expectations for sustainability and that stakeholders' impact on a corporate reputation is enormous. Buyer C described that pressure groups or trade unions may require various clarifications, even without concrete evidence of misconduct, for example, if the local Nordic LSP has been exchanged for a European "cheap" provider or driver. Buyer C also said that trade unions have started to demand reports on the working conditions of drivers coming from Central Europe and outside of the Nordic countries. In turn, LSP F and LSP G cooperate with customers and customs. In addition, LSP G cooperates with the chamber of commerce, ministry of transport and communications, and union of logistics service providers to affect the future standards in the industry. LSP H said it collaborates with Finnish Transport and Logistics SKAL, as well as with authorities related to food production.

4.2 Selection criteria and sustainability requirements for LSPs

Competitive *price* as a criterion was an important factor among all case companies in selecting LSPs or sub-contractors. Similarly, all of them asserted that a competitive price does not automatically mean the cheapest price but rather the ratio of price and quality. However, for Buyer B, "quality" means reliable deliveries that do not necessarily have any sustainability aspects. It mainly means reliable drivers with sufficient language skills, as well as reliable vehicles and deliveries. For the big buyers, Buyers A, C, D and E, environmental and/or social sustainability dimensions were, to some extent, included in quality requirements and were assessed as more or less important. Similarly, like small Buyer B, small LSP H considered the quality of logistics services to refer to experienced and reliable drivers as well as to reliable vehicles (in terms of condition and age). Moreover, similarly, like the big buyers, the big LSPs, LSPs F and G, included some sustainability requirements in their quality concepts.

Equally, all of the case companies mentioned that *compliance with environmental and social legislation* is a basic requirement in the selection of LSPs. In this view, specifically Buyers A and E as well as all of the LSPs referred to "the Act on the Contractor's Obligations and Liability"³.

Buyers A, B, C and E mentioned that an LSP's functioning according to the values of the buyer company is essential. Buyers C and E noted that a sustainability-related *reputation* within logistics services will be more emphasized *in the near future*, whereas the big LSPs, LSPs F and G, highlighted its *current* significance. LSP H mentioned a sub-contractor's good reputation in general as a selection criterion.

³ "The Act on the Contractor's Obligations and Liability" refers to the idea that the contracting party has entered the prepayment register and the employer register; it is registered as value added tax (VAT) - liable in the value-added tax register. The contracting party has paid its taxes and taken out pension insurances, and it has an account of the provision of occupational health care (Source: Regional State Administrative Agency for Southern Finland, Occupational Health and Safety Area of Responsibility, 2016).

Table 1 – Summary of mitigation means for supplier sustainability-related risks.

Criteria for logistics service providers	Buyer (A) (Property)	Buyer (B) (Equip)	Buyer (C) (Food)	Buyer (D) (Construction)	Buyer (E) (Food)	LSP (F) (Logistics)	LSP (G) (Logistics)	LSP (H) (Logistics)
Compliance with legislation env/soc	x	x	x	x	x	x	x	x
Act on Contractor's Obligations and Liability	x				x	x	x	x
Emission levels of motors	x				x	x	x	
Environmental aspects highlighted	x		x	x	x	x	x	x
Social aspects important			x	x	x	x	x	
Recycling degree of waste	x						x	
Suppliers act according to corporate values*)	x	x	x		x	x	x	
Reputation related to sustainability			x		x	x	x	
Planning of transportation				x	x	x	x	x
Good financial standing						x	x	x
Reliable and suitable vehicles	x			x		x	x	
Operational reliability, trained drivers*)	x	x		x	x	x	x	x
Operational efficiency*)	x	x		x	x	x	x	x
Competitive price (not always the cheapest*)	x	x	x	x	x	x	x	x
Mitigation tools for supplier sustainability-related risks								
Monitoring	x		x		x		x	
Audits	x			x	x	x	x	
Collaboration	x		x	x	x	x	x	x
Certificates, environmental and social								
Sustainability reporting	x		x	x	x	x	x	
Self-assessment	x							
CoC or mentioned in contract, environmental	x			x	x	x	x	
CoC, or mentioned in contract, social			x		x	x	x	
Assessment and selection of (sub)LSPs	x	x	x	x	x	x	x	x
Measurements, environmental	x			x	x	x	x	x
Measurements, social				x			x	
Investments in sustainable practices	x		x	x	x	x	x	
Risk management approach on sustainability	x		x	x	x	x	x	x
Sanctions for non-compliance (also chaining)					x			x

*) No specific environmental or social sustainability aspects.

