PhD Thesis

Title: Extending sustainable practices along the supply chain

PhD Candidate: Cristina Sancha Fernández
PhD Supervisor: Cristina Giménez Thomsen

Department of Operations and Innovation Management
Research Group on Business Network Dynamics (BuNeD)
ESADE Business School, Universitat Ramon Llull

TABLE OF CONTENTS

"If I have seen further, it is by standing on the shoulders of giants"
Isaac Newton, 1676

I dedicate this PhD Thesis to those who paved the way

ACKNOWLEDGEMENTS

I would like to express my special appreciation and thanks to my supervisor Dr. Cristina Gimenez, you have been a tremendous PhD supervisor for me. Your guidance since I was an undergraduate student has helped me to grow both as a researcher and as an academic. Many thanks for your encouragement, time, effort, care, confidence and advice throughout these years and for continuously believing on me. I would never be able to thank you for all the opportunities you brought me. Your advice on both research as well as on my career have been priceless.

I also want to give a special thanks to my co-authors, without you this Thesis would have never seen the light. I want to deeply thank Dr. Vicenta Sierra for being always there to help me with my never ending methodological doubts and for her support during tough times in the Ph.D. pursuit. I am also extremely thankful to Dr. Christina Wong for sharing with me projects and opportunities and for welcoming me to Hong Kong. You have been a very constructive and helpful co-author. Finally, I want to thank Dr. Annachiara Longoni for her constant advice and suggestions about research. It has been a tremendous pleasure to work with you.

I am not able to express in words my gratitude to all ESADE members. I first joined ESADE as an undergraduate in 2005 and never left it since then. During my years at ESADE I have had the opportunity to meet excellent people. I want to thank all of them for their support and for making me feel ESADE is my second home. I want to express my sincere gratitude to Silvia Espin, Pilar Gallego and Olga Linares. Thanks for all your help during the PhD years.

I want to give a very special acknowledgement to three professors who left a special mark on me. Dr. Eduard Bonet. The joy, love and enthusiasm you have for management

education has been contagious and motivational for me. Dr. Joan Rodon. Thanks for your guidance, support and advice throughout these years. Dr. Xari Rovira. I will never forget your enormous support and advice since I first joined ESADE.

I also want to thank the members of BuNeD Research Group: Dr. Feliciano Sesé, Jorge Rodriguez and Ali Kazeminia for their valuable comments in all our research seminars. A special thanks to Dr. Frank Wiengarten for his advice and suggestions both on research and academic issues.

I take this opportunity to thank all managers who participated in the studies developed in this PhD Thesis.

I will forever be thankful to Susanna and Solange, my friends through thick and thin. Thanks for your support in the moments when there was no one to answer my queries.

I want to thank my parents for their never ending care and support in my career and life.

A special thanks to Ferran, my fiancé. Thanks for your personal support and infinite patience. It is hard to imagine having made it to this point without you.

ACKNOWLEDGEMENTS OF FINANCIAL SUPPORT

I would like to acknowledge the financial support of the following entities and projects:

- ESADE Business School i Universitat Ramon Llull
- Secretaria d'Universitats i Recerca del Departament d'Economia i Coneixement de la Generalitat de Catalunya i Fons Socials Europeus (*Credencial: 2015 FI_B2 00108*).
- BuNeD Research Group
- Proyecto de Investigación fundamental no orientada, ECO2010-16840 "Sustainability through supply chain management", Ministerio de Ciencia e Innovación

LIST OF FIGURES

LIST OF TABLES

The impact of national culture on the sustainability practices-sustainability performance relationship: an empirical multi-country study

LIST OF APPENDICES

CHAPTER 1
Introduction

This chapter introduces the PhD Thesis topic and provides a general overview of the PhD Thesis content and structure.

The conservation and management of resources, as well as the quest for social and economic development have been in the agenda of world's leaders since the last century. Several world conferences and summits such as the United Nations Conference on the Human Environment celebrated in 1972 in Stockholm or the more recent United Nations Conference on Sustainable Development (Rio+20) held in Brazil in 2012 gathered world leaders and participants from the private sector as well as NGOs to discuss issues such as the advancement on social equity and the protection of the environment. In all these gatherings, the key role of companies in the sustainable development effort has been acknowledged. Companies have an influence on many of the environmental and social priorities of sustainable development such as the reduction of CO_2 emissions and the well-being of their workforce. Also, companies play a key role on extending sustainability to other members in their networks such as customers or suppliers. Krause et al. (2009) capture this idea in the following statement: "a company is no more sustainable than its supply chain" (p.8). This means that if a company aims to be sustainable, it needs to adopt sustainability not only internally in their plants or within its own workforce, but it needs to extend it to other supply chain members such as suppliers.

Nowadays, companies such as Apple, Inditex or Procter and Gamble claim to audit their suppliers in terms of environmental issues, provide training with respect to health and safety measures or work together with their suppliers in order to improve their sustainability performance. For instance, in 2014, Apple conducted more than 600 in-person audits to their suppliers to guarantee safe and ethical working conditions at their premises. Also, Inditex works with clusters of suppliers located in developing countries such as India, to ensure sustainability along the supply chain. However, besides from these efforts, there are still incidents at the suppliers' facilities. The factory collapse in

Rana Plaza or the continuous complaints with respect to Foxconn working conditions are clear and recent examples of such incidents. This shows that while buying firms seem to invest resources in the development of their suppliers in terms of sustainability issues; suppliers' sustainability is not always improved. These issues raise some questions such as: are all these practices effective for extending sustainability upstream the supply chain? Are there contextual variables (both at the firm's and country level) that can affect the effectiveness of these practices? In that sense, we can assert that there is a need to further study the adoption of practices that aim to extend sustainability along the supply chain as well as their effectiveness. This PhD Thesis will focus on the study of these practices, which in the supply chain management literature are known as supplier development practices. More specifically this PhD Thesis will study (1) factors involved in the adoption of sustainable supplier development practices and (2) the effectiveness of these practices on firm's performance.

This PhD Thesis takes the form of a monograph based on articles. That is, the main chapters of the thesis are derived from articles that do not necessarily need to be already published. The central topic of this thesis, which is the study of sustainable supplier development practices is presented and developed in Chapter 2. In this same chapter, a literature review on the topic, the main gaps found, the research questions to be answered and the expected contributions of the PhD Thesis are presented. Chapters 3, 4, 5 and 6 correspond to the each of the four articles included in the thesis that answer to the previously posited research questions. In the following lines, each of these chapters is briefly described.

Chapter 3 relates to the study of antecedents of sustainable supplier development practices. More specifically, in this paper the impact of institutional pressures at the country level and the role of supplier integration at the plant level on the adoption of

sustainable supplier development practices are studied. This paper has been already published in Journal of Purchasing and Supply Management under the title of "Sustainable supplier development practices: drivers and enablers in a global context". This article has been written in collaboration with Dr. Annachiara Longoni and Dr. Cristina Gimenez.

Chapter 4 studies the effectiveness of two sustainable supplier development practices (i.e., assessment and collaborative practices) on the buying firm's and suppliers' social performance. The paper entitled "Achieving a socially responsible supply chain through assessment and collaboration" has been accepted for publication in Journal of Cleaner Production and has been written in collaboration with Dr. Cristina Giménez and Dr. Vicenta Sierra.

Chapter 5 also studies the effectiveness of sustainable supplier development practices emphasizing the role of suppliers' social performance as a mediator in the relationship between practices and buying firm's performance. The paper is entitled "Does implementing social supplier development practices pay off?" and has been written in collaboration with Dr. Cristina Gimenez, Dr. Vicenta Sierra and Ali Kazeminia. The paper has been accepted for publication in Supply Chain Management: An International Journal.

The last paper, included in Chapter 6, analyzes the moderating role of national culture in the sustainable supplier development practices and sustainability performance relationship. The paper has been written together with Dr. Annachiara Longoni and Dr. Cristina Gimenez and is entitled "The impact of national culture on the sustainability practices – sustainability performance relationship: an empirical multi-country study.

The paper has been accepted for presentation at POMS and EurOMA Conferences and will be submitted to International Journal of Operations and Production Management.

Chapter 7 provides the discussion of the results. In this chapter we discuss the results, answer to research questions, and highlight the contribution of the thesis. Finally, Chapter 8 includes the thesis conclusions, limitations and future research lines.

The list of references of each paper is included at the end of each chapter (i.e., Chapter 3, 4, 5, and 6) together with their corresponding appendices. The reference list for the overarching framework, discussion and conclusions (i.e., Chapter 2, 7 and 8) are included at the end of the Thesis.

CHAPTER 2
Overarching framework

This chapter provides a literature review on the topic of sustainable supplier development practices and identifies the main research gaps. The objective, as well as the research questions, that this PhD Thesis aims to answer are also specified. Finally, the expected contributions of the PhD Thesis are presented.

2.1. LITERATURE REVIEW

2.1.1. SUSTAINABILITY AND THE TRIPLE BOTTOM LINE

Recently, there has been an increasing awareness of sustainability issues in both the management and the research fields. On the one hand, many large companies have started to report on their social and environmental performances. On the other hand, the concept of sustainability has also begun to appear in the literature of disciplines such as operations or supply chain management (SCM) (Carter and Rogers, 2008). The term sustainability was first coined by the World Commission on Environment and Development (WCED) (1987) and it is defined as: "Development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (p.8). However, this definition has been described as being too general and difficult for companies to apply (Linton et al., 2007). In that sense, the way sustainability is usually operationalized in the operations and SCM fields is through the triple bottom line (TBL) (Elkington, 1998). The TBL concept includes environmental, social and economic dimensions as measures of corporate performance. Environmental sustainability refers to the use of energy and other resources, and the footprint companies leave behind as a result of their operations. Social sustainability is met when firms support the preservation and creation of skills and capabilities of current and future generations, promote health and, support an equal and democratic treatment within and outside its borders (McKenzie, 2004). Finally, economic sustainability means that by achieving sustainable operations, firms may obtain cost reduction and/or positive financial gains. In conclusion, according to the TBL approach, a firm's sustainability performance integrates environmental, social and economic performances.

2.1.2. SUSTAINABLE SUPPLY CHAIN MANAGEMENT

The increase in sustainability awareness can be clearly observed in the SCM discipline, whose focus has recently moved from considering cost and operational issues such as service improvement or quality, to also include environmental and social aspects (Fabian and Hill, 2005; Jiang, 2009a) as a way to pursue sustainability along the entire supply chain. Sustainable SCM (SCM) embodies the firm's plans and activities that integrate both environmental and social issues into SCM to improve the firm's sustainability performance as well as that of its suppliers and customers (de Ron, 1998; Seuring and Muller, 2008; Pagell and Gobeli, 2009). Based on this definition, two important aspects need to be highlighted. On the one hand, to achieve sustainability firms should engage on both environmental and social issues. That is, firms should not only green their supply chain but also make it more socially responsible. On the other hand, sustainability extends the boundaries of the firm and includes not only the implementation of internal sustainable practices (e.g., use of clean technologies and/or the implementation of work/life balance policies) that improve the firm's sustainability performance but also the extension of sustainable practices to other partners in the supply chain (e.g., training suppliers on environmental risks) with the aim of having a positive impact on their sustainability performance. This PhD Thesis will mainly focus on this second set of practices (i.e. practices that aim to extend sustainability to suppliers) and will analyze and study their role on extending sustainability along the supply chain.

2.1.3. EXTENDING SUSTAINABILITY TO SUPPLIERS

As we have already mentioned, one particular challenge firms face when managing sustainability is its extension to other partners in the supply chain (i.e., suppliers) since firms are held responsible not only for their actions but also for their suppliers'

environmental damages or unethical behaviors. As pointed out by Faruk et al. (2002) suppliers' poor environmental management can harm the buying firm's environmental performance. This is also true in the case of social issues. For instance, companies such as Nike, Gap or Apple have been vilified because some of their suppliers were employing child labor in their facilities. As firms realize that customers and stakeholders do not distinguish between the lead company and its partners in the supply chain (Large and Gimenez, 2011) the need to develop governance mechanisms that allow them to extend sustainability along the supply chain becomes clear (Kytle and Ruggie, 2005). Many companies implement codes of conduct, supplier assessment practices and/or collaboration with suppliers in order to make their suppliers become more sustainable (Andersen and Skjoett-Larsen, 2009; Keating et al., 2008). In the SCM field, the set of practices aimed at improving suppliers' performance is known as supplier development (Krause et al., 2000). To improve suppliers' performance, buying firms can implement supplier development strategies such as assessing suppliers, providing suppliers with incentives, instigating competition among them or working directly with them (e.g., training suppliers' personnel) (Krause et al., 1997, 2000; Watts and Hahn, 1993). In the context of sustainable SCM two main sets of supplier development practices have been studied: supplier assessment and collaboration with suppliers (e.g., Gualandris and Kalchschmidt, 2014; Lee and Klassen, 2008; Vachon and Klassen, 2006).

Supplier assessment efforts by buying firms represent in-depth evaluations of the suppliers' performance (Krause et al. 2000). These activities can take the form of questionnaires, non-regulatory standards or third-party audits (Min and Galle, 1997; Walton et al., 1998) and suppliers' company visits (Large and Gimenez, 2011). This evaluation process, allows the buying firm to determine if the supplier meets current

and future business needs. The buying firm needs to quantify and communicate the results of the evaluation to suppliers so that they are aware of the possible discrepancies between their current performance and the buying firm expectations (Prahinski and Benton, 2004). Therefore, an essential part of the assessment process includes providing evaluative feedback to suppliers. This way, suppliers are given directions for improvement (Krause et al., 2000).

Supplier collaboration entails the direct involvement of the buying firm in the supplier development effort. The buying firm direct involvement includes investments in the supplier through training and education of supplier's personnel and/or dedicating buying firm personnel temporarily to the supplier (Krause et al., 2000). Examples of collaborative activities are: providing training programs to suppliers, sponsoring meetings for suppliers in order to share information and experience, and undertaking joint applied research regarding alternative materials or processes (Lee and Klassen, 2008) This supplier development strategy represents transaction-specific investments in the supplier by the buying firm (Williamson, 1975, 1991).

In the sustainable SCM literature, there is a growing body of empirical research that has studied these practices. Some papers have focused on their antecedents (e.g., Bowen et al. 2001; Paulraj 2009; Reuter et al., 2010; Vachon and Klassen, 2006a) and others on their impact on different dimensions such as the management of sustainability (e.g., Ciliberti et al., 2008; Klassen and Vachon, 2003), environmental capabilities (e.g., Lee and Klassen, 2008), environmental investments (e.g., Klassen and Vachon, 2003; Vachon, 2007), the successful implementation of codes of conduct (e.g., Lim and Philips, 2008; Jiang, 2009a,b), commitment (e.g., Simpson et al., 2007) and performance (i.e., Green et al., 2012; Hollos et al., 2012; Rao and Holt, 2005; Theyel, 2001; Vachon and Klassen, 2008; Zhu and Sarkis, 2004). This PhD Thesis will focus on

studying the antecedents of these practices and also the impact that these practices have on performance. In that sense, Tables 1 and 2 provide a classification of the literature that has studied these two aspects.

Table 1 includes papers that have analyzed the antecedents of assessment and/or collaboration. In that sense, the literature has been classified according to the methodology used (e.g., survey), the sustainability dimensions under study (i.e., green or social) and the scope of the antecedent(s) considered (i.e., internal or external). Internal antecedents cover factors within the boundaries of the firm. External antecedents include factors beyond the firm's boundaries which are, in general, related to the environment in which the firm operates. Additional information related to the name of the antecedent(s), the country/ies in which the study has been performed and the results of each paper have also been included. Based on this literature review the following points need to be highlighted. First, most of the papers have analyzed the antecedents of green supplier development practices, neglecting the antecedents for social ones. In fact, from the 26 papers identified, 19 papers have exclusively looked at antecedents of green practices, while 7 have considered both green and social practices. Second, the majority of the papers have considered internal antecedents (24 out of 25). That is, most of the papers have looked at the influence that factors such as the firm's orientation towards sustainability or the provision of training have on the adoption of assessment and collaborative practices. Only 11 papers have considered the role of factors coming from the external environment in which the firm is embedded. It is also important to highlight that from these 11 papers, 9 have looked at both internal and external antecedents. Finally, in the literature there is no agreement with respect to which factors influence the adoption of these practices. While some papers have found that external factors such as pressures coming from the government exert a positive

influence on their adoption (e.g. Holt and Ghobadian, 2009) others did not (e.g., Gonzalez-Benito and Gonzalez-Benito, 2006). One possible cause of these mixed results can be explained by differences in country. Most of the papers have been conducted in single countries. From the remaining papers, 3 have considered regions (e.g., North America, Europe) and 2 include multiple countries in their samples. However, these papers have not considered the country level in their analysis. In other words, these papers have not studied differences in the influence of practices' adoption due to differences in countries.

Table 2 includes papers that have analyzed the impact of sustainable supplier development practices (i.e., assessment and collaboration) on performance. The identified papers have been classified according to the methodology used, the practices' scope (i.e., social and/or green), the dimension of performance analyzed (i.e., operational, economic, environmental and/or social) and the entity considered (i.e., buying firm, supply chain or supplier). Similar to Table 1, we have included additional information about the country in which the study has been performed and the results obtained per each identified paper. From the review of the literature that considers the practices-performance relationship the following points need to be highlighted. First, most of the papers focus on the study of environmental practices while there is little research that has adopted a social focus. From a total number of 40 articles, only 15 study social practices while 39 included environmental practices. Second, the most studied dimensions of performance are the economic, operational and environmental ones while the social dimension has been neglected. In fact, only 4 papers (i.e., de Giovanni, 2012; Gimenez et al., 2012; Gualandris et al., 2014; Parmigiani et al., 2011) have included this dimension in their study. Third, the majority of the papers (34 out of 40) study the performance implications of adopting supplier development practices for

the buying firm. In other words, how the implementation of supplier assessment or collaboration with suppliers impacts the buying firm's performance has been extensively studied. From the remaining papers, 4 analyze the impact of these practices on the supply chain's performance (i.e., Keating et al., 2008; Spence and Bourlakis, 2009; Klassen and Vereecke, 2012; Parmigiani et al., 2011) and 3 on the suppliers' performance (i.e., Akamp et al., 2012; Blome et al., 2014; Carter, 2005). In that sense, how suppliers' are affected by the buying firm efforts to make them more sustainable has been scantily explored. Finally, most of the papers (i.e., 23 out of 40) have considered single country studies, neglecting possible differences on the effectiveness of these practices due to differences in countries. More specifically, national culture has been described in the SCM literature as a potential factor that leads to differences in performance outcomes (Metters, 2008; Wiengarten et al. 2011). However, its role has been neglected in the sustainable SCM literature.

Table 1. Classification of the papers that analyze the antecedents of sustainable supplier development practices

Authors	Method	Sustainability Dimensions	Antecedents	Scope		Country sample	Results
				Internal	External		
Lamming and Hampson (1996)	Case	G	Management involvement, commitment, role of purchasing	X		UK	The results suggest that key enablers to environmental practices are senior management involvement, important role of the purchasing function and commitment.
Walton et al. (1998)	Case	G	Resource availability and training	X		Not specified	The availability of resources as well as the implementation of training are two key enablers of green practices adoption.
Murray (2000)	Case	G	Training	X		Ireland	Communication and training to purchasing staff helps on the adoption of assessment practices.
Bowen et al. (2001)	Survey	G	Training, commitment/pro-activity, role of purchasing	X		UK	Training of purchaser's, firm's environmental commitment and the key role of purchasing facilitate the adoption of environmental practices.
Klassen (2001)	Survey	G	Plant management orientation, plant's characteristics	X		US	Both plant's management orientation as well as some plant characteristics enable of environmental management practices.
Zhu and Sarkis (2004)	Survey	G	Operational practices	X		China	Quality management practices are very important forerunners for green supply chain management practices.
Gonzalez-Benito and Gonzalez-Benito (2006)	Survey	G	Stakeholder pressure and managerial values	X	X	Spain	Non-governmental pressures explain the implementation of environmental practices in logistics. The results also suggest the effect of management's values is also significant.
Vachon and Klassen (2006)	Survey	G	Technological and logistical integration	X		North America (US and Canada)	Technological integration with suppliers and customers is linked to the adoption of environmental supplier development practices. Logistical integration is associated with the assessment of suppliers.

Zhu and Sarkis (2006)	Survey	G	Stakeholder pressures and firm's mission/policies	X	X	China	The firm's environmental missions and internal multinational policies are considered key for green purchasing practices.
Ciliberti et al. (2008)	Case	G + S	Trust, national culture, infrastructure	X	X	Italy and The Netherlands	National culture, trust and poor IT infrastructure are barriers to the implementation of CSR practices.
Walker et al. (2008)	Case	G	Stakeholders and organizational factors	X	X	UK	Organizational factors such as the role played by project leaders and value champions are key in incorporating environmental concerns in the buying process.
Andersen and Skjoett-Larsen (2009)	Case	G + S	Training, performance measurement systems, resource availability	X		Sweden	The adoption of a CSR approach is enabled by the provision of training to both purchasers and suppliers, the existence of a performance measurement system and resource availability.
Holt and Ghobadian (2009)	Survey	G	Legislation, societal, supply chain, competitive, internal	X	X	UK	Legislative and supply chain exert the most perceived pressure while societal and consumer the least.
Pagell and Wu (2009)	Case	G + S	Commitment, capabilities, and performance measurement system	X		Not specified	Key enablers of supplier certification and supplier development practices are sustainability orientation, innovation capabilities, measurement systems.
Pedersen (2009)	Survey	G + S	Size , management support, sophistication, sustainability orientation	X		Denmark	Size and sophistication of CSR systems seem to facilitate the implementation of CSR practices.
Reuter et al. (2010)	Case	G + S	Stakeholder pressures, top management support, resources	X	X	European	Available resources and top management support are key enablers of sustainable development practices
Sarkis et al. (2010)	Survey	G	Stakeholder pressure and training	X	X	Spain	The results of this study indicate that training, specifically environmental training, mediates the relationship between stakeholder pressures and various environmental practices.

Large and Gimenez (2011)	Survey	G	Commitment, capabilities, role of purchasing	X		Germany	The strategic role of purchasing, firm's commitment and capabilities are drivers of assessment and collaboration.
Hsu et al. (2013)	Survey	G	Regulation, customer, competitors, socio-cultural pressures		X	Malaysia	The results suggest that green supply chain drivers (i.e., regulation, customer, competitors and socio-cultural pressures) influence the adoption of green purchasing activities.
Zhu et al. (2013)	Survey	G	Institutional pressures (normative, coercive and mimetic)		X	China	The results suggest that institutional pressures drive the adoption of internal GSCM practices which in turn relate to their external GSCM practices adoption.
Blome et al. (2014)	Survey	G	Top management commitment	X		West Eastern Europe	Top management commitment is an important antecedent of green supplier development practices
Golini et al. (2014)	Survey	G + S	Site competence	X		Multicounty (no country differences analyzed)	Plants with higher site competence have higher adoption levels of sustainability programs.
Gualandris and Kalchschmidt (2014)	Survey	G + S	Innovativeness and customer pressure	X	X	Italy	The impact of innovativeness and customer pressure on the adoption of sustainable supplier development practices is mediated by supply management practices.
Jabbour et al. (2014)	Survey	G	Environmental management maturity	X		Brazil	The results show that environmental management maturity influences the adoption of green purchasing practices.
Mathiyazhagan et al. (2014)	Survey	G	Government, global competitiveness, customer, external, financial and operational	X	X	India	This study shows that government and policy regulations, global competitiveness, customer, external factors, financial factors and production and operational factors exert pressure on the adoption of green supply chain management practices
Jabbour (2015)	Case	G	Certification, firm's green orientation, green objectives	X		Brazil	This study shows that there are additional intra-organizational enablers for GSCM such as ISO certification and firm's green objectives linked to employees' rewards.

Notes: *G: Green; S: Social

Table 2. Classification of the papers that analyze the performance implications of sustainable supplier development practices

Authors	Method	Scope of practices	Performance entity	Performance Dimension	Country sample	Results
Green et al. (1998)	Case	G*	BF*	P* Environmental	UK	There is some evidence that both 30practices may contribute to performance, but more research on environmental performance measure is needed
Walton et al. (1998)	Case	G	BF	P Environmental	Not specified	Supplier evaluation and process improvement are primary areas to increase Purchasing's impact on environmental performance
Geffen and Rothenberg (2000)	Case	G	BF	P Environmental and Operational	US	The establishment of collaborative partnerships with suppliers lead to the successful implementation of environmental technologies which result in environmental performance improvements while maintaining production quality and cost goals
Murray (2000)	Case	G	BF	(P)*	Ireland	Assessment helped the company to increase the number of environmentally-certified suppliers
Theyel (2001)	Survey	G	BF	P Environmental	US	While assessment practices lead to better environmental results (e.g., waste reduction), collaborative practices do not. However, the author suggests that collaborative practices will result in improvements on environmental performance in the long term
Carter and Jennings (2002)	Survey	G+S*	BF	P Economic	US	Logistics Social Responsibility (which includes both assessment and collaborative practices) have a positive effect on the firm's economic performance
Rao (2002)	Survey	G	BF	P Environmental Economic Operational	South East Asia (The Philippines, Indonesia, Malaysia, Thailand and Singapore)	Greening suppliers improves environmental performance, which leads to improved competitiveness, which in turn leads to better economic performance
Zhu and Sarkis (2004)	Survey	G	BF	P Environmental Economic	China	External Green Supply Chain Management has positive effects on environmental and economic performance
Carter (2005)	Survey	G + S	BF + SP*	P Operational	US	No relationship between Purchasing Social Responsibility (PSR) and costs is found. However, organizational learning and supplier performance act as key mediating variables between PSR and costs
Rao and Holt (2005)	Survey	G	BF	P Operational Economic	South East Asia (The Philippines, Indonesia, Malaysia, Thailand and Singapore)	Greening suppliers leads to greening outbound which in turn leads to improved operational performance. In addition, greening suppliers leads to better economic results
Zhu et al. (2005)	Survey	G	BF	P Environmental Economic Operational	China	Green Supply Chain Management practices help to improve both environmental and operational performances. However, they do not help to improve economic performance
Vachon and Klassen (2006)	Survey	G	BF	P Environmental Operational	North America (US and Canada)	Green project partnership with suppliers is associated with better delivery performance
Montabon et al. (2007)	Content	G	BF	P Environmental	US and non-US	Environmental practices are associated with firm performance (both

	Analysis			Economic		environmental and economic)
Zhu et al. (2007)	Survey	G	BF	P Environmental Economic Operational	China	Green Supply Chain Management implementation has only slightly improved environmental and operational performance and has not resulted in significant economic improvements
Zhu and Sarkis (2007)	Survey	G	BF	P Environmental Economic	China	The authors found that the positive relationship between green purchasing and environmental performance is mediated by market and regulatory pressures. In the case of economic performance the relationship is mediated by competitive pressure
Keating et al. (2008)	Case	G + S	SC*	(P)	Australia	Both types of practices help to achieve a sustainable supply chain. Although in the case of assessment one should distinguish between small and large suppliers.
Vachon and Klassen (2008)	Survey	G	BF	P Environmental Operational	North America (US and Canada)	The authors found support for the positive relationship between environmental collaboration and quality, delivery, flexibility and environmental performance. However, their results suggest that cost performance was not improved by the use of environmental collaboration
Pagell and Wu (2009)	Case	G + S	BF	(P)	Not specified	Supplier certification and supplier development practices lead to more sustainable supply chains
Schliephake et al. (2009)	Case	G	BF	P Environmental	Australia	There are greater environmental efficiencies (e.g., waste reduction, material unsafe) when engaging proactively with supply chain partners
Spence and Bourlakis (2009)	Case	G + S	SC	(P)	UK	To achieve a sustainable supply chain Waitrose evolves from a monitoring approach to a collaborative one
Strand (2009)	Case	G + S	BF	(P)	Scandinavia (Sweden, Norway, Finland, Denmark)	Assessment practices and collaborative relationships results in a cooperative advantage that helps to build stronger and more engaged supply chains
Foerstl et al. (2010)	Case	G + S	BF	P Operational	Europe	Sustainable supplier management capabilities are a source of competitive advantage in terms of lower exposure to reputational risks and enhanced operational performance
Reuter et al. (2010)	Case	G + S	BF	(P)	Europe	Relying only on assessment is not sustainable, collaboration is needed to become sustainable
Borchardt et al. (2011)	Case	G	BF	P Environmental Operational	Brazil	Joint eco-design with suppliers reduces cost, toxic waste and energy consumption
Large and Gimenez (2011)	Survey	G	BF	P Environmental Operational	Germany	Green supplier assessment and collaboration have a positive impact on both environmental and operational performance
Parmigiani et al. (2011)	Conceptual	G + S	SC	P Environmental Social	N/A	Stronger social and environmental capabilities will lead to greater social and environmental performance.
Akamp and Muller. (2012)	Survey	G + S	SP	P Operational	Germany	While supplier assessment does not help to improve the suppliers' operational performance, collaboration with suppliers does it
Albino et al. (2012)	Content Analysis	G	BF	P Environmental	US	Collaborative practices are beneficial for the firm's environmental performance, the management of its environmental footprint, and its environmental reputation
de Giovanni (2012)	Survey	G	BF	P TBL*	Italy	External Environmental Management (mainly collaborative practices) helps to improve both environmental and social performances but not economic

						performance
Gallear et al. (2012)	Survey	G+S	BF	P Economic	UK	Neither monitoring nor sharing best practices leads to better economic results
Gimenez et al. (2012)	Survey	G+S	BF	P TBL	Multicountry (no country differences analyzed)	While no support is found for the impact of assessment on any TBL dimension, the impact of collaboration on the TBL is partially supported
Gimenez and Sierra (2013)	Survey	G	BF	P Environmental	Germany and Spain	Both suppliers' assessment and collaboration with suppliers helps to improve the firm's environmental performance
Green et al. (2012a)	Survey	G	BF	P Environmental and Economic	US	The authors found that environmental collaboration leads to environmental assessment which improves the firm's environmental performance. In addition, environmental performance leads to better economic results.
Green et al. (2012b)	Survey	G	BF	P Environmental and Economic	US	Green purchasing (collaboration) does not improve environmental performance but helps to improve the economic one
Hollos et al. (2012)	Survey	G+S	BF	P Operational	Western Europe	Sustainable supplier cooperation results in the adoption of green and social practices along the supply chain but does not directly help to improve operational performance. Operational performance only improves once the buying firm and the supplier have adopted green practices
Klassen and Vereecke (2012)	Case	S	SC	P Economic	Japan, Belgium and US	Monitoring and collaborative practices help to reduce the supply chain's social risk. In addition, collaboration helps to improve the supply chain's performance
Zhu et al. (2013)	Survey	G	BF	P Environmental, Economic, Operational	China	The results suggest that GSCM practices do not directly affect economic performance, but can improve it indirectly through environmental and operational performance.
Blome et al. (2014)	Survey	G	SP	P Operational	Western Europe	Green supplier development practices improve the suppliers' operational performance and act as a mediator in the relationship between green procurement and suppliers' operational performance
Gualandris et al. (2014)	Survey	G + S	BF	P Environmental Social	Multicountry (no country differences analyzed)	Practices such as assessment and collaboration improve sustainability performance. In addition, supplier management makes them more effective.
Yu et al. (2014)	Survey	G	BF	P Operational	China	The results show that iGSCM (i.e., GSCM with customer, suppliers and internal) is positively related to different dimensions of operational performance (flexibility, quality, cost delivery)

Notes: *G: Green; S: Social; BF: Buying Firm; SP: Supplier; SC: Supply Chain; P: Impact on Performance; (P): Implicit Impact on Performance; TBL: Triple Bottom Line

2.2. RESEARCH GAPS AND RESEARCH QUESTIONS

In conclusion, we can highlight the following general gaps in the sustainable supplier development practices literature: (1) the study of social supplier development practices, (2) their impact on the social dimension of sustainability and (3) the consideration of country/culture differences. In addition, there are two particular gaps linked to each literature review (i.e., antecedents and performance). In the case of the study of antecedents there is also a gap related to the study of external antecedents. Finally, in the case of the literature that has analyzed the practices-performance relationship, there is a gap related to the inclusion of the suppliers' performance construct.

In this PhD Thesis we aim to fill the abovementioned gaps and study (1) the antecedents of sustainable supplier development practices putting emphasis on country differences and (2) the impact of supplier development practices (i.e. assessment and collaboration) on both the buying firm's and the suppliers' sustainability performance with a special focus on the social dimension. More specifically, this PhD Thesis aims to answer the following research questions:

- ***RQ1.*** *Do external and internal antecedents have the same influence on the adoption of sustainable supplier development practices across countries?*
- ***RQ2.*** *Do sustainable supplier development practices (i.e., assessment and collaboration) contribute to improve suppliers' and/or buying firm's performance?*
- ***RQ3.*** *What is the role of suppliers' performance in the sustainable supplier development practices – buying firm's performance relationship?*
- ***RQ4.*** *Is the effectiveness of sustainable supplier development practices consistent across different national cultures?*

2.3. RESEARCH PARADIGM AND RESEARCH METHOD

The research paradigm refers to the way in which knowledge is perceived and obtained. Traditionally, two extreme positions have been adopted with respect to these issues in the field of social sciences: interpretivism and positivism. The interpretivism approach suggests that reality is viewed and interpreted by the individual and puts emphasis on the need of critical reflections on the research context (Galliers, 1993). Knowledge is understood as being subjective and personally experienced by the researcher rather than imposed. In that sense, interpretivism believes that knowledge is socially constructed as people interact with the world around them.

The positivistic approach suggests that knowledge is based on experience of sense and can be obtained by observation and experiment. In that sense, they believe that causal relationships can be found and that hypotheses can be developed and tested in order to predict a phenomenon. Positivist thinkers understand knowledge within the framework of the principles and assumptions of science: determinism, empiricism, parsimony and generality (Cohen et al., 2000). Determinism implies that events are caused by other circumstances (i.e., existence of cause-effect relationships). Empiricism suggests that quantifiable measures of variables exist and can be collected. Parsimony refers to explaining the phenomenon under study in the most economic possible way. Generality implies that it is possible to draw inferences about a phenomenon from a representative sample to a stated population. This PhD thesis adopts a positivistic approach to knowledge. The reason for adopting a positivistic approach lies in the nature of the research question, which aim not to interpret the phenomenon of sustainable supplier development practices but to understand the influence of other variables on their adoption as well as the relationship between the implementation of sustainable supplier

development practices and performance. In other words, this PhD Thesis research questions aim to explore causal-effect relationships between different constructs.

The chosen research paradigm has a great influence on the research method that needs to be employed. In this case, positivism gives importance to research methods focusing on quantitative analysis. This is the reason why in this PhD Thesis survey methodology is employed. More specifically, two different surveys are used to answer to the proposed research questions. In Chapters 3 and 6 we employ the 6th round of the International Manufacturing Strategy Survey (IMSS). The IMSS is an international network of researchers in universities located in more than 20 different countries that focuses on the study of manufacturing and supply chain practices. The IMSS-VI sample consists of 931 plants from 22 countries belonging to 6 different sectors. In Chapters 4 and 5, we use a survey developed in the BuNeD Research Group aimed at studying the implementation of sustainability practices in the supply chain. The sample consists of 120 Spanish manufacturing firms and data was collected in 2011. To analyze these two datasets we employ Ordinary Least Squares (OLS), Partial Least Squares (PLS) and multilevel regressions. The choice of the data analysis technique is dependent upon different factors such as sample size, clustering of data, and/or number of constructs and relationships. Additional details on the questionnaire, sample and data analysis techniques can be found in each chapter (i.e., Chapters 3, 4, 5, 6).

2.4. THEORETICAL FRAMEWORK

To answer the abovementioned research questions, this PhD Thesis will adopt the lenses of Institutional Theory, Transaction Cost Theory (TCT), the Resource Based View (RBV) and the Relational View. These theories have been widely used both in the supplier development and sustainable SCM literatures (e.g.: Simpson and Power, 2005:

Carter and Rogers, 2008; Pagell et al. 2010; Cao and Zhang, 2011; Zhu et al., 2013). In addition, to adopt the country perspective we will adopt Hofstede's conceptualization and framework of national culture (Hofstede, 1980). Table 3 summarizes the theories/views/framework used to answer each research question.

Table 3. Summary of research questions and theoretical framework

RQ	Theoretical framework
RQ1. Do external and internal antecedents have the same influence on the adoption of sustainable supplier development practices across countries?	Institutional Theory and the Resource Based View
RQ2. Do sustainable supplier development practices (i.e., assessment and collaboration) contribute to improve suppliers' and/or buying firm's performance?	Transaction Cost Economics and the Resource Based View
RQ3. What is the role of suppliers' performance in the sustainable supplier development practices – buying firm's performance relationship?	Relational View
RQ4. Is the effectiveness of sustainable supplier development practices consistent across different national cultures?	Hofstede's national culture framework

2.4.1. INSTITUTIONAL THEORY

Institutional theory provides explanations about the causes of the adoption of certain organizational practices by firms (Hirsch, 1975). That is, institutional theory examines the causes of isomorphism (Deephouse, 1996). This concept (isomorphism) was first developed by Dimaggio and Powell (1983) and refers to the similarity of processes between organizations as a result of imitation or independent development under similar constraints. The authors suggest that there are three types of mechanisms that lead to organizational isomorphism: coercive isomorphism, normative isomorphism and mimetic isomorphism.

Coercive isomorphism is defined as the influence or pressure of organizations in power or organizations in which the firm is dependent (Dimaggio and Powell, 1983). This coercive pressure can be exerted by governments, law or other companies (e.g.,

headquarters to subsidiaries) (Rivera, 2004). Normative isomorphism is related to pressures coming from social groups such as non-governmental organizations, media or consumers (Ball and Craig, 2010). Finally, mimetic isomorphism is related to the predisposition of an organization to imitate another organization as a mean to be perceived as legitimate (Dimaggio and Powell, 1983). Firms may adopt the same practices adopted by successful competitors in the same industry (Aerts et al., 2006).

In this PhD Thesis, we adopt the lenses of Institutional Theory to answer RQ1. More specifically, to examine how external pressures coming from the environment in which the firm operates (i.e., coercive, normative and mimetic pressures in the country in which firms are located) influence the adoption of certain organizational practices (i.e., sustainable supplier development practices).

2.4.2. TRANSACTION COST THEORY (TCT)

TCT has received recent attention for its use in explaining relationships among firms (Williamson, 1975; Barringer and Harrison, 2000) such as buyer-supplier relationships. The TCT uses the transaction cost as the unit of analysis and establishes that modes of exchange between a firm and its suppliers should be selected that economize on transaction costs (Williamson, 1975). Transaction costs are defined as those costs that result from an economic exchange and they include both the direct cost of managing the relationship as well as costs coming from transaction risks of inter-organizational activities (i.e.: buyer-supplier relationships) (Williamson, 1975, 1985, 1996; Simpson and Power, 2005). Direct costs are for instance the price of the exchange or the cost of formalizing the contract that governs the relationship. Transaction risks that can lead to exchange difficulties are related to two important assumptions that TCT makes about human behavior (Williamson, 1981). The first assumption has to do with the concept of

bounded rationality. Bounded rationality refers to the limitations associated with communication, information processing, and cognitive capabilities (Simon, 1957). The second assumption is related to the concept of opportunistic behavior, which "refers to a lack of candor or honesty in transactions, to include self-interest seeking with guile" (Williamson, 1975, p.9). In that sense, to avoid the emergence of opportunistic behavior in an established relationship and hence reduce its associated transaction risks, the implementation of costly monitoring activities is needed (Carter and Rogers, 2008). These monitoring activities, in the context of supplier development, are known as supplier assessment practices. In that sense, the implementation of these practices by the buying firm will lead to a reduction/cease on the opportunistic behavior of the supplier due to the pressure of being evaluated and controlled.

The TCT is used in this PhD Thesis to partly answer RQ2. In particular, we will use it to explain the relationship between supplier assessment practices and sustainability performance.

2.4.3. RESOURCE BASED VIEW (RBV)

The RBV has received increasing attention in explaining supply chain collaboration (Cao and Zhang, 2011). This theory suggests that variance in a firm's performance can be explained by the effective use of its resources (Penrose, 1959; Barney, 1991). These resources include "all assets, capabilities, organizational processes, firm attributes, information, knowledge, etc. controlled by a firm" (Barney, 1991, p.101). According to the RBV, the investment in relation-specific assets enables partnering firms to build rare, valuable, non-substitutable, and difficult-to-imitate resources that lead to competitive advantage (Barney, 1991). In the supplier development literature, the investment in relation-specific assets is related to the development of collaborative

activities between a buying firm and its suppliers. Additionally, according to the RBV, supply chain collaboration does not only help to build these valuable resources but it also allows firms to focus on their core activities, which increase firm specific skills and realize economies of scale and learning effects, that result in an improvement of their competitive position (Park et al., 2004).

In this PhD Thesis, we will use the RBV to answer RQ1 and 2. More specifically, in RQ1, the RBV will allow us to study the role of external integration (i.e., internal antecedent) as an enabler on the adoption of sustainable supplier development practices. In RQ2, the RBV will help us to explain the relationship between collaborative practices and performance.

