Social performance measurement for sustainable supply chain management

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Abstract
Performance measurement is an essential path for developing the field of Sustainable Supply Chain Management (SSCM). The literature points hurdles on assessing all three (i.e., economic, environmental, social) performances needed for sustainability, especially social. The research identified and analyzed key metrics for performance measurement for SSCM, targeting social issues.

Keywords: Social Performance Measurement; Social Metrics; Sustainable Supply Chain Management.

INTRODUCTION

The management of sustainable issues only inside business boundaries is evolving to englobe an interfirm scope (Ahi and Searcy, 2015a; Seuring and Gold, 2013). Focus on supply chains is a fundamental step toward this wider adoption of sustainability (Ashby et al. 2012) and is leading to the concept of Sustainable Supply Chain Management.

Since the 1990s, the integration of environmental and/or social concerns in Supply Chain Management (SCM) leads to new concepts. Among them are Closed-Loop Supply Chains (Beamon 1999a), Responsible Supply Chain Management (Bakker and Nijhof, 2002; Park-Poaps and Rees, 2010), Green Supply Chain Management (Srivastava 2007) and, more recently, Sustainable Supply Chain Management (SSCM) (Carter and Rogers, 2008; Pagell and Wu, 2009; Seuring and Müller, 2008).

The interest in SSCM arises from both academia and practitioners (Hassini et al. 2012) and it is motivated mostly by pressures from government, community and customers and by firm efforts in pursuing competitive advantage (Hassini et al. 2012; Seuring and Müller, 2008).

The literature published on the subject is gaining maturity (Touboulic and Walker, 2015) and even counts with a large number of literature reviews (Ahi and Searcy, 2013; Ashby et al. 2012; Brandenburg et al. 2014; Carter and Easton, 2011; Gimenez and Tachizawa, 2012; Schaltegger and Burritt, 2014; Seuring 2013; Seuring and Müller, 2008; Touboulic and Walker, 2015). They show the state of art of the research field and suggest paths for develop it further.

One of the identified paths indicates the need for more studies dealing specifically with performance measurement of sustainability in SCM (Schaltegger and Burritt, 2014). Recent literature addresses some hurdles and gaps. For Taticchi et al. (2013) is surprisingly how the literature on performance measurement and management in SSCM is dispersed and limited, in terms of quantity and scope. For Ahi and Searcy (2015a) there is disagreement on how performance should actually be measured. For Beske et al. (2015) few approaches seem to find their way into corporate practice and study those might provide insights for measurement methods. For Sancha et al. (2015) further research should try to obtain dyads of suppliers and buyers and assess both sides.

A strong gap refers to social aspects. Literature points that, while efforts to assess environmental sustainability are being developed, measuring social issues and integrating them into assessment frameworks are scarce (Ahi and Searcy, 2015a; Ahi and Searcy, 2015c; Bai and Sarkis, 2014; Beske et al. 2015; Carter and Rogers, 2008; Hassini et al. 2012; Schaltegger and Burritt, 2014; Seuring 2013; Seuring and Müller, 2008; Varsei et al. 2014; Yawar and Seuring, 2015). Few researchers discuss specific units of how to measure the metrics, being even scarcer for the social dimension (Beske et al. 2015).

This research aims to contribute to fill this gap by identifying and analyzing in the literature key metrics for performance measurement for SSCM, targeting social issues. The research seeks to answer: "what are the main metrics in the literature to measure performance, especially social, in the context of SSCM"? As a theoretical essay, this paper reviews the concepts of Sustainable Supply Chain Management (SSCM) and Sustainable Supply Chain Performance Measurements (SSCPM), and then deepens the debate on social performance and its metrics.

SUSTAINABLE SUPPLY CHAIN MANAGEMENT

Sustainability and SCM are concepts that have created many debates each (Seuring 2008). Sustainability is a complex and multidimensional issue that integrates efficiency and inter/intra generational equity on three bases: environmental, economic and social (Ahi and Searcy, 2015b). SCM "comprise different kinds of dependencies in, between and across companies in channels from manufactures/suppliers to customers/consumers" (Svesson 2007, p.263).

