

TABLE OF CONTENTS

1	INTRODUCTION	1
2	LITERATURE REVIEW	4
2.1	RISK, UNCERTAINTY AND VULNERABILITY IN GLOBAL SUPPLY CHAINS	4
2.2	GENERAL FRAMEWORKS	6
2.3	RISK IDENTIFICATION	10
2.3.1	<i>Risk classification</i>	10
2.3.2	<i>Types of losses</i>	12
2.3.3	<i>Identification tools</i>	13
2.4	RISK ASSESSMENT AND EVALUATION	15
2.4.1	<i>Risk calculation</i>	15
2.4.2	<i>Assessment tools</i>	16
2.4.3	<i>Risk tolerance</i>	18
2.5	RISK MANAGEMENT AND MITIGATION STRATEGIES	19
2.5.1	<i>Supplier improvement</i>	20
2.5.2	<i>Confidence improvement</i>	21
2.6	RISK CONTINGENCY PLANS	24
2.7	SUPPLY RELATIONSHIPS WITH EMERGING COUNTRIES: THE CASE OF BRAZIL	27
3	CASE-STUDY SELECTION AND METHODOLOGY	33
3.1	DESIGN AND CASE-STUDY SELECTION	33
3.2	DATA COLLECTION AND ANALYSIS	35
3.2.1	<i>Interviews</i>	36
3.2.2	<i>Documentation</i>	37
3.2.3	<i>Data analysis</i>	37
4	RESEARCH FINDINGS	38
4.1	CASE-STUDY A: WOODCO	38
4.1.1	<i>Presentation and rationale for sourcing in Brazil</i>	38
4.1.2	<i>Supplier selection</i>	38
4.1.3	<i>SCRM practices</i>	39
4.1.4	<i>Reflection on improvement</i>	43
4.1.5	<i>Personal analysis</i>	43

IV.

4.2	CASE-STUDY B: PHARMACo	44
4.2.1	<i>Presentation and rationale for sourcing in Brazil</i>	44
4.2.2	<i>Supplier selection</i>	44
4.2.3	<i>SCRM practices</i>	45
4.2.4	<i>Reflection on improvement</i>	49
4.2.5	<i>Personal analysis</i>	50
4.3	CASE-STUDY C: METCo	50
4.3.1	<i>Presentation and rationale for sourcing in Brazil</i>	50
4.3.2	<i>Supplier selection</i>	51
4.3.3	<i>SCRM practices</i>	52
4.3.4	<i>Reflection on improvement</i>	56
4.3.5	<i>Personal analysis</i>	56
4.4	CASE-STUDY D: FRUITCo	57
4.4.1	<i>Presentation and rationale for sourcing in Brazil</i>	57
4.4.2	<i>Supplier selection</i>	58
4.4.3	<i>SCRM practices</i>	58
4.4.4	<i>Reflection on improvement</i>	63
4.4.5	<i>Personal analysis</i>	63
4.5	CROSS-CASE ANALYSIS	64
5	RECOMMENDATIONS	76
6	LIMITATIONS AND FUTURE RESEARCHES	78
7	CONCLUSION	79
8	REFERENCES	81
9	APPENDICES	91

LIST OF TABLES

Table I: A non-exhaustive list of SCRM general frameworks	9
Table II: A risk assessment tool	18
Table III: A risk matrix, expressed qualitatively and quantitatively	19
Table IV: Strengths and weaknesses of the Brazilian business environment.....	32
Table V: Management and mitigation techniques implemented in studied firms	71
Table VI: A closer analysis on the state of collaboration.....	72

LIST OF FIGURES

Figure I: Relationship between uncertainty, risk and vulnerability in global supply chains.....	5
Figure II: the Porter Value Chain.....	5
Figure III: Risk management process developed in ISO 31000:2009	8
Figure IV: Supply chain-related risk classification, identification and types of losses.....	14
Figure V: An ideal crisis response process	25
Figure VI: International Division of Labor.....	27
Figure VII: Brazil, a raw materials exporter for Belgian companies in 2014	34
Figure VIII: Case-study selection.....	35