The social sustainability aspect as a selection criterion was approached differently. Buyer D highly emphasized workers' and drivers' *occupational health and safety* issues in working and driving at building sites, and Buyer C and Buyer E emphasized it when working on loading docks and in terminals. Buyers collaborate with their LSPs by training and giving instructions relating to work safety in the buyers' facilities. In contrast, Buyer A and Buyer B consider that the control of a safe working environment for workers and drivers is purely a concern of their employers, i.e., the task of LSPs or their sub-contractors. Moreover, LSP H sees that the control of safe working methods is a task of employers (sub-contractors). In the supplier selection phase, especially the LSPs F, G and H required sub-contractor candidates to present evidence of the *salary levels* of the drivers.

The environmental aspects of logistics services were highlighted by Buyers A, C, D and E, and similarly by LSPs F, G and H. However, only Buyers A and E, along with LSPs F and G, declared the minimum environmental criteria for the *emission levels* of the vehicles as EURO4-EURO6. Furthermore, Buyers A, D and E expect LSPs to calculate the carbon footprint of the logistics services, or at least to provide counters for the same to their customers. In addition, Buyer A mentioned that the *recycling degree of waste* has to be close to 100 percent and that development *plans for waste management* are decisive selection requirements. With a connection to the carbon footprint, LSP G said it can deliver calculations relating to its own logistics services and furthermore give the system to its sub-contractors to use. Referring to the selection criteria of its sub-contractors, LSP G noted that it uses only sub-contractors who have been registered in its corporate-level system as an acceptable actor. In addition, it asserted that even though it had agreed upon the price, the contract is valid only when the sub-contractor has provided the documents included in the "Act on the Contractor's Obligations and Liability."

4.3 Sustainability risk mitigation tools for logistics services

Buyers A, C and E use monitoring randomly as a sustainability-risk mitigation tool. Buyer A monitors the implementation of recycling, whereas Buyer C monitors working hours in warehouses, the statistics of employee accidents in the factory area, and the use of safety vests. They argue that drivers' working hours and working conditions are difficult to monitor. Instead, LSP G said it has a specific system in place for monitoring the working hours and the driving pattern of a single driver, as well as the number of kilometers the driver has traveled, his or her fuel consumption and the emissions of the vehicle. Furthermore, LSP G allows its sub-contractors to benefit from this system.

Buyers A, D and E conduct audits as a risk mitigation tool. Buyer A audits waste collection points and the development plans for the waste management of the transport operators. Buyer D audits transport contracts with safety requirements and claimed that these requirements are chained further to possible sub-contractors. Buyer E audits the transport vehicles of its LSPs to ensure that the vehicles used are the kind agreed upon in the contracts. Similarly, LSP F and LSP G audit sub-contractors' vehicles and permissions for dangerous goods. In contrast, LSP H stated it has never conducted sustainability-related audits, neither is it planning to conduct them in the near future.

Collaboration between buyers and LSPs, relating to sustainable logistics services, is one way of mitigating the sustainability-related risks of Buyers A, D and E as well as of all LSPs. Buyer A arranges training for the drivers of its transport operators relating to the occupational safety issues occurring when the license of a driver is valid for the next three years. Buyer D collaborates with key LSPs by planning activities that are important for scheduling deliveries from a work safety perspective. Buyer E conducts regular meetings with its LSPs once a month, taking into account sustainability issues. Similarly,

LSPs F and G collaborate with their long-term sub-contractors in terms of established sustainability procedures, such as those regarding work safety and environmental issues.