Among many definitions, Mentzer et al. (2001, p. 22) states that SCM is a "systemic, strategic coordination of the traditional business functions and the tactics across these business functions within a particular company and across businesses within the supply chain, for the purposes of improving the long-term performance of the individual companies and the supply chain as a whole".

To insert sustainability in this context would extend the aforementioned performance to involve not only economic performance, but two others as well: social and environmental. In this view, Ashby et al. (2012) clarify that a focus on supply chains is a step toward the broader adoption and development of sustainability, since the supply chain includes the product from processing of raw materials to delivery to the end-user.

There are many definitions to describe what a Sustainable Supply Chain Management (SSCM) is. Ahi and Searcy (2013) identified 12 unique definitions and developed a new one. Table 1 presents some of them. The definition of Carter and Rogers (2008), while mentions "organization's social, environmental, and economic goals", adresses improvement focusing only on economic performance. Although

Seuring and Muller's (2008) definition is the most cited in the literature, this research adopts Ahi and Searcy's (2013), due to its greater detail.

According to the authors, their definition meets 13 key characteristics of business sustainability and SCM (i.e., economic, environmental, social, stakeholder, volunteer, resilience, long-term focuses, flow, coordinations, relationship, value, efficiency and performance focuses).

Table 1 – Definitions of SSCM

Author	Definition
Carter and Rogers, 2008, p. 368	The strategic, transparent integration and achievement of an organizations **social, environmental, and economic** goals in the systemic coordinations of key inter-organizational business processes for improving the long-term economic performance of the individual company and its supply chains.
Seuring and Muller, 2008, p. 1700	The management of material, information and capital flows as well as cooperation among companies along the supply chain while taking goals from all three dimensions of sustainable development, i.e., **economic, environmental and social** into account which are derived from customer and stakeholders requirements.
Ahi and Searcy, 2013, p. 339	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.

SSCM, similar to most business operations, pursuit's specific performance goals (Beske et al. 2015). These must be measured to indicate opportunities for improvement and, hence, to promote a better management.

As highlighted in the three definitions presented, SSCM's performance is inextricably tied to three areas (i.e., economic, environmental and social), also known as the triple bottom line approach (Elkington 1997). We, then, discuss Sustainable Supply Chain Performance Measurements (SSCPM) in the following topic.

SUSTAINABLE SUPPLY CHAIN PERFORMANCE MEASUREMENT

As the business management evolves into a SCM perspective, also does the performance measurement. Thus, measuring performance of single businessess is progressing to measuring performance of supply chains (Ahi and Searcy, 2015c; Seuring and Gold, 2012). This advance, however, is not simple to accomplish. What it's difficult to measure inside a focal company becomes even more difficult across a supply chain (Beske et al. 2015) and choosing appropriate supply chain performance measures is a difficult process, due to the complexity of systems (Beamon 1999b).

Neely et al. (1995, p.80) defines performance measurement, as "the process of quantifying the efficiency and the effectiveness of action". When it comes to SSCM, these actions occur in more than one organization and in three dimentions (i.e. environmental, economic and social). Hence, Sustainable Supply Chain Performance Measurement (SSCPM) needs to be assessed among businessess and in all three dimensions.

A number of studies explore the field of SSCPM (Ahi and Searcy, 2015a; Ahi and Searcy, 2015c; Bai and Sarkis, 2014; Beske et al. 2015; Hassini et al. 2012; Schaltegger and Burritt, 2014; Varsei et al. 2014; Yawar and Seuring, 2015).

Hassini et al. (2012) carried out a literature review with focus on metrics. They identified some hurdles for the development of reliable metrics for SSCM. Among others reasons, they found that: some metrics are specific for intra-organizational management and will not be compatible for inter-oranizational scope; although environmental metrics exist, the excess of them makes it difficult to decide which ones, how and where to use; since there are different players on a supply chain, there is a need for agreements and negotiations on which metrics and datas to use; firms with different strategies along the supply chain may demand diferent metrics for its management and, thus, each one would prefer a specific metric.