2.4.4. RELATIONAL VIEW

The relational view considers networks and dyads of firms (i.e.: buyer-supplier relationships) to explain relational rents (Dyer and Singh, 1998). A relational rent is defined as "a supernormal profit jointly generated in an exchange relationship that cannot be generated by either firm in isolation and can only be created through the joint idiosyncratic contributions of the specific alliance partners" (Dyer and Singh, 1998, p. 662). Relational rents are then a result of activities (i.e.: buyer and supplier) in which partners exchange idiosyncratic assets, knowledge, and capabilities through relation-specific investments, inter-firm knowledge-sharing routines, complementary resource endowment, and effective governance mechanisms (Cao and Zhang, 2011). A significant idea in the relational view is the fact that by working together, firms generate common benefits that collaborative partners cannot generate independently. In the study of sustainable supplier development practices, the exchange relationship takes place when the buying firm implements the supplier development program with the supplier.

In this PhD Thesis, we adopt the lenses of the relational view to answer RQ3. More specifically, we will use the relational view to explain the impact of sustainable supplier development practices.

2.4.5. HOFSTEDE'S NATIONAL CULTURE FRAMEWORK

Hofstede's cultural dimensions is a framework that allows the study of differences between cultures (Hofstede, 1980). The framework helps to describe the effects of culture on the values of its members. As defined by Hofstede (1980), national culture is the collective programming of the mind, which helps to distinguish the members of one group from those of another (Hofstede, 1980).

The traditional framework proposes four dimensions of national culture: power distance, uncertainty avoidance, individualism and masculinity. Power distance is the extent to which members of a group or society accept and expect that power is distributed unequally. Uncertainty avoidance is related to the tolerance for uncertainty and ambiguity. Individualism (opposed to collectivism) measures the degree to which individuals are integrated into groups. Finally, masculinity (opposed to femininity) refers to the distribution of emotional roles between genders.

In the SCM literature, several papers have emphasized the key role of national culture in explaining variations in performance outcomes (e.g., Hope and Muehlemann, 2001; Kull and Wacker, 2010; Wiengarten et al., 2011). In that sense, in this PhD Thesis, Hofstede's national culture dimensions framework will be used to study differences in the effectiveness of sustainable supplier development practices due to differences in culture.

2.5. EXPECTED CONTRIBUTIONS

This thesis aims to contribute to both research and practice. First, we aim to contribute on the limited literature on sustainable supplier development practices that has considered the social dimension of sustainability. We will do this by considering the social dimension both in terms of practices and performance outcomes. The inclusion of the social dimension of sustainability will provide managers with insights and recommendations on how to achieve not only an environmentally friendly supply chain but also a socially responsible one. Second, we aim to contribute to the current literature by considering country differences with respect to the adoption and the effectiveness of these practices. For managers, it will be interesting to know which pressures and practices are more (in)effective with respect to the country in which their firm, plants or suppliers are located. Finally, we also aim to contribute to the scant literature that has analyzed the sustainable supplier development practices-performance relationship taking into account the suppliers' performance. The extension of sustainable practices to suppliers comprises two entities: the buying firm and the supplier. Until now, research has focused on the impact these practices have on the buying firm performance. This study will consider the supplier's side and hence broaden the understanding we have about the relationship between these practices and performance. This will provide managers with a better understanding of the effectiveness of these practices. For example, it can be the case that one set of practices (i.e., assessment or collaboration) is more effective than the other on improving the suppliers' performance.

Next four chapters (3, 4, 5 and 6) present the answer to each research question that has been previously posited. Each chapter corresponds to one journal paper. Table 4 presents a summary of each paper and relates it to each research question.

Table 4. Research questions and chapters

Ch.	Research Question	Paper Title	Status
3	RQ1. Do external and internal antecedents have the same influence on the adoption of sustainable supplier development practices across countries?	Sancha, C., Longoni, A., Gimenez, C. (2015), "Sustainable supplier development practices: drivers and enablers in a global context", *Journal of Purchasing and Supply Management*, 21, 95-102.	Published
4	RQ2. Do sustainable supplier development practices (i.e., assessment and collaboration) contribute to improve suppliers' and/or buying firm's performance?	Sancha, C., Gimenez, C., Sierra, V. "Achieving a socially responsible supply chain through assessment and collaboration" Submitted to *Journal of Cleaner Production*	Accepted for Publication
5	RQ3. What is the role of suppliers' performance in the sustainable supplier development practices – buying firm's performance relationship?	Sancha, C., Gimenez, C., Sierra, V., Kazeminia, A. (forthcoming) "Does implementing social supplier development practices pay off?" *Supply Chain Management: An International Journal*	Accepted for Publication
6	RQ4. Is the effectiveness of sustainable supplier development practices consistent across different national cultures?	Sancha, C., Longoni, A., Gimenez, C., "The impact of national culture on the sustainability practices – sustainability performance relationship: an empirical multi-country study" To be submitted to *International Journal of Production and Operations Management*	To be submitted

CHAPTER 3
Sustainable supplier development practices: drivers and enablers in a global context[1]

This chapter studies the impact of institutional pressures at the country level on the adoption of sustainable supplier development practices. Also, this chapter analyzes if firm specific capabilities (i.e. supplier integration) play an enabling role in the adoption of sustainable supplier development practices.

[1] This paper is published in Journal of Purchasing and Supply Management
Sancha, C., Longoni, A., Gimenez, C. 2015. Sustainable supplier development practices: drivers and enablers in a global context. *Journal of Purchasing and Supply Management*, Vol. 21, pp. 95-102. DOI: http://dx.doi.org/10.1016/j.pursup.2014.12.004

3.1. ABSTRACT

The objective of this paper is to study the impact of institutional pressures at the country level (i.e., coercive, regulatory, normative) on the adoption of sustainable supplier development practices. Globalization is allowing firms to expand in new markets and to leverage on localization advantages by establishing foreign plants and sourcing internationally. Plants located in different countries might be subject to different institutional pressures shaping their organizational response to sustainability within and outside their domain (e.g., in relation to their suppliers). The paper also aims to examine if firm specific capabilities (e.g., supply chain integration) play an enabling role in the adoption of sustainable supplier development practices. To analyze these relationships we relied on both primary and secondary data, and used hierarchical linear modelling to test our hypotheses. The results show that mimetic pressures have a positive effect on the adoption of sustainable supplier development and that this influence is positively moderated by the firm's level of supplier integration. Coercive and normative pressures have no effect on the adoption of sustainable supplier development practices. Overall our results suggest that sustainable supplier development is a proactive practice adopted for competitive reasons and enabled by firm specific capabilities.

Keywords: sustainable supplier development, institutional pressures, supplier integration, hierarchical linear modelling

3.2. INTRODUCTION

The management of sustainability, which entails both environmental and social dimensions besides the economic one, has become a top priority for both practitioners' and researchers' agendas. Supply chains have shifted their focus from cost or quality issues to also include the environmental and social dimensions of sustainability (Porter and Kramer, 2006). One key challenge firms face when managing sustainability in their supply chains is captured in the premise that a firm "is no more sustainable than its supply chain" (Krause et al., 2009, p. 8), meaning that to ensure sustainability firms need to extend it to other supply chain members (e.g., suppliers). Buying firms need to audit and collaborate directly with their suppliers to build a sustainable supply chain. To extend sustainability to suppliers, buying firms can rely on the use of supplier development (SD) practices which have been described in the literature as a set of practices aimed at improving suppliers' performance and/or capabilities (Krause et al., 2000). Examples of these practices are the evaluation and assessment of suppliers' performance and/or the collaboration with them by means of training provision. In the context of sustainable supply chain management (SSCM), sustainable SD practices are oriented towards the achievement of environmental and social goals (e.g., evaluation of the suppliers' environmental and social performance, supplier training in terms of health and safety and environmental practices). In that sense, their adoption is suggested to make suppliers environmentally and more socially responsible (Gimenez et al., 2012; Rao, 2002; Zhu and Sarkis, 2004).

Although different authors have studied the implementation of sustainable SD practices and their impact on different sustainability performance dimensions (i.e., economic, environmental and social performance) (e.g., Gimenez et al., 2012; Vachon and Klassen, 2006; Zhu and Sarkis, 2007), there are few papers that have as main research

aim the study of their antecedents (Gimenez and Tachizawa, 2012). In other words, what triggers the adoption of sustainable SD practices deserves further attention. In that sense, our objective is to study the factors that make firms adopt these sustainable SD practices. We will follow Lee and Klassen (2008) approach and distinguish between two types of antecedents: drivers and enablers. A driver is a factor that initiates the adoption of sustainable SD practices. Using the Institutional Theory we posit that coercive, normative and mimetic pressures drive firms to adopt sustainable SD practices with the aim of making suppliers more sustainable. Specifically, we believe that firms located in different countries might be subject to different institutional pressures to develop their answer to sustainability along the supply chain. Understanding to what extent country-specific institutional pressures impact on sustainable SD adoption may help global firms to shape their practices adoption to improve sustainability outside the firm domain. Moreover understanding what makes firms adopt sustainable SD practices will allow global policy makers to build a suitable environment and provide incentives for the adoption of these practices.

An enabler is a factor that facilitates or assists the firm in the adoption of these practices. Relying on the Resource Based View (RBV) we believe that the higher the level of firm-specific capabilities that allow sharing information and coordinating with suppliers, the easier the adoption of sustainable SD practices to extend sustainability to suppliers. In that sense we posit that the adoption of sustainable SD practices will be easier to the extent a firm is externally integrated with its suppliers. By external integration we mean the extent to which a firm coordinates and integrates physical and/or information flows with other parties in the chain (Frohlich and Westbrook, 2002). In this paper, we focus on external integration with suppliers. This entails, for example, the sharing of information about stock levels between both parties (Gimenez

and Ventura, 2005). An additional example of external integration with suppliers is the collaboratively replenishment between manufacturers and suppliers (Wiengarten et al., 2014). The identification of the factors that enable the adoption of sustainable SD practices will help (1) firms to understand which capabilities they need to answer to institutional pressures in their global context and (2) policy makers to support the development of such capabilities.

To achieve our research objectives, in Section 2 we briefly provide the theoretical background and develop our research hypotheses with respect to the drivers and enablers of sustainable SD practices. In Section 3 we describe the methodology employed in this paper. The research hypotheses are tested in Section 4. In this section we also provide a summary of the results which are then discussed in Section 5. Conclusions are derived at the end of the paper.

3.3. THEORETICAL BACKGROUND AND HYPOTHESES DEVELOPMENT

In a recent literature review on the extension of sustainability development to suppliers, Gimenez and Tachizawa (2012) identified that most of the papers studying antecedents of sustainable SD practices focused mainly on internal antecedents. As firms are not only influenced by their internal dynamics but also by the external environment in which they operate, especially the country in which their plants are based, our paper will focus not only on the internal dimension but also on studying how different external factors influence the adoption of sustainable SD practices. Additionally, as already mentioned, in the study of sustainable SD practices antecedents we will distinguish between drivers, considered in terms of country-specific external pressures (i.e., coercive, mimetic and normative pressures), and enablers, considered in terms of firm specific capabilities (i.e., supply chain integration (SCI)) (Lee and Klassen, 2008).

3.3.1. DRIVERS OF SUSTAINABLE SD PRACTICES

We adopt the lenses of Institutional Theory (DiMaggio and Powell, 1983; Scott, 1987) to examine how external pressures coming from the environment in which the firm operates, influence firms to adopt organizational practices (Hirsch, 1975; Lai et al., 2006). In our case, institutional pressures in the country where the firm's plant is located will influence the adoption of sustainable SD. In the current global environment it is needed to understand how plants located in different countries might be subject to different external pressures and adopt different organizational practices (e.g., sustainable SD).

Based on the Institutional Theory, we distinguish between three types of institutional drivers: coercive, normative and mimetic (DiMaggio and Powell, 1983). Coercive drivers have been described as a key element in exerting pressure to adopt sustainable oriented practices (Zhu et al., 2013). They are defined as the influence exerted by those in power such as governments (Rivera, 2004). Governments all over the world have developed and implemented laws with respect to environmental and social issues. For instance, in 2001 Japan introduced the Japanese Law on Promoting Green Purchasing, which forced firms to purchase from environmentally friendly suppliers. Similarly, the Occupational Health and Safety Act (OHSA) in Canada imposes labor standards and duties on employers, owners and suppliers among others. The extent to which these regulations are strictly enforced may affect the effectiveness of coercive measures (Zhu et al., 2013). In that sense, in this paper we consider coercive measures as the ability of the government in the country where the plant is located to implement sound policies and regulations.

Normative drivers are related to pressures coming from social groups (e.g., non-governmental organization (NGO)) (Ball and Craig, 2010). Firms will adopt organizational practices to be able to conform to social legitimacy as a result of normative pressures (Zhu et al., 2013). Social groups such as NGOs, the media, and/or trade unions influence organizations to adopt certain practices (e.g., environmental and socially responsible practices) (Gunningham et al. 2004; Hoffman, 1999). For instance, several NGOs have developed voluntary standards such as the Natural Step and the Global Initiative Guidelines to incentivize firms to go beyond minimal sustainability requirements (Bradbury and Clair, 1999; Delmas and Terlaak, 2002; Hedberg and von Malmborg, 2003). In addition, these groups influence firms to adopt sustainable practices since they have a huge impact on public opinion and guide consumers' behavior (Gunningham et al., 2004). Based on these previous arguments, in this study we will use the number of NGOs, media and trade unions in the country where the plant is located as a proxy for normative drivers.

Finally, mimetic drivers push firms to imitate successful competitors in the same industry (Aerts et al., 2006). Firms that adopt proactive environmental practices show higher levels of business and financial performance (Montabon et al., 2007; Zhu and Sarkis, 2004). In fact, customers may decide to buy from firms that are environmental and socially friendly than from firms that are not. According to mimetic pressures, firms follow the actions of successful competitors (i.e., green and social champions). In that sense, firms will be then pushed to imitate the environmental and social practices of green and social champions as a way to stay ahead of competitors. Accordingly, the greater the level of sustainable practices adopted by firms in the country where the plant is located, the higher the pressure to implement such practices.

Studies concerning sustainability development have generally recognized that firms are subject to institutional pressures in the form of normative expectations, coercive regulations, tight public policies, media and NGO scrutiny, and mimetic isomorphism within their fields (Aragon-Correa, 1998; Hoffman, 1999; Sharma, 2000; Sharma and Vredenburg, 1998; Lai et al., 2006). As pointed by Scott (1987) firms will adopt sustainable practices as a reaction to the influences of the external environment. In other words, the adoption of sustainable practices can be a result of coercive, normative and mimetic pressures. In line with this, Gonzalez-Benito and Gonzalez-Benito (2006) found that the pressure coming from competitors, NGOs and other entities explained the adoption of environmentally friendly practices such as green supplier selection.

Based on the Institutional Theory and the abovementioned empirical evidence we believe that the higher the ability of the government to implement sound laws and regulations in the country where the plant is located (coercive pressure) the higher the level of adoption of sustainable SD practices in order to guarantee with the compliance of law and avoid fines and penalties. In the same line, firms may decide to adopt sustainable SD practices to avoid scandals and reputational loses coming from media and NGOs. Therefore, the higher the pressure coming from these entities (normative pressure) the higher the level of adoption of sustainable SD practices. Finally, we believe that the engagement of competitors in sustainable practices in the country where the plant is located will also influence the adoption of sustainable SD practices as a way to keep abreast with the level of sustainability involvement in the country. Accordingly, the higher the level of adoption of sustainable practices by competitors in the country where the plant is located (mimetic pressure) the higher the level of adoption of sustainable SD practices. In that sense, we hypothesize the following:

H1: The higher the coercive (H1a), normative (H1b), and mimetic (H1c) pressures, the higher the level of adoption of sustainable SD practices.

3.3.2. ENABLERS OF SUSTAINABLE SD PRACTICES

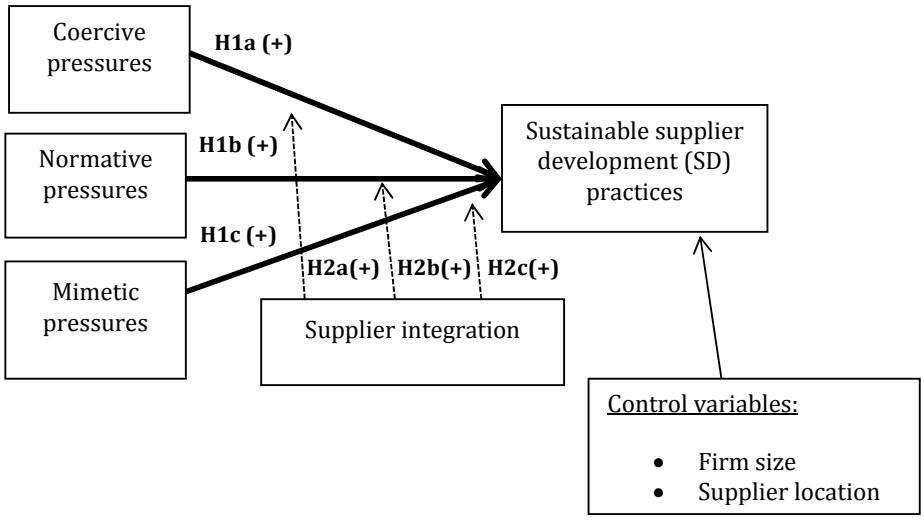
To manage these institutional pressures, firms need to develop specific capabilities (Rueda-Manzanares et al., 2008) that allow them to adopt these practices. That is, the adoption of sustainable SD practices is not straightforward. In fact, as pointed by Vachon and Klassen (2006), the assessment of suppliers and/or their training in terms of environmental and social issues requires high information sharing and coordination between parties (i.e., manufacturer and supplier). Zhu et al. (2013) also acknowledge that the implementation of sustainable SD practices entails a higher complexity than the implementation of internal practices (e.g., use of cleaner production processes or implementation of health and safety standards in the firm's facilities) due to the fact that the firm needs to cooperate with other parties (e.g., suppliers) (Zhu et al., 2013). Without the necessary capabilities, the pressures exerted by the government, NGO or competitors may go unheeded (Sarkis et al., 2010). The RBV suggests that firms need to build the necessary capabilities to adopt these practices. We believe SCI to be a key resource for firms in responding to institutional pressures and in developing the needed capabilities to adopt sustainable SD practices. SCI entails the coordination and integration of physical and information flows between the different stages in a supply chain (Frohlich and Westbrook, 2002). Flynn et al. (2010) distinguished between three types of SCI: customer, supplier and internal. As our objective is to study the adoption of practices with suppliers, our focus will be on supplier integration (SI) which has been defined as the extent to which a manufacturer collaborates with its suppliers to develop collaborative and synchronized strategies (Stank et al., 2002). From our point of view, SI will act as an enabler in the process of adoption of sustainable SD practices. The

existence of a formal communication system, through which a buyer and a supplier share information with respect to issues such as production plans or stock levels, can ease the sharing of information with respect to sustainability issues. In addition, the fact that a buyer and a supplier have already developed a collaborative approach and have already made joint decisions with respect to product design or quality improvements, can make the adoption of sustainable SD practices that imply a joint work between both parties, easier. In that sense, we hypothesize that:

> *H2: The level of SI positively moderates the relationship between coercive (H2a), normative (H2b), and mimetic (H2c) pressures and the adoption of SD practices.*

It is important to mention that to test the abovementioned hypotheses, we control for firm size and supplier location. Firm size is a traditional control variable in operations and SSCM research. As pointed by Min and Galle (2001) larger firms are more inclined and have more resources to invest in green and socially-oriented practices. The location of the supplier can also influence the adoption of these practices. Suppliers located in distant countries may pose a higher risk for buyers since there is less control pushing the later to adopt practices that extend sustainability to these high-risk suppliers (Foerstl et al., 2010).

Figure 1: Research model



3.4. METHODOLOGY

3.4.1. SAMPLING AND DATA COLLECTION

To test our model we combined primary and secondary data sources. Primary data are collected through the 6th Round (2014) of the *International Manufacturing Strategy Survey* (IMSS). IMSS was originally launched in 1992 by the London Business School (UK) and the Chalmers University of Technology (Sweden) and is a survey instrument that focuses on the study of manufacturing and supply chain strategies in different countries. The IMSS questionnaire is divided into three main sections. The first section of the questionnaire contains general information about firm size, business unit competitive strategy and organization of the plant. The second section gathers information about the strategy and performance of the plant's main dominant activity. Finally, the third section gathers information about current manufacturing and supply chain practices. A common questionnaire was developed by a global network of universities. After conducting a pilot test in different countries, the questionnaire was administered simultaneously in different countries by local research groups. The operations, production or plant managers were first contacted to ask for participation in

the study. If the respondent agreed, the questionnaire was then sent. A remainder was also sent after a few weeks. The IMSS-VI sample consists of 931 plants from 22 countries belonging to 6 different sectors. In our study, we decided to drop those observations that did not provide information on all the variables under study. The resulting sample consisted of 872 plants. Non-response and late-response bias tests were performed in each country by the local research coordinators and the results showed that non-/late-response bias was not an issue. Table 1 shows the descriptive statistics of the sample.

Table 1. Descriptive statistics of the sample

Country	**N**	**%**	**ISIC code[1]**	**N**	**%**	**Size**	**N**	**%**
Belgium	28	3.21	25	272	31.19	Less than 50	24	2.75
Brazil	29	3.33	26	115	13.19	Between 50 and 249	361	41.40
Canada	26	2.98	27	143	16.40	Between 250 and 499	139	15.94
China	117	13.42	28	212	24.31	More than 500	348	30.91
Denmark	37	4.24	29	88	10.09	**Total**	872	100
Finland	31	3.55	30	42	4.82			
Germany	12	1.38	Total	872	100			
Hungary	55	6.31						
India	89	10.21						
Italy	45	5.16						
Japan	81	9.29						
Malaysia	13	1.49						
Netherlands	47	5.39						
Norway	25	2.87						
Portugal	31	3.55						
Romania	39	4.47						
Slovenia	17	1.95						
Spain	28	3.21						
Sweden	31	3.55						
Switzerland	24	2.75						
Taiwan	28	3.21						
USA	39	4.47						
Total	872	100						

[1] ISIC Code. 25: Manufacture of fabricated metal products, except machinery and equipment; 26: Manufacture of computer, electronic and optical products; 27: Manufacture of electrical equipment; 28: Manufacture of machinery and equipment not elsewhere classified; 29: Manufacture of motor vehicles, trailers and semi-trailers; 30: Manufacture of other transport equipment.

3.4.2. MEASURES

Different secondary data sources were used to operationalize coercive and normative pressures. Using secondary data mitigates the chances of biases from both source and researcher (e.g., common method bias) but secondary data do not often completely capture the constructs of interest; therefore a combination of primary and secondary

data provides the benefits of both approaches (Calantone and Vickery, 2010). First, *coercive measures* were operationalized via quality of regulation. This is an indicator provided by the World Bank which captures the ability of the government to implement sound policies and regulations. Country environmental and labor related regulations have been considered in the construction of this indicator. *Normative pressures* were operationalized considering the number of NGOs, media and trade unions focusing on environmental and social issues that are located in each country. This information was gathered from the Civil Society database provided by the United Nations Department of Economic and Social Affairs (2010). Previous studies have considered these social groups (i.e., NGOs, media and workers) to measure this construct (e.g., Gonzalez-Benito and Gonzalez-Benito, 2006; Sarkis et al., 2010). Finally, to operationalize *mimetic pressures* we used data from IMSS-VI and computed the average, per each country, of the level of implementation of environmental and social practices. In our research, this information (environmental and social practices) describes the level of development of sustainability in competing firms, representing the mimetic pressure. Table 2 shows the country values for these indicators. The specific measures and their data source are provided in Appendix 1.

Table 2. Country normative, coercive and mimetic pressure indicators

Country	Normative pressure	Coercive pressure	Mimetic pressure
Belgium	254	1.22	2.48
Brazil	504	0.09	2.97
Canada	421	1.69	2.25
China	169	-0.26	3.44
Denmark	53	1.79	2.77
Finland	35	1.82	2.7
Germany	216	1.53	3.09
Hungary	21	0.97	3.04
India	1576	-0.47	3.93
Italy	234	0.73	3.07
Japan	218	1.12	3.02
Malaysia	54	0.55	3.16
Netherlands	183	1.75	2.59
Norway	60	1.53	3.28
Portugal	32	0.81	3.19
Romania	48	0.54	3.23
Slovenia	2	0.61	3.38
Spain	189	0.94	3.11
Sweden	87	1.89	3.27
Switzerland	411	1.66	2.8
Taiwan	169	-0.26	3.44
USA	121	1.29	2.83

To measure *sustainable SD practices*, *supplier integration*, *firm size* and *supplier location*, we used data coming from IMSS-VI. The constructs were developed based on previous literature and measured using a 1 to 5 Likert scale in terms of efforts in the last three years (2010-2013). Next, we provide a detailed description of each of them (See Appendix 1 for specific questionnaire items and their source). *Sustainable supplier development (SD) practices* was measured by three items related to the efforts in assessment of suppliers' sustainability performance, training and education in sustainability issues for the suppliers' personnel, and joint efforts with suppliers to improve their sustainability performance (Krause et al., 2000). *Supplier Integration* was measured using four items that include the efforts in: sharing information, adopting a collaborative approach, joint decision-making and system coupling with the suppliers (Ellinger et al., 2000; Handfield et al., 2000). *Firm size* was measured as the natural logarithm of the firm's number of employees. Finally, *supplier location* was measured as the percentage of raw materials, parts/components, and subassemblies/systems that are sourced outside the country (Cagliano et al., 2008).

3.4.3. RELIABILITY AND VALIDITY

We conducted confirmatory factor analysis (CFA) on *sustainable SD practices* and *supplier integration* items to validate our proposed factor structure. We assessed validity in terms of content validity, convergent validity, discriminant validity and reliability (Anderson and Gerbing, 1988; Nunnally, 1978). The contributions of managers and academics in the development of the IMSS questionnaire assure content validity. For convergent validity, we followed O'Leary-Kelly and Vokurka (1998) and use our CFA results. Our proposed structure of the items measuring *sustainable SD practices* and *supplier integration* resulted in a reasonably good model fit (X^2/df=2.89; RMSEA=0.06; CFI=0.985; TLI=0.975; SRMR=0.033; CD=0.978). In addition, all factor loadings exceeded the 0.5 suggested threshold, are significant at the 99% level and surpass twice the value of their associated standard error (Anderson and Gerbing, 1988). All these results indicate convergent validity (See Table 3). To test for discriminant validity we checked the square root of the AVE of each construct to be greater than all the inter-construct correlations (Chin, 1998; Fornell and Lacker, 1981). Table 3 provides support for this condition and shows sufficient discriminant validity. Finally, Cronbach alpha was used to test for reliability. As shown in Table 3 all values are greater than the threshold value of 0.7 suggesting that reliability is relatively strong (Nunnally, 1978).

Table 3. Reliability and validity assessment

Construct	Item	Loading	Std. Error	AVE	Cronbach	Corr
Sustainable SD practices	SD1	0.732***	0.0186	0.70	0.865	
	SD2	0.859***	0.0131			
	SD3	0.891***	0.0122			
Supplier Integration	SI1	0.762***	0.0176	0.64	0.851	0.570
	SI2	0.847***	0.0141			
	SI3	0.797***	0.0162			
	SI4	0.779***	0.0215			

*** p ≤ 0.00

3.5. DATA ANALYSIS AND RESULTS

To analyse our data we use Hierarchical Linear Modelling (HLM) (Stata 12 software) in which sustainable SD practices is the dependent variable and coercive, normative and mimetic pressures are the independent ones. The level of supplier integration efforts moderates these relationships. As already mentioned, firm size and supplier location are used as control variables. The fact that our data is clustered (i.e., plants are nested in countries) and that there exist different levels of analysis (i.e., country and plant level) in our dependent and independent variables make HLM an appropriate technique in our study. HLM accounts for the non-independence of samples (i.e., plants are nested with countries). Thus, it avoids getting inefficient estimators that would lead to type I errors. In addition it also accounts for the differences in sample sizes within countries.

Our first step, before running the analysis, is to check for multicollinearity among independent variables since its presence can bias the regression estimates. For this, we examined the Variance Inflation Factor (VIF). The results show that the highest VIF score is 3.29 below the 10.0 suggested threshold. Therefore, multicollinearity does not pose problems in the interpretation of the results.

The results of the HLM analysis are shown in Table 4. First, we run an empty model, which decomposes the variance of sustainable SD practices into within-group (firm level) variance σ^2 and between group (country level) variance τ^2_0. Based on these variances we compute the Intra-Class Correlation Coefficient (ICC), which we need to assess the proportion of residual variance in sustainable SD practices that remains to be explained across levels. The ICC at the country level is 27% meaning that 27% of the unexplained variance of sustainable SD practices is between countries. Next, we include our control variables (Model 0). In terms of the effects of the control variables, our results show that firm size has a significant and positive effect on the adoption of

sustainable SD practices. This result is in line with previous literature and suggests that larger firms will be more inclined to adopt sustainable SD practices (Min and Galle, 2001). One possible explanation is that larger firms may have more resources to invest in these practices and are also more sensitive to reputational issues coming from their suppliers acting unethically. Regarding our second control variable, our results show that supplier location is not significant, which is in line with Rivera (2004). In this previous study, the author suggests that a different location of subsidiaries or suppliers does not impact the adoption of sustainable programs with respect to the location of the buying firm.

Model 1 incorporates the independent variables (i.e., coercive, normative and mimetic pressures). The results show that mimetic pressures have a positive and significant effect on sustainable SD practices as predicted. In the case of coercive pressures the effect is significant only at the 10% level but in the opposite predicted direction. Finally, the effect of normative pressures is not significant.

Model 2 shows the results incorporating the moderating effect of supplier integration. The effect of mimetic pressures on sustainable SD practices is still positive and significant. Thus providing support for H1c. The same results of Model 1 are obtained for coercive pressures, which are only significant at the 10% and on the opposite predicted direction, not supporting H1a. Finally, the effect of normative pressures on the adoption of sustainable SD practices is not significant. Thus, providing no support for H1b. The moderating role of supplier integration in the relationship between institutional pressures and sustainable SD practices is only significant in the case of mimetic pressures, meaning that the impact of mimetic pressures on SD practices is higher in the presence of SI, as it enables the adoption of SD. This provides support for

H2c. For coercive and normative pressures, the moderating role is not significant. In that sense, H2a and H2b are both not supported.

To assess model fit we compare deviance reduction and Akaike Information Criteria (AIC) and Bayesian Information Criteria (BIC) across models. Our results show that the deviance reduction across models is significant. The bigger the reduction, the better. The biggest reduction stands for Model 2. However, the deviance is always reduced by introducing more predictors. AIC and BIC take into account the inclusion of indicators. Again, the lowest AIC and BIC values correspond to Model 2.

Table 4. Results

Parameters	**Dependent variable: sustainable SD practices**			
	Empty Model	**Model 0**	**Model 1**	**Model 2**
Grand intercept				
cons	2.580***	2.584***	2.700***	2.661***
Control variables				
Firm size		0.196***	0.187***	0.083**
Supplier location		0.017	-0.0029	-0.009
Supplier Integration				0.501***
Hypotheses				
H1a Coer -> SSD			-0.192*	-0.132*
H1b Norm -> SSD			-0.0452	-0.0078
H1c Mim -> SSD			0.392***	0.327***
H2a SI Mod H1a				-0.0346
H2b SI Mod H1b				-0.3161
H2c SI Mod H1c				0.091***
σ^2	0.8122	0.7777	0.7775	0.5606
τ^2_0	0.3046	0.2916	0.0551	0.0302
Deviance (D)	2350.99	2313.16	2282.70	1993.57
AIC	2356.99	2323.16	2298.70	2017.57
BIC	2371.31	2347.02	2336.87	2074.82
D reduction		37.73***	30.46***	289.13***

*p ≤ 0.10
** p ≤ 0.05
*** p ≤ 0.00

3.6. DISCUSSION AND CONCLUSION

The results of this study show the link between institutional pressures at the country level and sustainable SD practices, and the enabling role of supplier integration.

Focusing on the direct impact of institutional pressures on sustainable SD practices; it is possible to observe different roles. The only dimension of institutional pressures positively and significantly related to sustainable SD practices adoption is mimetic pressures. In countries, where environmental and social practices are extensively adopted, there is a greater pressure to adopt sustainable SD practices. Therefore, our results show that firms with plants located in competitive environments committed to sustainable practices adoption might be more willing to extent sustainable practices outside the firm's domain to legitimate their position as environmentally and socially oriented firms.

Instead, coercive and normative pressures do not exert a significant positive effect on sustainable SD adoption. These results are in line with Zhu et al. (2013) who found that coercive and normative pressures had a negative effect on external green supply chain management practices. Carter and Carter (1998) and Gonzalez Benito and Gonzalez Benito (2006) also found that coercive pressures do not constitute a driver of green purchasing activities. This might be due to two main reasons: First, for the case of coercive pressures, if the government of the country where the plant is located is putting a lot of pressure on firms to be sustainable in their operations, firms will have to focus on making their internal operations more environmentally and socially responsible. In that sense, firms will have less resources to invest in making their suppliers more sustainable since their main focus will be to make sure that their plants are complying with the governmental regulations. Second, sustainable SD practices go beyond regulatory compliance and therefore might not be related to coercive pressures but being more firm dependent. As pointed by Henriques and Sadorksy (1999) regulatory pressures are more related to a reactive sustainability strategy rather than a proactive one, such as SD. This second argument also serves to explain why normative pressures

do not have an effect on the adoption of sustainable SD practices. As suggested by Delmas and Toffel (2004) the way in which managers perceive and act in relation to sustainable aspects depends upon firm-specific factors, including their track record of past sustainable performance, the competitive position (see mimetic pressure) and their organizational structure and resources. Coercive and normative pressures lead to the adoption of compliance and recovery practices (Zhu and Sarkis, 2007) which are different from the sustainable SD practices considered in this study.

Concerning the interaction role of supplier integration (H2), results show that it exerts a positive effect on the relationship between mimetic pressures and sustainable SD practices. The reinforcing effect of supplier integration is in line with previous literature suggesting a positive impact of supplier integration practices on sustainable SD practices adoption. For instance, Wu (2013) showed that SCI enhances environmental practices implementation thanks to information sharing and collaboration (i.e., both green product and process innovations).

Overall our results suggest that among institutional pressures at the country level, mimetic pressures play the most powerful role in the adoption of sustainable SD practices supported by firm specific capabilities (i.e., supplier integration). The voluntary nature of sustainable SD practices makes them a competitive weapon rather than a tool to merely comply with stakeholders (e.g., government, NGOs, media, trade unions). Supplier integration capabilities enable the adoption of sustainable SD practices reinforcing the effect of country mimetic pressures.

3.6.1. THEORETICAL CONTRIBUTIONS

The combination of Institutional Theory and the RBV allowed us to better understand the relationship between external drivers (i.e., coercive, normative and mimetic

pressures) and the firm's specific capabilities (i.e., supplier integration) when studying the implementation of sustainable SD practices (Sarkis et al., 2010). Our results contribute to the sustainable supply chain literature by extending the relationship between institutional pressures and the implementation of sustainable supply chain practices, focusing at the country level. Specifically, we do this considering each institutional pressure dimension (i.e., mimetic, coercive and normative) and measuring coercive and normative pressures at the country level through the use of secondary data, increasing the validity and reliability of our results. Finally, we contribute to the literature identifying supplier integration as an enabler, showing its key role in sustainable supply chain development.

3.6.2. MANAGERIAL AND POLICY IMPLICATIONS

We think that this evidence provides also important managerial implications and possible recommendations for policy makers. Concerning managerial implications, supplier behavior in terms of environmental and social issues impacts on firm's reputation (Foerstl et al., 2010). In that sense, firms are trying to find ways to deal with this issue. However the adoption of sustainable SD practices is a clear managerial decision implying resource investments and the creation of a clear collaboration with suppliers. Research is needed to determine which pressures lead to this decision and which firm-related capabilities can support it. We show managers that what local competitors do in terms of sustainability will dictate the kind of practices to be adopted. It is important not to be left behind because sustainability development along the supply chain may be a way to compete. In addition, it is important to mention that these practices will be easier to adopt in the presence of supplier integration. Managers can further enhance the benefits of supplier integration including environmental and social principles in integration practices (i.e., auditing and training). This will allow them to

gain further competing advantage from firm-related capabilities such as information sharing and joint management decisions with their suppliers.

These results have also implications for policy makers. In order to encourage firms to adopt practices that extend sustainability along the supply chain, mimetic pressures are the most effective ones. Despite this, the implementation of sustainable SD is still relatively weak (Zhu et al., 2103). In that sense, governments should encourage the sharing of best practices with respect to social and environmental issues among firms. Governments should enforce transparency with respect to the sustainable practices firms are implementing. This will raise firm's awareness with respect to the actions that other firms in the same industry are taking, increasing sustainability commitment. Moreover, industrial associations can play a role enabling a learning process for the introduction of these practices. This learning process may allow to improve sustainability performance but also economic performance, by facilitating and supporting the sustainable SD adoption. Policy makers, regulators and industrial associations should encourage benchmarking and participation in sustainable SD practices. Only in this way, sustainability development along the supply chain will gain the same legitimation and positive effect as the internal sustainable practices adoption.

3.6.3. LIMITATIONS AND FUTURE RESEARCH DIRECTIONS

Besides from the abovementioned theoretical contributions and managerial and policy makers implications, our paper has some limitations that need to be acknowledged. First, we have used the number of NGOs, media and trade unions as a proxy for normative pressures. It is true that a high number of these types of organizations in a country does not necessarily signal high power from these organizations. However, we believe that countries with a high number of NGOs, trade unions and media entities

focusing on environmental and social issues denote a civil society structure that promotes sustainability values. Second, sustainable SD practices are considered in relation to both environmental and social aspects. Future research may investigate if different pressures have different effects if firms aim to develop environmental or social sustainability with their supplier. For example, regulations may be more or less powerful in relation to different aspects. Finally, future research may consider the effectiveness of the adoption of sustainable SD practices on the triple bottom line and the moderators increasing their effectiveness (e.g., supplier integration). In spite of these limitations, we believe that our research sheds some lights on the need to further investigate sustainability development not only focusing on internal operations but including different partners along the supply chain. Mimetic pressures, sustainable SD practices and supplier integration are identified as relevant aspects to study in relation to sustainable supply chain development.

ACKNOWLEDGEMENTS

The authors acknowledge financial support from research grant ECO2013-47794R from the Spanish Ministry of Science and Innovation and from research grant ECO/155/2012 (ref.2013FI_B 00281) from the Research and Universities Secretary, Economic Department, Generality of Catalonia.

REFERENCES

Aguilera-Caracuel, J., Aragon-Correa, J.A., Hurtado-Torres, N. and Rugman, A. (2012), "The Effects of Institutional Distance and Headquarters' Financial Performance on the Generation of Environmental Standards in Multinational Companies", *Journal of Business Ethics*, Vol. 105, pp. 461–474.

Aerts, W., Cornier, D., Magnan, M. (2006), "Intra-industry imitation in corporate environmental reporting: an international perspective", Journal of Accounting and Public Policy, Vol., 25, pp. 299-331.

Anderson, J.C. and Gerbing, D.W. (1988), Structural equation modelling in practice: a review and recommended two-step approach", Psychological Bulletin, Vol. 103, pp. 411.423.

Aragon-Correa, JA. (1998), "Strategic proactivity and firm approach to the natural environment" Academy of Management Journal, Vol. 41, No. 5, pp. 556-567.

Ball, A. and Craig, R. (2010), "Using neo-institutionalism to advance social and environmental accounting", Critical Perspectives on Accounting, Vol. 21, pp- 282-293.

Berrone, P., Fosfuri, A., Gelabert, L. and Gomez-Mejia, L.R. (2013), "Necessity as the mother of green inventions: institutional pressures and environmental innovations", Strategic Management Journal, Vol. 34, pp., 891-909.

Bowen, F., Cousins, P., Lamming, R. and Faruk, A. (2011), "The role of supply management capabilities in green supply", Production and Operations Management, Vol. 10, No. 2, pp. 174-89.

Bradbury H. and Clair, J.A. (1999), "Promoting sustainable organizations with Sweden's natural step", Academy of Management Executive, Vol. 12, No. 4.

Cagliano, R., Caniato, F., Golini, R., Kalchschmidt, M. and Spina, G. (2008), "Supply chain configurations in a global environment: a longitudinal perspective", Operations Management Research, Vol.1, pp. 86-94.

Calantone, R. and Vickery, S.K. (2010), "The use of archival and secondary data in supply chain management research", Journal of Supply Chain Management, Vol. 46, No. 4, pp. 3-11.

Carter, C.R. and Carter, J.R. (1998), "Interorganizational determinants of environmental purchasing: initial evidence from the consumer products industries", Decision Sciences, Vol. 29, No. 3, pp. 659-684.

Ciliberti, F., Pontrandolfo, P. and Scozzi, B. (2008), "Investigating corporate social responsibility in supply chains: a (sic) SME perspective", Journal of Cleaner Production, Vol. 16, No. 15, pp. 360-87.

Chin, W.W. (1998), The partial least squares approach for structural equation modelling in G.A. Marcoulides (Ed.), Modern methods for business research, Lawrence Erlbaum Associates: London.

Daily, B.F. and Huang, S. (2001), "Achieving sustainability through attention to human resource factors in environmental management", International Journal of Operations and Production Management, Vol. 21, No.12, pp. 1539-1552.