In terms of certificates, Buyers A, C, D and E themselves have environmental certificates at the moment, and Buyer B said it will be certified in the near future. Buyers C, D and E also have social certificates. Similarly, LSPs F and G have environmental and social certificates. Surprisingly, neither the buyers nor the LSPs require environmental or social certificates from their logistics providers/ sub-contractor LSPs.

Supplier self-assessment as a risk mitigation tool is also used sparingly. Only Buyer A stated that it requires self-assessment and related reporting about work safety risks as well as environmental emissions from its transport operators on a regular basis. It also follows eco-efficiency based on the self-reporting of its transport operators. Based on the annual reports available on the websites of the case companies, both the big buyers and big LSPs provide stakeholders with accurate *sustainability reports*. However, the interviews showed that the GRI format is used but not completely. Even though ordinary signed suppliers' environmental and social CoC are sparingly used to mitigate the sustainability-related risks of logistics services, Buyers A, D and E said that such sustainability requirements can be also included in the signed contracts and agreements. Buyer C requires signed social CoC from all LSPs working at Buyer C's facilities.

All of the buyers and all of the LSPs apply more or less accurate *supplier assessment and selection procedures* to manage sustainability-related risks. At the minimum, this means—in the selection phase—ensuring that the statutory sustainability level is fulfilled in providing logistics services. Buyer E stated it assesses the skills of drivers (education and training, language, hygiene passport). LSP F said its sub-contractors are evaluated either at the headquarters level or locally and that the ethical rules and key performance indicators (KPIs) are discussed yearly between the company and its key sub-contractors.

For environmental sustainability, Buyers A, D and E *measure environmental impacts* in terms of CO₂ emissions. Furthermore, Buyer D said it measures transport distances and gives efficiency points when under 80 km. In some circumstances, it may measure the overall carbon footprint of a single building site or the emissions of logistics. Buyer D also mentioned that, due to a large number of logistics providers, it calculates emissions on its own using a counter based on the kilometers transported and the occupancy of vehicles. Buyer E optimizes transport routes through a route planning system, which reduces all kinds of emissions, fuel consumption, and costs. Buyer E noted that its big LSPs are able to provide calculations of CO₂ emissions, but small LSPs are not. Buyer A also gets calculations of CO₂ emissions and recycling degrees from its transport operators. Similarly, LSPs F and G measure CO₂ emissions from both vehicles and terminals, whereas LSP H transmits only emission calculations from its operator to the customers when required. In addition, LSP G measures noise from railway transport. LSP F said it uses “flowsteaming”, when possible, in sea transport, which means slower speeds and therefore less fuel and emissions.

For *social measurements*, Buyer D measures non-compliance with work safety issues, e.g., the neglected use of a safety helmet or safety vest on building sites. It also measures timely deliveries: Being either late or ahead of the agreed-upon delivery time is problematic from a work safety perspective. On the LSP side, the LSP G measures working hours as well as work accidents.

In terms of *investments in more sustainable practices* to mitigate sustainability-related risks, Buyer A uses only transport operators that can recycle waste close to a 100 percent. It is obvious that if this buyer bargains on the demand for the recycling level, the price would be lower. Buyers C and E said they are willing to invest in the sustainability development of small key transport operators. Moreover, Buyer D invests time and

money in training and developing its LSPs' drivers. In the same way, LSPs F and G invest in cleaner technology, new vehicles with eco-efficient technology with good working facilities, and training its sub-contractors' workers. Furthermore, LSP F said it pays a bit more for the transport operators that use certain motor types with lower emissions in Central Europe. In addition, LSP G allows its sub-contractors to use its application, which assists in planning and following working hours.