To overcome some of these challenges, the authors suggest the use of composite indicators. In these indicators, each supply chain partner would colect its own measures on the three dimensions (i.e. environmental, economic and social) and, selects which ones to use, aligned with the partners' strategic goals. After this, each partner would produce their own internal sub-indicators, that, aggregated with sub-indicadors from the others partners, would form a supply chain composite indicator (Hassini et al. 2012). For this to work out, appropriate metrics developed in the three dimensions of sustainability and suited for each supply chain link would be highly important.

Beske et al. (2015) researched studies of the past 20 years to discover what has been achieved in SSCPM. The authors assessed 140 papers published until 2014 and found that over half of them say little to nothing about specific measurement and management methods for sustainable performance in SSCM.

The large portion of the articles discusses about the improvement of sustainable performance, but does not describe ways to measure it (Beske et al. 2015). For the papers that address SSCPM more descriptively, the authors indicates that economic and environmental performance are the two dimentions most analysed, while social dimension is considered only by one third of the publications.

Ahi and Searcy (2015a) also did a literature review on SSCPM. They conducted an analysis of metrics published in the literature to mesure sustainable performance in supply chains. A total of 2555 unique metrics were identified and their analysis points out two important findings: there is a lack of agreement on how performance should be measured in green and in sustainable SCM, and, in line with the findings of Beske et al. (2015), there is a great extent of metrics representing environmental issues, but few focussing on social issues (Ahy and Searcy, 2015a).

For economic performance measurements, also called traditional performance measurements, the main conventional indicators for SCM are quality, speed, dependability, flexibility and cost (Gunasekaran et al. 2004), plus time and innovation (Shepherd and Gunter, 2006). Some studies have indicated others, as shown in Table 2.

The environmental dimension, although lacks conventional indicators, is largely addressed. Metrics in this matter can be illustrated as: air emissions; energy use, greenhouse gas emissions, energy consumption; recycling; solid waste; carbon footprint; life cycle assessment; water consumption (Beske et al. 2015). Others examples are, also, in Table 2.

Traditional metrics for SCM tend to include economical and operational issues. For the papers consulted in this research, the traditional metric most mentioned was cost, appearing 10 times. In half of them only as "cost," and, in the other half, as: “cost reduction per product”, “cost savings”, “existing efficiency vs. cost of upgrading”, “increased cost efficiency” and “supply chain cost”.

Table 2 – Metrics for Traditional and Environmental SCM Performance

Authors	Metrics for traditional SCM performance	Metrics for environmental SCM performance
Gunasekaran, et al. (2004)	Quality; Speed; Cost Dependability; Flexibility	
Shepherd and Gunter (2006)	Cost; Time; Quality; Flexibility; Innovation	
Clemens (2006)		Environmental Policy; Investiment In Environmental Responsiveness; Environmental Consciousness
Sarkis (2006)		Water Consumption; Energy Usage; Organics Emitted; Sludge Emitted By Facility
Vachon and Klassen (2008)		Solid Waste Disposal; Air Emission; Water Emissions
Vachon and Mao (2008)		Waste Recycling Rate; Energy Efficiency; GHG Emissions; Environmental Innovation
Ashby et al. (2012)	Cost; Quality; Delivery	Environmental Management; Design For The Environment; Green Purchasing; Reverse Logistics; Recycling, Reuse And Remanufacturing
Brandenburg et al. (2014)	Cost; Profitability Or Revenue; Gross Domestic Product; Growth Rate; Labor Productivity, Market Concentration, Or Import Dependency Overall Macro-Economic Development	Renewable Energy Sources; Natural Resources, Water And Energy Consumption, Water Quality, Factors Focus On Waste And Pollution Impacts.
Varsei et al. (2014)	Supply Chain Cost; Service Level	GHG Emissions; Water Usage; Energy Consumption; Waste Generations; The Use Of Hazardous And Toxic Substances
Ahi and Searcy (2015a)	Risk and recoverability; Returning Customers Ratio; Cash Flow Provided by Operating Activities; Cooperation Degree; Profit; Market Share; Sales; Existing Efficiency Vs. Cost Of Upgrading; Increased Cost Efficiency; Cost Savings; Operational Performance	Environmental Costs; Buying Environmentally Friendly Materials; Environmental Social Concerns; Cooperation with Customers for Green Packaging; Risk of Severe Acidentes; Environmental Risks; LCA; Cumulative Energy Demand; Energy Requirement Per Unit; Global Warming Contribution Per Unit; Energy Efficiency; Recycling Efficiency; Process Optimization For Waste Reduction; Optimization of Process To Reduce Air Emissions
Beske et al. (2015)	Cost; Time; Quality; Flexibility; Innovation; Turnover Per Year; Cost Reduction Per Product	Air Emissions; Energy Use; GHG Emission; Energy Consumption; Recycling; Solid Wast; Flexibility; Environmental Management System; Carbon Footprint; LCA; Water Consumption; Waste Production Per Unit Output; CO_2 Emissions Per Ton; Land Use In Hectares