1 Introduction

In the late 1970's, the US government decided to deregulate finance in order to accelerate capital mobility. This decision was in line with the neo-liberalist thoughts at this time, personified by the elections of Margaret Thatcher in the UK and Ronald Reagan in the US (Vanloqueren, 2014). Economic liberalism finds its rationale in the Heckscher-Ohlin-Samuelson model, which supposes that any given country should specialize its production according to the production factor with which the country is most endowed with. By specializing, the model assumes that every country should benefit from trade revenues. Of course, the model can only work if tariffs and customs are diminished to the fullest (Leamer, 1995). This neo-liberalist trend has led to the birth of globalization, which, in the supply chain context, can take the shape of vertical integration (e.g. export processing zone), outsourcing (i.e. delegating activities that have been previously carried out by the company to another party) or extension of the supplier base, looking for raw materials and/or cheaper prices. As a matter of fact, companies are in constant research for new sources of competitive advantages (Christopher et al., 2011). Within this setting, academics have argued that competition is to be considered between integrated supply chains and no longer between individual organizations (Chen et al., 2013). If well implemented, global sourcing can lead to opportunities and to competitive advantages (Van Weele, 2010; Narasimhan & Talluri, 2009).

Reasons for going global are numerous. As a matter of fact, organizations may benefit from: cheaper labor costs; unique or cheaper raw materials; public inducements to attract new businesses or specific industries; larger supplier base; new sales market; flexibility; free-trade with the gradual disappearance of international barriers thanks to the GATT organism promoting the abolishment of obstacles to the free movement of goods between countries; release of internal resources; global improvement of infrastructures and increased opportunities thanks to the evolution of e-business, companies getting easier access to a wider supplier and customer base (Van Weele, 2010; Manuj & Mentzer, 2008; Harland et al., 2003; Gréga, 2014; Blome & Schoenherr, 2011). On the other hand, going global makes supply chain more vulnerable to disruptions and the potential competitive advantage from global sourcing can quickly become a burden (Narasimhan & Talluri, 2009; Van Weele, 2010). As a matter of fact, long and complex supply chains increase uncertainties that companies face (Manuj &

Mentzer, 2008). Factors increasing uncertainties include lack of visibility (i.e. having a detailed knowledge about what happens in the supply chain) and lack of control (i.e. possibility to respond to changes on short notice) (Christopher & Lee, 2004; Harland et al., 2003; Tang & Tomlin, 2008). Uncertainties expose companies to a greater level of risk related to their supply chains (e.g. supplier reliability, quality, price, inventory disruption...) which can incur several types of losses (e.g. financial, performance related, social...) (Manuj & Mentzer, 2008; Harland et al., 2003). Ultimately, an increase of risk makes modern supply chains more vulnerable, defined as the *“exposure to serious disturbance arising from risks within the supply chains as well as risks external from the supply chain”* (Christopher & Peck, 2004, p.6)

Estimating the worldwide cost of supply chain disruptions is an impossible task, but some examples can help to situate the importance of it. For example, the Ford Motor Company experienced tire failures with Firestone, its tires supplier, which resulted in 174 deaths and an approximate \$2.1B recall cost (Zsidisin et al., 2004). In their 2013 survey (n=637) on business continuity management, the Chartered Management Institute demonstrated that the average financial cost of disruption in the UK was about £52.770.

The topic of supply chain risk management (hereafter SCRM) has been increasingly important for those companies expanding their networks, SCRM being a strategic component of global business risk (Narasimhan & Talluri, 2009). As a matter of fact, economic consequences related to supply chain disruptions increase the need for SCRM researches as long as outsourcing will be considered as a dominant business strategy (Narasimhan & Talluri, 2009; Hendricks et al., 2009). Therefore, SCRM processes have been developed by academics, institutions, governments and individual organizations to be able to detect, assess, manage and mitigate supply chain risks. Likewise, planning for catastrophic events is also of primary importance (Narasimhan & Talluri, 2009).

However, literature linking SCRM and specificities of emerging countries is scarce. As a matter of fact, we can assume that as emerging, and even if they can achieve lower procurement costs, gaps in terms of performance and quality standards may exist between developed economies and emerging countries, leading to higher levels of risk and disruption (Lary, 1970; McMichael, 2012).