Delmas, M. and Terlaak, A. (2002), "Institutional factors and environmental voluntary agreements: the cases of the United States, Germany, the Netherlands and France", Journal of Comparative Policy Analysis, Vol. 4, No. 1, pp., 5-29.

Delmas, M. and Toffel, M. (2004), "Stakeholders and environmental management practices: an institutional framework", Business Strategy and the Environment, Vol. 13, pp. 209-222.

DiMaggio, P. and Powell, W. (1983), "The iron cage revisited: Institutional isomorphism and collective rationality in organizational fields", American Sociological Review, Vol. 48, pp. 147-160.

Elkington, J. (1994), "Towards the sustainable corporation: win-win-win business strategies for sustainable development", California Management Review, Vol. 36, No. 2, pp. 90-100.

Ellinger, A., Daugherty, P. and Keller, S. (2000), "The relationship between marketing/logistics interdepartamental integration and performance in US manufacturing firms: an empirical study", Journal of Business Logistics, Vol. 21, No.1, pp.1-22.

Flynn. B.B., Huo, B., Zhao, X. (2010), "The impact of supply chai integration on performance: a contingency and configuration approach", Journal of Operations Management, Vol. 28, pp. 58-71.

Foerstl, K., Reuter, C., Hartmann, E., Blome, C. (2010), "Managing supplier sustainability risks in a dynamically changing environment: sustainable supplier management in the chemical industry", Journal of Purchasing and Supply Management, Vol. 16, pp. 118-130.

Fornell, C. and Larcker, D.F. (1981), "Evaluating structural equation models with unobservable variables and measurement error", Journal of Marketing Research, Vol. 18, No. 1, pp. 39-50.

Frohlich, M.T., and Westbrook, R. (2001), "Arcs of integration: an international study of supply chain strategies", Journal of Operations Management, Vol. 19, pp. 185-200.

Gimenez, C., Sierra, V. and Rodon, J. (2012), "Sustainable operations: their impact on the triple bottom line", International Journal of Production Economics, Vol. 140, pp. 149-159.

Gimenez, C. and Tachizawa, E. (2012), "Extending sustainability to suppliers: a systematic literature review", Supply Chain Management: An International Journal, Vol. 17, No. 5, pp. 531-543.

Gimenez, C. and Ventura, E. (2005), "Logistics-production, logistics-marketing and external integration: their impact on performance", International Journal of Production Economics, Vol., 25, No.1, pp. 20-38.

Gonzalez-Benito, J. and Gonzalez-Benito, O. (2006), "The role of stakeholder pressure and managerial values in the implementation of environmental logistics practices", International Journal of Production Research, Vol. 44, No. 7, pp. 1353-1373.

Gunningham, N. Kagan, R.A., Thornton, D. (2004), "Social license and environmental protection: why business go beyond compliance", Law and Social Inquiry, Vol. 29, pp. 307-341.

Handfield, R., Krause, D., Scannell, T. and Monczka, R. M. 2000, "Avoid the pitfalls in Supplier Development", Sloan Management Review, Vol. 41, No. 2, pp. 37-49.

Hedberg, C.J. and von Malmborg, F. (2003), "The global reporting initiative and corporate sustainability reporting in Swedish companies", Corporate Social Responsibility and Environmental Management", Vol. 10, No. 3, pp. 153-164.

Hirsch, P. M. (1975), "Organizational Effectiveness and the institutional environment", Administrative Science Quarterly, Vol, 20, pp. 327- 344.

Henriques, I. and Sadorsky, P. (1999), "The relationship between envirnomental commitment and managerial perceptions of stakeholder importance", Academy of Management Journal, Vol. 42, No. 1, pp. 87-99.

Hoffman, A. (1999), "Institutional evolution and change: environmentalism and the US chemical industry", Academy of Management Journal,Vol. 42, No. 4, pp. 351-371.

Holt, D. and Ghobadian, A. (2009), "An empirical study of green supply chain management practices amongst UK manufacturers", Journal of Manufacturing Technology Management, Vol. 20, No. 7, pp. 933-56.

Klassen, R.D. and Whybark, C.D. (1999), "The impact of environmental technologies on manufacturing peformance", Academic of Management Journal, Vol. 42, No. 6, pp- 599-616.

Krause, D.R., Scannell, T. and Calantone, R. (2000), "A structural analysis of the effectiveness of buying firms' strategies to improve supplier performance", Decision Sciences, Vol. 31, No. 1, pp. 33-55.

Krause, D.R., Vachon, S., and Klassen, R.D. (2009), "Special topic forum on sustianable supply chain management: introduction and reflections on the role of purchasing management", Journal of Supply Chain Management, Vol. 45, No. 4, pp. 18-24.

Lai, K.H., Wong, C.W.Y., Cheng, T.C.E. (2006), "Institutional isomorphism and the adoption of information technology for supply chain management", Computers in Industry, Vol. 57, No. 1, pp. 93-98.

Lamming, R. and Hampson, J. (1996), "The environment as a supply chain management issue", British Journal of Management, Vol. 7, No. 1, pp. 45-62.

Lee, S. and Klassen, R.D. (2009), "Drivers and enablers that foster environmental management capabilities in small- and medium-sized suppliers in supply chains", Production and Operations Management, Vol 17, No. 6, pp.573-586.

Longo, M., Mura, M. Bonoli, A. (2005), "Corporate Social Responsibility and Corporate Perofrmance: the case of italian SMEs", Corporate Governance, Vol. 5, No. 4, pp. 28-42.

Min, H. and Galle, W.P. (2001), "Electronic commerce-based purchasing: a survey on the perceptual differences between large and small organizations", International Journal of Logistics: Research and Applications, Vol. 4, No. 1, pp. 79-95.

Montabon, F., Sroufe, R., Narasimhan, R. (2007), "An examination of corporate reporting, environmental management practices and firm performance", Journal of Operations Management, Vol. 25, No. 5, pp. 998-1014.

Nunnally, J.C. (1978), Psychometric Theory, McGraw-Hill: New York.

O'Leary-Kelly, Vokurka, R.J. (1998), "The empirical assessment of construct validity", Journal of Operations Management, Vol. 16, pp. 387-405.

Porter, M.E. and Kramer, M.R. (2006), "Strategy and Society: the link between competitive advantage and corporate social responsibility", Harvard Business Review, Vol. 84, No. 12, pp. 76-92.

Rao, P. (2002), "Greening the supply chain: a new initiative in South East Asia", International Journal of Operations and Production Management, Vol. 22, No. 6, pp. 632-55.

Rivera, J. (2004), "Institutional pressures and voluntary environmenal behaviour in developing countries: evidence from the Costa Rican hotel industry", Vol., 17, pp. 779-797.

Rueda-Manzanares, A., Aragon-Correa, J.A. and Sharma, S. (2008), "The influence of stakeholders on the environmental strategy of service firms: the moderating effects of complexity, uncertainty and munificence", British Journal of Management, Vol. 19, No. 2, pp. 185-203.

Sarkis, J . (1998), "Evaluating environmentally conscious business practices", European Journal of Operational Research, Vol. 107, pp. 159-174.

Sarkis, J., Gonzalez-Torre, P., Adenzo-Diaz, B. (2010), "Stakeholder pressure and the adoption of environmental practices: the mediating effect of training", Journal of Operations Management, Vol. 28, No. 2, pp. 163-176.

Scott, W.R. (1987), "The adolescence of institutional theory", Administrative Sience Quarterly, Vol. 32, pp. 493-511.

Sharma, S. (2000), "Managerial interpretations and organiztional context as predictors of corporate choice of environmental strategy", Academy of Management Journal, Vol. 43, No. 4, pp. 681-697.

Sharma, S. and Vredenburg, H. (1998), "Proactive corporate environmental strategy and the development of competitively valuable organizaitonal capabilities", Strategic Management Journal, Vol. 19, No. 8, pp.729-753.

Stank, T.P., Keller, S.B., Daugherty, P.J. (2001), "Supply chain collaboration and logistical service performance", Journal of Business Logistics, Vol. 22, No. 1, pp. 29-48.

Vachon, S. and Klassen, R.D. (2006), "Extending green practices across the supply chain", International Journal of Operations & Production Management, Vol. 26, No. 7, pp. 795-821.

WCED (1987), *Our Common Future*. Oxford University Press, Oxford and New York.

Wiengarten, F., Pagell, M., Ahmed, M. and Gimenez, C. (2014), "Do a country's logistical capabilities moderate the external integration performance relationship?", *Journal of Operations Management*, Vol. 32, No 1–2, pp. 51–63.

Wu, G.C. (2013), "The influence of green supply chain integration and environmental uncertainty on green innovation in Taiwan's IT industry", Supply Chain Management: An International Journal, Vol. 18, No.5, pp. 539-552.

Zhu, Q. and Sarkis, J. (2004), "Relationships between operational programs and performance among early adopters of green supply chain management programs in Chinese manufacturing enterprises" Journal of Operations Management, Vol. 22, No. 3, pp. 265-289.

Zhu, Q. and Sarkis, J. (2006), "An inter-sectoral comparison of green supply chain management in Chinar: drivers and practices", Journal of Cleaner Production, Vol. 14, No. 5, pp. 472-86.

Zhu, Q. and Sarkis, J. (2007), "The moderating effects of institutional pressures on emergent green supply chain practices and performance", International Journal of Production Research, Vol. 45, No. 18-19, pp. 4333-4355.

Zhu, Q., Sarkis, J., and Lai, K. (2013), "Institutional-based antecedents and performance outcomes of internal and external green supply chain management practices", Journal of Purchasing and Supply Management, Vol. 19, pp. 106-117.

Appendix A. List of items, description and source

Sustainable SD practices (Mean=2.68; Std Dev=1.05)	**Data source**	**References**
Indicate the effort put in the last 3 years into implementing action programs related to: (1. None – 5. High)		
SD1. Suppliers' sustainability performance assessment through formal evaluation, monitoring and auditing using established guidelines and procedures	IMSS VI (2014)	Krause et al., 2000
SD2. Training/education in sustainability issues for suppliers' personnel		
SD3. Joint efforts with suppliers to improve their sustainability performance		
Supplier integration (Mean=3.04; Std Dev=0.88)		
Indicate the effort put in the last 3 years into implementing action programs related to internal integration: (1. None – 5. High)		
SI1. Sharing information with key suppliers (about sales forecast, production plans, order tracking and tracing, delivery status, stock level)	IMSS VI (2014)	Ellinger et al., 2000; Handfield et al., 2000
SI2. Developing collaborative approaches with key suppliers (e.g. supplier development, risk/revenue sharing, long-term agreements)		
SI3. Joint decision making with key suppliers (e.g. vendor managed inventory, just-in-time, Kanban, continuous replenishment)		
SI4. System coupling with key suppliers (e.g. vendor managed inventory, just-in-time, Kanban, continuous replenishment)		
Normative pressures (Mean=229.86; Std Dev=330.79)		
NP1. Number of NGOs, trade unions and media related to sustainability issues per each country	UN Dept of Economic and Social Affairs (2010)	
Coercive pressures (Mean=0.98; Std Dev=0.73)		
CP1. Quality of regulation	World Bank (2010)	
Mimetic pressures (*average per country of the seven items)* **(Mean=3.04; Std Dev=0.37)**		
Indicate the current level of implementation of, actions programs related to: (1. None – 5. High)		
MP1. Environmental certifications		
MP2. Social certifications		
MP3. Formal sustainability oriented communication, training programs and involvement	IMSS VI (2014)	Daily and Huang, 2001; Klassen and Whybark, 1999; Longo et al., 2005; Sarkis, 1998
MP4. Energy and water consumption reduction programs		
MP5. Pollution emission reduction and waste recycling programs		
MP6. Formal occupational health and safety management system		
MP7. Work/life balance policies		
Firm's size (Mean=6.02; Std Dev=1.72)		
FS1. Number of employees	IMSS VI (2014)	
Suppliers' location (Mean=38.67; Std Dev=32.73)		
SL1. % of raw materials, parts/components, subassemblies/systems outside the country	IMSS VI (2014)	Cagliano et al., 2008

CHAPTER 4[2]

Achieving a socially responsible supply chain through assessment and collaboration

This chapter analyzes the effectiveness of social supplier development practices on achieving a socially-responsible supply chain. That is, the chapter analyzes whether the implementation of assessment and collaboration helps to improve both the buying firm's and the supplier's social performance.

[2] This paper is accepted for publication in Journal of Cleaner Production
Sancha, C., Gimenez, C., Sierra, V. Forthcoming. Achieving a socially responsible supply chain through assessment and collaboration. *Journal of Cleaner Production*.

4.1. ABSTRACT

Our study analyzes the effectiveness of two sustainable supply management practices (i.e., assessment and collaboration) on achieving a socially – responsible supply chain. Based on data from 120 Spanish manufacturers the paper investigates the impact that both practices have on the buying firm's and the supplier's social performances. SmartPLS was used to test the hypothesized relationships between practices and performance. Our results suggest that while assessing suppliers contributes to improve the buying firm's social performance, collaborating with them enhances the suppliers' social performance. Furthermore, the paper provides some additional insights on how to measure social performance.

Keywords: sustainable supply chains, social performance, assessment, collaboration, partial least squares

4.2. INTRODUCTION

In today's global context, firms are pressured by governments, non-governmental organizations and customers to act in a sustainable manner. In the pursuit of sustainability one key challenge they face is its extension to other supply chain partners such as suppliers. Customers and other stakeholders do not differentiate between all the different actors in a supply chain (Seuring and Gold, 2013) and therefore, buying firms take the responsibility for their suppliers in front of stakeholders (Hartmann and Moeller, 2014; Koplin et al., 2007; Seuring and Muller, 2008). Krause et al. (2009) emphasized this fact when stating that a firm is no more sustainable than its suppliers. In fact, a buying firm's sustainability performance can be damaged by their suppliers acting unethically (Faruk et al., 2002). This is also true for the case of the social dimension of sustainability. Companies such as Nike or Apple have been vilified

because of their suppliers employing child labor. In that sense, buying firms need to implement practices that ensure that their suppliers are sustainable.

When a buying firm encounters shortcomings in their suppliers' sustainability performance it has the following options: (1) invest resources to increase its suppliers' performance or (2) search for alternative suppliers (Krause et al., 2000). This paper is based on the premise that the buying firm has chosen to improve its supplier sustainability performance through practices such as supplier assessment and collaboration. Several authors have considered these two types of supply management practices to extend sustainability issues to suppliers (e.g. Gavronski et al., 2011; Gualandris and Kalchschmidt, 2014; Klassen and Vereecke, 2012; Lee and Klassen, 2008; Vachon and Klassen, 2006). While supplier assessment entails the use of arm's length transactions by the buying firm, such as the evaluation of suppliers' sustainability performance; collaboration with suppliers comprises the buying firm's direct efforts and involvement to jointly improve suppliers' sustainability performance (Gavronski et al., 2011; Gualandris and Kalchschmidt, 2014; Klassen and Vereecke, 2012; Lee and Klassen, 2008; Vachon and Klassen, 2006). It is important to mention that although firms may use a hybrid structure comprising a mix of both practices (Williamson, 1991), in this paper we will follow previous literature on the extension of sustainability to suppliers and focus exclusively on these two (i.e., supplier assessment and collaboration with suppliers).

There is a big stream of the literature that has analyzed the impact of these practices on performance. However, most of these papers have focused mainly on the environmental dimension (e.g., Green et al., 2012; Lee and Klassen 2008; Theyel, 2001; Vachon and Klassen, 2008; Zhu and Sarkis, 2007; Zhu et al., 2012, 2013) being very limited the literature on the social one (e.g., Foerstl et al., 2010; Hollos et al., 2012; Klassen and

Vereecke, 2012). Another characteristic of the existing literature is that most of the papers study the performance implications of these practices (i.e., assessment and collaboration) for the buying firms (e.g., Gimenez et al., 2012; Hollos et al., 2012; Rao and Holt, 2005; Zhu and Sarkis, 2004) neglecting the implications for suppliers. Few papers have considered the impact of these practices on the suppliers' side (e.g., Akamp and Muller, 2013; Carter, 2005) but no paper has considered the impact of assessment and collaboration on both the supplier and the buying firm's social performance. Thus, the current state of research in this area would seem to provide only a partial view of the effectiveness of these sustainable supply management practices.

In light of the abovementioned gaps, our objective is to study the effectiveness of both assessment and collaboration on achieving social sustainability along the supply chain by analyzing the effect of these practices on both the buying firm's and the supplier's social performance. More specifically, our study aims to answer the following research question: Are these practices contributing to improve suppliers' and/or buying firms' social performance? To answer our research question we elaborate a conceptual model and posit a set of research hypotheses that relate each type of practice to the suppliers' and buying firm's social performance. Then, we rely on data coming from 120 manufacturing firms and use Partial Least Squares (PLS) to test our model.

This study challenges and extends recent work on the adoption of supplier assessment and collaboration to achieve sustainability along the supply chain by analyzing a neglected area of sustainability - the social dimension – and by considering the suppliers' role. We argue that the adoption of the suppliers' perspective emphasizes the relevance of this research. The extension of sustainability to suppliers comprises two entities: the buying firm and the supplier. By considering not only the buying's firm performance but also the supplier's performance we will broaden the understanding we

have about the relationship between these supply management practices and performance. We will be able to study if buying firms rely on these practices to improve their suppliers' sustainability performance or if they implement them simply as a means to improve their own sustainability performance. For example, companies such as Apple perform audits to their suppliers' premises. These audits should serve not only to signal a sustainability behavior but also to achieve real improvements in the suppliers' working conditions. However, Foxconn, one of Apple's main suppliers, has been largely criticized due to the poor working conditions at their facilities (The Telegraph, 2012). A similar situation has been recently observed in the textile sector. While companies such as Inditex, GAP and H&M make efforts to assess and/or collaborate with their suppliers, the accident in Rana Plaza (April 2013) emphasizes the existing poor working conditions at the suppliers' facilities. This kind of events casts doubts upon the effectiveness that practices such as auditing suppliers have on making suppliers more sustainable. This study will help us to clarify if these practices contribute to improve the suppliers' sustainability performance or only the buying firm's performance. These results will guide companies in their work to extend sustainability to other partners such as suppliers and as a consequence, obtain a truly sustainable supply chain by really improving the suppliers' social performance.

The paper is organized as follows: In the following section we provide a literature review and develop our hypotheses. Next, we provide a description of the sample and the data collection process. Then, we present the data analysis and results. We finalize the paper by providing a discussion on the findings and by highlighting its main conclusions.

4.3. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

4.3.1. SUSTAINABLE SUPPLY CHAINS: THE SOCIAL DIMENSION

Sustainability has been described as encompassing economic, environmental and social dimensions (Elkington, 1994). However, recent studies on the topic of sustainable supply management highlight the imbalance between the number of papers focusing on environmental and social issues (Ashby et al., 2012; Gold et al., 2010; Hollos et al., 2012; Leppelt et al., 2013; Seuring and Muller, 2008). With the exceptions of Carter and Jennings (2004), one of the first papers analyzing social purchasing, and Awaysheh and Klassen (2010) and Klassen and Vereecke (2012), who focused on the social dimension of sustainability, research on social issues in supply management has been scarce.

Social sustainability is met when firms support the preservation and creation of skills and capabilities of current and future generations, and promote health, support and equal and democratic treatment within and outside its borders (McKenzie et al., 2004). Social sustainability encompasses two types of communities: internal (e.g., employees) and external (e.g., local communities with weak economic ties) (Pullman et al., 2009). In other words, firms need to care about the well-being of their employees and that of the local community in which it is embedded.

The difficulty to quantify social performance in comparison to the economic and the environmental performance dimensions makes it the most neglected element of the triple bottom line (McKenzie, 2004). The lack of studies that have looked at the social performance dimension of sustainability results in a lack of agreement with respect to the measurement of this construct (de Giovanni, 2012). For instance, some papers have considered employees' working conditions (e.g. de Giovanni, 2012) while others have used social reputation to measure social performance (e.g. Gimenez et al., 2012).

Recently, Golini et al. (2014) and Gualandris et al. (2014) measured social performance considering items related to both employees working conditions and social reputation. It is also important to highlight that all these previous authors have considered the social performance of the buying firm and not the social performance of the supplier in their studies.

Employees working conditions covers "a broad range of topics and issues, from working time (hours of work, rest periods, and work schedules) to remuneration, as well as the physical conditions and mental demands that exist in the workplace" (ILO, 2014). Corporate reputation, on the other hand, is a more intangible concept. It is the result of the process of ''social legitimization'' of the firm (Martin de Castro et al., 2006). Martin de Castro et al. (2006) carried out an empirical study to measure this "socially complex" factor and concluded that corporate reputation is made up of two dimensions: (1) business reputation and (2) social reputation. Business reputation includes the different aspects related to the agents and stakeholders closely tied to the business activities of the firm, such as customers, suppliers, managers or employees. Social reputation is related to the insights and perceptions of stakeholders not so close to the day-by-day business activities, such as investors and the community in a wider sense (Martin de Castro et al., 2006).

In this paper, we will follow the approach of Golini et al. (2014) and Gualandris et al. (2014) and will measure social performance of the buying firm using both, tangible measures such as employee working conditions and more intangible measures such as social reputation. Employees working conditions will be more related to the internal community while social reputation will be related to the beliefs of the external community (Golini et al. 2014).

It is important, to highlight that employees' concerns should not only be limited to the company workers but they should also include all parties in the supply chain (i.e., suppliers) (Kleindorfer et al., 2005). Firms that aim to be socially-oriented cannot leave suppliers out of the picture (Klassen and Vereecke, 2012). In fact, as pointed out by Krause et al. (2009) a company is no more sustainable than its suppliers, meaning that buying firms need to implement practices that allow them to extend social responsibility to suppliers. Our paper will focus on practices aimed at improving the well-being of suppliers' employees. The reason why we have focused on practices aimed at improving employees' working conditions at the suppliers' premises and not on other practices that exclusively look at the suppliers' local communities is the following: the most challenging sustainable issue that buying firms face is related to the poor working conditions existing in many suppliers plants. See for example the wide-known cases of Foxconn and the accident in Rana Plaza. Other papers in the supply chain management field have also followed a similar approach and have focused on practices aimed at the well-being of employees (e.g. Awaysheh and Klassen, 2010; Kleindorfer et al., 2005; Pagell and Gobeli, 2009).

One limitation of the studies that have previously analyzed the effectiveness of sustainable supply management practices is that they neglect their impact on the suppliers' performance, which is the other side of the coin in the implementation of sustainable supply management practices. The use of sweatshop labor and the guarantee of decent working conditions at the suppliers' premises (Awaysheh and Klassen, 2010) are problems that buying firms should try to mitigate by the implementation of these practices. In other words, one of the objectives of sustainable supply management practices should be the improvement of the suppliers' social performance. In that sense, when studying the impact of sustainable supply management practices on performance

it is worth to include the suppliers' social performance. For this reason, in this paper we consider the suppliers' social performance and measure it in terms of their employees' working conditions.

In the following section, we review more in detail the sustainable supply management practices (i.e., assessment and collaboration).

4.3.2. EXTENDING SOCIAL ISSUES TO SUPPLIERS: ASSESSMENT AND COLLABORATION

To effectively extend sustainability to its supply base a buying firm can adopt sustainable supply management, which entails the integration of sustainable considerations into supplier selection, assessment and collaboration (Gavronski et al., 2011). This paper is based on the premise that the buying firm has chosen to improve its supplier sustainability performance through practices such as supplier assessment and collaboration. Other studies have followed a similar approach (e.g. Gualandris and Kalchschmidt, 2014; Klassen and Vereecke, 2012; Lee and Klassen, 2008; Vachon and Klassen, 2006).

Supplier assessment entails arm's length transactions performed by the buying firm and is generally concerned with controlling suppliers' outputs with respect to specific performance criteria (i.e., social performance) (Gavronski et al., 2011; Gualandris and Kalchschmidt, 2014; Klassen and Vereecke, 2012; Lee and Klassen, 2008; Vachon and Klassen, 2006). In this case, the adoption of assessment practices implies the evaluation and control of suppliers with respect to social issues (i.e., working conditions, use of child labor, compliance with human rights). It includes in-depth evaluations of the suppliers' social performance (Krause et al., 2000) and can take the form of questionnaires, non-regulatory standards or audits (Min and Galle, 1997; Walton et al., 1998). The evaluation process, allows the buying firm to determine if the supplier meets

current and future business needs. The buying firm needs to quantify and communicate the results of the evaluation to suppliers so that they are aware of the possible discrepancies between their current performance and the buying firm expectations (Prahinski and Benton, 2004). This way, suppliers are given directions for improvement (Krause et al., 2000).

Collaboration with suppliers is based on the cooperation between a buyer and a supplier and aims to jointly improve performance (Gavronski et al., 2011; Gualandris and Kalchschmidt, 2014; Klassen and Vereecke, 2012; Lee and Klassen, 2008; Vachon and Klassen, 2006). These buyer-supplier interactions include: buying firm investments in the supplier through training and education of suppliers' personnel, dedicating buying firm personnel temporarily to the supplier, sponsoring meetings for suppliers in order to share information and know how, and undertaking joint applied research (Corbett and Klassen, 2006; Lee and Klassen, 2008; Vachon and Klassen, 2008).

Several authors have provided support for the relationship between supplier assessment and collaboration with suppliers (e.g. Foerstl et al. 2010; Krause et al., 2000; Large and Gimenez, 2010). Supplier assessment enables firms to identify where suppliers need to be developed (Hahn et al. 1990). Once the areas of improvement have been identified, buying firms can focus their resources to help suppliers to obtain the required capabilities. Foerstl et al. (2010), after conducting a multiple case study, point out that supplier assessment regarding sustainability issues enables the implementation of supplier development initiatives such as training. Similarly, Gimenez and Sierra (2013) found that before assisting suppliers in sustainability issues firms should assess them and identify those areas that require development. Thus, based on these arguments we hypothesize that:

Hypothesis 1. Supplier assessment is positively related to collaboration with suppliers

Based on the above definitions of assessment and collaboration it is clear that the extension of social sustainability to suppliers comprises two entities: the buying firm and the supplier. Papers analyzing the impact of these practices (i.e., assessment and collaboration) on social performance have focused on the buying firm, while there is little research that considers the impact of these practices on the supplier side. That is, most of the papers look at the benefits that buying firms can obtain from implementing sustainable supply management practices (Hartmann and Moeller, 2014) but not at how their implementation affects suppliers. In fact, to the best of our knowledge, papers considering the supplier's side have focused on dimensions such as environmental investment decisions (Klassen and Vachon, 2003; Vachon, 2007), environmental capabilities (Lee and Klassen, 2008), environmental commitment (Simpson and Power, 2005), compliance with codes of conduct (Jiang, 2009a,b) or supplier's operational performance (Akamp and Muller, 2013; Carter, 2005), neglecting the impact of these practices on the suppliers' social performance.

4.3.3. SUPPLIER ASSESSMENT, COLLABORATION WITH SUPPLIERS AND SOCIAL PERFORMANCE

Following Seuring and Muller's (2008) suggestion to conduct more research built on strong theoretical backgrounds, we adopt the lenses of the Transaction Cost Theory (TCT) and the Resource Based View (RBV). In addition, the lack of previous empirical studies on the impact of these practices on the social dimension of both buying firms and suppliers' performance also highlights the need to rely on sound theoretical paradigms. On the one hand, we will use TCT to develop the assessment – performance hypotheses. In a buyer-supplier relationship there is a risk that suppliers behave

opportunistically. That is, with a lack of candor or honesty in transactions, to include self-interest seeking with guile" (Williamson, 1975, p.9) (e.g., employ child labor to reduce costs). In that sense, to avoid the emergence of opportunistic behavior in an established relationship and hence reduce its associated transaction risks, the adoption of assessment practices, which aim to monitor suppliers, is needed (Carter and Rogers, 2008). On the other hand, the RBV will provide reasons why collaboration is suitable to manage buyer-supplier relationships although leading to an increase on transaction costs.

4.3.3.1 SUPPLIER ASSESSMENT AND SOCIAL PERFORMANCE

In a buyer-supplier relationship, the risk of suppliers acting opportunistically is present. Opportunistic behavior implies that suppliers exhibit "self-interest with guile" (Williamson, 1981). Suppliers can behave dishonestly when it comes to the management of sustainability. For example, to have lower labor costs, suppliers may deliberately decide to employ child labor in their premises or have poor health and safety conditions (e.g., making employees work an excessive number of hours, making employees manipulate hazardous/toxic products without providing the appropriate protection). These types of behaviors are what we consider opportunistic behaviors as they are used by suppliers to achieve lower costs knowing that these practices are not accepted by buying firms. Suppliers may make use of these practices due to the presence of information asymmetries: buying firms do not have a direct control over the working conditions in the suppliers' premises. To prevent their suppliers from acting unethically, buying firms can implement supplier assessment practices, which entail costly monitoring and evaluative programs (Carter and Rogers, 2008; Simpson and Power, 2005). The implementation of these types of practices by the buying firm will lead to a reduction/cease on the opportunistic behavior of the supplier due to the pressure of being evaluated and controlled. If opportunistic behavior is reduced (i.e.,

they stop using child labor, they do not force their employees to work an excessive number of hours, etc.) the social sustainability of the supplier will be improved (Carter and Rogers, 2008). As suggested by Parmigiani et al. (2011) suppliers' monitoring can help to address social issues in the supply chain. However, little research has analyzed the impact that these practices have on suppliers and when it has been studied the focus has been on the environmental dimension of sustainability. For instance, Klassen and Vachon (2003) found that suppliers' evaluation and monitoring causes changes in how suppliers regard environmental issues. In fact, as pointed out by Lee and Klassen (2008) suppliers' environmental evaluation pressures them to start considering environmental factors in their own supply chains. This mechanism exerts coercive pressure on the supplier. We believe this pressure will push suppliers to comply not only with environmental but also with social issues.

Based on the above studies and on the TCT, we expect the assessment of suppliers by the buying firm to exert pressure on the supplier and hence reduce their opportunistic behavior regarding social issues, leading to an increase in their social performance (i.e. compliance with human rights, child labor employment, etc.). In that sense, we hypothesize that:

Hypothesis 2. Supplier assessment improves the suppliers' social performance

In the literature, there is evidence for the positive and direct relationship between suppliers' evaluation and monitoring and the buying firm's sustainability performance (e.g.: Foerstl et al., 2010; Pagell and Wu, 2009; Spence and Bourlakis, 2009). For instance, assessing suppliers with respect to sustainability issues allows the buying firm to avoid reputation damage (Foerstl et al., 2010) and hence improve its performance. According to Handfield et al. (2005) firms possessing a formal monitoring system on corporate social responsibility in their supply chains will experience performance

advantages. Recently, Gualandris et al. (2014) found that the implementation of sustainable supply management practices (which included monitoring of corporate social responsibility practices) lead to improvements in the sustainability performance of buying firms (measured as reputation and employees' satisfaction). In line with these authors, we expect that the assessment of suppliers in terms of social issues leads to a better buying firm's social performance. By implementing assessment practices, buying firms will be able to evaluate their suppliers' performance in terms of social issues, avoiding reputational risk and showing that their supply chain is socially responsible. Also, by implementing assessment practices, buying firms will have more satisfied employees. Pagell and Gobelli (2009) argue that the improvement of employees' working conditions is related to product quality due to an enhancement of employees' motivation. Similarly, we can expect that the assessment of the working conditions at the suppliers' premises will lead to more satisfied workers in the buying firm as they will feel they are working in a more socially responsible oriented firm. Thus, based on the previous arguments we hypothesize that:

> *Hypothesis 3. Supplier assessment improves the buying firm's social performance*

4.3.3.2. COLLABORATION WITH SUPPLIERS AND SOCIAL PERFORMANCE

According to the RBV, collaboration enables the partnering firms (buyer and supplier) to build a set of valuable, rare and difficult to copy resources that lead to competitive advantage (Barney, 1991). As Carter and Rogers (2008), we consider as valuable, rare and difficult to copy resources the intangible resources such as the learning that occurs between buyers and suppliers when they are working together to improve sustainability. Hart (1995) and Aragon-Correa and Sharma (2003) extended the RBV to include environmental issues: the Natural-Resource-Based View. These authors claim that by working together with their suppliers, firms are able to develop a set of resources that

lead to better environmental results (Aragon-Correa and Sharma, 2003). We believe this environmental focus can be extended to include also the social dimension of sustainability. That is, through collaboration, better social results can be achieved. The collaboration between a buyer and a supplier entails training sessions as well as joint-work with respect to social issues (e.g., training with respect to health and safety measures), which will result in increased knowledge for both parties. This knowledge will allow both firms to develop specific capabilities to improve their own social performance (e.g., implementation of safety measures to avoid accidents). Gold et al. (2010) strengthen the key role of collaboration in achieving sustainability goals. In the same line, Klassen and Vereecke (2012) emphasize the fact that collaboration between a buying firm and a supplier improves the supply chain performance.

More specifically, regarding supplier performance, previous studies (most of them with an environmental focus) have shown that collaboration plays a role on the supplier side. Akamp and Muller (2013) in their study of sustainable supplier development practices in the context of developing countries found that the adoption of collaborative practices (e.g., provision of training and direct investments) resulted in improvements on the suppliers' performance. Similarly, Klassen and Vachon (2003) found that the development of joint efforts between the buying firm and its suppliers motivates changes in the suppliers' plants (i.e.: implementation of pollution prevention systems) to meet environmental requirements. Also, Jiang (2009a,b) found that collaboration with suppliers has a positive impact on suppliers' compliance with codes of conduct. We believe that buying firm's efforts to improve suppliers' working conditions will result in an enhanced social performance for the supplier. For instance, by training suppliers on social issues the health and safety conditions in the suppliers' facilities will improve.

Additionally, as pointed by Seuring and Muller (2008) activities such as suppliers' training should allow improvements in both the supplier and the buyer. Particularly, in the case of the buying firm's social performance, Gimenez et al. (2012) empirically showed that the implementation of cooperative activities with suppliers contributes to increase the buying firm's social reputation. Recently, Gualandris et al. (2014) found that the adoption of inter-organisational practices helped to improve the sustainability performance of the buying firm. Similarly, we believe that by working together with suppliers on social issues (e.g., offering training on social aspects or working together to solve deficiencies in the suppliers' health and safety conditions), buying firms will develop useful knowledge and skills that will serve to improve their own social performance.

Based on these arguments and on the RBV we hypothesize that:

> *Hypothesis 4. Collaboration with suppliers improves the suppliers' social performance*
>
> *Hypothesis 5. Collaboration with suppliers improves the buying firm's social performance*

4.3.3.4 BUYING FIRM'S AND SUPPLIERS' SOCIAL PERFORMANCE

Suppliers' performance impacts the competitive dimensions of buying firms and hence plays a key role on their long-term success (Carter, 2005; Krause et al., 2000). This can also be applied to the sustainability context. For example, in the case of the environmental dimension of sustainability, a buying firm's environmental performance can be damaged by a poor level of environmental performance of the supplier (Faruk et al., 2002). If the supplier serves to the buying firm products that contain high levels of hazardous or toxic materials, the buying firm will be using non-environmentally friendly products, leading to a decrease on its environmental performance. Gualandris and Kalchschmidt (2013) found support for the positive relationship between suppliers'

sustainability performance and buying firm's sustainability performance. In line with these authors we believe that buying firms employees' satisfaction and well-being (i.e., buying firm's social performance) will increase as a result of being in a firm that sources from socially-responsible suppliers (i.e., suppliers with high levels of social performance). Employees who feel that can make an impact on social and environmental issues while at work are twice more satisfied with their job than those who don't (Zukin and Szeltner, 2012). In addition, the buying firm will also be able to improve its social performance through increased social reputation. If the supplier is able to improve the working conditions and compliance with child labor standards and human rights the social reputation of the buying firm will improve.

Summarizing, better working conditions at the suppliers' premises lead both to higher satisfaction and well-being of employees at the buying firm as well as higher reputation. In that sense, in line with previous empirical results, we posit that suppliers' social performance is positively associated with the buying firm's social performance. Thus, based on these arguments we hypothesize that:

Hypothesis 6. Suppliers' social performance is positively related to buying firms' social performance

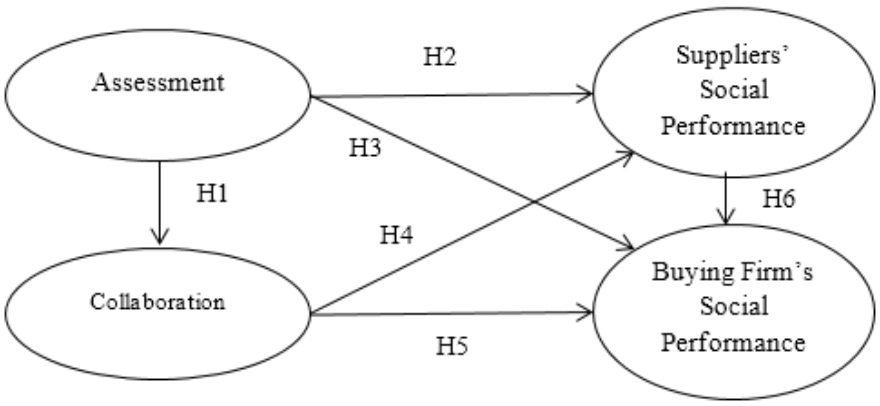
In summary, we have hypothesized the following direct effects. First, we have hypothesized a positive effect between assessment and collaboration (H1). Then, based on the TCT and empirical evidence we have posited a positive effect between assessment and both the suppliers' (H2) and buying firm's (H3) social performance. Similarly, based on the RBV, we have hypothesized a positive effect between collaboration and the suppliers' (H4) and buying firm's social performance (H5). We also believe that the suppliers' social performance has a positive impact on the buying firm's social performance (H6). The combination of the abovementioned hypotheses

results in a mediated model. This suggests that there might be an indirect effect between social supply management practices (i.e., assessment and collaboration) and the buying firm's social performance through suppliers' social performance (i.e., mediating variable). In other words, we expect that the suppliers' social performance mediates the relationship between social supply management practices and the buying firm's social performance. This mediating effect can be explained as follows: once suppliers have achieved a better social performance due to the implementation of social supply management practices, the buying firm's social performance will increase. The fact that we have hypothesized a direct effect between social supply management practices (i.e., assessment and collaboration) and buying firm's social performance (i.e., H3 and H5) suggests that the suppliers' performance acts as partial mediator rather than a full mediator (Baron and Kenny, 1986). This reasoning leads to the two following hypotheses:

> *Hypothesis 7. Suppliers' social performance partially mediates the relationship between assessment and the buying firm's social performance.*
>
> *Hypothesis 8. Suppliers' social performance partially mediates the relationship between collaboration and the buying firm's social performance.*

The combination of the previous hypotheses results in the conceptual model presented in Figure 1.

Figure 1. Conceptual model



4.4.1. QUESTIONNAIRE DESIGN AND MEASURES

The survey instrument employed in this study was designed and developed based on a literature review. A pre-test was carried out with academics in order to check the understanding and clarity of the questions resulting in minor changes with respect to the wording of some items. For each of the studied constructs multiple items were considered which were adapted from previous literature (See Appendix A for a detailed list of the items used).

Suppliers assessment – this construct includes the evaluation of suppliers' in terms of social issues, auditing suppliers with respect to social issues and the provision of feedback to suppliers as a result of their evaluations. This construct and items were adapted from Krause et al. (2000) and Large and Gimenez (2011).

Collaboration with suppliers – in the case of collaboration, the considered three items entail: visiting suppliers' premises, training suppliers in terms of social issues and the development of joint efforts with them with respect to social sustainability. These items were adapted from Krause et al. (2000) and Vachon and Klassen (2008).

Buying firm's social performance – buying firm's social performance items include the use of social indicators, the improvement of the company's social reputation, the reduction of industrial accidents, as well as the improvement of safety and labor conditions. These items were adapted from Maxwell et al. (2006), de Giovanni (2012) and Gimenez et al. (2012).

Suppliers' social performance – the suppliers' social performance items are related to the improvement of safety and labor conditions, the employment of child labor and the respect for human rights in the supplier's premises perceived by the buying firm.

These items were developed based on the works of Kleindorfer et al. (2005) and Awaysheh and Klassen (2010).

All the indicators used were measured by a seven-point Likert scale, where higher values indicated higher level of adoption or better performance.

4.4.2. SAMPLE AND DATA COLLECTION

Data from a sample of Spanish manufacturing firms was collected between March and June 2011. We used SABI Bureau Van Dijk Database to extract a list of all Spanish manufacturing firms that had at least 50 employees in the NACE codes 13-18, 20, 21, 26 and 27. After having eliminated those firms that did not meet with the NACE code and number of employees criteria as well as those that did not have complete contact details we were left with a sample of 580 firms. A phone call was made to all of them requesting their participation in the study; however 204 declined to participate. From the remaining companies (376) a total of 99 companies decided to answer the questionnaire by phone whereas the rest asked to have the survey e-mailed (from which 21 responded). In total, we obtained 120 (99+21) responses, representing an effective response rate of 20.69%, which is similar to previous studies in the field (e.g., Akamp and Muller, 2013). Table 1 shows the sample description.