The second more mentioned was quality (4), followed by flexibility (3), time (2) and innovation (2). A total of 30 different metrics were selected and presented in Table 2. The most frequent coincided with the ones mentioned in the literature as conventionals.

Examples of unconventional but interesting metrics to manage in an inter-firm scope were identified, as: cash flow provided by operating activities; existing efficiency vs. cost of upgrading; market concentration/import dependency; returning customers ratio; turnover per year. These metrics seem applicable to manage from a supply chain perspective as they are transparent in their meaning and potentially comparable among supply ties.

Environmental metrics for SCM were found extensively and, as suggested by Hassini et al. (2012), the excess of them may hinder deciding on which one to use. For the most mentioned (i.e. energy), there were 6 different metrics: energy consumption; energy efficiency; energy requirement per unit; energy usage; renewable energy sources; and cumulative energy demand. This metric was mentioned 9 times, only repeating in energy consumption, energy efficiency and energy usage – only two times for each.

Waste and air emissions were founded seven (7) times each, while issues with water were present six (6) times. These metrics had different representations too. Waste, for instance, appeared as: solid waste; solid waste disposal; waste generations; waste production per unit output; waste recycling rate; process optimization for waste reduction; factors focus on waste and pollution impacts. A total of 50 different metrics were identified for environmental issues.

As suggested for traditional SCM performance, environmental metrics understood as interesting for an inter-firm scope were: buying environmentally friendly materials; green purchasing; cooperation with customers for green packaging; cumulative energy demand (primary energy used over the life cycle of a product or a process); energy requirement per unit; and waste production per unit.

Considering the scarcity of deepening on the social dimension of SSCPM, this research has done additional efforts on the subject. The following subject focuses specifically on analyzing social SCM performance.

SOCIAL SUPPLY CHAIN MANAGEMENT PERFORMANCE

Social performance, in a broader sense, can be understood as the measurement of social issues that trigger concerns in society (Searcy 2013). Despite its recognized importance, its measurement so far is quite rare. This happens because measuring performance with social indicators is not an easy task. Social issues have a very dynamic nature and social indicators are difficult to enforce across the entire supply chain (Searcy 2013). Other challenges are related to an inclination for subjectivity in social indicators and a tendency of some of them not being truly quantifiable (Burritt and Schaltegger, 2014).

A definition for social issues in supply chain is provided by Klassen and Vereecke (2012, p. 103) as the “product/process-related aspects of operations that affect human safety, welfare and community development”. In line with its definition, some of the metrics for social issues include: health and safety incidents; health and safety practices; product safety; economic welfare and growth (Beske et al. 2015).

A selection of social metrics is in Table 3, arising from the literature reviews in previous section with social issues and from further reviews, with focus on the social dimension, as in Jørgensen et al. (2008), Ahi and Searcy (2015c), Yawar and Seuring (2015).

The two metrics for social performance most mentioned were community and health and safety. As environmental metrics, they exhibit a wide range of different denominations.