This exploratory thesis aims at identifying how Western countries companies deal with risks coming from emerging countries. Do they identify specific risks associated with doing business with emerging countries' suppliers? Do they implement specific

measures to ensure quality? Do they use the same procedures but with more intensity? Are they influenced by macro-economic factors? What are the management and mitigation techniques used? This is the type of questions that I will try to answer in the following thesis. As an exploratory-based study, I have decided to focus on a particular emerging country, Brazil and I will apply the following process: First of all, I will propose a thorough literature review on the SCRM in order to point out the best practices in this topic. Secondly, a quick snapshot of the Brazilian business environment's strengths and weaknesses will help the reader to situate the context of local conditions. Thirdly, a qualitative approach will be developed to conduct a case-study made up of four cases, in four different sectors. To do so, interviews with purchase managers were conducted to gather information and single case description were created before drawing the final cross-case analysis. As an early ascertainment, interviewees have found challenging to distinguish examples only related to Brazil, commonly exemplifying their claims with other emerging countries. The choice of keeping Brazil as a central part of the topic has been made to enhance reliability of the cross-case analysis, as one can argue that Brazilian reality is probably not the same than the one in India or in China (Yin, 2003). Finally, the conclusion will synthesize the main ideas and mentions the limitations that have been experienced during this thesis.

The contributions of this thesis are threefold: Firstly, it contributes to the still expanding topic of SCRM. As a matter of fact, the topic is not fully explored yet, disruptions being more costly and more frequent than ever, which makes the study of SCRM crucial (Aydin et al., 2009; Chen et al., 2013). Precisely, it will contribute to the definition of links between SCRM practices and suppliers coming from emerging countries within the context of Brazilian suppliers. Secondly, this thesis may help practitioners to gather information about practices within different settings of companies and optionally help them to choose suitable techniques to take the best advantage of the opportunities offered by Brazilian suppliers. Finally, socio-environmental concerns of studied companies will be analyzed, as it might incur loss as well (Harland et al., 2003). I will demonstrate that every company, to some extent, feels that it is a type of risk that has to be taken into account and tries to manage it on a more and less proactive basis.

2 Literature review

2.1 Risk, uncertainty and vulnerability in global supply chains

Risk is a component of human nature. As a matter of fact, humans and thus organizations take risks every day. Consequently, business can be perceived as a constant trade-off between risk and reward (Adams, 1995). It is also important to state that risk is somehow an abstract concept. Indeed, risk is principally based on individual perception and experience but also on belief and on societal acceptance or cultural filters (Manuj & Mentzer, 2008; Rohrmann, 1998; Adams, 1995). Therefore, we could characterize individuals and organizations according to their risk acceptance, which depends on the risk/benefit analysis of the organizations, but also on contextual factors, as abovementioned. Some will be inclined to take more risk than others, and risk behavior stemming from risk acceptance is more of an organizational construct than really based on empirical assessment (Adams, 1995; Rohrmann, 1998). In the literature, several definition of business risk can be found. As such, risk may be defined generally as “the effect of uncertainty on objectives”¹, as “the chance of danger, damage, loss, injury or any other undesired consequences” (Harland et al., 2003; Christopher & Peck, 2004). Other definitions are more precise: Mitchell (1995) defines risk as a combination between the probability of a loss and its significance while Manuj & Mentzer (2004) include both quantitative (e.g. losses due to late delivery) and qualitative (e.g. loss of brand image) perspectives.

With the trend toward outsourcing come greater risks for companies. Many authors have already highlighted the fact that in today’s world, supply chains are getting longer and more complex (Norrman & Jansson, 2004; Blome & Schoenherr, 2011; Manuj & Mentzer, 2008; Chen et al., 2013; Christopher & Peck, 2004; Tang & Tomlin, 2008). Harland et al. (2003) have empirically demonstrated that factor by mapping supply networks, highlighting the escalating number of points of compliance. Longer and more complex supply chains make it harder for companies to understand the whole range of risks that can potentially affect them, increasing uncertainties. Uncertainty can be defined as the “perceived inability to predict something accurately” (Milliken, 1987, p. 136). Uncertainties can be classified according to their type: State uncertainty relates to the organizational inability to discern how environmental components (e.g. a supplier, a