Table 1. Sample descriptives

Position	n	%
Health and Safety Dtor. or Manager	7	5.83%
Environmental Dtor. or Manager	14	11.67%
Health, Safety & Env. Dtor. or Manager	13	10.83%
Quality and Environmental Dtor. or Manager	23	19.17%
Quality, Health, Safety and Env. Dtor. or Manager	13	10.83%
Managing Dtor.	7	5.83%
Operations or Supply Chain Dtor. or Manager	8	6.67%
Quality Dtor. or Manager	8	6.67%
Human Resources Dtor. or Manager	16	13.33%
Other	11	9.17%
TOTAL	120	100%

Industry	n	%
Textile (NACE codes 13, 14 and 15)	12	10.00%
Wood and products of wood and cork, except furniture (NACE code 16)	11	9.20%
Paper and paper products (NACE code 17)	16	13.30%
Printing (NACE code 18)	6	5.00%
Chemical (NACE code 20)	25	20.80%
Pharmaceutical (NACE code 21)	15	12.50%
Electronics (NACE codes 26 and 27)	35	29.20%
TOTAL	120	100%

Number of employees	n	%
Between 50 and 249	76	63.33%
Between 250 and 499	31	25.80%
More than 500	13	10.80%
TOTAL	120	100%

Turnover	n	%
Less than € 10 million	7	5.80%
Between € 10 and € 50 million	63	52.50%
More than € 50 million	50	41.70%
TOTAL	120	100%

To minimize key-informant bias our first step was to contact each firm by phone and identify the most suitable respondent with respect to the extension of sustainability practices to suppliers (Kumar et al., 1993). Table 1 shows that there was no single position across firms with respect to these issues, leading to a high diversity in terms of the position held by the respondents. Non-parametric tests were performed for all the items involved in the study to check for any possible difference in the responses due to position held. Results showed that there are no significant differences. Furthermore, the use of different data collection methods (telephone and e-mail) may be a threat to the study. Due to the big difference in size regarding the total number of responses obtained by telephone (99) and e-mail (21), a subsample of 21 responses was randomly selected from the responses of the phone group. Parametric tests were performed for each item involved in the study and no significant differences between phone and e-mail responses were found.

Non-response bias could have also been a threat to our study. In that sense, we performed non-response bias tests comparing the demographic data (number of employees and turnover) of respondents and non-respondents. No noticeable pattern among the variables that could indicate the existence of a non-response bias was found.

4.5. DATA ANALYSIS AND RESULTS

The objective of our study is to explore the relationships among different theoretical constructs (i.e., practices and performance). In particular, our model examines whether the adoption of assessment and collaborative practices to manage the relationship with suppliers with respect to social issues directly improves both the supplier's and the buying firm's social performance. To test the hypothesized relationships between the constructs we used non-parametric structural equation modeling via partial least square (PLS) analysis. In PLS, measurement and structural parameters are estimated via an iterative procedure, which combines simple and multiple regressions by traditional ordinary least squares (OLS), thus avoiding any distributional assumption of the observed variables.

Three reasons made us use the PLS method for our data analysis. First, PLS is an appropriate tool when the research objectives are exploratory in nature (Peng and Lai, 2012). In our case, the relationships we aim to study have been seldom examined in the literature (i.e., the social dimension of sustainability has been scantily studied and the suppliers' performance has been largely neglected). Second, the impossibility to fulfill the set of assumptions of the parametric structural equation modeling technique (based on maximum likelihood estimators) including multivariate normality of data and minimum sample size suggests PLS procedure to be the best approach to the test the hypothesized model. Finally, it is important to highlight that PLS allow us to estimate simultaneously all the hypothesized relationships in our model.

PLS analysis requires a minimum sample size ten times the most complex relationship within the model. This relationship is the larger value between (1) the construct with the largest number of formative indicators and (2) the largest number of independent variables influencing a dependent variable (Peng and Lai, 2012). As our model is only composed by reflective indicators and the largest number of independent variables influencing a dependent variable is two, a minimum sample size of 20 observations would be needed.

Our PLS analysis entails two stages: the assessment of the measurement model and the evaluation of the path model. The first stage, measurement assessment, addresses the valuation of the reflective constructs in terms of internal consistency, individual indicators reliability, and convergent and discriminant validity. Then, the evaluation of the path model stage covers the estimation and the statistical test of the hypothesized relationships between the constructs. It is important to mention that concerns about OLS estimation were checked using jackknife estimation procedure to compute 95% bias corrected confidence intervals for every path coefficient.

Our PLS analysis entails two stages: the assessment of the measurement model and the evaluation of the path model. The first stage, measurement assessment, addresses the valuation of the reflective constructs in terms of internal consistency, individual indicators reliability, and convergent and discriminant validity. Then, the evaluation of the path model stage covers the estimation and the statistical test of the hypothesized relationships between the constructs. It is important to mention that concerns about OLS estimation were checked using jackknife estimation procedure to compute 95% bias corrected confidence intervals for every path coefficient.

4.5.1. MEASUREMENT ASSESSMENT

As already mentioned, in the sustainable supply management literature there is a lack of studies focusing on the social dimension of sustainability. In that sense, a scale that measures social constructs such as social performance or social practices has not been developed (de Giovanni, 2012). Therefore, our first step was to conduct an exploratory factor analysis via principal component analysis to define the fundamental constructs underlying our original indicators.

After having checked the sample adequacy for the exploratory factor analysis using Kaiser-Meyer-Olkin (KMO) test and Barlett's test of sphericity and having removed one item from the assessment construct (Ass2) because of cross loadings, we obtained a five factor solution which retains 84.24% of the constructs indicators' total variance (See Table 2).

The resulting five dimensions are labeled as *Assessment* (Ass1, Ass3), *Collaboration* (Coll1, Coll2, Coll3), *Buying Firm's Social Reputation* (BFPerf1, BFPerf2), *Buying Firm Employees' Well-Being* (BFPerf3, BFPerf4), and *Suppliers' Social Performance* (SupPerf5, SupPerf6, SupPerf7).

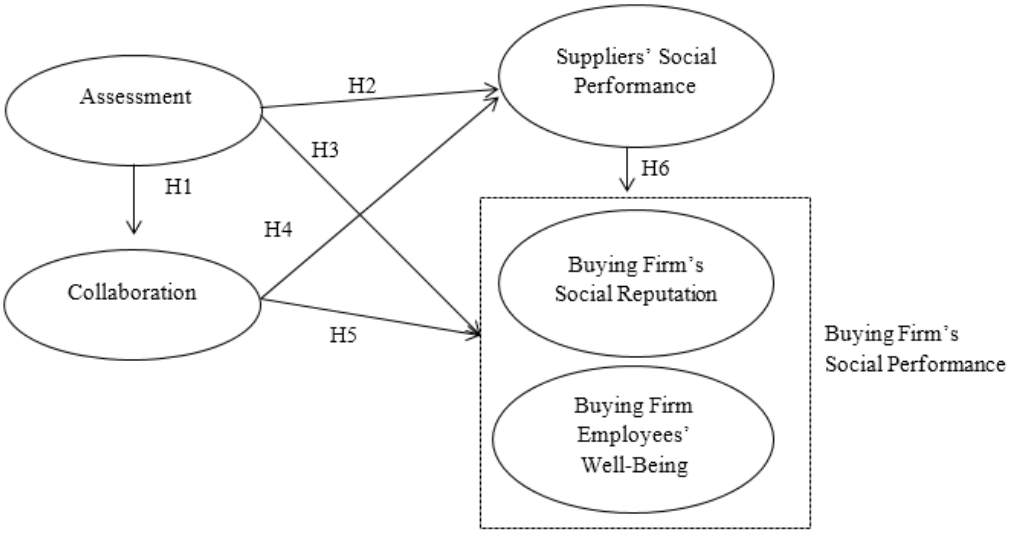
Table 2. Descriptives and measurement assessment (factor loadings and reliability)

Factor	Items	Mean	StDev	Loadings	% of explained variance (unid)	Alpha Cronbach	Comp Reliab	AVE
Assessment	Ass1	4.20	2.18	0.913	84.58%	0.816	0.92	0.846
	Ass2	3.79	2.24	-----				
	Ass3	3.66	2.35	0.926				
Collaboration	Coll1	3.32	2.07	0.887	71.19%	0.797	0.88	0.706
	Coll2	2.47	1.83	0.733				
	Coll3	3.63	2.25	0.891				
BF's Social Reputation	BFPerf1	4.31	2.01	0.939	87.60%	0.848	0.93	0.873
	BFPerf2	4.64	1.63	0.930				
BF Empl. Well-Being	BFPerf3	5.72	1.40	0.943	84.64%	0.800	0.91	0.839
	BFPerf4	5.97	1.05	0.888				
Supplier's Social Performance	SupPerf5	3.32	2.11	0.947	88.52%	0.930	0.95	0.872
	SupPerf6	3.53	2.43	0.917				
	SupPerf7	3.19	2.03	0.937				

EFA Analysis Adequacy:
KMO = 0.73 (threshold value is 0.5)
Barlett's test --> X^2= 740.37 p<.00

In a nutshell, the factorial structure of our measured indicators scale reveals five constructs: two that are related to the practices used to extend social issues to suppliers (the independent variables hypothesized in the structural model) and three related to social performance (the dependent variables). Regarding social performance constructs it is important to highlight the fact that three constructs were obtained. In our initial model we defined two constructs related to performance: the buying firm's and the suppliers' social performance (See Figure 1). However, the results of the exploratory factor analysis suggest that the buying firm's social performance indicators form two different constructs rather than one (See Figure 2). These new constructs are described as follows: one refers to reputation (*Buying Firm's Social Reputation)* and the other refers to employees' working conditions (*Buying Firm Employees' Well-Being)*. These results will be further commented on the discussion section.

Figure 2. Model (after exploratory factor analysis)



The adequacy of the scales was evaluated analyzing convergent validity, discriminant validity and reliability. Convergent validity is assessed by checking that the item loadings are significant and greater than 0.70 and that the average variance extracted (AVE) of each construct is greater than 0.50 (Peng and Lai, 2012). Results in Table 2 show that in our study convergent validity for both the construct and the indicator level is fulfilled. Discriminant validity is assessed by comparing the AVE of each construct and the shared variance between each pair of constructs (Anderson and Gerbing, 1988; Morgan et al., 2007). For the fulfillment of discriminant validity the square root value of AVE should be greater than all of the inter-construct correlations. Table 3 provides support for sufficient discriminant validity since the square root of the AVE of each construct is higher than its correlations. Finally, reliability was judged by using both composite reliability and Cronbach's alpha coefficient. Results in Table 2 show that all the scales have a value greater than the threshold value of 0.70 and the strictest threshold of 0.8 (Nunnally, 1978) for composite reliability. Cronbach's alpha values are also greater than the 0.70 threshold. These results indicate that all constructs are reliable.

Table 3. Measurement assessment: discriminant validity

	Assessment	Collaboration	BF's Social Reputation	BF Employees Well-Being	Social Suppliers' Performance
Assessment	0.92[1]				
Collaboration	0.66[2]	0.84			
BF's Social Reputation	0.44	0.30	0.93		
BF Empl. Well-Being.	0.19	0.13	0.36	0.92	
Social Suppliers' Perf.	0.28	0.35	0.31	0.16	0.93

[1] *AVE square root*
[2] *Correlations*

Finally, we checked that common method variance (CMV) is not a threat to the validity of our results. We used both a priori and a posteriori procedures. First, during the questionnaire design the dependent variables were placed after the independent variables in the survey (Podsakoff et al., 2003). This helps to diminish the effects of consistency artifacts. Then, we also checked for the presence of CMV a posteriori by using both the Harmans (Podsakoff, et al. 2003) method and the Lindell and Whitney's (2001) method. The rationale behind the Harmans' single factor method is that if a ''substantial amount of common method bias is present, either (a) a single factor will emerge from the factor analysis, or (b) one general factor will account for the majority of the covariance among measures'' (Podsakoff et al., 2003, p. 889). The results show that five factors emerge and that one single factor accounts only for the 39% of the variance. Lindell and Whitney's method examines the correlations between a variable that is theoretically unrelated to the constructs under study (marker variable) and the studied constructs. High correlations between the marker variable and the studied constructs indicate the presence of CMV. As a marker variable we used a variable from the survey, which was not included in our analysis (i.e., risk of supply). Table 4 shows the Pearson correlation coefficients between the marker variable and the studied constructs. The highest value corresponds to *Collaboration* (Pearson r = -0.13). If we

square the Pearson correlation coefficient we get the maximum percentage of variance shared by the marker and the construct (R^2). CMV would be a threat to the study if R^2 shows high values. In our case, R^2 equals 2%, which is a low value. These results confirm the absence of CMV.

Table 4. Common method variance

Construct	Correlation by Marker	R^2
Assessment	-.09	0.008
Collaboration	-0.13	0.02
BF's Social Reputation	.03	0.001
BF Empl. Well-Being	-.04	0.002
Suppliers' Social Performance	-.04	0.002

4.5.2. PATH MODEL EVALUATION

The second step in our analysis is the estimation of the path model relationships. Before looking at the results of the direct and indirect path coefficients, it is important to assess the structural model for multicollinearity issues. Since the estimation of the path coefficients is based on OLS regression, just as in regular multiple regression, the path coefficient might be biased if the estimation involves multicollinearity between the studied constructs. As shown in Table 5, VIFs between constructs are under the suggested threshold of 5 showing that multicollinearity is not an issue.

Table 5. VIF between constructs

Construct	Ass	Coll	Supp. Soc. Perf.
Assessment			
Collaboration			
BF's Social Reputation	1.699	1.699	
BF Empl. Well-Being	1.344	1.262	1.342
Suppliers' Social Performance	1.658	1.705	1.190

The results of the path model evaluation are shown in Table 6. To test the statistical significance of the model parameters we used the bootstrap procedure (Efron, 1979; Diaconis and Efron, 1983). The procedure entailed the generation of 1000 subsamples of cases with a bootstrap sample size of 120. The estimated values for the path coefficients, which indicate the strength of the direct relationships between constructs, provide full empirical support for three of the six hypotheses related to direct effects (H1, H4, H6) and partial support for one additional hypotheses (H3). Our results show that there is a positive and direct impact from *Assessment* to *Collaboration* ($p<0.001$), providing support for H1. This highlights that *Assessment* is an antecedent of *Collaboration.*

Assessment was significantly linked to the *Buying Firm's Social Reputation* ($p=0.0009$) but no support was found for the impact on *Buying Firm Employees' Well-Being* ($p=0.234$), providing partial support to H3. This means that by assessing suppliers, buying firms can improve their own social reputation but not their employees' well-being. In addition, there is also a positive and significant path between *Collaboration* and *Suppliers' Social Performance* ($p=0.012$) providing support for H4 and suggesting that the direct involvement of the buying firm in solving social issues (i.e., collaboration with suppliers) results in a higher social performance for the supplier (e.g., better safety and health conditions).

In addition, the direct paths from *Assessment* to *Suppliers' Social Performance* ($p=0.440$) and *Collaboration* to both the *Buying Firm's Social Reputation* ($p=0.425$) and *Buying Firm Employees' Well-Being* ($p=0.419$) were not significant, providing no evidence to support hypotheses H2 and H5.

Finally, there is a positive and direct impact between *Suppliers' Social* Performance and both the *Buying Firm's Social Reputation* (p=0.006) and *Buying Firm's Employees' Well-Being* (p=0.05). This provides support for H6.

Table 6. Direct Effects: Path Coefficient Results

Hypothesis		Original sample	Std. Error	Sign.	95% Bias Corrected CI	
H1	Assessment --> Collaboration	0.680	0.068	0.001	0.595	0.795
H2	Assessment --> Suppliers' Soc. Perf.	0.091	0.117	0.440	-0.147	0.335
H3	Assessment --> BF's Soc. Reputation	0.359	0.106	0.001	0.200	0.560
	Assessment --> BF Empl. Well-Being	0.148	0.120	0.234	-0.077	0.338
H4	Collaboration --> Suppliers' Soc. Perf.	0.300	0.117	0.012	0.097	0.544
H5	Collaboration --> BF's Soc. Reputation	-0.086	0.107	0.425	-0.284	0.067
	Collaboration --> BF Empl. Well-Being	-0.099	0.122	0.419	-0.286	0.113
H6	Suppliers' Soc. Perf. --> BF's Soc.Reputation	0.235	0.083	0.006	0.070	0.392
	Suppliers' Soc. Perf. --> BF Empl. Well-Being	0.185	0.095	0.05	0.025	0.360
Control Variables						
	Internal Soc. Practices → BF's Soc. Reputation	0.260	0.081	0.002	0.096	0.410
	Internal Soc. Practices → BF Empl. Well-Being	0.229	0.092	0.015	0.056	0.409

As suggested both by Maholtra et al. (2014) and Rungtusanatham et al. (2014) we relied on bootstrapping to test for the mediating role of *Suppliers' Social Performance* between both practices (i.e., *Assessment* and *Collaboration*) and the *Buying Firm's Social Performance* (H7 and H8). The results for the mediating effects results are reported in Table 7. In the case of *Assessment*, the fact that the relationship between *Assessment* and the *Suppliers' Social Performance* (a) is not significant (p=0.440) implies the non-existence of a potential mediating role of *Suppliers' Social Performance*. Thus, providing no support for H7. In the case of *Collaboration*, its relationship with *Suppliers' Social Performance* (a) is significant (p=0.012). In addition,

the relationship between *Suppliers' Social Performance* and the *Buying Firm's Social Reputation* (p=0.006) and *Buying Firm Employees' Well-Being* (p=0.05) (b) are both significant. For this case, the computed 95% bootstrapped confidence intervals for mediation (ab) show that *Suppliers' Social Performance* does not mediate the relationship between *Collaboration* on both *Buying Firm's Social Reputation* ([-0.307:0.448]) and *Buying Firm Employees Well-Being* ([-0.315:0.426]). These results do not provide support for H8.

Table 7. Mediation effects: boostrapping

		Direct effect coefficients (β)			Indirect effect (mediation)	
		a	b	c'	ab	95% IC
H7						
	Ass-> Suppliers' Soc. Perf -> BF's Soc. Rep. Perf	0.091 (0.440)[1]	0.235 (0.006)	0.359 (0.001)	-	-
	Ass-> Suppliers' Soc. Perf -> BF Empl. Well-Being		0.185 (0.095)	0.144 (0.234)	-	-
H8						
	Coll-> Suppliers' Soc. Perf -> BF's Soc. Rep. Perf	0.300 (0.012)	0.235 (0.006)	-0.086 (0.425)	0.070	[-0.307 : 0.448]
	Coll-> Suppliers' Soc. Perf -> BF Empl. Well-Being		0.185 (0.095)	-0.090 (0.419)	0.055	[-0.315 : 0.426]

(1) p-value

Firm's size, industry and the buying firm's level of social internal practices may have an impact on the buying firm's performance (de Giovanni, 2012: Gimenez et al., 2012; Klassen, 2001; Wiengarten et al., 2012 and Zhu et al., 2008). Because of this, prior to the testing of our model, we checked for their relationship with our two main dependent constructs (i.e., *Buying Firm's Social Reputation* and *Buying Firm Employees' Well-Being*). For size we checked for the correlation between the logarithm number of employees and the above-mentioned dependent variables. The results in Table 8 show that the correlation is non-significant. For industry, we employed the Kruskal Wallis non-parametric test (which is also reported in Table 8) and no significant relationships

were found between these variables. This implies that in our specific sample of Spanish manufacturing firms, size and industry are not an issue. Consequently, we did not include them in our model. For the level of internal practices we also computed the correlation and as seen in Table 8 it was significant. Therefore we included it when testing our model. As shown in the results (See Table 6) the relationships between our control variable (i.e., level of internal social practices) has a significant and positive impact on both dimensions of buying firm's social performance. This means that firms that have implemented internal social practices will have higher social performance. This is in line with previous literature (de Giovanni, 2012; Gimenez et al., 2012).

Table 8. Size, industry and internal social practices

		BF's Social Reputation	**BF Empl. Well-Being**
Size	Pearson corr	0.082	-0.060
	Sig.	0.374	0.517
Industry	Chi-square	8.000	8.702
	df	5	5
	Sig.	0.156	0.122
Int. social practice	Pearson corr	0.382	0.324
	Sig.	0.001	0.001

Finally, the coefficient of determination (R^2) for each dependent construct indicates the proportion of the dependent construct's variance that is explained by its predictors. The R^2 for the *Buying Firm's Social Reputation, Buying Firm Employees Well-Being* and *Suppliers' Social Performance* are 32.5%, 12.9% and 13.4% respectively and statistically different from zero ($p<.001$).

4.6. DISCUSSION

Our results show that when studying the impact of supplier assessment and collaboration with suppliers, there is the need to distinguish between the buying firm's and the suppliers' social performance. In fact, each practice impacts differently on each performance dimension. Furthermore, in the case of the buying firm's performance, our

results provide additional insights since two dimensions have to be distinguished: reputation and employees' well-being. Next, we structure our discussion focusing first on the results related to measuring social performance, and then, on the impact of assessment and collaborative practices on performance.

4.6.1. SOCIAL PERFORMANCE CONSTRUCT

Previous studies have acknowledged a lack of agreement on how to measure the social performance construct (de Giovanni, 2012). We believe our findings contribute to the development of a social performance scale by suggesting three key constructs to measure it: one related to the suppliers' social performance and two related to the buying firm's social performance. The following ideas can be derived from these findings.

First, when studying the adoption of assessment and collaborative practices to obtain a sustainable supply chain, not only the performance of the buying firm should be considered (e.g., de Giovanni, 2012; Gimenez et al., 2012) but also the performance of the supplier. Both the buying firm and the supplier are essential entities in the relationship. Studying only the performance of the buying firm will provide a partial view on the effectiveness of these practices. For instance, by only considering the buying firm's performance one can assume that assessment is effective on achieving social performance improvements. However, if firms aim to extend sustainability to suppliers and improve the suppliers' social performance, our results show that assessment is not that effective.

Second, when measuring the buying firm's performance our findings suggest that the distinction between buying firm's reputation and buying firm's employees' well-being is needed. As an additional analysis, we have computed the partial contribution of both *Assessment* and *Collaboration* on the R^2 of *Buying Firm Employees Well-Being*

(R^2=6.2%) and *Buying Firm's Social Reputation* (R^2=22.1%). In our study, by differentiating between both buying firm's performance dimensions, we have been able to denote that sustainable supply management practices (i.e., assessment and collaboration) do not really contribute to explain the *Buying Firm Employees' Well-Being* (R^2=6.2%) in contrast to the *Buying Firm's Social Reputation* (R^2=22.1%). The *Buying Firm Employees' Well-Being* is measured as improvements in health and safety conditions as well as a reduction in the number of accidents in the buying firm's premises. Thus, it makes sense that only 6.2% of the variance of the buying firm employees' well-being is explained by the use of these practices. These practices denote an external dimension (i.e., practices applied to suppliers) and therefore will contribute to improve the employees' well-being to a limited extent.

The mixed results that can be found in the literature regarding the impact of sustainable supply management practices on buying firms' social performance can be due to the fact that authors have considered only a partial view of the buying firm social performance. For example, Gimenez et al. (2012) when studying the impact of sustainable practices on the TBL used social reputation to measure the buying firm's social performance. In a similar study, de Giovanni (2012) measured social performance as a mixture of indicators of internal conditions (i.e., health and safety conditions) and impact on the external community. In this study, de Giovanni (2012) found that external sustainable practices (i.e. sustainable supply management) do not affect the buying firm's social performance. Although he provides a more complete construct than Gimenez et al. (2012) we believe that the omission of the social reputation construct could explain why this study did not find support for the relationship between practices and the buying firm's social performance.

In line with Gualandris et al. (2014) our results show that it is important to consider a more comprehensive construct for social performance. Social performance should therefore, be measured through a combination of measures related with employees' well-being and firm's reputation. This paper contributes with respect to the work of Gualandris et al. (2014) in the fact that our findings suggest that both types of measures (i.e., employees' well-being and firm's reputation) should be considered as two separate constructs, as sustainable supply management practices may impact them differently. In fact, as shown in our results, assessment has a positive impact on the buying firm's social reputation while no effect on the buying firm employees' well-being.

4.6.2. THE ROLE OF ASSESSMENT VS. COLLABORATION

In line with the results of Foerstl et al. (2010), Krause et al., (2009) and Gimenez and Sierra (2013), assessment and collaboration are positively associated. As suggested by Hahn et al. (1990) assessment enables firms to identify where to put efforts to develop suppliers through a more collaborative approach.

Our results also show that supplier assessment and collaboration with suppliers have a different effect for the buying firm's and for the suppliers' social performance: while assessing suppliers helps to improve the buying firm's social reputation, collaborating with them contributes to improve the suppliers' social performance.

These findings can be considered original since, to the best of our knowledge, there are no prior studies that have considered the impact of these practices on these different performance dimensions. They show that to improve buying firm and suppliers' social performance the implementation of both assessment and collaboration is needed. One key message from our results is the following: if buying firms aim to improve their suppliers' social performance in order to achieve a socially responsible supply chain

they need to collaborate with them. We will discuss these results in detail in the following lines.

Suppliers' monitoring and evaluation (i.e., assessment) help to improve the buying firm's social reputation. That is, by assessing their suppliers, buying firms are able to improve their social image. These results are in line with previous studies. Foerstl et al. (2010) found that assessing suppliers allows the buying firm to avoid reputation damage. In addition, Klassen and Vereecke (2012) describe suppliers' evaluation on social issues as a risk mitigation strategy for the buying firm rather than contributing to improvements in performance. Our results suggest that the assessment of suppliers, besides from reducing social related risks helps to project a socially responsible behavior in the eyes of the buying firm's stakeholders. In addition, although we hypothesized a relationship between assessment and buying firm employees' well-being based on the fact that employees would feel better because of working in a more-socially responsible firm, our results show that assessment is not related with their well-being. These results can help to explain why de Giovanni's (2012) did not find any relationship between external sustainable supply management practices and buying firm's social performancethe author did not include social reputation when measuring social performance.

Overall, taken together, both results (i.e., impact of assessment on buying firm's reputation and no impact of assessment on buying firm's employees well-being) reveal the importance of considering both social reputation and employees' well-being as two separate constructs.

We have found no support for the direct link between assessment and suppliers' social performance. This implies that auditing and monitoring suppliers on social issues (e.g., working conditions or child employment) does not lead to direct improvements in their

facilities. Recently, Akamp and Muller (2013) found a similar result when analyzing the link between evaluating and assessing suppliers and suppliers' operational performance. In that sense, they state that evaluative activities do not necessarily translate into improvements in suppliers' performance. The fact that assessing suppliers does not lead to improvements in the social performance of the supplier can also be explained following Jamison and Murdoch's (2004) description of audits: audits can only take a snapshot of what is happening in a supplier business (e.g., poor labor conditions) but they do not explore why this is happening or how the situation can be improved.

In order to further explore the role of assessment practices, we analyzed the mediating role of collaboration in the assessment – suppliers' performance relationship. The results, which can be found in Appendix B, suggest that collaboration mediates the abovementioned relationship. That is, assessment will improve the suppliers' performance through the implementation of collaborative activities. These results suggest that evaluative practices help to identify potential areas of improvement with respect to suppliers' social issues. These social issues at the suppliers' premises identified by the implementation of assessment practices are improved (i.e., leading to higher suppliers' social performance) when collaborative practices are implemented. Therefore, supplier assessment can be described as a driver/starting point of improvement (Godfrey, 1998; Klassen and Vachon, 2003) as opposed to a direct influence on the suppliers' performance. For evaluative practices to have an impact on the suppliers' social performance, collaborative practices are needed. In fact, as shown by Rao (2002) the lack of cooperation and involvement by the buying firm with the supplier prevents the supplier to achieve real improvements.

Our results also show that collaboration has a positive and direct influence on the suppliers' social performance, as suggested by the RBV. These results are in line with

Akamp and Muller (2013), who found a positive and direct impact of collaborative activities on the suppliers' operational performance. In addition, Klassen and Vereecke (2012) identified collaboration as leading to improvements in social performance. The authors argue that these improvements are both for the supplier and the buying firm. As we have already mentioned, collaboration has a direct impact on the suppliers' social performance, meaning that the provision of training and the direct involvement of the buying firm helps the supplier to improve their working conditions.

Finally, it has to be pointed out that the supplier's social performance does not mediate the relationship between supply management practices and the buying firm's performance. In our model, this means that (1) assessment has an impact on buying firm's reputation regardless of the performance improvements achieved in the suppliers' premises; and (2) collaboration improves the supplier's performance although this improvement does not lead to improvements in the buying firm's social performance. Summarizing, the main message is that both supplier assessment and collaboration with suppliers are needed to achieve a socially-responsible supply chain. Whereas assessment contributes to improve the social reputation of the buying firm; collaboration helps to improve the social performance of the supplier.

4.7. CONCLUSION

The objective of our study was to analyze the effectiveness of sustainable supply management practices (i.e., assessment and collaboration) on achieving a socially – responsible supply chain. In that sense, we studied the impact that each of these practices have on both the buying firm's and the suppliers' social performances. Our results suggest that while assessing suppliers contributes to improve the buying firm's social reputation, collaboration enhances the suppliers' social performance (e.g., helps to improve their working conditions).

By studying not only the impact of these practices on the buying firm but also on the supplier, we have been able to obtain a better picture regarding their implementation. Additionally, we have also contributed to current research by focusing on a neglected area of sustainability: the social dimension. In that sense, we believe that future research should include the three identified constructs (i.e., suppliers' social performance, buying firm's social reputation and buying firm employees' well-being) when studying social performance in supply chains.

Besides extending the results of previous research, the study has also some key managerial implications. Companies willing to improve their social image can implement supplier assessment practices. The monitoring and evaluation of suppliers helps to improve the buying firm's social reputation. However, if companies aim to achieve a truly socially responsible supply chain (i.e., they need their suppliers to be sustainable) they need to collaborate with them. Suppliers' social performance only improves with the adoption of collaborative practices (e.g., training suppliers, visiting their premises…).

Despite these contributions to both research and the managerial field, our study has some limitations that need to be acknowledged. First, performance has been measured using self-reported data. Objective indicators should be used to measure this construct. Second, respondents were buying firms. This means that we asked buying firms about their perception with respect to their suppliers' performance. Although previous studies have analyzed suppliers' performance by relying on the perception that the buying firm has (e.g., Akamp and Muller, 2013; Carter, 2005) further research should try to obtain dyads of suppliers and buyers and distribute questionnaires to both sides to replicate this study. Third, following previous literature on the extension of sustainability to suppliers we have focused on two types of practices: assessment and collaboration. We

acknowledge that firms may adopt a hybrid structure comprising a mix of both practices (Williamson, 1991). Further research should include this hybrid structure as well as other type of strategies such as selection of suppliers based on social issues or the use of certifications (e.g., Zhu et al., 2013). Fourth, we have analyzed the adoption of assessment and collaboration by a buying firm with a key supplier and not with its entire supply base. Although this might be a limitation of our study, we believe that firms do not implement this kind of practices with all their suppliers. In line with this, it is important to bear in mind that as suggested by Parmigiani et al. (2011) the assessment of a multitude of suppliers by a single buying firm can become more difficult and hence diminish its effectiveness. Therefore, our results need to be interpreted in the context where a buying firm implements these practices with a key supplier. Fifth, we limited the objective of our paper to the exploration and understanding of the relationships between social supplier development practices (i.e., assessment and collaboration) and both suppliers' and buying firm's performance. Some recent literature has emphasized the role of third parties such as NGOs or trade unions on the effective deployment of sustainable supplier development practices (Egels-Zanden, 2014; Egeles-Zanden and Lindholm, 2014). Also, Huq et al. (2014) and Toubolic et al. (2014) suggested that in power balance situations the suppliers' performance is further improved. In that sense, future research should try to look at contingencies such as power im(balance), parties involved in the supplier development effort and/or environmental complexity (Egels-Zanden, 2014; Egels-Zanden and Lindholm, 2014; Huq et al. 2014; Pagell et al., 2007; Touboulic et al., 2014). Finally, as data was collected only in Spain, our study is limited to the Spanish scope. Further research should try to overcome these limitations.

ACKNOWLEDGEMENTS

The authors acknowledge financial support from research grant ECO2010-16840 from the Spanish Ministry of Science and Innovation and from research grant ECO/155/2012 (ref. 2015FI_B2 00108) from the Research and Universities Secretary, Economic Department, Generality of Catalonia

REFERENCES

Akamp, M., Muller, M. 2013. Supplier management in developing countries. Journal of Cleaner Production, 56(1): 54-62.

Anderson, J.C., Gerbing, D.W. 1988. Structural equation modeling in practice: A review and recommended two-step approach. Psychological Bulletin, 103(3): 411-423.

Aragon-Correa, J.A., Sharma, S. 2003. A contingent resource-based view of proactive corporate environmental strategy. Academy of Management Review, 28(1): 71-88.

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.

Awaysheh, A., Klassen, R.D. 2010. The impact of supply chain structure on the use of supplier socially responsible practices. International Journal of Operations and Production Management, 30(12): 1246-1268.

Barney, J.B. 1991. Firm resources and sustained competitive advantage. Journal of Management, 17(1): 99-120.

Baron, R.M., Kenny, D.A. 1986. The moderator-mediator variable distinction in social psychological research: Conceptual, strategic and statistical considerations. Journal of Personality and Social Psychology, 51: 1173-1182.

Caniels, M.C.J., Gehrsitz, M.H., Semeijn, J. 2013. Participation of suppliers in greening supply chains: an empirical analysis of German automotive suppliers. Journal of Purchasing & Supply Management, 19: 134-143.

Carter, C.R. 2005. Purchasing social responsibility and firm performance: the key mediating roles of organizational learning and supplier performance. International Journal of Physical Distribution & Logistics Management, 35(3): 177-194.

Carter, C.R., Jennings, M.M. 2004. The role of purchasing in corporate social responsibility: a structural equation analysis. Journal of Business Logistics, 25(1): 145-186.

Carter, C.R., Rogers, D. 2008. A framework of sustainable supply chain management moving toward new theory. International Journal of Physical Distribution & Logistics Management, 38(5): 360-87.

Corbett, C.J., Klassen, R.D. 2006. Extending the horizons: environmental excellence as key to improving operations. Manufacturing & Service Operations Management, 8(1): 5-22.

Diaconis, P., Efron, B. 1983. Computer-intensive methods in Statistics. Scientific American, 248: 96-108.

de Giovanni, P. 2012. Do internal and external environmental management contribute to the triple bottom line? International Journal of Operations & Production Management, 32(3): 265-290.

Efron, B. 1979. Boostrap methods: Another look at the Jackknife. Annals of Statistics, 7: 1-26.

Egels-Zandén, N., 2014. Revisiting supplier compliance with MNC codes of conduct: Recoupling policy and practice at Chinese toy suppliers. Journal of Business Ethics 119: 59-75.

Egels-Zandén, N., Lindholm, H., 2014. Do codes of conduct improve worker rights in supply chains? A study of fair wear foundation. Journal of Cleaner Production.

Elkington, J. 1994. Towards the sustainable corporation: win-win-win business strategies for sustainable development. California Management Review, 36(2): 90-100.

Faruk, A.C., Lamming R.C., Cousins, P.D., Bowen, F.E. 2001. Analyzing, mapping, and managing environmental impacts along supply chains. Journal of Industrial Ecology, 5(2): 13-36.

Foerstl, K., Reuter, C., Hartmann, E., Blome, C. 2010. Managing supplier sustainability risks in a dynamically changing environment – sustainable supplier management in the chemical industry. Journal of Purchasing and Supply Management, 16(2): 118-130.

Gavronski, I., Klassen, R.D., Vachon, S., Machado do Nascimento, L.P. 2011. A resource-based view of green supply management. Transportation Research Part E, 47:872-885.

Gimenez, C., Sierra, V. 2013. Sustainable supply chains: governance mechanisms to greening suppliers. Journal of Business Ethics, 116(1): 189-203.

Gimenez, C., Sierra, V., Rodon, J. 2012. Sustainable operations: their impact on the triple bottom line. International Journal of Production Economics, 140: 149-159.

Gold, S., Seuring, S., Beske, P. 2010. Sustainable Supply Chain Management and Inter-Organizational Resources: A Literature Review. Corporate Social Responsibility and Environmental Management, 17: 230-245.

Godfrey, R. 1998. Ethical purchasing: developing the supply chain beyond the environment. In T. Russel (Ed.), Greener Purchasing: Opportunities and Innovations: 244-253. Greenleaf Publishing: Sheffield.

Golini, R., Longoni, A., Cagliano, R. 2014. Developing sustainability in global manufacturing networks: the role site competence on sustainability performance. International Journal of Production Economics, 147: 448-459.

Green, K.W., Zelbst, P.J., Bhadauria V.S., Meacham J. 2012. Do Environmental Collaboration and Monitoring Enhance Organizational Performance? Industrial Management & Data Systems, 112(2): 186-205.

Gualandris, J. and Kalschmidt, M. (2013). "Sustainability: the key role of trust and suppliers', in 20th EurOMA Conference proceedings, eds. Coughlan P. and Fynes B., Dublin.

Gualandris, J., Kalchschmidt, M. 2014. Customer pressure and innovativeness: Their role in sustainable supply chain management. Journal of Purchasing & Supply Management, 20:92-103.

Gualandris, J., Golini, R., Kalchschmidt, M. 2014. Do supply management and global sourcing matter for firm sustainability performance?: An international study. Supply Chain Management: An International Journal, 19(3): 258-274.

Hahn, C.K., Watts, C.A., Kim, K.Y. 1990. The supplier development program: a conceptual model. International Journal of Purchasing and Materials Management, 26(2): 2-7.

Hart, S.L. 1995. A natural-resource-based view of the firm. Academy of Management Review, 20(4): 986-1014.

Hartmann, J., Moeller, S. 2014. Chain liability in multitier supply chains? Responsibility attributions for unsustainable supplier behavior. Journal of Operations Management, 32: 281-294.

Handfield, R.B., Stroufe, R.,Walton, S. 2005. Integrating environmental management and supply chain strategies. Business Strategy and the Environment, 14: 1-19.

Hollos, D., Blome, C., Foerstl, K. 2012. Does sustainable supplier cooperation affect performance? Examining implications for the triple bottom line. International Journal of Production Research, 50(11): 2968-2986.

Huq, F.A., Stevenson, M., Zorzini, M., 2014. Social sustainability in developing country suppliers: An exploratory study in the ready made garments industry of Bangladesh. International Journal of Operations & Production Management 34, 610-638.

ILO (2014) http://www.ilo.org/global/topics/working-conditions/lang--en/index.htm

Jamison, L., Murdoch, H. 2004. Taking the temperature: ethical issues in the supply chain. London: Institute of Business Ethics.

Jiang, B. 2009a. The effects of interorganizational governance on supplier's compliance with SCC: an empirical examination of compliant and non-compliant suppliers. Journal of Operations Management, 27(4): 267-80.

Jiang, B., 2009b. Implementing supplier codes of conduct in global supply chains: process explanations from theoretic and empirical perspectives. Journal of Business Ethics, 85(1): 77-92.

Klassen, R.D. 2001. Plant level environmental management orientation: the influence of management views and plant characteristics. Production and Operations Management, 10(3): 257-275.

Klassen, R.D., Vachon, S. 2003. Collaboration and evaluation in the supply chain: the impact on plant-level environmental investment. Production and Operations Management, 12(3): 336-352.

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.

Kleindorfer, P.R., Singhal, K., van Wassenhove, L. 2005. Sustainable Operations Management. Production and Operations Management, 14(4): 482-492.

Koplin, J., Seuring, S., Mesterharm, M. 2007. Incorporating sustainability into supply management in the automotive industry – the case of Volkswagen AG. Journal of Cleaner Production, 15: 1053-1062.

Krause, D., Scannell, T., Calantone, R. 2000. A structural analysis of the effectiveness of buying firms' strategies to improve supplier performance. Decision Sciences, 31(1): 33-55.

Krause, D., Vachon, S., Klassen, R. 2009. Special topic forum on sustainable supply chain management: introduction and reflections on the role of purchasing management. Journal of Supply Chain Management, 45(4): 18-25.

Kumar, N., Stern, L.W., Anderson, J.A. 1993. Conducting inter-organizational research using key informants. Academy of Management Journal, 36(6): 1633-1651.

Large, R.O., Gimenez, C. 2011. Drivers of green supply management performance: evidence from Germany. Journal of Purchasing and Supply Management, 17(3): 176-184.

Lee, S., Klassen, R.D. 2008. Drivers and enablers that foster environmental management capabilities in small- and medium sized suppliers in supply chains. Production and Operations Management, 17(6): 573-586.

Leppelt, T., Foerstl, K., Reuter, C., Hartmann, E. 2013. Sustainability management beyond organizational boundaries – sustainable supplier relationship management in the chemical industry. Journal of Cleaner Production, 56(1): 94-102.

Lindell, M.K., Whitney, D.J. 2001. Accounting for common method variance in cross-sectional research designs. Journal of Applied Psychology, 86(1): 114-121.

Maholtra, M.K., Singhal, C., Shang, G., Ployhart, R.E. 2014. A critical evaluation of alternative methods and paradigms for conducting mediation analysis in operations management research. Journal of Operations Management, 32: 127-137.

Martin de Castro, G., Navas-Lopez, J.E., López-Sáez, P. 2006. Business and social reputation: exploring the concept and main dimension of corporate reputation. Journal of Business Ethics, 63: 361-370.

Maxwell, D., Sheate, W., van der Vorst, R. 2006. Functional and systems aspects of the sustainable product and service development approach for industry. Journal of Cleaner Production, 14(17): 1466-1479.