Table 3 – Metrics for Social SCM Performance

Authors	Metrics for social SCM performance
Jørgensen et al. (2008)	Human Rights; Labour Practices and Decente Work Conditions; Society; Product Responsibility
Ashby et al. (2012)	Social Equity; Fair Trade; Socially Responsible Purchasing; Health and Safety
Brandenburg et al. (2014)	Wages, Employment Gender Ratio; Individual Customer need/requirement; Social Acceptance; Contribution to Employment; Population Growth
Varsei et al. (2014)	Labour Practices and Decente Work; Human Rights; Society; Product Responsibility
Ahi and Searcy (2015a)	Participation in Voluntary Programs; Number of Individual Volunteering; Corruption Risk; Health Status and Risks; Stakeholder Engagement; Stakeholder Empowerment; Relationship after Sales Service; Publicly Available Missions and Values Statement(s); Value Added and Community Benefits; Institutional Efficiency; Optimization of Process to Reduce Noise; Health And Safety Performance Measurement Systems
Ahi and Searcy (2015c)	Health and Safety Incidentes; Health and Safety Practices; Product Safety; Community Complaints; Community Initiatives; Work Safety and Labor Health; Per Cent of Employment Sourced from Local Communities; Safety; Worker Health and Safety; Involvement in Health and Safety Committees; Health and Safety Performance Measurement Systems; Employees' Health and Safety; Improvement Of Community Health and Safety; Reduced Safety Incidence; Health and Safety Results; Improved Health and Safety Standards; Supplier and Certifiable Safety Standard; Standardized Health and Safety Conditions; Safety of Workers; Welfare; Social Welfare; Human Welfare; Community Stakeholders; Improvement in Community Relations and Corporation Image; Community Ideology; Construction of Community Style and Features; Community Connection; Community Network; Complaints from Community; Pressure of Complaints From Neighboring Communities; Reduction of The Impact of Products, Services and Activities on The Local Community; Firm's Community Development Efforts; Support by Communities; Community Impact Rate; Community Engagement; Significant Improvement in Relations With Community Stakeholders, e.g. NGOs and Community Activists; Contribution To Community; Economic Linkages with Communities
Beske et al. (2015)	Safer Manufacturing; Gender Diversity and Harassment; Human Rights; Occupational Health and Safety; Fair Trade; Fair Labor Metrics; Ration of Direct And Indirect Employees; Training Time Per Employee
Yawar and Seuring (2015)	Labour Conditions; Human Rights; Health and Safety; Minority Development; Disable/Marginalised People Inclusion; Gender

For community, cited 19 times, it was identified metrics to deal with community ideology, community connection, and community engagement, among others. As for health and safety, found 15 times, issues were for health and safety incidentes, health and safety practices, health and safety results, among others.

These metrics would be already an example of the difficulties highlighted by Burritt and Schaltegger (2014), subjective and hard to quantify, and for Ahi and Searcy (2015a), with no agreement on how should be measured. Other recurring metrics were: labour (5), human rights (4); minority development (5). Considering the extra effort and the focus on the social dimention, a total of 76 different metrics were identified for social issues.

Some of the metrics founded were interesting options for applying in an inter-firm scope management: marginalised people inclusion; number of individual volunteering;

per cent of employment sourced from local communities; ration of direct and indirect employees; standardized health and safety conditions; training time per employee.

Taking into account the consideration of Searcy (2013) that social issues are of dynamic natures and the suggestion of Hassini et al. (2012) to criate a composite indicators, where every supply chain partner would use specific metrics for their activities, this paper makes a recommendation: create a matrix framework to supports the selection of appropriate metrics for each supply chain partner.

The first step would be to divide metrics by stakeholder and by dimention. In a second step, we analyze the adherence of metrics for each supply chain partner. A reduced version to illustrate the matrix framework is presented in Table 4, with some of the metrics identified throughout this research.

Table 4 – Matrix Framework of Metrics for S SCPM

	Supplier	Employee	Focal Firm	Consumer	Community
Economic	Cost reduction per product Returning customers ratio	Turnover per year	Cost reduction per product Returning customers ratio	Sales	Macro-economic development
Environmental	Waste production per unit	Waste production per unit	Waste production per unit	Waste production Per Unit	Environmental Social Concerns
Social	Training time per employee Per cent of employment from local communitie	Training time per employee Per cent of employment from local communitie	Training time per employee Per cent of employment from local communitie	After sales service	Community complaints Per cent of employment from local communitie

The more a metrics fits, greater its applicability in terms of supply chain. Eventually, some metrics may be perceived as intra-firm or better for downstream or upstream management.