The interviews also showed that Buyers A, C, D and E, as well as LSPs F and G, apply various *proactive risk management approaches* to mitigate sustainability-related risks from their logistics service providers. These activities relate to proactive work safety and prompt corrective actions in cases of misconduct. Buyer A has security rounds and risk assessments with its transport operators four times a year. On the LSP side, LSPs F and G state that they require occupational safety cards from their sub-suppliers' drivers. Furthermore, LSP G has a system for monitoring working hours, which also measures the emissions and fuel consumption of vehicles. LSP G uses only sub-contractors registered with its corporate-level system as accepted actors. With regard to the non-compliance of LSPs, Buyer E stated that, in the case of an LSP's non-compliance with safety instructions, the buyer at first issues a complaint requiring a written response from the LSP. If repeated, financial sanctions are imposed.

Discussion and conclusions

The object of this study was to examine sustainability-related risk management in logistics services buying. The multiple-case study investigated a total of eight companies that buy logistics services: five primary buyer companies and three LSPs that buy transportation from sub-contractors. In general, interest in sustainability is increasing in logistics services buying. Stakeholders are increasingly demanding sustainable SCs, and the focal companies of SCs are thus paying greater attention to the sustainability of logistics services as a part of their overall sustainability performance. The study addressed the research problem of *how can companies mitigate sustainability-related risks in buying logistics services*.

The findings showed that, in the context of logistics services buying in Finland, compliance with legislation is a basic requirement for LSPs. As the study examined the buying of *logistics* services, it is evident that most case companies highlighted environmental aspects in their LSP selections, such as practices that reduce emissions and energy consumption. Moreover, social aspects—which, in this research, mainly referred to the work safety levels of LSPs' and sub-contractors' workers—were emphasized particularly in the construction industry and in big LSPs. Consequently, environmental standards are used in primary buyers' and LSPs' assessing LSPs'/sub-contractors' functions, whereas the big LSPs also use social standards. Collaboration between the buyers and LSPs in the case companies was wide ranging, related primarily to the training of suppliers' drivers in work safety issues, planning social and/or environmental activities, and procedures in suppliers' processes. Collaboration between the case companies and their stakeholders was mainly related to practical issues with customers and trade unions, as well as consultative actions with environmental authorities, health care authorities and customs agencies, which is in line with stakeholder theory (Freeman et al., 2010).

The findings indicated that the big Buyers and LSPs annually provide stakeholders with accurate sustainability reports, and some of the case companies report the results of sustainability audits to environmental authorities. This finding is in line with the results of Piecyk and Björklund (2015), who observed that company size and the use of formal

reports indicate a company's maturity with regard to sustainability practices and their communication.

This study also showed that, if there are no requirements from buyers for LSPs' sustainability (as observed in Large et al., 2013) and no collaboration between the buyers and small LSPs, small LSPs keep their sustainability on the legislative level without any additional investments in it. This finding is corroborated by Foerstl et al. (2010) in the context of supplier management; they noted that supplier development is essential for enhancing SC sustainability and managing sustainability-related risks.

The study showed that the case companies have used several risk management tools. Based on the findings, a distinction seems to exist between the buyers and the big LSPs in terms of their preparedness to manage sustainability-related risks from LSPs and sub-contractors. The use of risk mitigation tools in established supply relationships proved to be quite similar, but it is more extensive and sophisticated in big LSP companies. In addition, the selection criteria for logistics service suppliers are stricter when an LSP company is in a buyer's role. In the primary logistics buyer companies, processes for managing sustainability-related risks from logistics services currently seem to be at a relatively early stage of development. Moreover, both the buyers and the LSPs have proactive risk management tools or initiatives, although no systematic risk management models to ensure the sustainability of LSPs were found in the data. Collaborative risk mitigation activities between buyers and LSPs seem to focus on social issues only, such as work safety and the scheduling of deliveries. Collaboration in practices that can improve environmental performance, such as emissions reduction or the development of more sustainable transport solutions, were not mentioned among the case companies.

The study showed that the processes for more accurate sustainability-related risk management for logistics services are under development in the primary buyer companies. The buyers acknowledge that their big LSPs act in a sustainable manner, but in some circumstances, the buyers need to use small LSPs that may have no sustainability practices. Hence, the big buyers must build, and they are currently building processes for monitoring and measuring these small LSPs to ensure sustainability in their SCs.