¹ Retrieved from <https://www.iso.org/obp/ui/fr/#iso:std:iso:31000:ed-1:v1:en> [on line] consulted on February 27th 2015

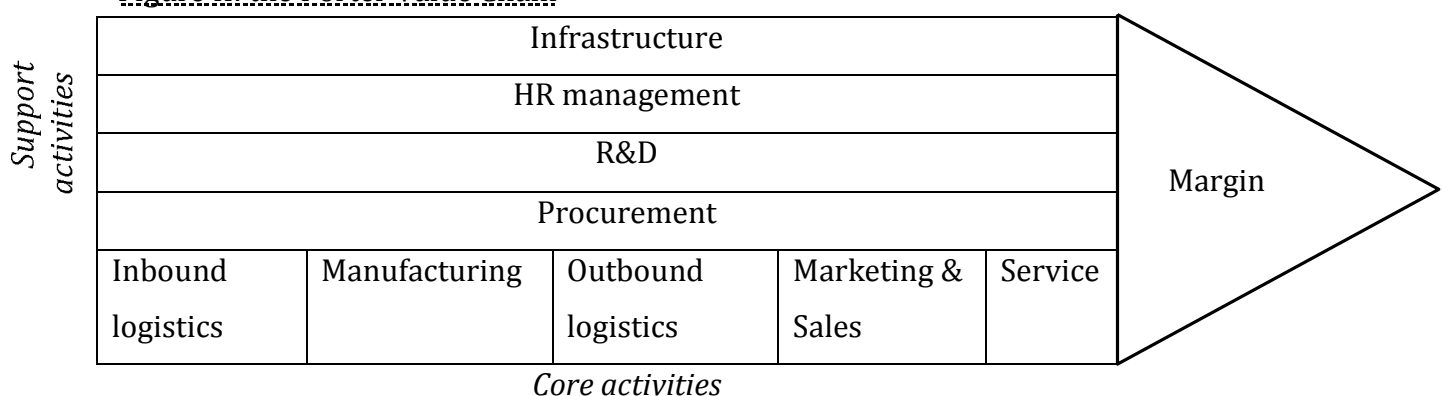
competitor) might change. Effect uncertainty relates to the inability to understand impacts of environmental changes. Response uncertainty relates to the inability to weigh in benefits of available options (Milliken, 1987). An increase of uncertainties consequently enhances the level of risk of modern supply chains, eventually making supply chains more vulnerable. Christopher & Peck (2004) define vulnerability in modern supply chains as the “exposure to serious disturbance, arising from risks within the supply chain as well as risks external from the supply chain” (p.6). Figure I shows the relationship between risk, uncertainty and vulnerability in the context of modern supply chains:

Figure I: Relationship between uncertainty, risk and vulnerability in global supply chains.



It is easy to understand why companies need to have an overall view of the global supply chain when deciding on risk management strategies. As a matter of fact, if we consider that the value created and distributed by any firm can be represented by the Porter Value Chain (Figure II), a disruption in inbound logistics due to poor procurement performances negatively affect value distributed to the customers as other core activities will suffer from those bad performances (Manuj & Mentzer, 2008). Zsidisin et al. (2004) come up with the same idea by defining supply risk as the “potential occurrence of an incident associated with inbound supply from individual supplier failure or the supply market, in which its outcomes result in the inability of the purchasing firm to meet customer demand or cause threat to customer life and safety” (p.397).

Figure II: the Porter Value Chain



Adapted from: Porter, the competitive advantage (1985) in Kotler et al., 2009, p.46

It is mainly because of this growth of uncertainty on risk exposure and the importance of effective supply chain performances on the value creation and delivery that the need for effective supply chain risk management process has been recently growing. In the following chapter, I present the different frameworks that have been developed in the literature.