CONCLUSIONS AND RESEARCH OPPORTUNITIES

This research aimed at identifying and analyzing in the literature key metrics for performance measurement for SSCM, targeting social issues. The research sought to answer: “what are the main metrics in the literature to measure performance, especially social, in the context of SSCM”? The research was not designed to exhaust all of the existing metrics in the literature, with a more exploratory and descriptive scope.

Considering the focus on the social dimension, the research identified 76 different socias metrics. Issues related to community and health and safety were the main ones, but there is no consensus for which metric should measure these requisites (e.g. community had 19 different metrics). Recurring metrics also were about labour, human rights and minority development. For environmental issues, metrics were related to energy, waste, air emissions and water. The traditional metric most mentioned was cost, followed by quality, flexibility, time and innovation.

A recommendation for selecting and organizing the most appropriate metrics for each supply chain partner is to create a matrix framework. A reduced version of what would be the matrix framework was presented. Future reseach should strive to find solutions to reduce the difficulties in measuring sustainable performance in supply chains, especially in the social dimension. The environmental dimension is at a stage of

consolidating the existing metrics and filters the most suitable for each type of company, industry and/or supply chain partner. A systematic assessment of existing metrics, organized into a matrix from the perspective of interested stakeholders can be a starting point.

REFERENCES

Ahi, P., Searcy, C. 2015a. An analysis of metrics used to measure performance in green and sustainable supply chains. *Journal of Cleaner Production* **86**: 360-377.

Ahi, P., Searcy, C. 2015b. Assessing sustainability in the supply chain: A triple bottom line approach. *Applied Mathematical Modelling* **39**(10): 2882-2896.

Ahi, P., Searcy, C. 2015c. Measuring social issues in sustainable supply chains. *Measuring Business Excellence* **19**(1): 33-45.

Ahi, P., Searcy, C. 2013. A comparative literature analysis of definitions for green and sustainable supply chain management. *Journal of Cleaner Production* **52**: 329-341.

Ashby, A., Leat, M., Hudson-Smith, M. 2012. Making connections: a review of supply chain management and sustainability literature. *Supply Chain Management: An International Journal* **17**(5): 497-516.

Bai, C., Sarkis, J. 2014. Determining and applying sustainable supplier key performance indicators. *Supply Chain Management: An International Journal* **19**(3): 275-291.

Bakker, F., Nijhof, A. 2002. Responsible chain management: a capability assessment framework. *Business Strategy and the Environment* **11**(1): 63-75.

Beamon, B. M. 1999a. Designing the green supply chain. *Logistics Information Management* **12**(4): 332-342.

Beamon, B. M. 1999b. Measuring supply chain performance. *International Journal of Operations & Production Management* **19**(3): 275-292.

Benoît, C. 2010. *Guidelines for Social Life Cycle Assessment of Products*. UNEP/Earthprint.

Beske, P., Johnson, M. P., Schaltegger, S. 2015. 20 years of performance measurement in sustainable supply chain management–what has been achieved? *Supply Chain Management: International Journal* **20**(6): 664-680.

Brandenburg, M., Govindan, K., Sarkis, J., Seuring, S. 2014. Quantitative models for sustainable supply chain management: Developments and directions. *European Journal of Operational Research* **233**(2): 299-312.

Burritt, R., Schaltegger, S. 2014. Accounting towards sustainability in production and supply chains. *The British Accounting Review* **46**(4): 327-343.

Carter, C. R., Rogers, D. S. 2008. A framework of sustainable supply chain management: moving toward new theory. *International Journal of Physical Distribution & Logistics Management* **38**(5): 360-387.

Clemens, B. 2006. Economic incentives and small firms: does it pay to be green? *Journal of Business Research* **59**(4): 492–500.

Elkington, J. 1997. Cannibals with forks. *The triple bottom line of 21st century*. Capstone, Oxford.

Gimenez, C., Tachizawa, E. M. 2012. Extending sustainability to suppliers: a systematic literature review. *Supply Chain Management: An International Journal* **17**(5): 531-543.

Gunasekaran, A., Patel, C., McGaughey, R. E. 2004. A framework for supply chain performance measurement. *International journal of production economics* **87**(3): 333-347.

Hassini, E., Surti, C., Searcy, C. 2012. A literature review and a case study of sustainable supply chains with a focus on metrics. *International Journal of Production Economics* **140**(1): 69-82.