McKenzie, S. 2004. Social sustainability: towards some definitions. Hawke Research Institute, University of South Australia, Magill.

Min, H., Galle, W.P. 1997. Green purchasing strategies: trends and implications. International Journal of Purchasing and Materials Management, 33(3): 10-17.

Morgan, N. A., Kaleka, A., Gooner, R.A., 2007. Focal supplier opportunism in supermarket retailer category management. Journal of Operations Management, 25: 512-527.

Nunnally, J.C. 1978. Psychometric theory. New York: McGraw-Hill.

Pagell, M., Gobeli, D. 2009. How plant managers' experiences and attitudes toward sustainability relate to operational performance. Production and Operations Management, 18(3): 278-299.

Pagell, M., Krumwiede, D., Sheu, C., 2007. Efficacy of environmental and supplier relationship investments—moderating effects of external environment. International Journal of Production Research, 45: 2005-2028.

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

Parmigiani, A., Klassen, R.D., Russo, M.V. 2011. Efficiency meeting accountability: performance implications of supply chain configuration, control, and capabilities. Journal of Operations Management, 29(3): 212-223.

Peng, D.X., Lai F. 2012. Using partial least squares in operations management research: A practical guideline and summary of past research. Journal of Operations Management, 30: 467-480.

Podsakoff, P.M., MacKenzie, S.B., Lee, J.Y., Podsakoff, N.P. 2003. Common method biases in behavioural research: A critical review of the literature and recommended remedies. Journal of Applied Psychology, 88(5): 879-903.

Pullman, M., Maloni, M., Carter, C. 2009. Food for Thought: Motivations to Adopt Sustainability Practices and Perceived Outcomes. Journal of Supply Chain Management, 45(4): 38-54.

Prahinski, C., Benton W.C. 2004. Supplier evaluations: communication strategies to improve supplier performance. Journal of Operations Management, 22(1): 39-62.

Rao, P. 2002. Greening the supply chain: a new initiative in South East Asia. International Journal of Operations and Production Management, 22(6): 632-655.

Rao, P., Holt, D. 2005. Do green supply chains lead to competitiveness and economic performance? International Journal of Operations & Production Management, 25(9): 898-916.

Rungtusanatham, M., Miller, J.W., Boyer, K.K. 2014. Theorizing, testing, and concluding for mediation in SCM research: tutorial and procedural recommendations. Journal of Operations Management, 32: 99-113.

Seuring, S., Muller, M. 2008. From a literature review to a conceptual framework for sustainable supply chain management. Journal of Cleaner Production, 16(15): 1699-1710.

Seuring, S., Gold, S. 2013. Sustainability management beyond corporate boundaries: from stakeholders to performance. Journal of Cleaner Production, 56: 1-6.

Simpson, D., Power, D. 2005. Use the supply relationship to develop lean and green suppliers. Supply Chain Management: An International Journal, 10(1): 60-68.

Spence, L., Bourlakis, M. 2009. The evolution from corporate social responsibility to supply chain responsibility: the case of Waitrose. Supply Chain Management: An International Journal, 14(4): 291-302.

The Telegraph, 2012. Mass suicide protest at Apple manufacturer Foxconn factory. Available at: http://www.telegraph.co.uk/news/worldnews/asia/china/9006988/Mass-suicide-protest-at-Apple-manufacturer-Foxconn-factory.html

Theyel, G. 2001. Customer and supplier relations for environmental performance. Greener Management International, 35(3): 61-69.

Touboulic, A., Chicksand, D., Walker, H., 2014. Managing Imbalanced Supply Chain Relationships for Sustainability: A Power Perspective. Decision Sciences 45: 577-619.

Vachon, S. 2007. Green supply chain practices and the selection of environmental technologies. International Journal of Production Research, 45(18/19): 4357-4379.

Vachon, S., Klassen, R.D. 2006. Extending green practices across the supply chain: the impact of upstream and downstream integration. International Journal of Operations and Production Management, 26: 795-821.

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.

Walton, S.V., Handfield, R.B., Melnyk, S.A. 1998. The green supply chain: integrating suppliers into environmental management processes. International Journal of Purchasing and Materials Management, 34(2): 2-11.

Wiengarten, F., Pagell, M., Fynes B. 2012. Supply chain environmental investments in dynamic industries: comparing investment and performance differences with static industries. International Journal of Production Economics, 135: 541-551.

Williamson, O.E. 1975. Markets and hierarchies: analysis and antitrust implications. New York: Free Press.

Williamson, O.E. 1981. The Economic of Organization: The Transaction Cost Approach. American Journal of Sociology, 87(3): 548-577.

Williamson, O.E. 1991. Strategizing, economizing, and economic organization. Strategic Management Journal, 12: 75-94.

Zhu, Q., Sarkis, J. 2004. Relationships between operational programs and performance among early adopters of green supply chain management programs in Chinese manufacturing enterprises. Journal of Operations Management, 22(3): 265-289.

Zhu, Q., Sarkis, J. 2007. The moderating effects of institutional pressures on emergent green supply chain practices and performance. International Journal of Production Research, 45(18): 4333-4355.

Zhu, Q., Sarkis, J., Lai, K. 2012. Examining the effects of green supply chain management practices and their mediations on performance improvements. International Journal of Production Research, 50: 1377-1394.

Zhu, Q., Sarkis, J., Lai, K. 2013. Institutional-based antecedents and performance outcomes of internal and external green supply chain management practices. Journal of Purchasing & Supply Management, 19:106-117.

Zhu, Q., Sarkis, J., Lai, K., Geng, Y. 2008. The role of organizational size in the adoption of green supply chain management practices in China. Corporate Social Responsibility and Environmental Management, 15: 322-337.

Zukin, C., Szeltner, M. 2012. Talent Report: what workers want in 2012. Net Impact. Online access: www.netimpact.org/whatworkerswant

Appendix A. Measures

Construct	No.	Phrase	Sources
Please indicate the use of the following practices with a social focus with your key supplier in the last two years:			
Assessment	Ass1	We assess our suppliers' performance through formal evaluation, using established guidelines and procedures	Adapted from Krause et al. (2000), Large and Gimenez (2011)
	Ass2	We provide suppliers with feedback about the results of their evaluation	
	Ass3	We perform audits for suppliers' internal management system	
Collaboration	Coll1	We visit our suppliers' facilities to help them improve their performance	Adapted from Krause et al. (2000), Vachon and Klassen (2008)
	Coll2	We provide training/education to these suppliers' personnel	
	Coll3	We make joint efforts with these suppliers to improve results	
Please indicate the improvement on the following performance dimensions with respect to two years ago:			
BF's Social Performance	BFPerf1	We have social performance indicators	Adapted from Maxwell et al. (2006), de Giovanni (2012), Gimenez et al. (2012)
	BFPerf2	We have improved the social reputation of our company	
	BFPerf3	We have reduced the number of industrial accidents	
	BFPerf4	We have improved safety and labor conditions in our facilities	
Suppliers' Social Performance	SupPerf5	We have improved compliance with human rights in the suppliers' facilities	Adapted from Kleindorfer et al. (2005) and Awaysheh and Klassen (2010)
	SupPerf6	We have improved compliance with child labor employment in the suppliers' facilities	
	SupPerf7	We have improved safety and labor conditions in the suppliers' facilities	
CONTROL VARIABLES			
Please indicate the extent to which your company uses socially-responsible practices to manage the following issues:			
Internal Social Practices	Int1	Support to employees' social progress	Pullman et al. (2009), Longo et al. (2005)
	Int2	Work and life balance policies	

Appendix B. Mediating effects of collaboration

	Direct effect coefficients (β)			Indirect effect (mediation)	
	a	b	c'	ab	Sobel Test
Ass-> Coll. -> Suppliers' Soc. Perf	0.680 (0.001)[1]	0.300 (0.012)	0.091 (0.440)	0.197	2.41 (0.016)

(1) p-value

CHAPTER 5[3]

Does implementing social supplier development practices pay off?

This chapter investigates the impact of social supplier development practices on the suppliers' social performance and analyzes if the implementation of supplier development practices by Western buying firms pays off in terms of operational and economic outcomes

[3] This paper is accepted for publication in Supply Chain Management: An International Journal
Sancha, C., Gimenez, C., Sierra, V., Kazeminia, A. 2015. Does implementing social supplier development practices pay off? *Supply Chain Management: an International Journal*, Vol. 20, Issue 4. DOI: http://dx.doi.org/10.1108/SCM-07-2014-0239

5.1. STRUCTURED ABSTRACT

Purpose: The objective of this paper is twofold. First, to investigate the impact of social supplier development practices on the suppliers' social performance. Second, to analyze if the implementation of supplier development practices by Western buying firms pays off in terms of operational and economic results.

Design/methodology/approach: Our hypotheses are tested in a sample of 120 Spanish manufacturing firms using Path Analysis.

Findings: The results suggest that while supplier development practices help to improve the suppliers' social performance and the buying firm's operational performance, they do not pay off in terms of economic performance.

Research limitations/implications: The paper shows that supplier development practices help to improve the suppliers' social performance while improving the operational performance of the buying firm. The study has two main limitations. First, we use cross-sectional data and therefore we are not able to account for possible recursive relationships. Second, our study is limited to the Spanish scope and as such results need to be interpreted in that context.

Practical implications: We believe the results of our study provide insights to managers with respect to the implementation of supplier development practices to make their suppliers more socially responsible. We also show managers the implications of implementing such practices in terms of operational and economic outcomes.

Originality/value: This paper contributes to the existing literature on the effectiveness of sustainable supplier development practices by including the suppliers' performance, which has been generally neglected. We also include objective measures for economic performance.

Keywords: social supplier development practices, suppliers' performance, buying firm's performance

5.2. INTRODUCTION

Nowadays, supply chains are becoming more and more global. One example of this trend is that firms buy from suppliers located all over the world. In this context, it is important to highlight the key role that the suppliers' performance plays on the long-term success of buying firms (Carter, 2005; Krause et al., 2000). For example, the quality level of the products served by suppliers as well as the on-time delivery of these products impact the operational performance of the buying firm. This key role of suppliers can also be translated to the sustainability arena. The increasing level of outsourcing to developing countries has emphasized the focus on sustainability (Andersen and Skjoett-Larsen, 2009). The concept of sustainability has been traditionally operationalized using the concept of the Triple Bottom Line (TBL), which encompasses the combination of economic, environmental, and social performances and relieves the key role of social and environmental aspects besides economical ones (Elkington, 1998).

In the context of Supply Chain Management (SCM), when a firm aims to achieve sustainability it is necessary that it extends it to all the members in their supply chain. In this paper, we will specifically focus on the extension of sustainability to suppliers and analyze the role played by the suppliers' sustainability performance on the success of the buying firm in terms of operational and economic outcomes.

Suppliers' poor environmental performance can damage the buying firm's performance (Faruk et al., 2002). For example, in 2007 Mattel had to recall nearly 1 million toys due to its contract manufacturer using lead paint in their products (The New York Times, 2007). This caused Mattel not only an increase in their operational costs, (i.e., products had to be recalled before they reached the stores) but it also damaged its reputation, leading to a potential decrease on sales. Recently, Bangladesh faced one of the worst

industrial accidents in modern human history in which more than 2500 people were injured and 1000 killed. The factory collapsed due to its dilapidated conditions (The New York Times, 2013). At the same time, these poor conditions damaged the reputation of some apparel companies such as Gap, Primark and Benetton, who were sourcing from this factory. These real-life examples illustrate how the suppliers' sustainability performance (i.e., environmental and social performance) impacts buying firms' performance. That is, suppliers' poor sustainability performance seems not only to impact buying firms' reputation and hence sales but it could also create disruptions in their supply chains damaging their operational performance. In that sense, it is necessary that buying firms make an effort to extend sustainability to suppliers with the aim of improving suppliers' sustainability performance since it appears to have an impact on their own performance.

To improve the suppliers' sustainability performance firms need to manage their supply chains (Andersen and Skjoett-Larsen, 2009; Beske and Seuring, 2014; Schaltegger and Burritt, 2014). To do so, they can rely on the use of supplier development practices such as: supplier assessment and collaboration with suppliers (Gualandris and Kalchschmidt, 2014; Gualandris et al., 2014; Klassen and Vachon, 2003; Vachon and Klassen, 2006). Up until now, studies focusing on sustainable supplier development have been lacking (Akamp and Muller, 2013). Furthermore, the scarce literature that has looked at sustainable supplier development practices has mainly focused on the environmental dimension of sustainability (e.g. Ehrgott et al. 2013; Klassen and Vachon, 2003; Yu et al., 2014) while literature that has investigated the role of these practices adopting a social focus is scarce (Gimenez and Tachizawa, 2012; Hoejmose and Adrien-Kirby, 2012; Moxham and Kauppi; 2014; Seuring and Muller, 2008).

In this research, we will focus on the social dimension, as the study of social sustainability has become a necessity in the SCM field since companies need to operate "in a responsible manner and take care of employees' health and safety" (Kleindorfer, et al., 2005). More specifically, we will follow Pagell and Gobelli's (2009) approach and understand the social dimension of sustainability as the firm's responsibility to protect employees' working conditions. In our paper, we will focus on the employees' working conditions in the suppliers' premises and their impact on the buying firm's performance. There is a variety of problematic issues for the buying firm that can appear in the suppliers' premises such as the use of child labor or the existence of poor health and safety measures that can result in labor accidents (e.g., Awaysheh and Klassen, 2010: Klassen and Vereecke, 2012). Our objective in this paper is to analyze the impact that the suppliers' social performance has on the buying firm's performance, and to investigate how the suppliers' social performance can be improved by the implementation of social supplier development practices.

As we have already mentioned, there is limited literature that has considered social supplier development practices (e.g., Akamp and Muller, 2013; Gallear et al., 2012; Gimenez et al., 2012; Hollos et al, 2012). This scarce literature has mainly analyzed the impact that social supplier development practices have on the buying firm's economic and/or operational performance. However, this impact is not clear and mixed results have been found. While some papers have found that social supplier development practices lead to improvements on buying firm's performance (e.g., Akamp and Müller, 2013; Gimenez et al., 2012; Klassen and Vereecke, 2012) others have found no such support (e.g., Gallear et al., 2012; Hollos et al., 2012). We believe these contradictory results could be due to the following issues: (1) they have neglected the role of the supplier's social performance improvement achieved with the implementation of social

supplier development practices and/or (2) they have used different operationalization of the operational and economic performance constructs (being the economic construct mostly measured with subjective data). In order to shed light on this existing debate, the aim of this paper is to include the impact of social supplier development practices on the suppliers' social performance. We will also try to shed some light regarding the impact of these practices on the buying firm's operational and economic results. Thus, we address the following research questions:

(1) Do social supplier development practices lead to an improvement in suppliers' social performance?

(2) Does it pay off in terms of operational and economic outcomes for the buying firm to implement social supplier development practices? (i.e. what are the effects of social supplier development practices on buying firms' operational and economic performance?)

By answering these questions we aim to make the following contributions: to extend the limited studies that have analyzed the impact of social supplier development practices on performance; to have a better understanding of the implementation of these practices by studying their impact on the suppliers' performance; and to include objective indicators to measure the impact of these practices on the economic dimension of performance. Apart from these contributions to research, we aim to provide managers with some recommendations that will help them in their effort to make their supply chains more socially responsible while achieving operational and economic improvements.

The paper is organized as follows: In the following sections, we present the related literature and our research hypotheses. Next, we describe the research methodology used in our study as well as data analysis. Then, we discuss the results. The paper

finalizes with a conclusion section in which limitations and future lines of research are suggested.

5.3. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

5.3.1. SOCIAL SUPPLIER DEVELOPMENT AND PERFORMANCE

Several problematic issues related to social aspects can arise at the supplier's premises: unsafe and harsh working conditions and employees' safety, use of child labor, human rights abuses, low and unfair wages, unfair work/life balance policies, sanitation and housing, and use of dangerous and poisonous materials (e.g., Klassen and Vereecke, 2012; Pagell and Gobeli, 2009; Pullman et al, 2009; Vachon and Mao, 2008).

To reduce these problematic issues and improve the suppliers' social performance, buying firms implement supplier development practices. Supplier development is defined as "any activity undertaken by a buying firm to improve either the supplier performance, supplier capabilities, or both" (Krause et al., 2000, p. 34). These practices comprise the assessment of suppliers, the provision of training and/or incentives to suppliers, the promotion of competition among them and the direct work with suppliers (e.g., training suppliers' personnel). In the sustainable supply chain literature, the concept of supplier development has mainly included supplier assessment and collaboration with suppliers (Gualandris and Kalchschmidt, 2014; Gualandris et al., 2014; Klassen and Vachon, 2003; Vachon and Klassen, 2006). In this paper, we have defined supplier development as those practices related to evaluations of suppliers' social performance in the form of questionnaires and audits, visits to the suppliers' premises, training in terms of social issues and the development of joint efforts between the buying firm and the supplier.

To the best of our knowledge, the impact of social supplier development practices on firms' performance has been scantily studied in the literature (e.g., Akamp and Muller, 2013; Gallear et al. 2012; Gimenez et al. 2012; Hollos et al., 2012; Klassen and Vereecke, 2012). Akamp and Müller (2013) in their study about the implementation of supplier management practices, found support for the supplier development and suppliers' operational performance relationship. Similarly, Hollos et al. (2012) studied how supplier cooperation impacts the buying firm's operational and economic outcomes. However, contrary to the results of Akamp and Muller (2013) they found that the buying firm's effort to induce socially responsible behavior in the supplier premises do not help the buying firm to reduce costs or improve its operational performance. Gallear et al. (2012) studied how firm's internal awareness on sustainability issues, the monitoring of the firm's sustainability performance and the sharing of best practices with suppliers affect the firm's financial performance. Similar to Hollos et al. (2012) no support was found for the relationship between supplier development practices and economic performance improvements. Gimenez et al. (2012) analyzed the impact of internal and external social programs – with an environmental and social focus – on each dimension of the TBL (environmental, social and economic performances). For the external programs (i.e., supplier development practices) they found mixed results. While collaboration with suppliers improves the buying firm's economic performance, assessment does not. Finally, Klassen and Vereeke (2012) developed a framework based on case studies in which they explored the role of supplier development programs in achieving economic improvements. Their results suggest that joint efforts between buying firms and suppliers lead to improvements on economic performance.

From the abovementioned papers, the two following points need to be highlighted. First, the results found in the literature are mixed. While some papers have found that supplier

development practices on social issues lead to improvements on buying firm's performance (e.g., Akamp and Müller, 2013; Gimenez et al., 2012; Klassen and Vereecke, 2012) others have found no such support (e.g., Gallear et al., 2012; Hollos et al., 2012). These contradictory results can be due to (1) different operationalization of the operational and economic performance constructs and (2) the fact that the suppliers' social performance has been neglected. Regarding the operationalization of the constructs, in our model we will include both performance dimensions (i.e., operational and economic). For the operational one we will consider traditional operational measures such as quality, delivery and costs as done by Akamp and Muller (2013) and Hollos et al. (2012). In the case of economic performance, we will follow Gallear et al. (2012) and include objective economic measures.

The existence of mixed results can also be explained by the fact that none of these papers, with the exception of Akamp and Muller (2013), have considered the role of suppliers in their models. That is, how suppliers are affected by the implementation of supplier development practices. We believe that supplier's performance mediates the relationship between supplier development practices and buying firm's performance. In other words, the buying firm's performance will only improve once the supplier development practices have resulted in real improvements for the supplier. As stated by Bai and Sarkis (2014), suppliers' sustainability performance is key in the management of the buying firm's competitiveness.

In this sense, in this paper we aim to consider the following issues: (1) the impact of social supplier development practices on suppliers' social performance, and (2) how this affects the buying firm's operational and economic performance.

5.3.2. HYPOTHESES DEVELOPMENT

To develop our hypotheses we will adopt the lenses of the relational view, which has been used in the supplier development and sustainable SCM literatures (e.g., Cao and Zhang, 2011; Carter and Rogers, 2008; Simpson and Power, 2005). The relational view considers networks and dyads of firms (i.e.: buyer-supplier relationships) to explain relational rents (Dyer and Singh, 1998). A relational rent is defined as "a supernormal profit jointly generated in an exchange relationship that cannot be generated by either firm in isolation and can only be created through the joint idiosyncratic contributions of the specific alliance partners" (Dyer and Singh, 1998, p. 662). Relational rents are then a result of collaborative activities (i.e.: supplier development programs) in which partners exchange valuable knowledge and capabilities through relation-specific investments, inter-firm knowledge-sharing routines, complementary resource endowment, and effective governance mechanisms (Cao and Zhang, 2011). A significant idea in the relational view is the fact that by collaborating, firms generate common benefits that collaborative partners cannot generate independently. In our paper, we will consider that the exchange relationship takes place when the buying firm implements the supplier development program with the supplier. In this way, the relational rents will be the result of the valuable knowledge shared by the buying firm through the offering of training activities to the suppliers' personnel, the visits to the suppliers' premises and the monitoring of the suppliers' performance.

In the sustainable SCM literature, different studies (most of them with an environmental focus) show the positive impact that supplier development programs have on the suppliers' performance. Foerstl et al. (2010) show that the implementation of supplier development practices by a buying firm helps to diminish the suppliers' use of un-environmental practices improving their environmental performance. Similarly, Lee and

Klassen (2008) claim that activities such as suppliers' evaluations and/or providing training to suppliers' personnel result in better suppliers' environmental management capabilities and support their better environmental performance. As suggested by Lippmann (1999), to improve the supplier's environmental performance it is advisable that the buying firm organizes workshops and provides technical assistance on this dimension. In that sense, according to the relational view, the buying firm is an external source of resources and valuable knowledge for the supplier that will result in increased rents in the form of increased performance.

In the case of social issues, to the best of our knowledge, there is no paper that has empirically shown the relationship between social supplier development practices and the suppliers' social performance. However, based on the relational view and the abovementioned empirical evidence, it is expected that evaluating suppliers, training the supplier's personnel and working together with the supplier with respect to social issues will lead to improvements in their social performance. For instance, the evaluation of the suppliers' social performance by the buying firm can be an effective mechanism to pressure suppliers so that they start considering social issues in their own supply chain. In addition, the knowledge generated as a result of the buying firm's training to suppliers' personnel will result in better working conditions at the suppliers' premises and a reduction of the number of accidents. Accordingly, we hypothesize that:

> *Hypothesis 1. Social supplier development practices have a positive impact on the suppliers' social performance.*

Krause et al. (2000) in their definition of supplier development practices state that buying firms' motivation to implement these practices is twofold: (1) to improve the suppliers' performance and (2) to guarantee their own supply needs. In that sense, supplier development practices seem to have an impact not only on the suppliers'

performance but also on the buying firm's performance. In the literature, different authors have studied the impact of sustainable supplier development practices on the buying firm's economic and operational performance dimensions with mixed results. For instance, Gimenez et al. (2012) show that the implementation of environmental supplier development programs lead to better economic results for the buying firm. Similarly, Klassen and Vereecke (2012) in what they call "development link" explain that collaborative activities on social issues between buyer and supplier lead to better economic results in the form of market expansion and cost reduction. On the contrary, Gallear et al. (2012) and Hollos et al. (2012) found no support for the relationship between sustainable supplier development practices and the buying firm's performance. Despite of these mixed results, based on the relational view we will hypothesize a positive relationship between social supplier development practices and buying firm's performance. The relational view suggests that the result of the joint work between two partners (buyer and supplier) results in common benefits. This implies that by working together on improving social sustainability, not only the suppliers' performance will improve but also the buying firm's performance.

Social supplier development practices contribute to improve quality, cost, and delivery because buying firm's employees are more motivated since they believe they are working on a more socially responsible firm. In addition, supplier development practices contribute to improve the buying firm's economic performance through increasing sales, since consumers may be willing to purchase goods that come from a more socially responsible firm (Andersen and Skjoett.Larsen, 2009; Carter and Jennings, 2004; Geffen and Rothenberg, 2000; Guoyou et al., 2013). This improvement in economic performance could also come from a reduction in cost. In a more socially-oriented firm, employees are more motivated (Zukin and Szeltner, 2012) and therefore

the cost of absenteeism could be reduced and productivity increased. Therefore, based on the relational view and on the empirical evidence provided by Gimenez et al. (2012) and Klassen and Vereecke (2012), we hypothesize that:

> *Hypothesis 2. Social supplier development practices have a positive impact on the buying firm's operational performance.*
>
> *Hypothesis 3. Social supplier development practices have a positive impact on the buying firm's economic performance.*

Suppliers' performance has been described in the literature as playing a relevant role on the long-term success of buying firms since it could impact its competitive dimensions (Krause et al., 2000, Tracey et al., 2005). This is also true in the case of the social dimension of sustainability. In fact, suppliers' improved social performance can contribute to both the buying firm's economic and operational performances in the following ways.

The supplier's improved social performance can contribute to the competitive advantage of the whole supply chain and result in higher market share and reduced costs (Klassen and Vereecke, 2012; Rao and Holt, 2005). The fact that the buying firm employs suppliers that are socially oriented (i.e., have a higher social performance) results in a better social reputation and hence attracts socially conscious consumers (i.e., increasing sales). Furthermore, the improvement of the working conditions in the suppliers' premises results in a reduction of accidents and suggests fewer disruptions in the supply process and less delays in product delivery, improving the operational performance of the buying firm (Freire and Alarcon, 2002; Yuan and Woodman, 2010). Moreover, if the working conditions of the suppliers' employees are improved, the quality of the supplied product can increase due to an enhancement of employees' motivation (Pagell et al., 2010). Based on the abovementioned arguments, we believe that improvements in

the suppliers' social performance will result in an enhanced economic and operational performance for the buying firm. Accordingly, we hypothesize that:

> *Hypothesis 4. Suppliers' social performance has a positive impact on the buying firm's operational performance.*
>
> *Hypothesis 5. Suppliers' social performance has a positive impact on the buying firm's economic performance.*

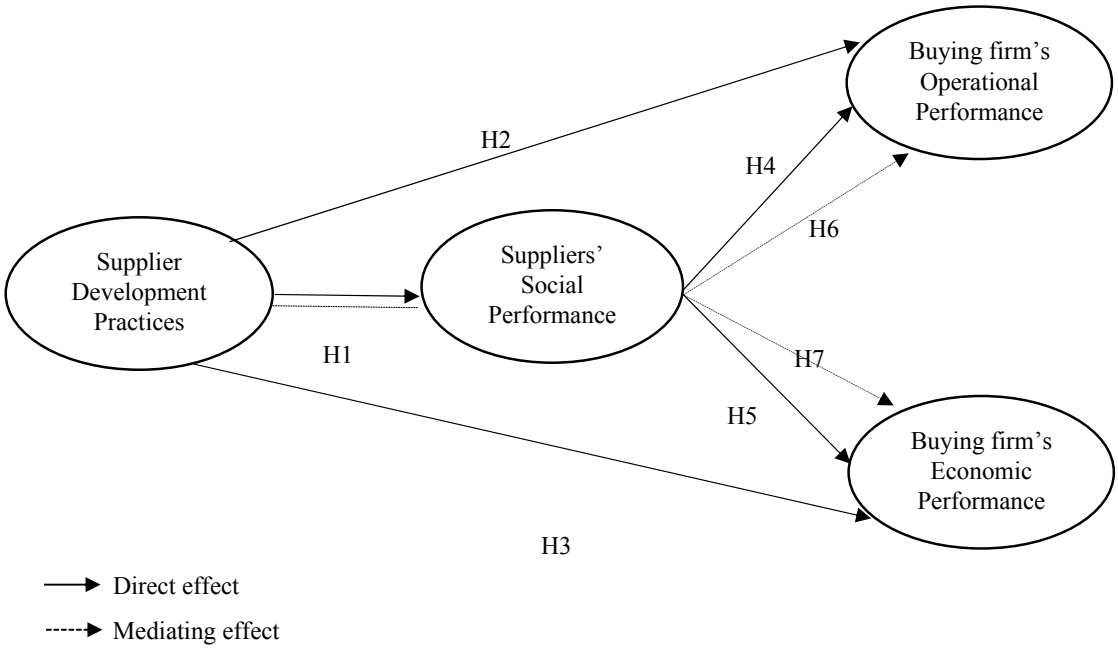
In summary, we have hypothesized the following effects. Based on the relational view and on empirical evidence, we have posited a direct and positive effect between social supplier development programs and the suppliers' social performance (Hypothesis 1). In the same line and based on the same theoretical framework, we have also hypothesized a direct and positive effect between these programs and the buying firm's operational and economic performances (Hypotheses 2 and 3 respectively). We also believe that the suppliers' social performance has a positive impact on the buying firm's performance (i.e., operational and economic) (Hypotheses 4 and 5). The combination of the abovementioned hypotheses results in a mediated model. This means that an indirect effect between supplier development programs and both buying firm's performances through suppliers' social performance (i.e., mediating variable) may exist. In other words, we expect that the supplier's social performance mediates the relationship between supplier development programs and the buying firm's operational and economic performances. This mediating effect could be explained as follows: once the supplier has achieved a better social performance due to the implementation of supplier development practices, the buying firm's economic and operational performances will increase. It is important to mention that hypotheses 2 and 3 (direct effect between supplier development practices and buying firm's performances) suggest that suppliers'

social performance may function as a partial mediator rather than a full mediator (Baron and Kenny, 1986). This reasoning leads to the two following hypotheses:

> *Hypothesis 6. Suppliers' social performance partially mediates the relationship between social supplier development practices and the buying firm's operational performance.*
>
> *Hypothesis 7. Suppliers' social performance partially mediates the relationship between social supplier development practices and the buying firm's economic performance.*

Figure 1 describes the hypothesized relationships.

Figure 1. Conceptual Model



5.4. METHODOLOGY

5.4.1. QUESTIONNAIRE DEVELOPMENT

To test our model we first developed a questionnaire based on the literature review. To check the understanding and the clarity of the questions we carried out a pre-test with academics, which resulted in minor changes in the wording of some items. The

constructs used in this study are the following: *Social Supplier Development Practices* which refers to the evaluation of suppliers' social performance as well as to practices that entail a more direct involvement of the buying firm with the supplier, *Suppliers' Social Performance* which refers to the working conditions, human rights compliance and use of child labor in the suppliers' premises, *Buying Firm's Operational Performance,* which considers dimensions such as quality, delivery and cost, and *Buying Firm's Economic Performance* which includes objective data on profit and sales (See Appendix A for the specific items used and their sources).

The first three constructs (i.e., *Supplier Development Practices, Suppliers' Social Performance* and *Buying Firm's Operational Performance*) have been adapted from available studies in the literature and all used a seven-point Likert scale where higher values indicated higher level of adoption or better performance. We measured the fourth construct (i.e., *Buying Firm's Economic Performance)* via two commonly used objective indicators: sales and profit (Gallear et al., 2012). The data of these two variables was obtained from SABI Bureau Van Dijk Database. Following Peng and Lai (2012) suggestions, we have considered both the *Buying Firm's Operational* and *Economic Performance* as formative constructs. In formative constructs the direction of causality is from the indicators to the construct. In the case of a firm's operational performance, the construct is defined by its costs, quality, and flexibility performances, not the opposite way (Jarvis et al., 2003). In fact, the different dimensions that form the constructs are not expected to change in the same direction and the same magnitude (Peng and Lai, 2012). This is also clear in the case of economic performance; an increase on sales does not necessarily imply an increase on total benefits. Additionally, the items that form each of the constructs are not interchangeable with other items in the construct. For example, cost performance cannot be changed by quality or delivery

performance (Peng and Lai, 2012). All these points suggest that both the *Buying Firm's Economic and Operational Performance* are formative constructs in which the combination of the considered items define the concept by postulation. This is not the case for *Supplier Development Practices* and *Suppliers' Social Performance,* which have been designed as reflective constructs. The interchangeability of their items as well as the high-expected covariation among them suggest their reflective nature (Jarvis et al., 2003; Peter et al. 2007). For instance, in the case of *Suppliers' Social Performance*, item SuppSoc1 is expected to highly covariate with item SuppSoc2, since a violation on the compliance with the use of child labor (SuppSoc2) would imply no compliance with human rights (SuppSoc1). Regarding interchangeability, items Ext1 and Ext3 from *Supplier Development Practices* provide a good example. In addition, the elimination of any of the included items in the *Suppliers' Social Performance* and *Supplier Development Practices* will not change the meaning of the underlying latent variables. For instance, if items Ext1 and/or SuppSoc2 are eliminated, the remaining items will be still referring to *Supplier Development Practices* and *Suppliers' Social Performance* respectively.

5.4.2. SAMPLE AND DATA COLLECTION

To test our model, we decided to ask buying firms about the supplier development practices they were using, the social performance of their most critical supplier, and their (buying firm's) operational performance. This way, Spanish buying firms answered about their perceptions on: (1) the level of implementation of supplier development practices with their most critical supplier; (2) their (buying firm's) operational performance; (3) the social performance of their most critical supplier in terms of sustainability. The starting population in this study was made up of Spanish

manufacturing companies that had at least 50 employees in the following sectors: textile (NACE codes 13-15), wood and wood products (16), paper and paper products (17), printing (18), chemical (20), pharmaceutical (21), and electronics (26 – 27). We used SABI Bureau Van Dijk Database to extract this information. This database contains information of more than 2 million Spanish firms. We also extracted from this database the economic performance measures of the firms comprising our sample (i.e. profit and sales). SABI Bureau Van Dijk Database contains financial and economic information extracted from the firm's P&L accounts. Data collection took place during March-June 2011. The original sample was made up of 580 firms. To increase response rate a phone call was made to all 580 firms to ask for participation in this study; however 204 declined to participate. We conducted the survey using the telephone but gave firms the opportunity to answer the questionnaire by other means (mail/e-mail). Finally, 99 answered the questionnaire by phone and 21 by e-mail. In total, we obtained 120 responses, representing a response rate of 20.69%. Table 1 shows the descriptive of the sample. All buying firms were Spanish. However, the location of their most critical supplier in terms of sustainability varied across the final sample. Please see Table 2 for a summary on the location of suppliers.

To minimize key-informant bias we contacted each firm by phone and identified the most suitable respondent with respect to sustainability issues in the supply chain (Kumar et al., 1993). As firms did not have a common position that dealt with these issues there is high diversity in terms of the position held by respondents (See Table 1).

In addition, the use of different data collection methods (i.e., phone and e-mail) may pose a threat to the validity of our results. To check for possible differences with respect to the data collection method we randomly selected a subsample of 20 responses from each group and performed parametric and non-parametric tests. Results suggest that

there are no significant differences between those participants that answered by phone and those that did it by e-mail. Finally, non-response bias may also be a threat to the study. We performed non-response bias tests comparing the demographic data of respondents and non-respondents and found no statistically significant differences in the responses of the two groups.

Table 1. Descriptives of the sample

Position	n	%
Health and Safety Dtor. or Manager	7	5.83%
Environmental Dtor. or Manager	14	11.67%
Health, Safety &Env. Dtor. or Manager	13	10.83%
Quality and Environmental Dtor. or Manager	23	19.17%
Quality, Health, Safety and Env. Dtor. or Manager	13	10.83%
Managing Dtor.	7	5.83%
Operations or Supply Chain Dtor. or Manager	8	6.67%
Quality Dtor. or Manager	8	6.67%
Human Resources Dtor. or Manager	16	13.33%
Other	11	9.17%
TOTAL	120	100%

Industry	**n**	**%**
Textile (NACE codes 13, 14 and 15)	12	10.00%
Wood and products of wood and cork, except furniture (NACE code 16)	11	9.20%
Paper and paper products (NACE code 17)	16	13.30%
Printing (NACE code 18)	6	5.00%
Chemical (NACE code 20)	25	20.80%
Pharmaceutical (NACE code 21)	15	12.50%
Electronics (NACE codes 26 and 27)	35	29.20%
TOTAL	120	100%

Number of employees	**n**	**%**
Less than 50	1	0.80%
Between 50 and 249	75	62.50%
Between 250 and 499	31	25.80%
More than 500	13	10.80%
TOTAL	120	100%

Position in the supply chain	**n**	**%**
End-consumer market	37	31%
Not end-consumer market	83	69%
TOTAL	120	100%

Table 2. Location of suppliers

Region	n
Africa	1
Asia	20
Europe	80
United States of America	6
South America	1
Missing	12
TOTAL	120

5.5. DATA ANALYSIS AND RESULTS

To determine simultaneously the effect of *Supplier Development Practices* and *Supplier Social Performance* on both the *Buying Firm's Operational* and *Economic Performances* we employed path modeling analysis using hierarchical multiple regression. A single multiple regression model can only specify one response variable at a time. However, path analysis estimates as many regression equations as are needed to relate all the proposed theoretical relationships among the variables in the explanation at the same time. That is, we performed a set of multiple regressions to estimate the presence of relationships in the hypothesized structural model. This is an iterative algorithm that separately estimates the beta coefficients for every hypothesized relationship using ordinary least squares (OLS) regression.

The evaluation of our model followed a two-step approach. In the first step we assessed the adequacy and quality of our measurement model, which specifies the relationships between indicators (i.e., observable variables) and latent constructs. In this evaluation, different measures for reflective and formative constructs were used. The second step includes the analysis of the structural model, which covers the estimation of direct and indirect path coefficients and test the strength of the hypothesized relationships between constructs.

5.5.1. MEASUREMENT ASSESSMENT

To assess the adequacy of the reflective scales (i.e., *Supplier Development Practices* and *Suppliers' Social Performance*) we analyzed convergent validity, discriminant validity and reliability. Convergent validity was checked both at the item and the construct level. As shown in Table 3, all items loadings are greater than the 0.70 suggested threshold level (Hulland, 1999). At the construct level, we checked that the average variance extracted (AVE) of each construct is greater than 0.50 (Chin, 1998; Fornell and Larcker, 1981). Table 3 shows that convergent validity is met at both levels (i.e., item and construct). Discriminant validity is fulfilled if the square root of the AVE of each construct is greater than all the inter-construct correlations (Chin, 1998; Fornell and Lacker, 1981). Table 3 provides support for this condition and shows sufficient discriminant validity. Finally, to check the reliability of reflective constructs we used the Cronbach alpha coefficient. All reflective constructs show values greater than the threshold value of 0.70 for Cronbach alpha (See Table 3) suggesting that they are all reliable.

Table 3. Assessment of reflective measurement model

Indicator	Mean	Std. Dev.	Stand. Loadings	Critical ratio	Lower bound (95%)	Upper bound (95%)	Cronbach Alpha	AVE	√AVE	Corr.
Supp. Dev. Practices							0.890	0.698	0.835	
sdp1	4.198	2.170	0.903	32.150	0.825	0.950				
sdp2	3.789	2.230	0.848	22.647	0.743	0.914				
sdp3	3.664	2.341	0.787	17.293	0.652	0.863				
sdp4	3.319	2.058	0.816	23.191	0.743	0.883				0.097
sdp5	3.626	2.236	0.819	19.320	0.702	0.896				
Supp' Soc Perform							0.939	0.897	0.947	
supperf1	3.319	2.096	0.956	75.439	0.930	0.979				
supperf2	3.528	2.421	0.951	42.607	0.880	0.973				
supperf3	3.191	2.025	0.937	71.306	0.912	0.961				

The measurement assessment for formative scales is different than for reflective scales. Neither convergent validity and discriminant validity nor reliability can be used to assess their quality since formative indicators do not have to be strongly interrelated (Diamontopoulos, 1999). To evaluate the quality of formative measurement models, Chin (1998) suggests checking the following criteria: (1) multicollinearity between indicators, (2) indicators' relative importance and (3) indicators' absolute importance. Regarding multicollinearity, high values indicate that the indicator's information is redundant. As shown in Table 4, all VIFs (Variance Inflation Factor) are lower than the boundary value of 5; therefore multicollinearity is not a problem. To check for the indicators' relative and absolute importance we looked at the indicators' outer weights and outer loadings, respectively. When an indicator's weight is significant, there is empirical support to retain it. In case it is not significant but the corresponding loading is relatively high (>.5), the indicator should also be retained. In the case of the *Buying Firm's Operational Performance*, although not all indicator's weight are significant (i.e., opperf2 and opperf3) all loadings are greater than 0.5. In the case of the *Buying Firm's Economic Performance,* there is one indicator (i.e., sales) that is non-significant and has a loading value of 0.410 (See Table 4). However, formative indicators should not be eliminated based on statistical outcomes. In this sense, we have decided to keep it since deleting it will change the construct under study (Chin, 1998).