2.2 General frameworks

Given the pressing need for effective SCRM, an array of processes has been developed in recent years. Based on the earlier definition of risk, Norrman & Jansson (2004) define risk management as a “process whereby decisions are made to accept a known risk and/or the implementation of actions to reduce the consequences or probability of occurrence” (p. 438). More specifically, any risk management process can be defined as a “systematic application of management policies, procedures and practices to the activities of communicating, consulting, establishing the context and identifying, analyzing, evaluating, treating, monitoring and reviewing risks.”² SCRM can thus be viewed as a part of this general definition of risk management process, but focusing on risks and uncertainties caused by logistics related activities and resources (Norrman & Lindroth, 2002, cited by Norrman and Jansson, 2004).

As supply chains are getting longer and more complex, disruption costs and frequencies are at a level that has never been seen before (Aydin et al., 2009). In their 2013 survey conducted among 637 managers across the UK on business continuity, the Chartered Management Institute has demonstrated that the average disruption cost was £52,700. The Supply chain Risk Leadership Council (2011), cites cost savings along with the possibility to build a competitive advantage and intangible benefits (e.g. avoidance of reputational damages) as the major advantages of implementing an effective SCRM approach. The International Organization for Standardization also provides a list of the advantages of implementing an effective risk management process (see appendix 1).

If we would like to put into light any disadvantage to implementing a complete SCRM process, it would be the following: proactive SCRM approaches and measures can consume a lot of internal resources (both in terms of capital and human) and can lead to inefficiencies. As a matter of fact, there is always a trade-off to be made between accuracy and speed when assessing the risk. As a matter of fact, the more accurate the

² Retrieved from <https://www.iso.org/obp/ui/fr/#iso:std:iso:31000:ed-1:v1:en> [on line] consulted on February 27th 2015

risk assessment, the slower and the more internal resources must be engaged to deal with the issue (Zsidisin et al., 2004). However, a rational comparison between cost and benefits makes the decision to implement a SCRM process a no-brainer.

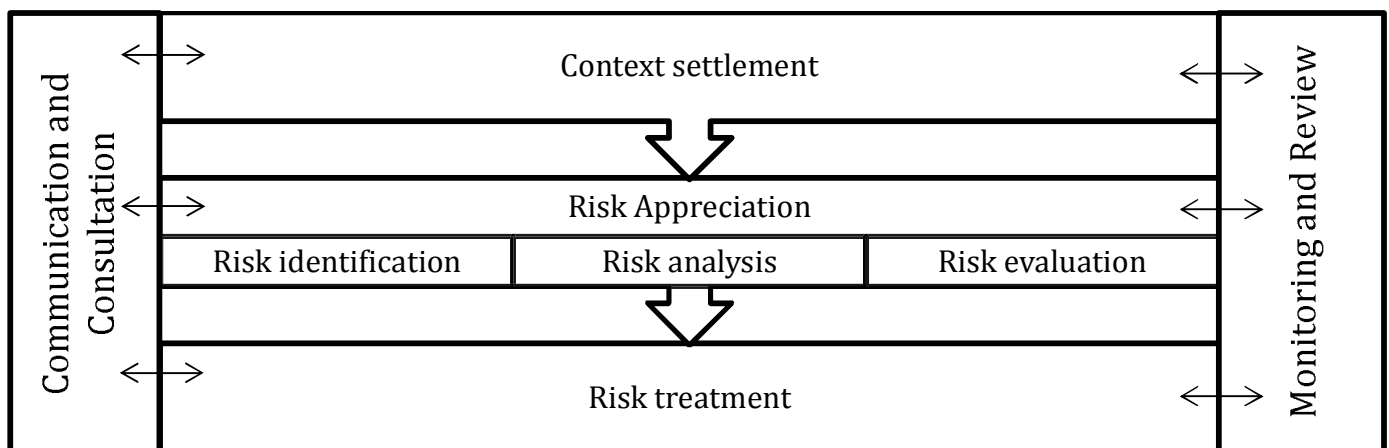
Interestingly, general frameworks on SCRM come from different sources. As a matter of fact, academics, institutions and private companies have all developed processes and tools to improve the management of supply chains (see Table I).