This study indicates that both big logistics buyer companies and big LSPs have resource-picking capabilities of integrating sustainability-oriented LSPs/sub-contractors into their SCs, and for preventing non-sustainability-oriented actors entering the SC, which is in line with the RBV context referred to in Makadok (2001). Furthermore, big LSPs have already developed sustainability practices and built capabilities of managing sustainability-related risks as preparation for foreseeable changes in the business environment and future competition in logistics services provision. These actions are in line with Foerstl et al. (2010) and Reuter et al. (2010), who concluded that first-mover advantages are available for the companies who begin to evaluate their suppliers for sustainability and develop their sustainability-related risk management capabilities. It can be stated that these capabilities and advantages can manifest in financial forms when markets are mature enough to pay for sustainable practices, not just to discuss them.

Primary logistics buyer companies have realized the need for the assurance of sustainability in the context of buying logistics services and are currently building related capabilities. At the moment, they seem to focus mainly on responding to stakeholders' expectations and on preventing possible critical reactions (which is essential based on the research of Hofmann et al., 2014). However, the findings from this work indicate that, in addition to big LSPs, big buyers are increasingly building sustainability-related risk management capabilities to derive competitive advantage from sustainable logistics services. In particular, the enhancement of collaboration and supplier development capabilities in relationships with small LSPs is becoming essential.

The results of this study additionally show that the big LSPs currently perform much more responsibly than their customers expect them to, and they have more advanced sustainability practices than required by the law or regulations. In contrast, small LSPs mostly just comply with prevailing legislation and have no sustainability orientation over regulation. Big LSPs collaborate with customers, authorities and other stakeholders to be prepared for the challenges of the future business environment in terms of sustainability. In addition, they proactively and voluntarily develop new sustainability practices and solutions, and they even allow their transport operators to benefit from these developments, thus advancing SC sustainability.

Managerial implications

Big buyers mostly buy logistics services from big LSPs when practically, no sustainability-related problems exist in these relationships. However, when they need / benefit to buy logistics services from small local LSPs, buyers must ensure the fulfilment of the sustainability-related expectations of key stakeholders, specifically with regard to the use and actions of possible sub-contractors. The findings also reflect that, in the Finnish context, big buyer companies at the national level may consider sustainability levels defined in national legislation to be adequate. However, it may be not adequate for stakeholders. Also, small LSPs seem to consider that compliance with legislation is sufficient because customers make no further demands for environmental and social sustainability.

It is evident that buyers must define clear environmental and social criteria for supplier selection. In established relationships, they need to collaborate with key suppliers and clearly communicate requirements for environmental and social sustainability, as well as agree on appropriate sustainability practices. They should communicate openly and agree on related financial issues as well as on the continuity of the supply relationship. Furthermore, buyers should agree on information sharing related to sustainability, as well as measurements and controls for sustainability practices. Incentives need to be created (financial or training) and procedures agreed upon if sustainability goals are not achieved. Additionally, buyers should collaborate on sustainability issues with different stakeholders and attempt to identify future stakeholders' interests, preparing for the changing sustainability requirements of existing stakeholders. They must also be prepared for changing business environments and collaborate on the development of new sustainable logistical solutions and processes, as well as allocate resources to sustainability initiatives and capabilities building.

Limitations

Due to the case study method used, the generalization of the results may be a limitation. However, as Yin (2003) argues, case studies should not be evaluated in terms of generalization, i.e., universality of the theory, but in terms of whether the results contribute to contextual factors and whether a case study generates local and context-specific understanding—in this research, managing sustainability-related risks in buying logistics services. The buyers suggested the LSP case companies of this study, and thus, the selection procedure may be a limitation. Moreover, the double role of the LSP companies as buyers of logistics services from sub-LSPs (suppliers), on the one hand, and, on the other hand, as suppliers (LSPs) of primary buyer companies can be slightly confusing and thus a limitation of the research.

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