Table 4. Assessment of formative measurement model

Indicator	Mean	Std. Dev.	VIF (max)	Stand. Loadings	Weight	Critical ratio	Lower bound (95%)	Upper bound (95%)
BF's Operational Performance			1.748					
opperf1	5.692	1.094		0.779	0.543	3.324	0.200	0.875
opperf2	5.025	1.405		0.501	-0.106	-0.767	-0.372	0.134
opperf3	4.712	1.427		0.601	0.088	0.283	-0.199	0.349
opperf4	4.220	1.519		0.829	0.412	4.590	0.221	0.599
BF's Economic Performance			1.285					
sales (dif)	1868120	14594094.4		0.401	-0.058	-0.155	-1.203	1.550
ebit (dif)	-642148	11165797.4		0.997	1.141	1.211	-1.260	3.272

Finally, Common Method Variance (CMV) becomes a threat when two variables that have a hypothesized relationship are measured using the perceptions of the same individual. This is especially problematic when the variables are the independent and dependent variables of the study. To prevent and minimize CMV the design of a survey study can be adjusted. In that sense, in the survey the dependent variables were placed after the independent ones (Podsakoff et al., 2003). Additionally, after data has been collected, different statistical procedures can be performed to assess if CMV influences the study results. We performed the following tests suggested in the literature (Podsakoff et al., 2003): First, following Harmann's single factor test we checked that neither a single nor a general factor accounted for the majority of the covariance among measures. The results show that a single factor accounts for 34% of the variance, confirming the absence of CMV. Second, we analyzed the correlation matrix between the different constructs in our study (Bagozzi et al., 1991). The existence of high correlations (i.e., $r > 0.90$) between our constructs would be a signal of CMV. As shown in Table 5 none of the values surpasses the suggested threshold providing evidence that CMV is not a threat to the study. Third, we followed Lindell and Whitney's (2001) method and examined the correlations between a marker variable (i.e., a variable that is theoretically unrelated to the constructs under study) and *Supplier Development*

Practices, *Suppliers' Social Performance* and *Buying Firm's Operational Performance*. If the marker variable and the studied constructs are highly correlated, then CMV is present. However, results in Table 6 suggest that CMV is not an issue in our study since the highest value corresponds to *Supplier Development Practices* (Pearson r = -.147). If we square the Pearson correlation coefficient we get the maximum percentage of variance shared by the marker and the construct (R^2). CMV would be a threat if R^2 shows high values. In our case, R^2 equals 2%, which is a low value and suggests that CMV is not an issue.

Table 5. Correlations between constructs

	SuppDevPrac	Supp' Soc Perform	BF's Operat. Performance	BF's Econ. Performance
SuppDev Practices	1.000	0.311	0.495	-0.115
Supp' Soc Perform	0.311	1.000	0.453	0.279
BF's Operational Performance	0.495	0.453	1.000	0.097
BF's Economic Performance	-0.115	0.279	0.097	1.000

Table 6. Marker variable

	Correlation	R^2
SuppDevPrac	-0.147	0.022
Supp' Soc Perform	-0.133	0.018
BF's Operational Performance	-0.122	0.015

5.5.2. STRUCTURAL MODEL

As we have already mentioned, to test the hypothesized relationships between our latent constructs we employed path modeling analysis by hierarchical multiple OLS regression. Based on the estimated path coefficients we can obtain the direct, indirect and total effects between variables. The total effect of one variable on another is the sum of the direct effect (i.e., no intervening variables involved) and indirect effect (i.e.,

through one or more intervening variables). This decomposition let us check for the possible mediating effects of the variable *Suppliers' Social Performance* between *Supplier Development Practices* and *Buying Firm's Operational* and *Economic Performance.* It is also important to mention that to test our model we controlled for the firm's size using the number of employees (mean= 339.14; std dev= 820.96)

Before looking at the results of the direct and indirect path coefficients, it is important to assess the structural model for multicollinearity issues. Since the estimation of the path coefficients is based on OLS regression, just as in regular multiple regression, the path coefficient might be biased if the estimation involves multicollinearity between the studied constructs. As shown in Table 7, VIFs between constructs are under the suggested threshold of 5 showing that multicollinearity is not an issue.

Table 7. VIF between constructs

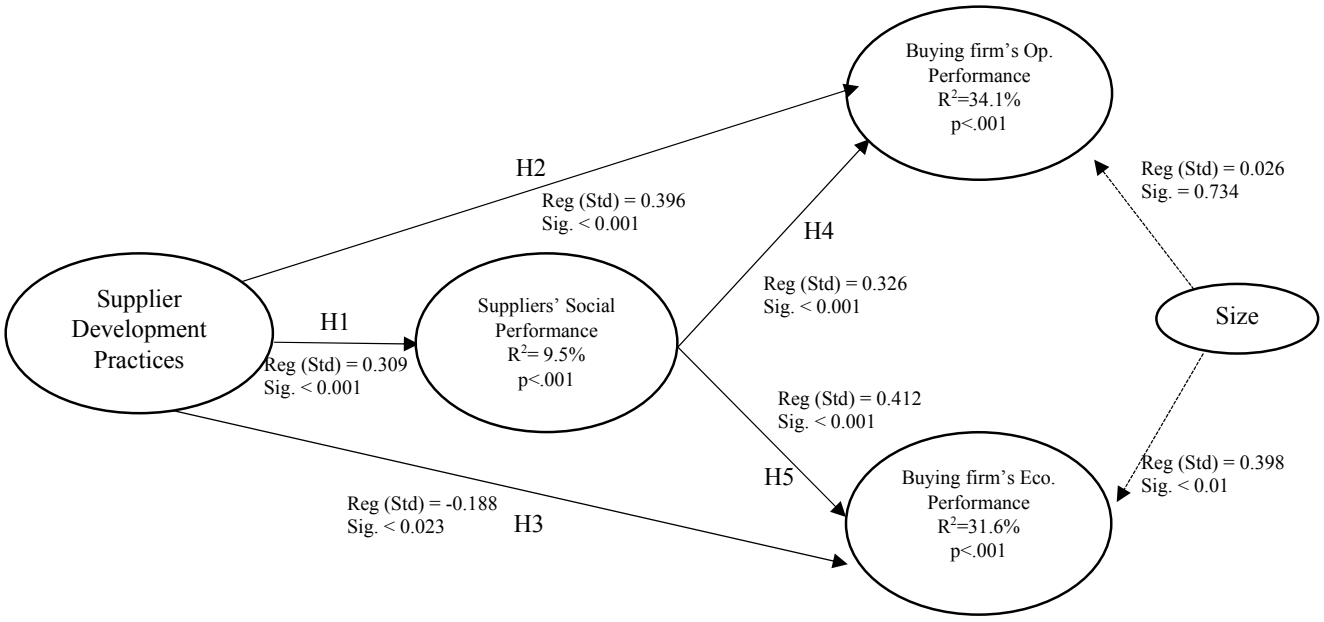
	Dependent Variable	
Independent Variable	BF Operational Performance	BF Economic Performance
Supp DevPractices	1.128	1.259
Supp' Soc Performance	1.128	1.199
BuyingFirm's Operational Performance	-	1.265

The analysis of the hypothesized relationships is divided in two sections. First, we will report the results related to the hypothesized direct effects, which correspond to Hypotheses 1, 2, 3, 4 and 5. Then we will discuss the results corresponding to the hypothesized mediating role of *Suppliers' Social Performance* in the relationship between *Supplier Development Practices* and *Buying Firm's Operational* and *Economic Performance* (Hypotheses 6 and 7).

5.5.2.1. DIRECT EFFECTS RESULTS

As shown in Figure 2, our results provide support for four of the five hypotheses that correspond to the hypothesized direct effects between the constructs under study. *Supplier Development Practices* are positively related to both *Suppliers' Social Performance* (β=0.309, p < 0.001) and the *Buying Firm's Operational Performance* (β=0.396, p < 0.001) providing support for Hypotheses 1 and 2. In addition, *Suppliers' Social Performance* is positively associated with both the *Buying Firm's Operational* (β=0.326, p < 0.001) and *Economic Performance* (β=0.412, p < 0.001). These results support Hypotheses 4 and 5, respectively. Regarding Hypothesis 3, which posited a direct and positive effect between *Supplier Development Practices* and *Buying Firm's Economic Performance,* our results show that the effect is significant (p=0.023). However, the direction of the effect is opposite to what we hypothesized (β=-0.188), meaning that *Supplier Development Practices* negatively impacts the *Buying Firm's Economic Performance*. Thus, not providing support for Hypothesis 3.

Figure 2. Direct effect results



5.5.2.2. MEDIATING EFFECTS RESULTS

In the literature, different approaches to test for models that include mediating effects have been proposed: causal steps, evaluating differences in coefficients, and computing and testing indirect effects by the products of coefficients. Based in the last approach, we can also find different resources available for testing models with mediating effects (i.e., R, SAS and SPSS macros). In our study, we run the Sobel test described in Preacher and Hayes (2004) for bootstrapped mediation analysis. Table 8 show the main numerical reports to analyze the mediation effect of *Suppliers' Social Performance* between *Supplier Development Practices* and *Buying Firm's Operational* and *Economic Performance.*

Table 8. Results mediation effects

	Direct effect coefficients (β)			**Indirect effect (mediation)**		
	a	**b**	**c'**	**ab**	**Sobel test**	**95% IC**
SuppDev -> mediator -> BF's oppperformance	.309 (.001)[1]	.328 (.001)	.396 (.001)	.101	2.66 (.004)	[.030: .184]
SuppDev -> mediator -> BF's econ performance		.412 (.001)	-.188 (.023)	.127	2.86 (.002)	[-.014 : .230]

(1) p-value

Supplier Development Practices was significantly predictive of the hypothesized mediating variable (a=.309, p <.001). When controlling for *Supplier Development Practices*, the mediator (*Suppliers' Social Performance*) was significantly predictive of *Buying Firm's Operational Performance* (b=.328, p <.001). The estimated direct effect of *Supplier Development Practices* on *Buying Firm's Operational Performance,* controlling for mediator, was also significant (c'=.396, p<.001). Based on these values,

the total effect of *Supplier Development Practices* on *Operational Performance* takes a value of .497 (i.e., total effect: (a*b) + c').

The mediating effect (ab) equals 0.101 (i.e., .309 * .328). This is judged to be statistically significant using the Sobel test ($z=2.66$, $p<.05$). Bootstrapping procedure using 5000 samples was performed and a bias-corrected and accelerated confidence interval (CI) was created for ab. The lower and upper limits of the 95% CI for the ab mediation effect ranges between .030 and .184.

To assess the significance of the mediating path several criteria can be used. First, both *a* and *b* coefficients are statistically significant. Second, the Sobel test for the ab product is also significant. However, as several authors point out the limitations related to the Sobel test power (i.e., power is low due to the test statistic not being really normally distributed) we have decided to additionally use boostraping procedures to compute CIs to be able to decide on the statistically significance of the mediating effect (MacKinnon et al., 2002; Shrout and Bolger, 2002). Therefore, as a third step it is necessary to check that the boostrapped CI for ab does not include zero. Based on these criteria we can state that the mediating effect of *Suppliers' Social Performance* between *Supplier Development Practices* and *Buying Firm's Operational Performance* is statistically significant. As the direct path from *Supplier Development Practices* and *Buying Firm's Operational Performance* controlling for the mediating variable is also significant, *Social Suppliers' Performance* is meant to be a partial mediator rather than a full mediator. These results provide support for Hypothesis 6.

The same analysis was carried out for the remaining independent variable (i.e., *Buying Firm's Economic Performance)*. The mediating role of *Suppliers' Social Performance* in the relationship between *Supplier Development Practices* and *Buying Firm's Economic Performance* was found to be non-significant for the following reasons:

Although the direct effects (a= .309 and b=.412) are both significant (p<.001) and according to the Sobel test the mediating effect (*a*b* = .127) is also found to be significant (p < .001); the CI for ab includes zero ([-.014 : .230]). This suggests that *Suppliers' Social Performance* does not mediate the relationship between *Supplier Development Practices* and the *Buying Firm's Economic Performance*. In other words, no support was found for Hypothesis 7 (See Table 9 for a summary of the Hypotheses results).

Table 9. Hypotheses: Results

Hypotheses	Result
Direct effects	
H1.Supplier development practices -> Suppliers' social performance	Supported
H2. Supplier development practices -> Buying firm's operational performance	Supported
H3. Supplier development practices -> Buying firm's economic performance	Not supported
H4. Suppliers' social performance -> Buying firm's operational performance	Supported
H5. Suppliers' social performance -> Buying firm's economic performance	Supported
Mediating effects	
H6. Supplier development practices -> Suppliers' Social Performance -> Buying Firm's Operational Performance	Supported
H7. Supplier development practices -> Suppliers' Social Performance -> Buying Firm's Economic Performance	Not supported

Finally, to check for the predictive relevance of the model it is important to consider the determination coefficient R^2. An acceptable R^2 should be greater than the suggested threshold of 10% and significant (Falk and Miller, 1992). In our case, as shown in Figure 2, the R^2 of all our dependent constructs are significant and with values close or above to the suggested threshold.

5.6. DISCUSSION

Our discussion will be centered around two main points: (1) the impact of social supplier development practices on suppliers' social performance and (2) the impact of supplier development practices on both the buying firm's operational and economic performance.

5.6.1. SUPPLIER DEVELOPMENT PRACTICES AND THE SUPPLIERS' SOCIAL PERFORMANCE

Supplier development practices are described as aiming to improve the suppliers' performance and/or capabilities (Krause et al., 2000). In the sustainable SCM literature the scarce research that has considered the suppliers' performance is limited to the environmental dimension of sustainability while the literature adopting a social focus has only considered the buying firm's performance, hence, providing a partial view on the effectiveness of these practices. In our paper we have studied this neglected relationship (i.e., social supplier development and suppliers' social performance) and our results indicate that buying firms perceive that the implementation of these practices leads to an improvement on the suppliers' social performance. That is, by auditing suppliers and by directly working with them with respect to social issues the buying firm perceives improvements on the compliance of its suppliers' facilities with human rights and child labor employment. These supplier development practices also contribute to improve the safety and labor conditions in the suppliers' facilities. Our results extend the previous positive results of Foerstl et al. (2010), Lee and Klassen (2008) and Lipmann (1999) from the environmental stream of the literature and support the fact that the implementation of these supplier development practices helps to improve not only the suppliers' environmental performance but also the social one.

5.6.2. SUPPLIER DEVELOPMENT PRACTICES AND THE BUYING FIRM'S PERFORMANCE

We hypothesized direct and indirect effects of supplier development practices on the buying firm's operational and economic performance.

Regarding the buying firm's operational performance, our results support the fact that supplier development practices have a direct and positive effect on operational performance and that this impact is also mediated by the suppliers' social performance. The direct effect could be explained as follows: in a more socially responsible firm employees are more motivated, increasing their productivity and quality outcomes (Pagell et al., 2010). Our results extend this idea and suggest that better operational results can be achieved if these supplier development practices really contribute to improve the suppliers' social performance. Buying firms will experience operational improvements not only because their own employees are motivated because of the implementation of these practices but also because the working conditions on the suppliers' premises have improved. In addition, better working conditions at the suppliers' premises lead to a reduction in the number of accidents and hence fewer disruptions in the supply chain leading to better delivery outcomes (Freire and Alarcon, 2002; Yuan and Woodman, 2010).

Regarding the buying firm's economic performance, contrary to what we expected, our results show that there is a negative relationship between the implementation of supplier development practices and the buying firm's economic performance. To better understand this unexpected result and the impact of social supplier development practices on the buying firm's economic performance we also run the model considering only the sales indicator in the economic performance construct (See Appendix B for further details on the results). The results of the sales model indicate that the social

supplier development practices – buying firm's economic performance (only sales) relationship is not significant. This together with the results of our initial model, which indicated a significant and negative impact of these practices on economic performance (i.e., sales and EBIT) can be interpreted as follows: (1) the implementation of social supplier development practices does not lead to an increase on sales; (2) the implementation of these practices implies a cost for the buying firm in the short-term, affecting negatively its economic performance (i.e., EBIT).

Our results also show that suppliers' social performance has a positive impact on the buying firm's economic performance when we consider both EBIT and sales. However, the results for the model that considers only the sales figure indicate that the relationship between suppliers' social performance and buying firm's economic performance is non-significant. These results suggest that an improvement in the suppliers' social performance does not lead to an increase in sales but to an improvement in EBIT by reducing costs and increasing productivity. In terms of sales this means that "working with suppliers that are socially oriented" can be described as an order qualifier rather than an order winner.

In addition, contrary to what we expected, suppliers' social performance does not mediate the relationship between supplier development practices and the buying firm's economic performance. Taken together, these results imply that although supplier development practices help to improve the suppliers' social performance, and the suppliers' social performance has a positive impact on the buying firm's economic performance (through increased EBIT), this latter positive impact is not explained by the implementation of these supplier development practices (i.e., no mediating role of suppliers' social performance) but by other factors such as the implementation of

internal social practices in the suppliers' premises and/or the suppliers' sustainability commitment. Further research should consider including these variables in the model.

In summary, from an economic point of view, our results suggest that the implementation of supplier development practices does not pay off in the short term. These results position us on the stream of the literature that advocates for a negative effect on economic outcomes and they are in line with the results of Gallear et al. (2012) who also used objective measures for the economic performance construct. The differences in the results from Gimenez et al. (2012), who found a positive relationship, could be explained because these authors measured economic performance using a single and self-reported indicator related to manufacturing costs, which is more in line with operational measures rather than economic. As mentioned before, our results indicate that, in the short-run, the implementation of these practices implies higher cost, which could be related to the cost of evaluating suppliers or to the provision of training. However, in the literature there are authors who state that when firms work with their suppliers for more than short periods both buying firms and suppliers are able to achieve cost reductions through reduced evaluative and control costs (Hakansson, 1982). Over time, both parties develop trust, which allows them to better adapt to the needs of the counterpart and reduce transaction costs in the relationship (Hakansson and Sharma, 1996; Ganesan, 1994; Gold et al., 2010). In that sense, it could be the case that when the buying firm has developed a strong relationship with its suppliers the cost of evaluation diminishes since the supplier may have adapted to the buying firm's requirement with respect to social compliance. Future studies should consider the role of supplier development practices taking a long run perspective.

Based on our results, the implementation of social supplier development programs such as audits to suppliers or the joint collaboration with them contributes to improve the

suppliers' social performance and the buying firm's operational performance but worsens the buying firm's economic performance in terms of increased cost in the short term. As suggested by the relational view, the joint collaboration between two partners (i.e., supplier and buying firm) results in rents for both parties (Dyer and Singh, 1998). Our results are in line with this statement and have shown that when implementing supplier development practices, the supplier experiences improvements on its social performance and the buying firm is able to improve its operational outcomes. Additionally, our results also serve to emphasize that in the case of buying firms these higher rents in the short term take the form of operational improvements rather than economic.

5.7. CONCLUSIONS

The objective of this paper was to investigate the impact of social supplier development practices on the suppliers' social performance and to analyze if the implementation of these practices pays off in terms of operational and economic outcomes. These two objectives have been analyzed for the context of manufacturing firms. Regarding the first objective, we have found that the implementation of social supplier development practices contributes to improve the suppliers' social performance. These results have helped to contribute to the existing literature on the effectiveness of sustainable supplier development practices by analyzing their role with respect to the suppliers' performance, which has been generally neglected. Regarding our second objective, our results show that while implementing supplier development practices pays off in terms of operational performance (i.e., improved quality and delivery times and reduced costs) it does not in terms of economic outcomes in the short term. By including objective measures for economic performance we have been able to overcome the limitations of

previous studies which included self-reported measures for this construct. Our results have some managerial implications. First, if buying firms aim to make their suppliers more socially responsible they can rely on the use of supplier development practices such as auditing suppliers and/ or working directly with them in terms of social issues. Second, it is important that managers care about the suppliers' social performance. The buying firm can achieve better operational results if the implementation of the abovementioned practices leads to real improvements in the suppliers' facilities. In the case of economic results, selecting suppliers with high social performance levels can result in better economic outcomes for the buying firm. Finally, managers should bear in mind that although implementing supplier development practices may damage the firm's economic performance in the short term it is important to acknowledge that it helps to improve the working conditions in the suppliers' premises. Therefore managers may decide which cost is more important to bear: the cost of implementing these practices or the cost of their suppliers acting unethically.

Besides from these contributions our study has some limitations that need to be acknowledged. Our study uses cross-sectional data and therefore we are not able to account for possible recursive relationships. Future research should consider the use of longitudinal data to study the relationship between these constructs. Our study is limited to the Spanish scope as data was only collected in Spain. Future research should try to replicate the presented research in other countries, especially countries that differ in the level of social risk. An additional limitation in our study is that in our sample most of the buying firm's suppliers are located in Europe. It could be the case that the positive effect of supplier development practices on the supplier's social performance may not be significant in a sample in which suppliers are mostly located in developing countries. Thus, further research should analyze the effectiveness of these practices in the context

of suppliers located in developing countries. Finally, as we already mentioned, our sample considers only manufacturing firms. Therefore, our results are not applicable to the case of service firms. Future research should include both type of firms and analyze the differences between both sectors.

ACKNOWLEDGEMENTS

The authors acknowledge financial support from research grant ECO2010-16840 from the Spanish Ministry of Science and Innovation and from research grant ECO/155/2012 (ref. 2014FI_B1 00203) from the Research and Universities Secretary, Economic Department, Generality of Catalonia

REFERENCES

Andersen, M., and Skjoett-Larsen, T. (2009), "Corporate social responsibility in global supply chains", Supply Chain Management: An International Journal, Vol. 14, No. 2, pp. 75-86.

Akamp, M., and Muller, M. (2013), "Supplier management in developing countries", Journal of Cleaner Production, Vol. 56 No. 1, pp. 54-62.

Awaysheh, A., and Klassen, R.D. (2010), "The impact of supply chain structure on the use of supplier socially responsible practices", International Journal of Operations and Production Management, Vol. 30, No. 12, pp. 1246-1268.

Bagozzi, R.P., Yi, Y., and Phillips, L.W. (1991), "Assessing Construct Validity in Organizational Research", Administrative Science Quarterly, Vol. 36 No. 3, pp. 421-458.

Bai, C.A. and Sarkis, J. (2014), "Determining and applying sustianable supplier key performance indicators", Supply Chain Management: An International Journal, Vol, 19 No. 3.

Baron, R.M. and Kenny, D.A. (1986), "The moderator-mediator variable distinction in socual psychological research: conceptual, strategic, and statistical considerations", Journal of Personality and Social Psychology, Vol. 51, No. 6, pp. 1173-1182.

Beske, P., and Seuring, S. (2014), "Putting sustainability into supply chain management", Supply Chain Management: An International Journal, Vol. 19, No. 3, pp. 324-333.

Bowen, F., Cousins, P., Lamming, R., and Faruk, A. (2001), "The role of supply management capabilities in green supply", Production and Operations Management, Vol. 10 No. 2, pp. 174-189.

Cao, M., and Zhang, Q. (2011), "Supply chain collaboration: impact on collaborative advantage and firm performance", Journal of Operations Management, Vol. 29, pp. 163-180.

Carter, C.R. (2005), "Purchasing social responsibility and firm performance: the key mediating roles of organizational learning and supplier performance", International Journal of Physical Distribution & Logistics Management, Vol. 35, No. 3, pp. 177-194.

Carter, C.R. and Jennings, M.M. (2004), "The role of purchasing in corporate social responsibility: a structural equation analysis", Journal of Business Logistics, Vol. 25, No. 1, pp. 145-186.

Carter, C.R., and Rogers, D. (2008), "A framework of sustainable supply chain management moving toward new theory", International Journal of Physical Distribution & Logistics Management, Vol. 38, No. 5, pp. 360-87.

Chin, W. (1998). "The Partial Least Squares approach to Structural Equation Modeling." In Marcoulides, G.A. (Ed.), Modern methods for business research, Erlbaum, Mahwah and London, pp. 295-336.

Cruz, J.M., and Wakolbinger, T. (2008), "Multiperiod effects of corporate social responsibility on supply chain networks, transaction costs, emissions, and risk", International Journal of Production Economics, Vol. 116 No. 1, pp. 61-74.

Diamontopoulos, A. (1999), "Export performance measurement: reflective versus formative indicators", International Marketing Review, Vol. 16 No. 6, pp. 444-457.

Dyer, J.H., and Singh, H. (1998), "The relational view: cooperative strategy and sources of interorganizational competitive advantage", Academy of Management Review, Vol. 23 No. 4, pp. 660-679.

Elkington, J. (1998), Cannibals with forks: The triple bottom line of the 21st century, Stoney Creek: New Society Publishers.

Ehrgott, M., Reimann, F., Kaufmann, L. and Carter, C.R. (2013), “Environmental development of emerging economy suppliers: Antecedents and outcomes”, Journal of Business Logistics, Vol. 34 No. 2, pp. 131-147.

Falk, R.F., and Miller, N.B. (1992), A primer for soft modeling, Akron, Ohio: The University of Akron Press.

Faruk, A.C., Lamming R.C., Cousins, P.D., and Bowen, F.E. (2001), "Analyzing, mapping, and managing environmental impacts along supply chains" Journal of Industrial Ecology, Vol. 5, No. 2, pp. 13-36.

Foerstl, K., Reuter, C., Hartmann, E., and Blome, C. (2010), "Managing Supplier Sustainability Risks in a Dynamically Changing Environment—Sustainable Supplier Management in the Chemical Industry", Journal of Purchasing and Supply Management, Vol. 16 No. 2, pp. 118–30.

Fornell, C., and Lacker, D.F. (1981), "Evaluating structural equation models with unobservable variables and measurement error", Journal of Marketing Research, Vol. 18 No. 2, pp. 39-50.

Freire, J., and Alarcon, L.F. (2002), "Achieving a lean design process: improvement methodology", Journal of Construction Engineering and Management, Vol. 128 No. 2, pp. 248-256.

Gallear, D., Ghobadian, A., and Chen, W. (2012), "Corporate responsibility, supply chain partnership and performance: An empirical examination", International Journal of Production Economics,Vol. 140, pp. 83-91.

Ganesan, S. (1994), "Determinants of long-term orientation in buyer-seller relationships, Journal of Marketing, Vol. 58, pp. 1-19.

Geffen, C.A., and Rothenberg, S. (2000), "Suppliers and environmental innovation: the automotive paint process", International Journal of Operations and Production Management, Vol. 20, No. 2, pp. 166-186.

Gimenez, C., and Tachizawa, E. (2012), "Extending sustainability to suppliers: A systematic literature review", Supply Chain Management: An International Journal, Vol. 17 No. 5, pp. 531-543.

Gimenez, C., Sierra, V., and Rodon, J. (2012), "Sustainable operations: their impact on the triple bottom line", International Journal of Production Economics,Vol. 140, pp. 149-159.

Gold, S., Seuring, S., Beske, P. (2010), "Sustainable Supply Chain Management and inter-organizational resources: a literature review", Corporate Social Responsibility and Environmental Management, Vol. 17, No. 4, pp. 230-245.

Gualandris, J. Golini, R. and Kalchschmidt, M. (2014), "Do supply management and global sourcing matter for firm sustainability performance?: An international study", Supply Chain Management: An International Journal¸Vol. 19 No. 3, pp. 258-274.

Gualandris, J., Kalchschmidt, M. (2014), "Customer pressure and innovativeness: their role in sustainable supply chain management", Journal of Purchasing and Supply Management, Vol. 20, pp. 92-103.

Guoyou, Q., Saixing, Z., Chiming, T., Haitao, Y. and Hailiang, Z. (2013), "Stakeholders' influences on corporate green innovation strategy: a case study of manufacturing firms in China", Corporate Social Responsibility and Environmental Management, Vol. 20, No.1, pp. 1-4.

Hakansson, H. (1982), International Marketing and Purchasing of Industrial Goods - An Interaction Approach, IMP Project Group, John Wiley & Sons, Chichester.

Hakansson, H., and Sharma, D.D. (1996), "Strategic alliances in a network perspective" in Iacobucci, D. (ed), Networks in Marketing, Sage Pubication, pp. 108-124.

Hoejmose, S.U., and Adrien-Kirby, A.J. (2012), "Socially and environmentally responsible procurement: A literature review and future research agenda of a managerial issue in the 21st century", Journal of Purchasing and Supply Management, Vol. 18, pp. 232-242.

Hollos, D., Blome, C., and Foerstl, K. (2012), "Does sustainable supplier co-operation affect performance? Examining implications for the triple bottom line", International Journal of Production Research, Vol. 50 No. 11, pp. 2968-2986.

Hulland, J. (1999), "Use of partial least squares (PLS) in strategic management research: a review of four recent studies", Strategic Management Journal, Vol. 20 No. 2, pp. 195-204.

Jarvis, C.B., MacKenzie, S.B., Podsakoff, P.M. Mick, D.G., and Bearden, W.Q. (2003), "A critical review of construct indicators and measurement model misspecification in marketing and consumer research." Journal of Consumer Research, Vol. 30 No. 2. pp. 199-218.

Klassen, R.D., and Vachon, S. (2003), "Collaboration and evaluation in the supply chain: the impact on plant-level environmental investment", Production and Operations Management,Vol. 12, No. 3, pp. 336-352.

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

Kleindorfer, P.R., Singhal, K., and Wassenhove, L.N.V. (2005) "Sustainable Operations Management." Production and Operations Management, Vol. 14 No. 4, pp. 482–92.

Krause, D. R., Scannell, T.V., and Calantone, R. J. (2000), "A Structural Analysis of the Effectiveness of Buying Firms' Strategies to Improve Supplier Performance" Decision Sciences, Vol. 31 No. 1, pp. 31-55.

Kumar, N., Stern, L.W., and Anderson, J.A. (1993), "Conducting inter-organizational research using key informants", Academy of Management Journal, Vol. 36 No. 6, pp. 1633-1651.

Lee, S.Y., and Klassen, R.D. (2008), "Drivers and Enablers That Foster Environmental Management Capabilities in Small- and Medium-Sized Suppliers in Supply Chains", Production and Operations Management, Vol. 17 No. 6, pp. 573–86.

Lippmann, S. (1999), "Supply chain environmental management: elements for success", Corporate Environmental Strategy, Vol. 6 No. 2, pp. 175-182.

Lindell, M.K., and Whitney, D.J. (2001), "Accounting for common method variance in cross-sectional research designs", Journal of Applied Psychology, Vol. 86 No. 1, pp. 114-121.

Maxwell, D., Sheate, W., and van der Vorst, R. (2006), "Functional and systems aspects of the sustainable product and service development approach for industry", Journal of Cleaner Production, Vol. 14 No. 17, pp. 1466-1479.

MacKinnon, D.P., Lockwood, C.M., Hoffman, J.M., West, S.G., and Sheets, V. (2002), "A comparison of methods to test mediation and other intervening variable effects", Psychological Methods, Vol. 7 No. 1, pp. 83-104.

Moxham, C., and Kauppi, K. (2014), "Using organizational theories to further our understanding of socially sustainable supply chains: the case of fair trade", Supply Chain Management: An International Journal, Vol. 19, No. 4, pp. 413-420.

Pagell, M., and Gobeli, D. (2009), "How Plant Managers' Experiences and Attitudes Toward Sustainability Relate to Operational Performance", Production and Operations Management, Vol. 18 No. 3, pp. 278–99.

Pagell, M., Wu, Z., and Wasserman, M.E. (2010), "Thinking differently about purchasing portfolios: an assessment of sustainable sourcing", Journal of Supply Chain Management, Vol. 46 No. 1, pp. 57-73.

Peng, D.X., and Lai F. (2012), "Using partial least squares in operations management research: A practical guideline and summary of past research", Journal of Operations Management, Vol. 30, pp. 467-480.

Peter, S., Straub, D., and Rai, A. (2007), "Specifying formative constructs in Information Systems research", MIS Quarterly, Vol. 31, No. 4, pp. 623-656.

Podsakoff, P.M., MacKenzie, S.B., Lee, J.Y., and Podsakoff, N.P. (2003), "Common method biases in behavioural research: A critical review of the literature and recommended remedies". Journal of Applied Psychology, Vol. 88 No. 5, pp. 879-903.

Preacher, K.K., and Hayes, A.F. (2004), "SPSS and SAS procedures for estimating indirect effects in simple mediation models", Behaviour Reserch Methods, Instruments & Computers, Vol. 36, pp. 717-731.

Pullman, M.E., Maloni, M.J., and Carter, C.R. (2009), "Food for Thought: Social versus Environmental Sustainability Practices and Performance Outcomes", Journal of Supply Chain Management, Vol. 45 No. 4, pp. 38-54.

Rao, P., and Holt, D. (2005), "Do green supply chains lead to competitiveness and economic performance?", International Journal of Operations and Production Management, Vol. 25, No. 9, pp. 898-916.

Schaltegger, S. and Burritt, R. (2014), "Measuring and managing sustainability performance of supply chains", Supply Chain Management: An International Journal, Vol.19, No. 3, pp. 232-241.

Seuring, S., and Muller, M. (2008), "From a literature review to a conceptual framework for sustainable supply chain management", Journal of Cleaner Production, Vol. 16, No. 15, pp. 1699-1710.

Simpson, D.F., and Power, D.J. (2005), "Use the supply relationship to develop lean and green suppliers", Supply Chain Management: An International Journal, Vol. 10 No. 1, pp. 60-68.

Shrout, P., and Bolger, N. (2002), "Mediation in experimental and nonexperimental studies: new procedures and recommendations", Physcological Bulletin, Vol. 7, pp. 422-445.

The New York Times (2013), Death toll in Bangladesh collapse, Available at: http://www.nytimes.com/2013/05/12/world/asia/death-toll-in-bangladesh-collapse.html

The New York Times (2007), Lead Paint Prompts Mattel to Recall 967,000 Toys. Available at: http://www.nytimes.com/2007/08/02/business/02toy.html?_r=0

Tracey, M., Lim, J.S., and Vonderebse, M.A. (2005), "The impact of supply chain management capabilities on business performance", Supply Chain Management: An International Journal, Vol. 10 No. 3, pp. 179-191.

Vachon, S., and Klassen, R. (2006), "Extending green practices across the supply chain: the impact of upstream and downstream integration", International Journal of Operations and Production Management, Vol. 26, No. 7, pp. 795-821.

Vachon, S., and Mao, Z. (2008), "Linking supply chain strength to sustainable development: a country-level analysis", Journal of Cleaner Production, Vol. 16 No. 15, pp. 1552-1560.

Yu, W., Chavez, R., Feng, M, and Wiengarten, F. (2914), "Integrated green supply chain management and operational performance", Supply Chain Management: An International Journal, Vol. 19, No. 5/6, pp. 683-696.

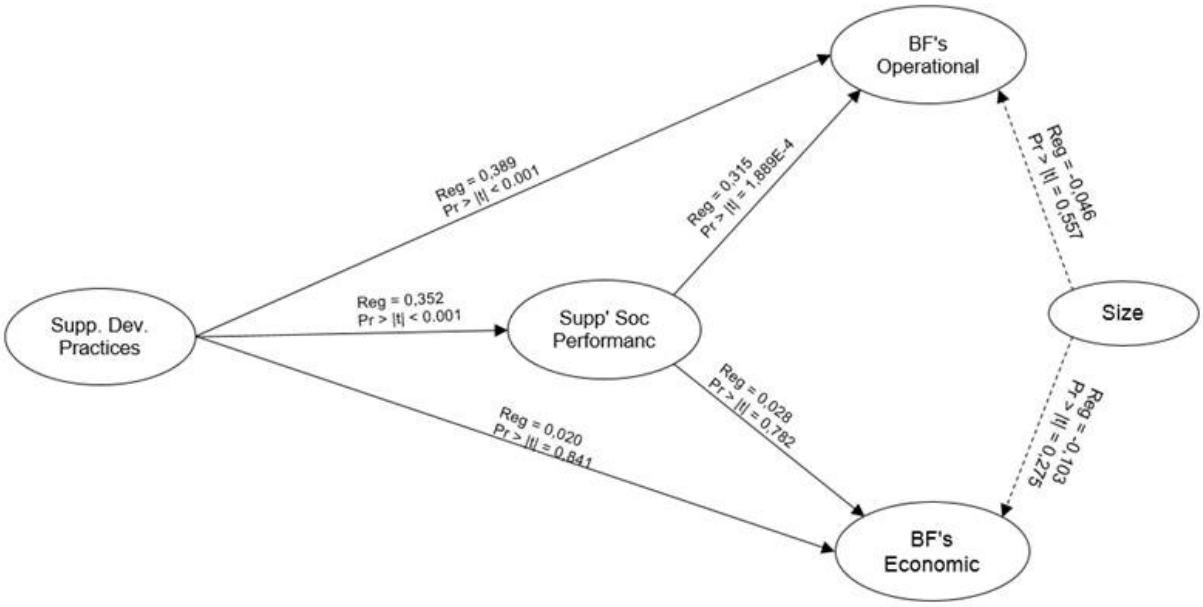
Yuan, F., and Woodman, R.W. (2010), "Innovative behaviour in the workplace: the role of performance and image outcome expectations", Academy of Management Journal, Vol. 53 No. 2, pp. 323-342.

Zukin, C., and Szeltner, M. (2012), Talent Report: what workers want in 2012. Net Impact. Available at: www.netimpact.org/whatworkerswant

Appendix A. Measures

Construct	No.	Phrase	Sources
Social Supplier Development Practices	SDP1	We assess our suppliers' performance through formal evaluation, using established guidelines and procedures	Adapted from Krause et al. (2000), Bowen et al. (2001)
	SDP2	We provide suppliers with feedback about the results of their evaluation	
	SDP3	We perform audits for suppliers' internal management systems	
	SDP4	We visit our suppliers' facilities to help them improve their performance	
	SDP5	We make joint efforts with these suppliers to improve results	
BF's Operational Performance	OpPerf1	The company has improved its product/service quality	Adapted from Rao and Holt (2005) and Cruz and Wakolbinger (2008)
	OpPerf2	The company has reduced delivery times to clients	
	OpPerf3	The company has reduced total costs	
	OpPerf4	The company has reduced purchasing costs	
BF's Economic Performance	Sales	Difference on sales figure 09 and 10	SABI Database
	EBIT	Difference on EBIT figures 09 and 10	
Suppliers' Social Performance	SupPerf1	We have improved compliance with human rights in the suppliers' facilities	Adapted from Maxwell et al. (2006)
	SupPerf2	We have improved compliance with child labor employment in the suppliers' facilities	
	SupPerf3	We have improved safety and labor conditions in the suppliers' facilities	

Appendix B. Model with BF's Economic Performance including only sales



CHAPTER 6[4]

The impact of national culture on the sustainability practices-sustainability performance relationship: an empirical multi-country study

This chapter studies how differences in national culture influence the impact of sustainability on sustainability performance. In other words, the chapter analyzes the moderating role of national culture on the sustainability practices-performance relationship.

[4] This paper is accepted for presentation in POMS and EurOMA conferences (2015).

6.1. ABSTRACT

The objective of this paper is to study how differences in national culture influence the impact of sustainability practices on sustainability performance. To study these relationships we relied on both primary data from IMSS database and secondary data from Hofstede's national culture dimensions. We used hierarchical linear modelling to analyze our data. The results show the important role of national culture in the sustainable operations field. First, the impact of external sustainability practices on sustainability performance is higher for countries scoring high on femininity. Second the impact of both internal and external sustainability practices on social performance is higher for countries with high power distance. The contributions of the paper are discussed in terms of research and managerial implications.

Keywords: sustainability practices, sustainability performance, national culture, hierarchical linear modelling

6.2. INTRODUCTION

The management of sustainability has become an essential element of the firm's corporate and operations strategy, which need to integrate the concepts of profit, people and the planet (Kleindorfer et al., 2005). Sustainable Operations Management (OM) includes those plans and activities that integrate both social and environmental issues into the management of firm's operations with the aim of improving the firm's environmental and social performance as well as that of its suppliers and customers (Seuring and Muller, 2008; Pagell and Gobeli, 2009). The key points of this definition are the following two: (1) firm's need to be not only environmentally friendly but also socially-responsible, (2) to achieve sustainability firms need to implement internal

practices as well as external practices which aim to extend sustainability across the supply chain. In this paper, we will focus on the effectiveness of internal environmental and social practices as well as external practices that aim to extend sustainability upstream the supply chain (i.e., to suppliers).

In the literature, the effectiveness of these practices has been widely studied. However, results are mixed. While there are papers that have found that the implementation of internal environmental practices lead to higher levels of environmental performance (e.g., Gimenez et al., 2012) others did not (e.g., Pullman et al., 2009). This discrepancy on results is also applicable to the case of external sustainable practices. For instance, while Zhu and Sarkis (2004), Golini et al. (2014) and Vachon and Klassen (2008) found support for the link between external practices and environmental/social performance, others such as Theyel (2001) and Gimenez et al. (2012) did not. These and many studies in the field of sustainable operations have been conducted in different countries (e.g., Gimenez et al. (2012) and Golini et al. (2014) analyzed a multi-country sample; Pullman et al. (2009) surveyed firms in the US; Vachon and Klassen (2008) in Canada and Zhu and Sarkis (2004) in China). This fact could be one source of explanation for possible differences in the practices – performance relationship. This would imply that different results are due to data being collected in different countries. However, as pointed by Pagell et al. (2005) this would assume that crossing borders automatically means a change in business practices and therefore a potential change on the impact of these practices on performance which is a risky assumption to make. To address this limitation, many studies have advocated that more important than comparing differences between countries is the comparison at the national culture level (Hofstede, 1980).

National culture is defined as the collective programming of the mind, which helps to distinguish the members of one group from those of another (Hofstede, 1980). In the OM literature, several studies have considered its role. For instance, Pagell et al. (2005) studied the impact of national culture on operational decision-making. Cagliano et al. (2011) studied the influence of national culture on the adoption of new forms of work organization. Kull and Wacker (2011) analyzed the moderating role of national culture on the quality management practices – quality performance relationship. Similarly, Wiengarten et al. (2011) analyzed the impact of national culture on the efficacy of investments on manufacturing practices. Even when national culture has proved to be key in explaining OM and firm's success (Pagell et al., 2005; Metters, 2008), the field of sustainable OM has neglected it. In line with the abovementioned papers, our objective is to study how differences in national culture influence the impact of sustainability practices on sustainability performance. More specifically this paper aims to answer the following research question:

RQ. Does national culture affect the efficacy of sustainability practices?