Academics: Norrman & Jansson (2004) have analyzed how Ericsson developed a more comprehensive approach to SCRM after experiencing an incident with one of their sub-supplier, implementing new measures to decrease the likelihood of occurrence of identified risks and measures to decrease the impact of those if materialization. Similarly, Manuj & Mentzer (2008) propose a five steps model: risk identification, risk assessment, risk management and strategy selection, implementation of SCRM strategy and mitigation of supply chain risks. They also highlight the importance of communication and feedback between those five steps, which are interdependent and interactive. For pragmatic reasons, they suggest a team-based and cross-functional SCRM approach, as there is a better chance that strategic decisions will be rational (as risk is based on individual perception). Christopher & Peck (2004) provide tools and guidelines from best-practices to build a resilient supply chain. The term resilient refers to the flexible and adaptable character of the supply chain. According to the authors, those characteristics should help to reduce the supply chain vulnerability. Harland et al. (2003) have developed a supply network risk tool to increase the visibility and global awareness of companies on their supply chains. This tool consists of five steps: Mapping of the supply network, risk identification and location, risk assessment, risk management and redesign of the network.

Institutions and governments: Some international institutions have also developed extensive SCRM approaches. Firstly, the International Organization for Standardization (ISO) has developed a standard (ISO 31000:2009) related to general risk management process. However, this process can easily be applied to supply chains. As displayed in Figure III, it follows a similar process that the ones developed by academics. Similarly, the Supply Chain Risk Leadership Council (hereafter SCRLC), a cross-industry organization (with members such as Boeing, Cisco, FedEx, P&G...) jointly working on developing best-practices in SCRM, creating standards, processes and metrics, has developed a framework (2011) following more and less the same steps than the ones provided by ISO 31000:2009. The difference in their approach is related to risk

treatment. They go a little further by dividing this step into three: Protecting and securing the supply chain, responding to the event and continuity and recovery. They have also developed a self-assessment tool which is available for free on their website³. Thanks to this tool, anyone can evaluate the SCRM capabilities of their own company according to five criteria: Leadership, Planning, Implementation, Evaluation and Improvement. For each category, users will have to answer questions (e.g. about governance, risk tolerance, risk monitoring, performance review, continuous program improvement...) by rating their companies from 1 to 5. The maturity of the supply chain characterizes the ability of each company to face all types of risks related to their supply chain (traditional, non-traditional and emerging risk). Depending on the answers of the user, the SCRM maturity will be characterized as reactive, aware, proactive, integrated or resilient (from less to more mature). Finally, the German government has introduced a law in 1998, called the KonTraG, which obliges German companies to develop risk management systems in an effort of transparency to meet shareholders' expectations, informing them about risk identification and assessment techniques (Zsidisin et al., 2004; Börsch, 2007).

Figure III: Risk management process developed in ISO 31000:2009.



Adapted from: International Organization for Standardization, ISO 31000:2009⁴.

Companies: Finally, frameworks have been developed by companies themselves. As a matter of fact, findings of Norrman & Jansson (2004) were based on the Ericsson's case study and their approach to extend the implementation of proactive measures to their supply chain management. Similarly, the SCRLC 2011 report is, at the end of the day, just a compilation of best-practices from different industries. IBM even proposes a software

³ <http://www.scrhc.com/>

⁴ Op.cit.

(IBM Emptoris Strategic Supply Management Solutions⁵) to help companies to manage their relationships with their suppliers, save costs and mitigate the risks. In order to get to this state of resiliency, Resilinc is a company that has developed a tool, SupplyIntel, which works much like a supplier LinkedIn and aims at enhancing visibility on multiple tiers for buying companies by consistently mapping supply network and share it with all member of the platform. It facilitates the flow of information and help companies to look outside of their tier 1 supplier base.