Jørgensen, A., Le Bocq, A., Nazarkina, L., Hauschild, M. 2008. Methodologies for social life cycle assessment. *The International Journal of Life Cycle Assessment* **13**(2): 96-103.

Klassen, R. D., Vereecke, A. 2012. Social issues in supply chains: Capabilities link responsibility, risk (opportunity) and performance. *International Journal of Production Economics* **140**(1): 103-115.

Mentzer, J. T., DeWitt, W., Keebler, J. S., Min, S., Nix, N. W., Smith, C. D., Zacharia, Z. G. 2001. Defining supply chain management. *Journal of Business logistics* **22**(2): 1-25.

Neely, A., Gregory, M. Platts, K. 1995. Performance measurement system design. *International Journal of Operations and Production Management*, **15**(4): 80-116.

Pagell, M., Wu, Z. 2009. Building a more complete theory of sustainable supply chain management using case studies of 10 exemplars. *Journal of supply chain management* **45**(2): 37-56.

Park-Poaps, H., Rees, K. 2010. Stakeholder forces of socially responsible supply chain management orientation. *Journal of Business Ethics* **92**(2): 305-322.

Sancha, C., Gimenez, C., Sierra, V. 2015. Achieving a socially responsible supply chain through assessment and collaboration. *Journal of Cleaner Production*. Article in press.
Sarkis, J. 2006. The adoption of environmental and risk management practices: relationships to environmental performance. *Annals of Operations Research* **145**(1): 367–381.
Schaltegger, S., Burritt, R. 2014. Measuring and managing sustainability performance of supply chains: Review and sustainability supply chain management framework. *Supply Chain Management: An International Journal* **19**(3): 232-241.
Searcy, C. 2013. Corporate sustainability performance measurement systems: A review and research agenda. *Journal of Business Ethics* **107**(3): 239–253.
Seuring, S. 2008. Assessing the rigor of case study research in supply chain management. *Supply Chain Management: An International Journal* **13**(2): 128-137.
Seuring, S. 2013. A review of modeling approaches for sustainable supply chain management. *Decision support systems* **54**(4): 1513-1520.
Seuring, S., Gold, S. 2013. Sustainability management beyond corporate boundaries: from stakeholders to performance. *Journal of Cleaner Production* **56**: 1-6.
Seuring, S., Müller, M. 2008. From a literature review to a conceptual framework for sustainable supply chain management. *Journal of Cleaner production* **16**(15): 1699-1710.
Shepherd, C., Günter, H. 2006. Measuring supply chain: current research and future directions. Journal of Productivity and Performance Management **55**(3/4): 242-58.
Srivastava, S. K. 2007. Green supply-chain management: a state-of-the-art literature review. *International Journal of Management Reviews* **9**(1): 53-80.
Svensson, G. 2007. Aspects of sustainable supply chain management SSCM: conceptual framework and empirical example. *Supply Chain Management: An International Journal* **12**(4): 262-266.
Taticchi, P., Tonelli, F., Pasqualino, R. 2013. Performance measurement of sustainable supply chains: A literature review and a research agenda. *International Journal of Productivity and Performance Management* **62**(8): 782-804.
Touboulic, A., Walker, H. 2015. Theories in sustainable supply chain management: a structured literature review. International *Journal of Physical Distribution & Logistics Management* **45**(1/2): 16-42.
Vachon, S., Klassen, R. D. 2008. Environmental management and manufacturing performance: the role of collaboration in the supply chain. *International Journal of Production Economics* **111**(2): 299–315.
Vachon, S, Mao, Z. 2008. Linking supply chain strength to sustainable development: a country-level analysis. *Journal of Cleaner Production* **16**(15): 1552–1560.
Varsei, M., Soosay, C., Fahimnia, B., Sarkis, J. 2014. Framing sustainability performance of supply chains with multidimensional indicators. *Supply Chain Management: An International Journal* **19**(3): 242-257.
Yawar, S. A., Seuring, S. 2015. Management of social issues in supply chains: a literature review exploring social issues, actions and performance outcomes. *Journal of Business Ethics* 1-23.