To answer this research question we will use Hofstede four-factor conceptualization of national culture and a multi-country study (i.e., IMSS-VI database). We will perform a series of hierarchical OLS regressions and analyze the moderating role of each Hofstede's national culture dimension on the practices – performance relationship.

By answering our research question we aim to extend the current literature on sustainable OM and better understand under which contingencies the practices – performance positive relationship holds. Also, since globalization plays a key role in the current business landscape, understanding the role of national culture will help managers to achieve sustainability improvements in this global setting.

The paper is structured as follows. In the following section a review of the literature in sustainable OM is provided and national culture is extensively described. Next, we present the methodology used in the study. Then, data is analyzed and results are presented. Finally, we discuss the results of our analysis. Conclusions, limitations and avenues for future research are also provided.

6.3. LITERATURE REVIEW

6.3.1. SUSTAINABILITY PRACTICES AND SUSTAINABILITY PERFORMANCE

To achieve sustainability firms need to be both environmentally friendly and socially responsible (Kleindorfer et al., 2005). In addition, to implement sustainability, a firm can rely on internal and external practices. Internal practices are those implemented in a business function (Carter and Carter, 1998) (e.g.: purchasing) and aim to achieve a firm's specific internal target (Rao, 2002). In addition, sustainable practices can also be extended to other actors in the supply chain. For instance, in order to "green" products and processes firms can develop sustainable programmes with their suppliers (Vachon and Klassen, 2008). Environmental internal practices aim to reduce the negative environmental impact of the company's own activities (Bowen et al., 2001; Rao, 2002). Some of the practices examined in previous studies are: use of environmental-friendly materials (Carter and Carter 1998) and processes (Rao and Holt 2005), pollution emission reduction programs (Klassen and Whybark, 1999), energy and water consumption programs (Sarkis, 1998). Internal social practices aim to provide economic development while improving the quality of life of the workforce and their families as well as of the local community and society at large (WBCSD, 1999). Previous literature reports some examples of internal social practices: employees' health and safety (Pagell and Gobeli, 2009), job satisfaction, fair compensation and employment status (Pullman et al., 2009) and work and life balance policies (Longo et al., 2005). Although social

sustainability entails impact on the internal and external communities, in this paper, we will focus, as previous OM literature has done, on the internal practices which aim to improve employees' working conditions. External sustainable practices are defined as practices that aim to extend sustainability upstream the supply chain. The literature suggests that to obtain a greener and a more socially responsible supply chain buying firms can assess their suppliers in terms of sustainability issues, provide training to the suppliers' personnel and/or make joint effort to improve performance (Andersen and Skjoett-Larsen, 2009; Klassen and Vachon, 2003; Keating et al., 2008).

Firms implementing these practices (i.e., internal and external) aim to be greener and more socially oriented. Higher levels of environmental and social performance will lead to these objectives. Environmental performance is related to reducing the footprint that companies leave behind as a result of operations (Kleindorfer et al., 2005). In other words, environmental performance entails the reduction of waste and pollution, the more efficient use of products and processes (Rao 2002; Zhu and Sarkis, 2004). Social performance relates to the quality of life of the firm's workforce and entails improvements in dimensions such as employees' health and safety conditions and/or employees' motivation (Pagell and Gobeli, 2009; Gimenez et al., 2012).

Several papers have analyzed the impact of practices (i.e., internal environmental practices, internal social practices and external sustainability practices) on the sustainability performance (i.e., environmental and social) (e.g., Gimenez et al. 2012; Golini et al., 2014; Gualandris et al. 2014; Green et al., 2012a,b; Large and Gimenez, 2011; Pullman et al. 2009; Rao, 2002; Rao and Holt, 2005; Theyel, 2001; Vachon and Klassen, 2008; Zhu and Sarkis, 2004, 2007; Zhu et al., 2005, 2007). The majority of these papers found a positive and significant impact between environmental/social internal practices and environmental/social performance (e.g., Gimenez et al., 2012;

Golini et al., 2012; Zhu and Sarkis, 2004). In addition, in a recent literature review on the extension of sustainability to suppliers, Gimenez and Tachizawa (2012) concluded that there is a general agreement on the positive impact between external practices and environmental and social performance. However, there are some studies that have shown that the efficacy of these practices is not that straightforward. Gimenez et al. (2012) in their study of the impact of internal and external sustainability practices on the triple bottom line found that external practices do not impact the environmental or the social performance dimensions. The authors used a multi-country sample of more than 20 countries to conduct their study. Also, Pullman et al. (2009) and Theyel (2001) found that the implementation of neither internal environmental practices (e.g., waste recycling practices) nor external practices impacted the environmental performance of the firm. Both studies were carried out in the United States (U.S.). Additionally, Carter et al. (1998) show that differences exist in the level of environmental practices between German and U.S. firms. Taken together these results suggest that the efficacy of sustainability practices may vary across countries. Following Hofstede (1980) and Ronen and Shenjar (1985) suggestions, we will consider the role of national culture as a way to explain (sustainable) OM in a global context (Govindarajan and Gupta, 2001) and its performance implications. National culture is more appropriate for understanding business behavior than merely considering individual country differences (Hofstede, 1980; Ronen and Shenjar, 1985). Despite the emphasis of several papers on the important role played by national culture in the management of firm's operations (e.g., Gupta and Govindarajan, 2001; Hope and Muehlemann, 2001; Pagell et al., 2005; Wiengarten et al., 2011), the role of national culture on the effectiveness of operational practices has been generally neglected in the OM literature (Wiengarten et al., 2011) and more specifically in the sustainable OM literature.

6.3.2. HOFSTEDE'S CULTURAL DIMENSIONS

When addressing national culture issues, Hofstede (1980) is usually one of the most cited scholars. In an empirical study that involved more than 10.000 managers in over 50 countries, Hofstede (1980) developed a quantitative classification proposal that measured differences and similarities between national cultures. As a result of the study four dimensions of national culture were identified: power distance, individualism, uncertainty avoidance, and masculinity. In a latter study, two additional dimensions were incorporated to the original four: long-term orientation and indulgence versus restraint. These two additional dimensions have been less used in the literature. Therefore, to avoid construct-validity related issues we will consider the four original dimensions.

Some authors have pointed out some critiques on Hofstede's model based on its lack of generalizability, validity of the constructs, date of the study and assumed homogeneity in each of the studied cultures (Magnusson et al., 2008; Sivakumar and Nakata, 2001; Smith, 1992). However, the Hofstede's cultural dimensions have been extensively adopted in several studies and is widespread accepted in the OM literature (e.g., Cagliano et al., 2011; Pagell et al., 2005; Power et al., 2010; Vecchi and Brennan, 2009; Wiengarten et al., 2011). Also, the construct validity and relevance of Hofstede's dimension has been reconfirmed (Merritt et al., 2000) and it has been shown that Hofstede's model compares satisfactorily to other existing models (e.g., GLOBE).

Power distance represents human inequality from below and is the extent to which members of a group accept and expect that power is distributed unequally. In countries scoring high in the power distance dimension, power needs less legitimization and this power is described as coercive and referent. On the contrary, in countries scoring low in power distance, legitimate power is more frequent (Hofstede, 1980).

Uncertainty avoidance is related to the tolerance for uncertainty and ambiguity. In other words, it is the extent to which the members of a group/organization/institution feel either comfortable or uncomfortable with novel, unknown, different or unexpected situations. Members of countries characterized by high uncertainty avoidance try to avoid these unstructured situations by implementing strict laws, rules and safety measures. On the contrary, countries characterized by low uncertainty avoidance accept more informal actions and are willing to take risks (Hofstede, 1980).

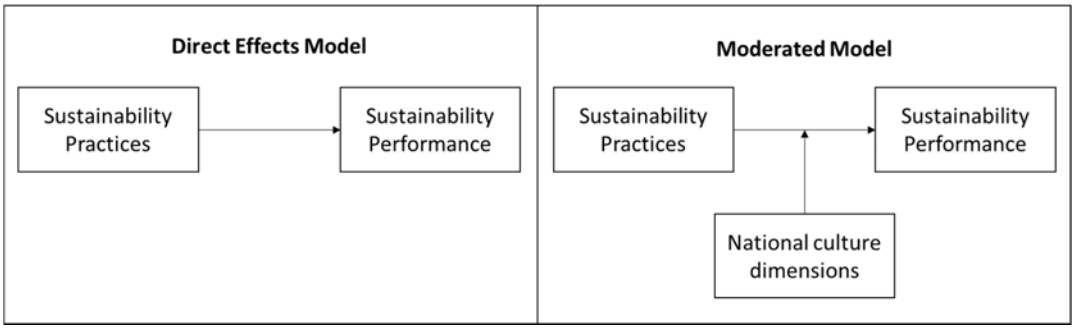
Individualism is defined as the opposite to collectivism. Both concepts measure the degree to which individuals are integrated into groups. Members in individualistic countries do not have close ties with other members while members in collectivist countries form cohesive and strong groups. Members of collectivistic countries are more emotionally dependent while in individualistic countries members are responsible for their individual actions (Hofstede, 1980).

Masculinity is opposed to femininity and both concepts refer to the distribution of emotional roles between genders. Countries that score low in masculinity (i.e., high femininity scores) are characterized by placing life satisfaction over job success (Hofstede, 1980).

In the literature review we have concluded that previous literature has generally agreed on the positive and significant impact between internal and external practices (i.e., environmental and social) and the firm's sustainability performance (i.e., environmental and social). This can lead to assume that the implementation of sustainability practices leads to superior sustainability performance irrespective of the context. However, some papers have provided contradictory results challenging this assumption. In addition, several researchers have emphasized the important role of national culture in OM

research (Pagell et al., 2005) and in explaining variations in performance outcomes (Hope and Muehlemann, 2001; Kull and Wacker, 2010; Wiengarten et al., 2011). In that sense, our objective in this paper is to study the role of national culture on the effectiveness of sustainability practices (i.e., internal environmental, internal social, external sustainable) and sustainability performance (i.e., environmental and social). More specifically we want to explore the moderating role of national culture on the relationship between sustainability practices and sustainability performance. In that sense, we will compare two competing models (Figure 1). First, we will test the direct relationship between practices and performance. Second, we will introduce each Hofstede's national culture dimension as a moderator in the practices-performance relationship to test whether sustainability performance depends on differences in national culture dimensions.

Figure 1. Research models



6.4. METHODOLOGY

6.4.1. SAMPLE

To test our research model we combine primary and secondary data sources. Primary data are gathered from the International Manufacturing Strategy Survey (IMSS) and collected in 2013 as part of the sixth iteration of the survey. Secondary data are related to national cultural variables. Hofstede's four cultural dimensions (2010) are used to

draw data on cultural variables in different countries. The combination of the strong construct validity of national culture variables and the multi-country database on sustainability practices and performance provides an excellent opportunity to start assessing the role of national culture on the sustainable OM field.

The IMSS is a global network that was originally launched by the London Business School (UK) and the Chalmers University of Technology (Sweden) and that is currently managed by Politecnico di Milano (Italy). The network is comprised by different business schools that collaborate together with manufacturing firms to develop a common survey instrument and data collection protocol to study manufacturing and supply chain management. The IMSS questionnaire is divided into three main sections. The first section includes general information about the business unit and the plant organization. The second section comprises information about the plant's strategy and performance. The third section gathers information about manufacturing and supply chain practices. To ensure that data was sampled in the same way in all countries, a common research methodology was used. First, a common questionnaire was developed and a pilot test was conducted in different countries. Then, a common questionnaire was simultaneously administered by local research groups. The operations, production or plant manager was the target respondent and was contacted to ask for participation in the study. Once the respondent agreed the questionnaire was sent and a remainder was made few weeks later. Finally, non-response and late-response bias tests were performed in each country by the local research coordinators and the results showed that non-/late-response bias was not an issue. The magnitude (i.e., relatively high sample size), the involvement of companies in developing the questionnaire (ensuring content validity) and the history (i.e., both instrument and protocols have been extensively pre-tested by other researchers) are the strengths of the IMSS data set (Wiengarten et al.,

2014). The original IMSS-VI initial sample consists of 931 plants from 22 countries with an average response rate of 13%. The descriptives of the sample as well as the Hofstede's scores per each country can be found in Tables 1 and 2 respectively.

Table 1. Descriptive statistics of the sample

Country	N	%	ISIC code[1]	N	%	Size	N	%
Belgium	29	3%	25	282	30%	Less than 50	24	3%
			26			Between 50 and 249		41
Brazil	31	3%		123	13%		385	%
			27			Between 250 and 499		16
Canada	30	3%		153	16%		151	%
		14	28			More than 500		40
China	128	%		231	25%		371	%
Denmark	39	4%	29	93	10%	Not defined	24	3%
Finland	34	4%	30	49	5%	**Total**	931	100
Germany	15	2%	**Total**	931	100			
Hungary	57	6%						
		10						
India	91	%						
Italy	48	5%						
Japan	82	9%						
Malaysia	14	2%						
Netherlands	49	5%						
Norway	26	3%						
Portugal	34	4%						
Romania	40	4%						
Slovenia	17	2%						
Spain	29	3%						
Sweden	32	3%						
Switzerland	30	3%						
Taiwan	28	3%						
USA	48	5%						
Total	931	100						

[1] ISIC Code. 25: Manufacture of fabricated metal products, except machinery and equipment; 26: Manufacture of computer, electronic and optical products; 27: Manufacture of electrical equipment; 28: Manufacture of machinery and equipment not elsewhere classified; 29: Manufacture of motor vehicles, trailers and semi-trailers; 30: Manufacture of other transport equipment.

Table 2. Hofstede's cultural dimension scores per country

Country	Power distance	Uncertainty avoidance	Individualism	Masculinity
Belgium	65	94	75	54
Brazil	69	76	38	49
Canada	39	48	80	52
China	80	30	20	66
Denmark	18	23	74	16
Finland	33	59	63	26
Germany	35	65	67	66
Hungary	46	82	80	88
India	77	40	48	56
Italy	50	75	76	70
Japan	54	92	46	95
Malaysia	104	36	26	50
Netherlands	38	53	80	14
Norway	31	50	69	8
Portugal	63	104	27	31
Romania	90	90	30	42
Slovenia	71	88	27	19
Spain	57	86	51	42
Sweden	31	29	71	5
Switzerland	34	58	68	70
Taiwan	58	69	17	45
USA	40	46	91	62

6.4.2. MEASURES

In our analysis we have three constructs related to practices (i.e., internal environmental practices, internal social practices, external sustainability practices) and two constructs related to performance (i.e., environmental performance and social performance). All items were developed based on previous literature. To measure internal environmental practices we considered energy and water consumption reduction programs as well as pollution emission reduction and waste recycling programs. For internal social practices we included items related to formal occupational health and safety management system and work/life balance policies. In the case of external sustainability practices the items were related to the assessment of suppliers' sustainability performance, the provision of training to suppliers' personnel and the joint effort with suppliers. Responses ranged from one to five, where one indicates no effort put in the implementation of the abovementioned practices and five high efforts.

Environmental performance was measured considering items such as materials, water and energy consumption as well as pollution, emissions and waste production levels. Social performance included worker's motivation and satisfaction and health and safety conditions. Responses also ranged from one to five, where one indicates performance increases and five performance decreases. Appendix A provides more details with respect to constructs and items.

Differences in national culture were measured using Hofstede's (2010) four-factor model in the dimensions of power distance (PD), uncertainty avoidance (UA), individualism (IDV), masculinity (MAS). Higher scores meant higher power distance, higher uncertainty avoidance, higher levels of individualism and higher masculinity orientation. Additionally, in our model we added firm's size as a control variable. Firm's size was measured as the natural logarithm of the number of employees. Firm's size is a traditional control variable in the sustainable OM field. As pointed by Min and Galle (2001) larger firms are more inclined and have more resources to invest in green and socially-oriented practices.

6.4.3. CONSTRUCT VALIDATION

An exploratory factor analysis (EFA) via principal component using varimax rotation was performed to explore the factor structure of the different items. We performed an EFA since the measurement of both sustainability practices and performance varies across the literature, especially for the case of the social dimension where there is no agreement with respect to its measurement (de Giovanni, 2012; McKenzie, 2004).

Results for sustainability practices and sustainability performance can be found in Tables 3 and 4. The resulting dimensions are labelled as *Internal Environmental* (SustPrac1, SustPrac2), *Internal Social* (SustPrac3, SustPrac4), *External Sustainability*

(SustPrac5, SustPrac6, SustPrac7), *Environmental Performance* (SustPerf1, SustPerf2), and *Social Performance* (SustPerf3, SustPerf4).

The adequacy of the scales was evaluated analyzing convergent validity, discriminant validity and reliability. Convergent validity is assessed by checking that the item loadings are significant and greater than 0.70 and that the average variance extracted (AVE) of each construct is greater than 0.50 (Peng and Lai, 2012). Results in Table 3 and 4 show that in our study convergent validity for both the construct and the indicator level is fulfilled. Discriminant validity is assessed by comparing the AVE of each construct and the shared variance between each pair of constructs (Anderson and Gerbing, 1988; Morgan et al., 2007). For the fulfilment of discriminant validity the square root value of AVE should be greater than all of the inter-construct correlations. Table 5 provides support for sufficient discriminant validity since the square root of the AVE of each construct is higher than its correlations. Finally, reliability was judged by using Cronbach's alpha coefficient. Results in Tables 3 and 4 show that all the scales have a value greater than the threshold value of 0.70 (Nunnally, 1978). These results indicate that all constructs are reliable.

Table 3. Descriptives and measurement assessment (factor loadings and reliability) for practices

Factor	Items	Mean	StDev	Loadings	% of explained variance (unid)	Cronbach alpha	AVE
Env Practices	SustPrac1	3.07	1.17	0.825	86.38	0.842	0.69
	SustPrac 2	3.11	1.21	0.837			
Soc Practices	SustPrac3	3.38	1.13	0.741	73.44	0.70	0.59
	SustPrac4	2.74	1.18	0.701			
Ext Sust Practices	SustPrac 5	2.97	1.16	0.717	78.65	0.864	0.67
	SustPrac 6	2.43	1.22	0.867			
	SustPrac 7	2.65	1.18	0.860			

Table 4. Descriptives and measurement assessment (factor loadings and reliability) for performance

Factor	Items	Mean	StDev	Loadings	% of explained variance (unid)	Cronbach alpha	AVE
Env Performance	SustPerf1	2.57	0.934	0.885	78.51	0.726	0.77
	SustPerf 2	2.79	0.948	0.870			
Soc Performance	SustPerf3	2.91	1.21	0.928	86.45	0.843	0.85
	SustPerf4	3.23	1.19	0.913			

Table 5. Measurement assessment: discriminant validity

	Env. Practices	Soc. Practices	External Practices	Env. Perf.	Soc. Perf.
Env. Practices	0.83[1]				
Soc. Practices	0.67[2]	0.77			
External Practices	0.61	0.65	0.82		
Env. Performance	0.28	0.21	0.22	0.88	
Soc. Performance	0.29	0.37	0.34	0.38	0.92

[1] *AVE square root*
[2] *Correlations*

A concern with self-reported subjective survey data is related to the presence of common method variance (CMV). Since our data was collected from one single respondent and at single point in time, we checked that CMV is not a threat to the validity of our results. We used both a priori and a posteriori procedures. First, in the questionnaire the dependent (i.e., performance) and the independent (i.e., practices) variables were placed in different and separate sections (Podsakoff et al., 2003). This helps to diminish the effects of consistency artifacts. Then, we also checked for the presence of CMV a posteriori by using the Harmans (Podsakoff, et al. 2003) method. The rationale behind the Harmans' single factor method is that if a ''substantial amount of common method bias is present, either (a) a single factor will emerge from the factor analysis, or (b) one general factor will account for the majority of the covariance among measures'' (Podsakoff et al., 2003, p. 889). The results show that one single factor accounts only for the 39% of the variance. Thus, confirming the absence of CMV in our study.

6.5. DATA ANALYSIS AND RESULTS

The objective of the paper was to analyze whether national culture, operationalized through the four Hofstede's dimensions (i.e., power distance, individualism, uncertainty

avoidance and masculinity,) affect the efficacy of sustainability practices (i.e., internal environmental practices, internal social practices and external sustainability practices). In other words, our objective was to analyze the moderating role of national culture in the sustainability practices – sustainability performance relationship. To test this we run a series of ordinary least square (OLS) regression analysis. Table 6 shows the correlation matrix between national culture dimensions, internal environmental practices, internal social practices, external sustainability practices, environmental performance and social performance. The results suggest that there is strong correlation between practices, performance and national culture dimensions. In that sense, we checked for the presence of multicollinearity in our data and we computed the variance inflation factors (VIFs). Results suggest that multicollinearity is not an issue in our study since all VIFs were below four, which is less than the commonly used threshold of ten.

Following Wiengarten et al. (2011) we tested the regression analysis that included the interaction terms in separate models. This allowed us to further ensure that multicollinearity was not an issue in our analysis. Tables 7 to 9 show the results of the OLS analysis. Our analysis entails two models: the environmental and the social one. For the environmental one, we run five models. The first model tests for the impact of internal environmental and external sustainability practices on environmental performance. The remaining four models include the moderating role of each Hofstede's national culture dimension. The same pattern was applied for the social model. In all models we controlled for company size.

Table 6. Correlation matrix

	Mean	SD	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Internal Environmental Practices (1)	3.09	1.11	1									
Internal Social Practices (2)	3.06	0.99	0.674*	1								
External Sustainable Practices (3)	2.69	1.05	0.606*	0.649*	1							
Environmental Performance (4)	2.68	0.84	0.279*	0.211*	0.221*	1						
Social Performance (5)	3.07	0.85	0.288*	0.369*	0.339*	0.384*	1					
PDI (6)	56.41	20.26	0.204*	0.211*	0.339*	0.072*	0.238*	1				
IDV (7)	53.69	23.41	-0.184*	-0.197*	-0.334*	-0.055	-0.207*	-0.774*	1			
MAS (8)	52.87	25.23	0.060	0.012	0.095*	-0.064	-0.139*	0.289*		1		
UAI (9)	60.19	24.62	0.024	-0.013	-0.041	-0.019	-0.196*	0.035	0.009	0.276*	1	
Size (10)	2962.96	11966.7	0.10*	0.098*	0.098*	0.028	0.008	-0.006	-0.020	0.011	-0.004	1

* $p \leq 0.05$; ** $p \leq 0.00$

Table 7. Direct effects results

DV: Environmental Performance		
Variable	**β Estimate (p-value)**	**β Estimate (p-value)**
Intercept	2.687 (0.000)	2.689 (0.000)
Control variable: firm size	0.035 (0.303)	0.060 (0.075)
IV: internal environmental practices	0.269** (0.000)	
IV: external sustainability practices		0.208** (0.000)
Adjusted R^2	0.077	0.050
F-model	37.078**	24.005**

* p ≤ 0.05; ** p ≤ 0.00

DV: Social Performance		
Variable	**β Estimate (p-value)**	**β Estimate (p-value)**
Intercept	3.080 (0.00)	3.079 (0.00)
Control variable: firm size	-0.021 (0.519)	-0.004 (0.910)
IV: internal social practices	0.374**(0.000)	
IV: external sustainability practices		0.341**(0.00)
Adjusted R^2	0.135	0.113
F-model	70.396**	57.894**

* p ≤ 0.05; ** p ≤ 0.00

6.5.1. ENVIRONMENTAL PERFORMANCE

6.5.1.1. PRACTICES AND PERFORMANCE

Table 7 shows the results of the internal environmental practices and external sustainability practices – environmental performance relationship. As expected, internal environmental practices ($\beta = 0.269$, $p<0.001$) and external sustainability practices ($\beta = 0.208$, $p<0.001$) positively impact environmental performance.

6.5.1.2. MODERATING ROLE OF HOFSTEDE'S NATIONAL CULTURE DIMENSIONS

The results of the moderating role of each Hofstede's national culture dimension in the practices – environmental performance relationship can be found in Tables 8. We run two models per each Hofstede's dimension. In the first model, internal environmental practices were introduced as the independent predictor of environmental performance

and each Hofstede's national culture dimension as a moderator. Results show that there is no Hofstede's dimension that moderates the relationship between internal environmental practices and environmental performance. The internal environmental practices – environmental performance relationship is positively significant across models, but the interaction terms are no significant.

The second model included external sustainability practices as the independent predictor of environmental performance and each Hofstede's dimension as a moderating variable. As seen in Table 8, adding the interaction term for the masculinity dimension in the second step contributes to a significant change in the variance explained (adjusted R^2 = 0.059, ΔF = 4.100, p = 0.043). Results show that masculinity negatively moderates the relationship between external sustainability practices and environmental performance (β = -0.067, p<0.005). This means that the positive and significant impact of external sustainability practices on environmental performance is lower for countries scoring high in masculinity.

Table 8. Moderated model results for environmental performance

DV: Environmental Performance								
	PDI		IDV		MAS		UAI	
Variable	**Estimate (p-value)**	**Estimate (p-value)**	**Estimate (p-value)**	**Estimate (p-value)**	**Estimate (p-value)**	**Estimate (p-value)**	**Estimate (p-value)**	**Estimate (p-value)**
Intercept	2.687 (0.00)	2.689 (0.00)	2.687 (0.00)	2.689 (0.00)	2.686 (0.00)	2.688 (0.00)	2.687 (0.00)	2.69 (0.00)
Control variable: firm size	0.035 (0.296)	0.060 (0.076)	0.035 (0.301)	0.061 (0.070)	0.037 (0.269)	0.063 (0.064)	0.033 (0.327)	0.060 (0.079)
IV: internal environmental practices	0.266**(0.00)		0.270**(0.00)		0.273**(0.00)		0.270**(0.00)	
IV: external sustainability practices		0.208**(0.00)		0.217**(0.00)		0.216**(0.00)		0.208**(0.00)
Moderator: PDI	0.016 (0.637)	0.00 (0.994)						
Env. Practices x PDI	-0.020 (0.539)							
Ext. Practices x PDI		-0.002 (0.949)						
Moderator: IDV			0.004 (0.912)	0.027 (0.449)				
Env. Practices x IDV			0.016 (0.617)					
Ext. Practices x IDV				-0.015 (0.657)				
Moderator: MAS					-0.084* (0.010)	-0.091**(0.006)		
Env. Practices x MAS					-0.050 (0.125)			
Ext. Practices x MAS						-0.067*(0.043)		
Moderator: UAI							-0.021 (0.512)	-0.010 (0.769)
Env. Practices x UAI							0.013 (0.688)	
Ext. Practices x UAI								0.019 (0.559)
Step 1: Adj. R^2	0.076	0.049	0.076	0.050	0.082	0.056	0.076	0.049
Step 2: Adj. R^2 (incl. int.)	0.075	0.048	0.075	0.049	0.083	0.059	0.075	0.048
F-model (change)	0.377	0.004	0.251	0.197	2.363	4.100*	0.162	0.342
p-value (change)	0.539	0.949	0.617	0.657	0.125	0.043	0.688	0.559

* $p \leq 0.05$; ** $p \leq 0.00$

6.5.2. SOCIAL PERFORMANCE

6.5.2.1. PRACTICES AND PERFORMANCE

Results in Table 7 show a positive and significant impact of internal social practices (β = 0.2169, p<0.001) and external sustainability practices (β = 0.2355, p<0.001) on social performance.

6.5.2.2. MODERATING ROLE OF HOFSTEDE'S NATIONAL CULTURE DIMENSION

The results of the moderating role of each Hofstede's national culture dimension in the practices – social performance relationship can be found in Table 9. As in the case of environmental performance, we run two models per each Hofstede's dimension. In the first model, internal social practices were introduced as the independent predictor of social performance and each Hofstede's national culture dimension as a moderator. Results show that adding the interaction term for the power distance dimension contributes to a significant change in the variance explained (adjusted R^2 = 0.161, ΔF = 4.210, p = 0.040). The interaction term is positive and significant (β = 0.063, p<0.005), showing that power distance positively moderates the relationship between internal social practices and social performance. These results suggest that countries characterized by having high power distance levels get higher social performance improvements (as a result of the implementation of internal social practices) than countries with lower power distance levels. The internal social practices – social performance relationship is positively significant across models, but the rest of interaction terms are no significant.

The second model included external sustainability practices as the independent predictor of social performance and each Hofstede's dimension as a moderating variable. Results show that power distance and masculinity moderate the relationship between external

sustainability practices and social performance. Similar to the internal social practices model, adding the interaction term for the power distance dimension contributes to a significant change in the variance explained (adjusted R^2 = 0.133, ΔF = 6.395, p = 0.012). Power distance positively moderates the practices – performance relationship (β = 0.079, p<0.005) meaning that the positive and significant impact of external sustainability practices on social performance is higher in countries scoring high in the power distance dimension.

Also, adding the interaction term for the masculinity dimension contributes to a significant change in the variance explained (adjusted R^2 = 0.146, ΔF = 5.059, p = 0.025). Masculinity negatively moderates the impact of external sustainability practices on social performance (β = -0.07, p<0.005). As in the case of environmental performance, these results suggest that the positive and significant impact of external sustainability practices on social performance is lower for countries scoring high in masculinity.

All together the previous results show that national culture moderates the relationship between sustainability practices and sustainability performance. The discussion of the results is provided in the next section.

Table 9. Moderated model results for social performance

DV: Social Performance								
	PDI		IDV		MAS		UAI	
Variable	**Estimate (p-value)**	**Estimate (p-value)**	**Estimate (p-value)**	**Estimate (p-value)**	**Estimate (p-value)**	**Estimate (p-value)**	**Estimate (p-value)**	**Estimate (p-value)**
Intercept	3.079 (0.00)	3.079 (0.00)	3.079 (0.00)	3.078 (0.00)	3.079 (0.00)	3.078 (0.00)	3.083 (0.00)	3.082 (0.00)
Control variable: firm size	-0.017 (0.602)	0.003 (0.930)	-0.028 (0.372)	-0.007 (0.830)	-0.014 (0.658)	0.001 (0.981)	-0.033 (0.271)	-0.014 (0.662)
IV: internal social practices	0.339**(0.00)		0.350**(0.00)		0.373**(0.00)		0.374**(0.00)	
IV: external sustainability practices		0.294**(0.00)		0.310**(0.00)		0.356**(0.00)		0.334**(0.00)
Moderator: PDI	0.165**(0.00)	0.135**(0.00)						
Soc. Practices x PDI	0.063*(0.04)							
Ext. Practices x PDI		0.079* (0.012)						
Moderator: IDV			-0.130**(0.00)	-0.095**(0.005)				
Soc. Practices x IDV			-0.005 (0.870)					
Ext. Practices x IDV				-0.019 (0.542)				
Moderator: MAS					-0.141**(0.00)	-0.178**(0.00)		
Soc. Practices x MAS					-0.020 (0.520)			
Ext. Practices x MAS						-0.070*(0.025)		
Moderator: UAI							-0.19** (0.00)	-0.178 (0.00)
Soc. Practices x UAI							0.049 (0.112)	
Ext. Practices x UAI								-0.003 (0.911)
Step 1: Adj. R^2	0.158	0.128	0.150	0.120	0.153	0.142	0.170	0.144
Step 2: Adj. R^2 (incl. int.)	0.161	0.133	0.149	0.120	0.152	0.146	0.171	0.143
F-model (change)	4.210*	6.395*	0.027	0.372	0.414	5.059*	2.530	0.013
p-value (change)	0.040	0.012	0.870	0.542	0.520	0.025	0.112	0.911

* $p \leq 0.05$; ** $p \leq 0.00$

6.6. DISCUSSION

Our objective was to study how differences in national culture influence the impact of sustainability practices on sustainability performance. Our results show that two (i.e., power distance and masculinity) out of the four Hofstede's national culture dimensions moderate this relationship. More specifically, power distance positively moderates both the relationship between internal social practices and social performance and external sustainability practices and social performance. Masculinity negatively moderates the relationship between external sustainability practices and both environmental and social performance. These results are in line with previous research in OM that emphasized the key role of national culture in explaining and predicting operational outcomes (Pagell et al., 2005; Metters, 2008; Wiengarten et al., 2011). More specifically, the results have contributed to highlight that the role of national culture is relevant when studying sustainable OM. In fact, implementing the same sustainability practices in different countries can have different performance implications.

Next, we provide more detail on the specific results of the moderating role of national culture. The discussion is structured in two sections: (1) moderating role of national culture for environmental models and (2) moderating role of national culture for social models

6.6.1. NATIONAL CULTURE IMPLICATIONS FOR ENVIRONMENTAL MODELS

Power distance, individualism and uncertainty avoidance, do not moderate the relationship between internal environmental/external sustainability practices and environmental performance. This suggests that the reduction on water and materials consumption as well as the reduction on waste and pollution levels as a result of the implementation of internal and external practices are not linked to the acceptance of

inequality, the integration levels of individuals to the group or the (in)tolerance for uncertainty and ambiguity. Masculinity, however, is relevant in determining the efficacy of external sustainability practices. As already stated, countries scoring high in masculinity (i.e., low in femininity) will have lower environmental performance levels as a result of the implementation of external sustainability practices compared to countries scoring low in masculinity (i.e., high in femininity). External sustainability practices imply that the buying firm works closely with suppliers by providing training to them or by working together to improve environmental outcomes. Masculinity cultures are described as aggressive and competitive with the main objective of achieving success (Wiengarten et al., 2011). Thus, it makes sense that countries scoring low in masculinity (i.e., high femininity), which place more value on relationships, are able to get higher environmental performance levels as a result of the implementation of practices that imply sharing resources with other partners (i.e., suppliers) and devoting time and effort.

6.6.2. NATIONAL CULTURE IMPLICATIONS FOR SOCIAL MODELS

In the case of social performance, the results suggest that individualism and uncertainty avoidance do not moderate the relationship between internal social/external sustainability and social performance. This suggests that better health and safety conditions as well as higher worker's motivation as a result of the implementation of internal and external practices are not affected by the integration levels of the individual to the group nor the (in)tolerance for ambiguity and uncertainty. However, the practices – performance relationship for the social model is affected by the acceptance of inequality and the distribution of roles between genders.

Power distance, positively moderates the relationship between both type of practices (i.e., internal social and external sustainability) and social performance. Countries that score high in power distance accept inequality in power. In that sense, the fact that the impact of internal and external practices is higher in these countries can be explained by the fact that these practices counter balance inequalities at the country level. The implementation of practices related to health and safety issues and work and life balance policies will lead to higher levels of employees' motivation because in countries characterized by having high power distance there are more inequalities. Similar to the environmental model results, masculinity negatively moderates the relationship between external practices and social performance. The same logic applies, since countries scoring high in femininity (i.e., low in masculinity) put more emphasis on relationships, the impact of the implementation of practices such as training suppliers or working directly with them will be higher than in countries that score higher in masculinity (i.e., value success). Also, femininity countries are characterized by focusing on satisfaction. Therefore, it makes sense that the impact is higher in these kind of countries were employees' satisfaction is sought and valued.

Overall, taken together, the results of the environmental and social models provide three key messages (See a summary of the results in Table 10). First, the impact of external sustainability practices on both dimensions of sustainability performance (i.e., environmental and social) is higher for countries scoring high in femininity (i.e., low masculinity). The collaborative approach that characterizes these countries enhances their impact on performance. Second, countries scoring high in power distance will benefit from higher levels of social performance as a result of the implementation of both internal and external practices as these practices will help to counter balance the existing inequalities. Finally, comparing environmental and social models, our results

suggest that the social dimension of sustainability is more sensitive to cultural issues. These results make sense if we take into account that while the environmental dimension of sustainability is related to improvements in products and processes ("hard" issues), the social dimension relates to "softer" components since it is related human behavior.

Table 10. Summary of results

Practices	**Sustainability Performance Dimension**	
	Environmental Performance	Social Performance
Internal Practices		POWER DISTANCE
External Practices	MASCULINITY	POWER DISTANCE MASCULINITY

The results are important both for researchers and practitioners. The main research implication of this study is that when looking at the relationship between sustainability practices and sustainability performance there is a need to control by elements of national culture. Performance implications are different for different cultures. Previous authors have highlighted the need to include national cultural elements in OM studies (Cagliano et al., 2011; Pagell et al., 2005; Metters et al., 2008; Wiengarten et al., 2011), however this suggestion has been neglected in the sustainable OM stream of the literature. From a managerial point of view, this study raises interesting points about how to take into account cultural variables when adopting sustainable practices in different countries. The results are relevant for managers of multinational companies with plants located in different regions of the world and for managers that source from firms located in countries with different national cultures. First, managers need to understand the national culture of the country in which their plants/suppliers are located, especially if their objective is to improve the social dimension of sustainability. In that sense, the impact of social performance will be higher as a result of the implementation

of social practices in countries characterized by high power distance. Second, external practices are more effective in countries scoring high in femininity. Being aware of these differences makes the management of sustainability in global supply chains easier.

6.7. CONCLUSIONS, LIMITATIONS AND FURTHER RESEARCH

Our results add to the sustainable OM literature by highlighting the important role of national culture. In fact, national culture moderates the relationship between sustainability practices and sustainability performance. In other words, differences in national culture lead to differences in sustainability performance outcomes. Besides from the study contributions, the paper suffers from some limitations that need to be acknowledged. First, our data is cross-sectional in nature. Thus, it does not account for possible recursive relationships. Second, we have used subjective measures for both environmental and social performance. Future research should try to include objective measures such as CO_2 emissions for environmental performance and number of industrial accidents for social performance. Third, we have used the Hofstede model of national culture. Other models can be found in the literature (e.g. GLOBE) that may lead to different results and provide additional insights. Future research should try to replicate this study by using different conceptualizations of national culture to (1) prove that the role of national culture still holds and to (2) identify other dimensions that have been neglected by solely relying on the Hofstede model. Finally, we have focused on explaining differences in sustainability outcomes due to differences on national culture. Future research should include measures of organizational culture, which has been not captured in this study, since it could also explain potential differences in sustainability performance and could counter balance the effect of national culture.

ACKNOWLEDGEMENTS

The authors acknowledge financial support from research grant ECO/155/2012 (ref. 2015FI_B2 00108) from the Research and Universities Secretary, Economic Department, Generality of Catalonia

REFERENCES

Andersen, M., and Skjoett-Larsen, T. (2009), "Corporate social responsibility in global supply chains", Supply Chain Management: An International Journal, 14(2): 75-86.

Anderson, J.C. and Gerbing, D.W. (1988), Structural equation modelling in practice: a review and recommended two-step approach", Psychological Bulletin, 103: 411.423.

Bowen, F., Cousins, P., Lamming, R. and Faruk, A. (2011), "The role of supply management capabilities in green supply", Production and Operations Management, 10(2): 174-89.

Cagliano, R., Caniato, F., Golini, R., Longoni, A., Micelotta, E. (2011). "The impact of country culture on the adoption of new forms of work organization", International Journal of Operations & Production Management 31 (3): 297-323.

Carter, C.R. and Carter, J.R. (1998), "Interorganizational determinants of environmental purchasing: initial evidence from the consumer products industries", Decision Sciences, 29(3) : 659-684.

Carter, C.R., Ellram, L.M., Ready, K.J. (1998), "Environmental purchasing: benchmarking our German counterparts", International Journal of Purchasing and Materials Management, 34(3): 28-38.

de Giovanni, P. (2012). Do internal and external environmental management contribute to the triple bottom line? International Journal of Operations & Production Management, 32(3): 265-290.

Govindarajan, V., Gupta, A. (2001), "Building an effective global business team", Sloan Management Review, 42:4, 63-71.

Keating, Byron, Ali Quazi, Anton Kriz, and Tim Coltman. (2008). "In Pursuit of a Sustainable Supply Chain: Insights from Westpac Banking Corporation." Supply Chain Management: An International Journal 13 (3): 175–179.

Klassen, R.D., Vachon, S. (2003). Collaboration and evaluation in the supply chain: the impact on plant-level environmental investment. Production and Operations Management, 12(3): 336-352.

Klassen, R.D. and Whybark, C.D. (1999), "The impact of environmental technologies on manufacturing peformance", Academic of Management Journal, 42(6): 599-616.

Kleindorfer, P.R., Singhal, K., van Wassenhove, L. (2005). Sustainable Operations Management. Production and Operations Management, 14(4): 482-492.

Gimenez, C., Sierra, V. and Rodon, J. (2012), "Sustainable operations: their impact on the triple bottom line", International Journal of Production Economics, Vol. 140, pp. 149-159.

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

Golini, R., Longoni, A., Cagliano, R. (2014). Developing sustainability in global manufacturing networks: the role site competence on sustainability performance. International Journal of Production Economics, 147: 448-459.

Green, K.W., Zelbst, P.J., Bhadauria V.S., Meacham J. (2012). Do Environmental Collaboration and Monitoring Enhance Organizational Performance? Industrial Management & Data Systems, 112(2): 186-205.

Green, K.W., Zelbst, P.J., Meacham J., Bhadauria V.S. (2012) "Green supply chain management practices: impact on performance", Supply Chain Management: An International Journal, 17(3): 290 – 305.

Gualandris, J., Golini, R., Kalchschmidt, M. (2014). Do supply management and global sourcing matter for firm sustainability performance?: An international study. Supply Chain Management: An International Journal, 19(3): 258-274.

Hofstede, G. (1980). *Culture's consequences: International differences in work-related values*. Beverly Hills, CA: Sage Publications.

Hofstede, G., Hofstede, G.J., and Minkov, M. (2010). *Cultures and organizations: software of the mind,* McGraw-Hill Professional Publishing: New York: NY.

Hope, C.A., Muehlemann, A.P. (2001), "The impact of culture on best-practice production/operations management", International Journal of Management Reviews, 3(3): 199-217.

Krause, D.R., Scannell, T. and Calantone, R. (2000), "A structural analysis of the effectiveness of buying firms' strategies to improve supplier performance", Decision Sciences, 31(1): 33-55.

Kull, T. J., and Wacker, J. G. (2010). Quality management effectiveness in Asia: The influence of culture. Journal of Operations Management, 28: 223-239.

Large, R.O., Gimenez, C. (2011). Drivers of green supply management performance: evidence from Germany. Journal of Purchasing and Supply Management, 17(3): 176-184.

Longo, M., Mura, M. Bonoli, A. (2005), "Corporate Social Responsibility and Corporate Perofrmance: the case of italian SMEs", Corporate Governance, 5(4): 28-42.

Magnusson, P., Wilson, R.T., Zdravkovic, S., Zhou, J.X., Westjohn, S.A. (2008), "Breaking through the cultural clutter; a comparative assessment of multiple cultural and institutional frameworks", International Marketing Review, 25(2), 183-201.

McKenzie, S. (2004). Social sustainability: towards some definitions. Hawke Research Institute, University of South Australia, Magill.

Merritt, A. (2000). Culture in the cockpit: do Hofstede's dimensions replicate? Journal of Cross-Cultural Psychology, 31(3): 283-301.

Metters, R. (2008). A case study of national culture and offshoring services, International Journal of Operations and Production Management, 28(8): 727-747.

Min, H. and Galle, W.P. (2001), "Electronic commerce-based purchasing: a survey on the perceptual differences between large and small organizations", International Journal of Logistics: Research and Applications, 4(1): 79-95.

Morgan, N. A., Kaleka, A., Gooner, R.A., (2007). Focal supplier opportunism in supermarket retailer category management. Journal of Operations Management, 25: 512-527.

Nunnally, J.C. (1978), Psychometric Theory, McGraw-Hill: New York.

Pagell, M., Gobeli, D. (2009). How plant managers' experiences and attitudes toward sustainability relate to operational performance. Production and Operations Management, 18(3): 278-299.

Pagell, M., Katz, J.P., Sheu, C. (2005). The importance of national culture in operations management research. International Journal of Operations and Production Management, 25(4): 371-394.

Peng, D.X., Lai F. (2012). Using partial least squares in operations management research: A practical guideline and summary of past research. Journal of Operations Management, 30: 467-480.

Podsakoff, P.M., MacKenzie, S.B., Lee, J.Y., Podsakoff, N.P. (2003). Common method biases in behavioural research: A critical review of the literature and recommended remedies. Journal of Applied Psychology, 88(5): 879-903.

Power, D., Schoenherr, T., and Samson, D. (2010). The cultural characteristic of individualism/collectivism: a comparative study of implications for investments in operations between emerging Asian and industrialized Western countries. Journal of Operations Management, 28(3): 206-222.

Pullman, M., Maloni, M., Carter, C. (2009). Food for Thought: Motivations to Adopt Sustainability Practices and Perceived Outcomes. Journal of Supply Chain Management, 45(4): 38-54.

Rao, P. (2002), "Greening the supply chain: a new initiative in South East Asia", International Journal of Operations and Production Management, 22(6): 632-55.

Rao, P., Holt, D. (2005). Do green supply chains lead to competitiveness and economic performance? International Journal of Operations & Production Management, 25(9): 898-916.

Ronen, S., Shenkar, O. (1985). Clustering countries on attitudinal dimensions - a review and synthesis. Academy of Management Review, 10(3): 435-454.

Sarkis, J . (1998), "evaluating environmentally conscious business practices", European Journal of Operational Research, 107: 159-174.

Seuring, S., Muller, M. (2008). "From a literature review to a conceptual framework for sustainable supply chain management", Journal of Cleaner Production, 16(15): 1699-1710.

Sivakumar, K. and Cheryl Nakata (2001), "The Stampede Toward Hofstede's Framework: Avoiding the Sample Design Pit in Cross-Cultural Research," Journal of International Business Studies, 32(3): 555-574.

Smith, P. B. (1992). Organisational behavior and national cultures. British Journal of Management, 3: 39-51.

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.

Vecchi, A., Brennan, L., (2009) "Quality management: a cross-cultural perspective", Cross Cultural Management: An International Journal, 16(2): 149 – 164.

Wiengarten, F., Fynes, B., Pagell, M. and de Burca, S. (2011). Exploring the impact of national culture on investments in manufacturing practices and performance. International Journal of Operations and Production Management, 31(5): 554-578.

World Business Council for Sustainable Development (WBCSD) (1999), Corporate Social Responsibility, Meeting changing expectations, http://www.wbcsd.org/

Theyel, G. (2001). Customer and supplier relations for environmental performance. Greener Management International, 35(3): 61-69.

Zhu, Q. and Sarkis, J. (2004), "Relationships between operational programs and performance among early adopters of green supply chain management programs in Chinese manufacturing enterprises" Journal of Operations Management, Vol. 22, No. 3, pp. 265-289.

Zhu, Q., Sarkis and J. (2007), "The moderating effects of institutional pressures on emergent green supply chain practices and performance", International Journal of Production Research, 45(18), 4333 - 4355.

Zhu, Q., Sarkis, J., Geng, Y. (2005), "Green supply-chain management practices in China: Drivers, practices and performance", International Journal of Operations and Production Management, 25: 449-468.

Zhu, Q., Sarkis, J., Lai, K.H. (2007), "Initiatives and outcomes of green supply chain management implementation by Chinese manufacturers", Journal of Environmental Management, 85(1): 179-189.

Appendix A. List of items, description and source

Internal Environmental Practices	**Data source**	**References**
Indicate the effort put in the last 3 years into implementing action programs related to: (1. None – 5. High)		
EP1. Energy and water consumption reduction programs	IMSS VI (2014)	Sarkis (1998) Klassen and Whybark (1999)
EP2. Pollution emission reduction and waste recycling programs		
Internal Social Practices		
Indicate the effort put in the last 3 years into implementing action programs related to: (1. None – 5. High)		
SP1. Formal occupational health and safety management systems	IMSS VI (2014)	Longo et al. (2005)
SP2. Work/life balance policies		
External Sustainability Practices		
Indicate the effort put in the last 3 years into implementing action programs related to: (1. None – 5. High)		
EP1.Suppliers' sustainability performance assessment through formal evaluation, monitoring and auditing using established guidelines and procedures	IMSS VI (2014)	Adapted from Krause et al. (200)
EP2. Training/education in sustainability issues for suppliers' personnel		
EP3. Joint efforts with suppliers to improve their sustainability performance		
Environmental Performance		
How has your performance changed over the last 3 years? (1 – Increased (+5% or worse); 5 – Strongly decreased (-25% or more))		
ENVP1. Materials, water and/or energy consumption	IMSS VI (2014)	Rao (2002) Zhu and Sarkis (2004
ENVP2. Pollution emission and waste production levels		
Social Performance		
How has your performance changed over the last 3 years? (1 – Decreased (-5% or worse); 5 – Strongly increased (+25% or more))		
SOCP1. Workers' motivation and satisfaction	IMSS VI (2014)	Gimenez et al. (2012); Pagell and Gobeli (2009)
SOCP2. Health and safety conditions		
Firm's size		
FS1. Number of employees	IMSS VI (2014)	

CHAPTER 7
Discussion

This chapter provides a discussion on the results of the PhD Thesis and an explicit answer to the four research questions previously stated

The objective of this PhD Thesis was twofold. The first objective was linked to the study of the antecedents of sustainable supplier development practices with an emphasis on country differences. The second objective was related to the study of the effectiveness of sustainable supplier development practices on both the supplier and the buying firm's performance putting emphasis on the social dimension. In that sense, the PhD Thesis presented the four following research questions:

- ***RQ1.*** *Do external and internal antecedents have the same influence on the adoption of sustainable supplier development practices across countries?*
- ***RQ2.*** *Do sustainable supplier development practices (i.e., assessment and collaboration) contribute to improve suppliers' and/or buying firm's performance?*
- ***RQ3.*** *What is the role of suppliers' performance in the sustainable supplier development practices – buying firm's performance relationship?*
- ***RQ4.*** *Is the effectiveness of sustainable supplier development practices consistent across different national cultures?*

Each of these four research questions has been addressed in Chapters 3, 4, 5 and 6 respectively. In the following lines we discuss the results obtained in each of the chapters and provide an explicit answer to each research question.

RQ1. *Do external and internal antecedents have the same influence on the adoption of sustainable supplier development practices across countries?*

Chapter 3 studies the influence of both internal and external antecedents on the adoption of sustainable supplier development practices. Supplier integration is considered as an internal antecedent and its enabling role in the adoption of sustainable supplier development practices is studied. Mimetic, normative and coercive pressures at the country level are considered as external antecedents and its role as drivers in the adoption of sustainable supplier development practices is analyzed.

Results in Chapter 3 show that while mimetic pressures have a positive and significant effect on the adoption of sustainable supplier development practices, coercive and normative pressures do not. In addition, our results also show that supplier integration positively moderates the relationship between mimetic pressures and sustainable supplier development practices adoption.

These results can be interpreted as follows: In countries in which firms extensively implement sustainability practices (e.g., energy and water consumption reduction programs or work and life balance policies), firms are more pressured to adopt practices that have as an aim the extension of sustainability to suppliers. Regulations and pressures coming from social groups such as NGOs or the media do not seem to affect the adoption of these sustainable supplier development practices. Furthermore, the adoption of these practices due to mimetic pressures is higher when these firms are externally integrated with their suppliers (i.e., in the context in which firms have already in place mechanisms to share information or make joint decisions with their suppliers).

Overall, answering RQ1, the adoption of sustainable supplier development practices is higher in countries characterized by high levels of mimetic pressures. That is, firms with plants located in countries largely committed to sustainability might be more willing to adopt practices that aim to extend sustainability to suppliers in order to legitimate their position as sustainability oriented firms. These results show that sustainable supplier development practices can be described as a competitive weapon rather than a tool to merely comply with stakeholders such as governments, NGOs and/or trade unions.

RQ2. *Do sustainable supplier development practices (i.e., assessment and collaboration) contribute to improve suppliers' and/or buying firm's performance?*

Chapter 4 analyzes the effectiveness of supplier development practices on both the suppliers' and the buying firm's performance with a special focus on the social

dimension. Assessment (e.g., evaluation of supplier in terms of social issues) and collaboration (e.g., provision of training related to health and safety issues to suppliers) have been considered as supplier development practices. Both the suppliers' and the buying firm's performance are focused on the social dimension of sustainability. In addition, our results highlight that the following three performance dimensions need to be distinguished: buying firm's social reputation, buying firm employees' well-being, and suppliers' social performance.

Our results show that assessment and collaboration impact differently on each performance dimension. While assessment helps to improve the buying firm's social reputation, collaboration has a positive influence on supplier's social performance. Furthermore, our results show that there is no support for the link between assessment and both buying firm's employees well-being and suppliers' social performance and for the link between collaboration and buying firm's social performance (i.e., social reputation and employees' well-being).

When a buying firm evaluates suppliers in terms of social issues it projects a socially-responsible image in the eyes of its stakeholders which helps to improve its reputation as a socially responsible firm. However, the assessment of suppliers does not help to improve employees' well-being in the buying firm, as these improvements might be more related to the implementation of sustainability practices within the boundaries of the firm. In this same line, assessing suppliers does not improve the suppliers' performance. While assessment practices can help to identify potential areas of improvements at the suppliers' facilities they do not contribute to real improvements. To improve the suppliers' performance buying firms need to directly collaborate with them by providing training, working directly with them or investing resources.

Overall, answering RQ2, both assessment and collaboration are needed to achieve a socially-responsible supply chain. However, their contribution is different. While assessment helps to improve the buying firm's social reputation; collaboration improves the social performance of the supplier.

RQ3. *What is the role of suppliers' performance in the sustainable supplier development practices – buying firm's performance relationship?*

To answer to this research question, in Chapter 5, we first studied the impact of social supplier development practices on the suppliers' social performance and the buying firm's operational and economic performance and then analyzed the mediating role of suppliers' social performance on the supplier development practices – buying firm's performance relationship.

Our results show that supplier development practices help to improve both the suppliers' social and the buying firm's operational performance. However, they have a negative impact on the buying firm's economic performance. Also, with respect to the role of suppliers' social performance, our results indicate that suppliers' social performance has a positive impact on both buying firm's performance outcomes (i.e., operational and economic performance) and that it mediates the relationship between supplier development practices and operational performance.

These results imply that implementing social supplier development practices have benefits for both suppliers and buying firms. On the one hand, working together with suppliers or providing training to them contributes to improve the working conditions at the suppliers' premises. On the other hand, the buying firm achieves operational improvements from the implementation of supplier development practices. That is, in a more socially responsible firm (i.e., in a firm that works with its suppliers to improve the supplier employees' well-being), employees are more motivated, increasing their

productivity and quality outcomes. In addition, the operational performance of the firm also increases as a result of improvements on the suppliers' social performance. That is, once the supplier social performance has improved as a result of the implementation of supplier development practices, the operational performance of the buying firm also improves. The economic performance of the buying firm though, does not improve, suggesting that the implementation of supplier development practices in the short-term is costly for the buying firm and worsens its economic outcomes.

Overall, if we analyze with more detail the role of the suppliers' social performance, in order to answer RQ3, we can highlight the following facts. First, having suppliers that are socially responsible helps the buying firm to achieve better operational and economic outcomes. Second, buying firms can achieve additional improvements on their operational performance by effectively implementing supplier development practices. That is, better operational results can be achieved if the implementation of supplier development practices results in improvements for the suppliers' social performance.

RQ4. *Is the effectiveness of sustainable supplier development practices consistent across different national cultures?*

Chapter 6 analyzed the differences in sustainability performance outcomes as a result of the implementation of supplier development practices due to differences in country-factors. More specifically, the chapter analyzed the moderating role of national culture in the sustainable supplier development – buying firm's sustainability performance dimension.

The results suggest that while there is a positive relationship between supplier development practices on both the environmental and social buying firm's performance dimensions, this impact is influenced by the country's national culture. More

specifically, masculinity negatively moderates the relationship between supplier development practices and both performance dimensions (i.e., environmental and social performance). This means that the positive impact of practices on performance is higher for countries scoring low in masculinity (i.e., high in femininity). In addition, the supplier development practices – social performance relationship is positively moderated by power distance. Thus suggesting that the positive social performance outcomes that result from the implementation of supplier development practices is higher for counties characterized by high power distance.

The implications of these results are discussed in the following lines. Masculinity, which refers to the distribution of roles between genders, plays a key role in determining the efficacy of sustainable supplier development practices both in terms of environmental and social performance dimensions. Masculinity countries are characterized by being aggressive and competitive, while femininity countries are characterized by emphasizing collaboration and value relationships. Thus, it makes sense that the efficacy of sustainable supplier development practices, which imply collaboration between partners, is higher in more collaborative-oriented practices. On the other hand, countries with wide acceptance of power inequalities are able to get better benefits on performance since the implementation of sustainable supplier development practices help to counterbalance the existent inequalities at the country level.

Overall, answering RQ4, supplier development practices are effective in terms of sustainability outcomes for the buying firm across countries. However, its effectiveness is higher in countries characterized by low levels of masculinity and high levels of power distance.

In the introduction of the PhD Thesis the need to further investigate the adoption of practices that aim to extend sustainability upstream the supply chain (i.e., supplier development practices) was highlighted. Once the four research questions related to the concept of sustainable supplier development practices included in this PhD Thesis have been answered there is a need to summarize the main takeaways related to this set of practices:

i. Mimetic pressures at the country level and supplier integration at the plant level are antecedents of sustainable supplier development practices. The country commitment towards sustainability pressures firms in that country to adopt sustainable supplier development practices in order to legitimate their position as sustainability oriented firms. Supplier integration enables their adoption.

ii. Supplier development practices are associated to the buying firm's performance. In other words, the firm that implements these practices is able to reap the benefit of its implementation in terms of sustainability and operational outcomes. That is, assessing suppliers in terms of sustainability issues improves the buying firm's social reputation. Also, the implementation of sustainable supplier development practices helps improve the operational, environmental and social performance of the buying firm.

iii. The efficacy of sustainable supplier development practices in terms of sustainability performance is influenced by the national culture of the country in which the firm's plant is located. In that sense, firms located in countries scoring low in masculinity are able to get higher environmental and social improvements. In the same line, firms located in countries scoring high in power distance are able to achieve higher social performance improvements.

iv. Although the implementation of sustainable supplier development practices results in improved operational, environmental and social performance outcomes for the buying firm its implementation is costly. Therefore, in the short-term, the implementation of these practices damages the buying firm's economic performance.

v. The implementation of sustainable supplier development practices leads to better supplier's sustainability performance. That is, working together with suppliers and/or providing training to them results in better working conditions at the suppliers' premises as well as higher suppliers' compliance in terms of sustainability issues.

vi. The effective implementation of sustainable supplier development practices leads to higher operational performance levels for the buying firm. That is, once the supplier's social performance has improved as a result of the implementation of sustainable supplier development practices, the buying firm's operational performance is also improved.

In the following chapter we provide the contributions of the PhD Thesis, highlight its main limitations and provide lines for further research.

CHAPTER 8
Conclusions

This chapter shows the PhD Thesis main contributions and highlights its main limitations. It also suggests lines for further research.

This PhD Thesis has deepened into the understanding we have about the implementation of practices that aim to extend sustainability to suppliers (i.e., sustainable supplier development practices) by studying their antecedents and performance implications in a different set of outcomes. In that sense, this PhD Thesis has contributed to extend the existing literature on sustainable supplier development practices by including the social dimension of sustainability which has been generally neglected, by analyzing the effectiveness of these practices not only for the buying firm but also for the supplier, and by considering country factors in the analysis of both antecedents and performance implications.

More specifically, in the study of sustainable supplier development practices antecedents (Chapter 3) we contribute to the sustainable supply chain literature by extending the relationship between institutional pressures and the adoption of sustainable supply chain practices focusing at the country level. Countries in which firms are highly committed to sustainability there is more pressure to adopt practices that aim to extend sustainability to suppliers. In the study of antecedents we have also been able to highlight the key role of supplier integration as an enabler of sustainable supplier development practices adoption.

In the study of performance implications (Chapters 4, 5, and 6), we have contributed to better understand the effectiveness of sustainable supplier development practices. First, we have emphasized that in the study of their effectiveness it is necessary to consider both the buying firm and the supplier performance since practices impact differently on different performance outcomes. Second, we have been able to highlight the key role of suppliers' performance in the achievement of buying firm's operational improvements. Third, we have also shown the role played by national culture in achieving a sustainable supply chain and emphasized its importance in the sustainable supply chain

management literature. In fact, the effectiveness of sustainable supplier development practices can be enhanced in countries in which there is high power distance and high femininity values.

To answer our research questions we have adopted the lenses of the Institutional Theory, RBV, TCT and relational view. In Chapter 4, the combination of both the institutional theory and the RBV allowed us to better understand the relationship between external drivers and the firm's specific capabilities. In that sense, we have been able to denote that when looking at country level pressures, mimetic pressures exert a positive influence on the adoption of these external practices. In addition, in line with the RBV, firms need to develop specific capabilities (i.e., supplier integration) to implement sustainable supplier development practices. Results in Chapter 5 show that that evaluation does not help to reduce suppliers' opportunistic behavior as posited by the TCT rationale, however these costly monitoring practices help to improve buying firm's reputation. In addition, as suggested by the RBV collaboration helps to improve suppliers' social performance. Finally, Chapter 6 relies on the relational view to explain the increase in rents resulting from supplier development practices. Our results show that these rents take the form of increased operational performance for the buying firm and increased social performance for the supplier.

We believe this PhD Thesis has also some managerial implications. These implications are divided into recommendations with respect to the adoption of sustainable supplier development practices and recommendations related to their effectiveness. On the one hand, regarding their adoption, managers need to be aware that what local competitors do in terms of sustainability will dictate the kind of practices to be adopted. It is important not to be left behind because the extension of sustainability to suppliers may be a way to compete. Also, sustainable supplier development practices will be easier to

adopt in the presence of supplier integration. In that sense, managers can gain additional competitive advantage from firm related capabilities such as information sharing and joint management decisions with their suppliers.

On the other hand, regarding the performance implications of sustainable supplier development practices, managers need to be aware of the following issues. First, the implementation of sustainable supplier development practices helps to improve the buying firm's social performance in terms of reputation. Companies willing to improve their social image can rely on the use of assessment practices and evaluate their suppliers in terms of sustainability issues. However, if they want to be sustainable across their supply chain, assessment is not enough and collaboration with suppliers is needed.

Second, the implementation of these practices will help buying firms to achieve better operational results. That is, by collaborating with their suppliers to improve social issues, buying firms can benefit from higher quality and delivery outcomes. Regarding economic performance, managers need to be aware that the implementation of sustainable supplier development practices is costly, however it helps to improve the suppliers' social performance. That is, managers can rely on the use of these practices, especially collaborative ones, to make their suppliers more socially responsible and hence extend sustainability along the chain. In that sense, managers need to decide which cost to bear: the cost of implementing sustainable supplier development practices or the cost of their suppliers behaving unethically.

Finally, for managers with plants located all over the world it is important to take into account cultural variables when implementing these practices. The effectiveness of

sustainable supplier development practices may vary depending on the cultural characteristics of the country in which the plant is located.

Besides from these contributions to both research and practice, this PhD Thesis has some limitations that need to be acknowledged. First, the PhD Thesis employs survey based methodologies. The adoption of this methodology responds to the positivistic approach of the PhD Thesis and allowed us to test the proposed research hypotheses on a large scale; to study cause-effect relationships between different constructs such as institutional pressures and SD practices or SD practices and different performance dimensions; and to analyze the role of variables such as national culture, supplier integration and supplier's performance on some of the abovementioned relationships. However, by relying only on survey based research we have not been able to deepen into the understanding of "how" and "why" some practices are effective, some variables play a key role on the effectiveness of sustainable SD practices and/or certain results are achieved. In that sense, further research should try to deepen in our results and better understand them by employing case study methodology. Second, the different databases used in our study employ data that is cross-sectional in nature. Thus, the different analysis we have performed do not account for possible recursive relationships between the constructs under study (e.g., practices and performance). Future research should try to use longitudinal data to overcome this limitation. Third, although we employed objective data to measure economic outcomes, we used self-reported data to measure environmental and social outcomes. In that sense, future research should try to include measures such as the level of CO_2 emissions and/or the number of accidents at the company/plant level when measuring sustainability performance to strengthen the validity and reliability of results. Fourth, throughout the different chapters of the thesis respondents have been buying firms. This means that we asked buying firms about their

perceptions with respect to suppliers' performance. Although previous studies have analyzed suppliers' performance by relying on buying firm's perception (e.g., Akamp and Muller, 2013; Carter, 2005), future research should try to obtain dyads of suppliers and buyers. Fifth, related to the construct of suppliers' performance, we have mainly analyzed its role focusing on the social dimension. Future research should also study the effectiveness of sustainable supplier development practices and the role of suppliers' performance in the context of environmental sustainability. Sixth, we have highlighted the key role of national culture in the effectiveness of sustainable supplier development practices. However, we have just considered it for the buying firm. Future research should try to investigate if national culture also affects the sustainable supplier development practices – suppliers' performance relationship. Finally, we have focused on the adoption and effectiveness of sustainable supplier development practices for manufacturing firms. Therefore, our results are not applicable to service firms. Future research should try to include both type of sectors in their studies and analyze potential differences.

REFERENCES

Aerts, W., Cornier, D., Magnan, M. (2006), "Intra-industry imitation in corporate environmental reporting: an international perspective", Journal of Accounting and Public Policy, 25: 299-331

Akamp, M. And Muller, M. (2012), "Supplier management in developing countries", Journal of Cleaner Production

Albino, V., Dangelico, R.M. and Pontrandolfo, P. (2012), "Do inter-organizational collaborations enhance a firm's environmental performance? A study of the largest U.S. companies", Journal of Cleaner Production, 37, 304-315.

Andersen, M. and Skjoett-Larsen, T. (2009), "Corporate social responsibility in global supply chain", Supply Chain Management: An International Journal, 14(2): 75-86.

Ball, A. and Craig, R. (2010), "Using neo-institutionalism to advance social and environmental accounting", Critical Perspectives on Accounting, 21: 282-293.

Barney, J.B. (1991), "Firm resources and sustained competitive advantage", Journal of Management, 17(1), 99-120.

Barringer, B.R. and Harrison, J.S. (2000), "Walking a tightrope: creating value through interorganizational relationships", Journal of Management, 26(3), 367-403.

Blome, C., Hollos, D., Paulraj, A. (2014), "Green procurement and green supplier development: antecedents and effects on supplier performance", International Journal of Production Research, 52(1): 32-49.

Borchardt, M., Wendt, M.H., Pereira, G.M. and Selitto, M.A. (2011), "Redesign of a component based on ecodesign practices: environmental impacts and cost reduction achievements", Journal of Cleaner Production, 19(1), 49-57.

Bowen, F., Cousings, P., Lamming, R. and Faruk, A. (2001), "The role of supply management capabilities in green supply", Producton and Operations Management, 10 (2), 45-63.

Cao, M. and Zhang, Q. (2011), "Supply chain collaboration: impact on collaborative advantage and firm performance", Journal of Operations Management, 29, 163-180.

Carter, C.R. (2005), "Purchasing social responsibility and firm performance: the key mediating roles of organizational learning and supplier performance", International Journal of Physical Distribution and Logistics Management, 35(3-4), 177-194.

Carter, C.R. and Jennings, M.M. (2002), "Logistics social responsibility: an integrated framework", Journal of Business Logistics, 23(1), 145-180.

Carter, C.R. and Rogers, D.S. (2008), "A framework of sustainable supply chain management moving toward new theory", International Journal of Physical Distribution & Logistics Management, 38(5), 360-87.

Ciliberti, F., Pontrandolfo, P. and Scozzi, B. (2008), "Investigating coporate social responsibility in supply chains: a (sic) SME perspective", Journal of Cleaner Production, 16(15), 1579-88.

Cohen, L., Manion, L. and Morisson, K. (2000), Research methods in education. RoutledgerFalmer: London.

de Giovanni, P. (2012), "Do internal and external environmental management contribute to the triple bottom line?", International Journal of Operatons and Production Management, 32(3), 265-290.

de Ron, A.J. (1998), "Sustainable production: the ultimate result of a continuous improvement", International Journal of Production Economics, 56-57, 99-110.

Deephouse, D.L. (1996), "Does isomorphism legitimate?", *The Academy of Management Journal*, 39(4): 1024-1039.

DiMaggio, P. and Powell, W. (1983), "The iron cage revisited: Institutional isomorphism and collective rationality in organizational fields", American Sociological Review, 48: 147-160.

Dyer, J.H. and Singh, H. (1998), "The relational view: cooperative strategy and sources of interorganizational competitive advantage", Academy of Management Review, 23(4), 660-679.

Elkington, J. 1998. Cannibals with forks: The triple bottom line of the 21st century. Stoney Creek: New Society Publishers.

Fabian, T. & Hill, C. (2005), "Sourcing overseas for the retail sector: CSR and the ethical supply chain", PriceWaterhouseCoopers.

Faruk, A., Lamming, R., Cousing, P. and Bowen, F. (2002), "Analyzing, mapping and managing environmental impacts along supply chains", Journal of Purchasing and Supply Management, 16, 2, 1180-30.

Foerstl, K., Reuter, C., Hartmann, E. and Blome, C. (2010), "Managing supplier sustainability risks in a dynamically changing environment – sustainable supplier management in the chemical industry", Journal of Purchasing and Supply Management, 16(2), 118-30.

Gallear, D., Ghobadian, A. and Chen, W. (2012), "Corporate responsibility, supply chain partnership and performance: An empirical examination", International Journal of Production Economics, 140, 83-91.

Galliers, R.D. (1993), "Research issues in information systems", Journal of Information Technology, 8(2), 7.

Geffen, C. and Rothenberg, S. (2000), "Suppliers and environmental innovation: the automotive paint process", International Journal of Operations and Production Management, 20(2), 166-86.

Gimenez, C. and Sierra, V. (2013), "Sustainable Supply Chains: Governance Mechanisms to Greening Suppliers", Journal of Business Ethics, 85(1), 77-92.

Gimenez, C., Sierra, V. and Rodon, J. (2012), "Sustainable operations: their impact on the triple bottom line", International Journal of Production Economics, 140: 149-159.

Golini, R., Longoni, A., Cagliano, R. 2014. Developing sustainability in global manufacturing networks: the role site competence on sustainability performance. International Journal of Production Economics, 147: 448-459.

Gonzalez-Benito, J. and Gonzalez-Benito, O. (2006), "The role of stakeholder pressure and managerial values in the implementation of environmental logistics practices", International Journal of Production Research, 44(7): 1353-1373.

Green, K., Zelbst, P., Bhadauria, V. and Meacham, J. (2012a), "Does environmental collaboration and monitoring enhance organizational performance?", Industrial Management and Data Systems, 112(2), 186-205.

Green, K., Zelbst, P., Bhadauria, V. and Meacham, J. (2012b), "Green supply chain management practices: impact on performance", Supply Chain Management: An International Journal, 17(3), 290-305.

Green, K., Morten, B. and New, S. (1998), "Green purchasing and supply policies: do they improve companies' environmental performance?", Supply Chain Management: An International Journal, 3(2), 89-95.

Gualandris, J., Golini, R., Kalchschmidt, M. 2014. Do supply management and global sourcing matter for firm sustainability performance?: An international study. Supply Chain Management: An International Journal, 19(3): 258-274.

Gualandris, J., Kalchschmidt, M. (2014), "Customer pressure and innovativeness: their role in sustainable supply chain management", Journal of Purchasing and Supply Management, Vol. 20, pp. 92-103.

Hirsch, P. M. (1975), "Organizational Effectiveness and the institutional environment", Administrative Science Quarterly, 20: 327- 344.

Hofstede, G. (1980). *Culture's consequences: International differences in work-related values*. Beverly Hills, CA: Sage Publications.

Hollos, D., Blome, C. and Foerstl, K. (2012), "Does sustainable supplier co-operation affect performance? Examining implications for the triple bottom line", International Journal of Production Research, 50(11), 2968-2986.

Holt, D. and Ghobadian, A. (2009), "An empirical study of green supply chain management practices amongst UK manufacturers", Journal of Manufacturing Technology Management, 20(7): 933-56.

Hope, C.A., Muehlemann, A.P. (2001), "The impact of culture on best-practice production/operations management", International Journal of Management Reviews, 3(3): 199-217.

Hsu, C.C., Tan, K.C., Zailani, S.H.M., Jayaraman, V. (2013), "Supply chain drivers that foster the development of green initiatives in an emerging economy" International Journal of Operations & Production Management, 33 (6): 656‑688.

Jabbour, A.B. (2015) "Understanding the genesis of green supply chain management: lessons from leading Brazilian companies", Journal of Cleaner Production, 87: 385-390.

Jabbour, A.B., Jabbour, C.J., Latan, H., Teixeira, A.A., de Oliveira, J.H. (2014) "Quality management, environmental management maturity, green supply chain practices and green performance of Brazilian companies with ISO 14001 certification: direct and indirect effects" Transportation Research Part E-Logistics and Transportation Review 67: 39-51

Jiang, B. (2009a), "The effects of interorganizational governance on supplier's compliance with SCC: an empirical examination of compliant and non-compliant suppliers", Journal of Operations Management, 27(4), 267-80.

Jiang, B. (2009b), "Implementing supplier codes of conduct in global supply chains: process explanations from theoretic and empirical perspectives", Journal of Business Ethics, 85(1), 77-92.

Keating, B., Quazi, A., Kriz, A., and Coltman, T. (2008), "In pursuit of a sustainable supply chain: Insights from Westpac Banking Corporation", Supply Chain Management: An International Journal, 13(3): 175-179.

Klassen, R. D. 2001. Plant-level environmental management orientation: The influence of management views and plant characteristics. Production and Operations Management, 10(3): 257-275

Klassen, R.D. and Vachon, S. (2003), "Collaboration and evaluation in the supply chain: the impact on plant-level environmental investment", Production and Operations Management, 12(3): 336-352.

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

Krause, D. (1997), "Supplier development: Current practices and outcomes", International Journal of Purchasing and Materials Management, 33(2), 12-19.

Krause, D., Scannell, T. and Calantone, R. (2000), "A structural analysis of the effectiveness of buying firms' strategies to improve supplier performance", Decision Sciences, 31(1): 33-55.

Kull, T. J., and Wacker, J. G. (2010). Quality management effectiveness in Asia: The influence of culture. Journal of Operations Management, 28: 223-239.

Kytle, B. and Ruggie, J.G. (2005), "Corporate social responsibility as risk management: a model for multinationals", Corporate Social Responsibility initiative working paper 10, John F. Kennedy School of Government, Harvard University.

Lamming, R. and Hampson, J. (1996), “The environment as a supply chain management issue”, British Journal of Management, 7(1): 45-62.

Large, R.O. and Gimenez, C. (2011), “Drivers of green supply management performance: evidence from Germany”, Journal of Purchasing and Supply Management, 17(3): 176-184.

Lee, S. and Klassen, R.D. (2008), “Drivers and enablers that foster environmental management capabilities in small- and medium sized suppliers in supply chains”, Production and Operations Management, 17(6): 573-586.

Lim, S: and Phillips, J. (2008), “Embedding CSR values; the gobal footwear industry’s evolving governance structure”, Journal of Business Ethics, 81(1), 143-56.

Linton, J.D., Klassen, R. and Jayaraman, V. (2007), “Sustainable supply chains: an introduction”, Journal of Operations Management, 25, 1075-1082.

Lippmann, S. (1999), "Supply chain environmental management: elements for success", Corporate Environmental Strategy, Vol. 6 No. 2, pp. 175-182.

Mathiyazhagan, K, Govindan, K., Noorul Haq, A. (2015), “Pressure analysis for green supply chain management implementation in Indian industries using analytic hierarchy process”, International Journal of Production Research, 52(1): 188-202.

McKenzie, S. (2004), Social sustainability: towards some definitions. Hawke Research Institute, University of South Australia, Magill.

Metters, R. (2008), A case study of national culture and offshoring services, International Journal of Operations and Production Management, 28(8): 727-747.

Min, H. and Galle, W.P. (1997), “Green purchasing strategies: trends and implications” International Journal of Purchasing and Materials Management, 33(3): 10-17.

Montabon, F., Sroufe, R., Narasimhan, R. (2007), “An examination of corporate reporting, environmental management practices and firm performance”, Journal of Operations Management, 25(5): 998-1014.

Murray, J.G. (2000), “Effects of green purchasing strategy: the case of Belfast City Council”, Supply Chain Management: An International Journal, 5(1), 37-44.

Pagell, M. and Gobeli, D. (2009), “How plant managers' experiences and attitudes toward sustainability relate to operational performance”, Production and Operations Management, 18(3), 278-299.

Pagell, M. and Wu, Z. (2009), “Building a more complete theory on sustainable supply chain management using case studies form 10 exemplars”, Journal of Supply Chain Management, 45(2), 37-56.

Pagell, M., Wu, Z., and Wasserman M. (2010), “Thinking differently about purchasing portfolios: An assessment of sustainable sourcing”, Journal of Supply Chain Management, 46(1), 57-73.

Park, N.K., Mezias, J.M., and Song, J. (2004), "A resource-based view of strategic alliances and firm value in the electronic marketplace", Journal of Managemet, 30(1): 7-27.

Parmigiani, A., Klassen, R.D., Russo, M.V. 2011. Efficiency meeting accountability: performance implications of supply chain configuration, control, and capabilities. Journal of Operations Management, 29(3): 212-223.

Paulraj, A. (2009), "Environmental motivations: a classification scheme and its impact on environmental strategies and practices" Business Strategy and the Environment, 18(7), 453-468.

Pedersen, E.R. (2009), "The many and the few: rounding up the SMEs that manage CSR in the supply chain", Supply Chain Management: An International Journal, 14(2): 109-16.

Penrose, E.T. (1959), The theory of the growth of the firm, New York: John Wiley & Sons.

Prahinski, C. and Benton W.C. (2004), "Supplier evaluations: communication strategies to improve supplier performance", Journal of Operations Management, 22(1), 39-62.

Rao, P. (2002), "Greening the supply chain: a new initiative in South East Asia", International Journal of Operations and Production Management, 22(6), 632-55.

Rao, P. and Holt, D. (2005), "Do green supply chains lead to competitiveness and economic performance?", International Journal of Operations and Productions Management, 25(9), 898-916.

Reuter, C., Foerstl, K., Hartmann, E., Blome, C. (2010), "Sustainable global supplier management: the role of dynamic capabilities in achieving competitive advantage", Journal of Supply Chain Management, 46(2), 45-63.

Rivera, J. (2004), "Institutional pressures and voluntary environmenal behaviour in developing countries: evidence from the Costa Rican hotel industry", Society and Natural Resources: An International Journal, 17: 779-797.

Sarkis, J., Gonzalez-Torre, P., Adenzo-Diaz, B. (2010), "Stakeholder pressure and the adoption of environmental practices: the mediating effect of training", Journal of Operations Management, 28(2): 163-176.

Schliephake, K., Stevens, G. and Clay, S. (2009), "Making resources work more efficiently – the importance of supply chain partnerships", Journal of Cleaner Production, 17(14), 1257-63.

Seuring, S. and Muller, M. (2008), "From a literature review to a conceptual framework for sustainable supply chain management", Journal of Cleaner Production, 16(15), 1699-1710.

Simon, H.A. (1957), Models of man: social and rational, New York: John Wiley & Sons.

Simpson, D. and Power, D. (2005), "Use the supply relationship to develop lean and green suppliers", Supply Chain Management: An International Journal, 10(1), 60-68.

Simpson, D., Power, D. and Samson, D. (2007), "Greening the automotive supply chain: a relationship perspective", International Journal of Operations and Production Management, 27(1), 28-48.

Spence, L. and Bourlakis, M. (2009), "The evolution from corporate social responsibility to supply chain responsibility: the case of Waitrose", Supply Chain Management: An International Journal, 14(4), 291-302.

Strand, R. (2009), "Corporate responsibility in Scandinavian supply chains", Journal of Business Ethics, 85(1), 179-85.

Theyel, G. (2001), "Customer and supplier relations for environmental performance", Greener Management International, 35(3), 61-9.

Vachon, S. (2007), "Green supply chain practices and the selection of environmental technologies" International Journal of Production Research, 45(18/19), 4357-4379.

Vachon, S. and Klassen, R.D. (2006), "Extending green practices across the supply chain" International Journal of Operations and Production Management, 26(7), 795-821.

Vachon, S. and 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.

Walton, S.V., Handfield, R.B., and Melnyk, S.A. (1998), "The green supply chain: integrating suppliers into environmental management processes", International Journal of Purchasing and Materials Management, 34(2): 2-11.

Watts, C.A. and Hahn, C.K. (1993), "Supplier development programs: An empirical analysis", International Journal of Purchasing and Materials Management, 29(2), 11-17.

Wiengarten, F., Fynes, B., Pagell, M. and de Burca, S. (2011). Exploring the impact of national culture on investments in manufacturing practices and performance. International Journal of Operations and Production Management, 31(5): 554-578.

Williamson, O.E. (1975), Markets and hierarchies: analysis and antitrust implications, New York: Free Press.

Williamson, O.E. (1981), "The Economic of Organization: The Transaction Cost Approach", American Journal of Sociology, 87(3), 548-577.

Williamson, O.E. (1985), The economic institutions of capitalism: firms, markets, relational contracting, New York: Free Press.

Williamson, O.E. (1991), "Strategizing, economizing, and economic organization", Strategic Management Journal, 12, 75-94.

Williamson, O.E. (1996), The mechanisms of governance, New York: Oxford University Press.

World Commission on Environmental and Development (1987), Our Common Future. Oxford University Press, Oxford and New York.

Zhu, Q., Sarkis, J. (2004), "Relationships between operational programs and performance among early adopters of green supply chain management programs in Chinese manufacturing enterprises" Journal of Operations Management, 22(3), 265-289.

Zhu, Q., Sarkis, J. (2007), "The moderating effects of institutional pressures on emergent green supply chain practices and performance", International Journal of Production Research, 45(18-19), 4333-4355.

Zhu, Q., Sarkis, J., Geng, Y. (2005), "Green supply chain management in China: pressures, programs and performance", International Journal of Operations and Production Management, 25(5), 449-468.

Zhu, Q. and Sarkis, J. (2006), "An inter-sectoral comparison of green supply chain management in Chinar: drivers and practices", Journal of Cleaner Production, Vol. 14, No. 5, pp. 472-86.

Zhu, Q., Sarkis, J. and Lai, K. (2007), "Green supply chain management: pressures, practices and performance within the Chinese automobile industry", Journal of Cleaner Production, 15(11-12), 1041-1052.

Zhu, Q., Sarkis, J., and Lai, K. (2013), "Institutional-based antecedents and performance outcomes of internal and external green supply chain management practices", Journal of Purchasing and Supply Management, 19: 106-117.