Table I: A non-exhaustive list of SCRM general frameworks

Source	Authors	Methodology	Focus	Summary
Academics	Norrman & Jansson (2004)	Single case-study	SCRM	The study explores the new SCRM approach Ericsson has implemented after experiencing serious disturbances following a fire at a sub-supplier.
	Manuj & Mentzer (2008)	Modeling	SCRM	The study proposes a comprehensive SCRM model consisting of five steps: Identification; Assessment; Strategy selection; Strategy implementation; Risk mitigation.
	Harland et al. (2003)	Modeling & Case-study	SCRM	The study develops a tool, to some extent consisting in the steps of Manuj & Mentzer (2008) but focusing on the importance of mapping supply networks.
	Christopher & Peck (2004)	Conceptual development	SCRM	The study provides tools to build a more resilient supply chain, based on collaboration, flexibility and agility.
Institutions	ISO (2009)	Modeling & Conceptual development	ERM	Developed a standard (ISO31000:2009) for enterprise risk management and applicable to SCRM. It follows the same steps than academics.
	SCRLC (2011)	Best practices	SCRM	The paper provides a guide for best practices in each step of the SCRM, with a particular emphasis on crisis management
	German government. (1998)	-	Transparency	The KonTraG law, primarily intended to increase financial transparency for shareholders, also finds application in SCRM, as German firms are obliged to develop and document risk management techniques.
Companies	IBM	Modeling	SCRM	IBM developed Emptoris Strategic Supply Management Solutions, which is a software helping to manage supplier relationships.
	Resilinc	Modeling	SCRM	They have developed SupplyIntel, a tool aiming at enhancing visibility on multiple tiers supply chains by putting in contact buyers and suppliers.

All those frameworks, if slightly different in their approaches, have the same objective: they aim at reducing uncertainties related to today's supply chains. The

⁵ Retrieved from <http://www-01.ibm.com/software/info/emptoris/> [on line] consulted on Feb 27th 2015.

general frameworks have guided researchers into a deeper analysis of each of the commonly accepted steps of SCRM: risk identification, risk assessment, risk management and mitigation.

Thanks to those researches, a thorough analysis of each step will be provided in the following chapters. It also seems important to state that the following methods only provide guidelines and that organizations must select and adapt them to their own realities and circumstances.

2.3 Risk identification

Even though every framework has its own specificities, all agree on the fact that risk identification is the first critical step towards a complete and effective SCRM approach. It is common sense that implementing effective management and mitigation strategies would be nearly impossible if the risks that might affect a company are not clearly defined (Norrman & Jansson, 2004).

2.3.1 Risk classification

In the literature, many attempts for risk classification and identification techniques can be found. Van Weele (2010) identifies four types of risks that can arise from outsourcing:

- Technical: Supplier's ability to deliver the required performance.
- Commercial: Uncertainty related to the price to be paid.
- Contractual: Is the contract sufficiently detailed?
- Performance: Supplier's ability to be flexible on fluctuating requirements.

Simchi-Levi (2010) proposes a more precise risk classification, as he categorizes them according to their predictability: if the company has data from past experience, they might be able to construct a model and forecast their impacts. As typical examples, geopolitical problems or natural disasters are very difficult to forecast. On the other side, supplier's performances can be tracked and thus forecasting becomes possible. Therefore, risks (a comprehensive list is available in appendix 2) range from uncontrollable to controllable. However, the SCRM process must be able to deal with both uncontrollable and controllable risks. In the same vein, Chen et al. (2013) make the distinction between operational risks (e.g. quality problems - controllable) and disruption risks (e.g. natural disaster - uncontrollable). It is interesting to notice that managers still identify the controllable risks as the most important ones (Byrne, 2007, cited by Chen et al., 2013). Going even further, an Accenture study (2006), conducted

with 151 supply chain managers from U.S. firms (with revenues over \$1 billion) showed that the three major reasons of disruptions are: raw materials supply, supply chain partner performances (e.g. quality requirements) and fuel price volatility⁶, which highlights even more the fact that controllable risks still constitute the most important source of risks. Jüttner et al. (2002) (cited by Norrman & Jansson, 2004) identify three risk sources: External to the supply chain (e.g. natural disaster), internal to the supply chain (e.g. equipment, quality, IT systems...) and network related, which result from insufficient cooperation between supply chain partners. Going further, Manuj & Mentzer (2008) make the distinction between atomistic sources of risk, when only a part of the supply chain is affected and thus necessary for risk assessment (typically for low-value, highly available products) and holistic sources of risk, when the whole supply chain can be affected (typically for high-value, rare products). They also categorize risks as qualitative (e.g. precision, reliability of the components) or quantitative (e.g. stock out, component unavailability...) and indicate that both can necessitate atomistic or holistic supply chain assessment. They also bring a more precise classification of supply chain risks than Jüttner et al. (2002). As a matter of fact, they break down the risks that are internal to the supply chain into four categories: supply, operational, demand and security risks. As this thesis focuses mainly on the supply-side of the supply chain, let's take a deeper look at what they defined as supply risks. First of all, they identify 4 categories of risks:

- Supplier reliability: this type of risk is tightly linked with the agency theory, which aims at studying the problems between the principal and the agent, when the first delegates work to the last. Typical risks related to supplier reliability are adverse selection (misinterpretation of suppliers' ability during the selection phase and/or when the supplier is under contract), moral hazard (supplier unwilling to put in extra efforts to meet requirements) and goal conflict, which can be easily answered through incentives such as reward/penalty or promise of future business (Eisenhardt, 1989a; Handfield & Nichols, 1999).
- Single versus multiple sourcing: supply disruption, inventory disruption, technology access disruption, price escalation, quality issue (Berger et al., 2004; Treleven & Schweikhart, 1988, cited by Manuj & Mentzer, 2008).
- Make-or-buy: technological uncertainties, product complexity and design changes.

⁶http://www.forbes.com/2006/09/25/accenture-supply-chain-risks-biz_logistics_cx_rm_0925risks.html [on line] consulted on Mar. 10th, 2015.

- Centralized versus decentralized: Treleven & Schweikhart (1988, cited by Manuj & Mentzer, 2008) highlight the similarities between centralized sourcing and single sourcing and thus the same risks than those cited above can arise.

2.3.2 Types of losses

There are several types of losses that can be identified and associated to risk. As a matter of fact, financial losses are not alone and other assets, sometimes less tangible, can be harmed. As example, assets such as credibility, reputation and trust are intangible assets that can be endangered if risks realize. There are six types of losses: financial, performance, physical, psychological, social and time related. Of course, one single risk may lead to several types of losses if it realizes (Harland et al., 2003). As an example, when the Ford Motor Company experienced on tires failures provided by one of its historical supplier, Firestone, and which resulted to 174 deaths and recall cost of \$2.1 billion, we can argue that they experienced all six types of losses. They lost money and time as they had to recall a lot of their vehicles, they experienced physical losses by incurring death in their customer base, and this vastly documented incident probably had a huge impact (maybe not always measurable) in terms of psychological and social losses (Zsidisin et al., 2004). It is even truer in today's world, as information flies faster than ever. As a matter of fact, the power of media, along the growing importance of pressure groups and social activism tend to amplify the social side of risk (Harland et al., 2003). Those pressure groups, citizens and non-governmental organizations will not hesitate to denunciate unethical practices. As an example, the video made by Greenpeace denouncing Nestlé for their unethical practices in Indonesia⁷. Greenpeace also denounces other brands such as Volkswagen (for their unwillingness to reduce their CO2 emissions⁸) or Mattel (for playing a big role in the deforestation of the tropical forest⁹). In another area, the FXB Center for Health & Human Rights (a university-wide human rights center from the Harvard University and mainly active in the field of the well-being of children and teenagers¹⁰) issued a report (2014) denouncing the forced, bonded labor of children in the Indian rug industry. They found that approximately 45% of the Indian carpets sold in the U.S. could come from forced labor, under the Indian law. In this report, they do not hesitate to condemn companies such as IKEA, Macy's, Home

⁷ <https://www.youtube.com/watch?v=hgcHTHGu5tA> consulted on Mar. 10th, 2015

⁸ <https://www.youtube.com/watch?v=nXndQuvOacU> consulted on Mar. 10th, 2015

⁹ <https://www.youtube.com/watch?v=Txa-XcrVpvQ> consulted on Mar. 10th, 2015

¹⁰ <http://fxb.harvard.edu/what-we-do/>, consulted on Mar. 10th, 2015

Depot, Wal-Mart and Target and while none of the companies will admit knowing these issues on beforehand, it exposes them to social and psychological risks. It also highlights the need for buyers to be able to trace their supply chains and to implement a multiple-tier analysis. Indeed, we learn from this report that in the carpet industry, those aforementioned big firms get their merchandise from big wholesalers importing from big Indian exporters, themselves working with wholesalers and carpet producers. The report strongly encourages those companies to make a better effort to be sure they clean their supply chain from forced labor.

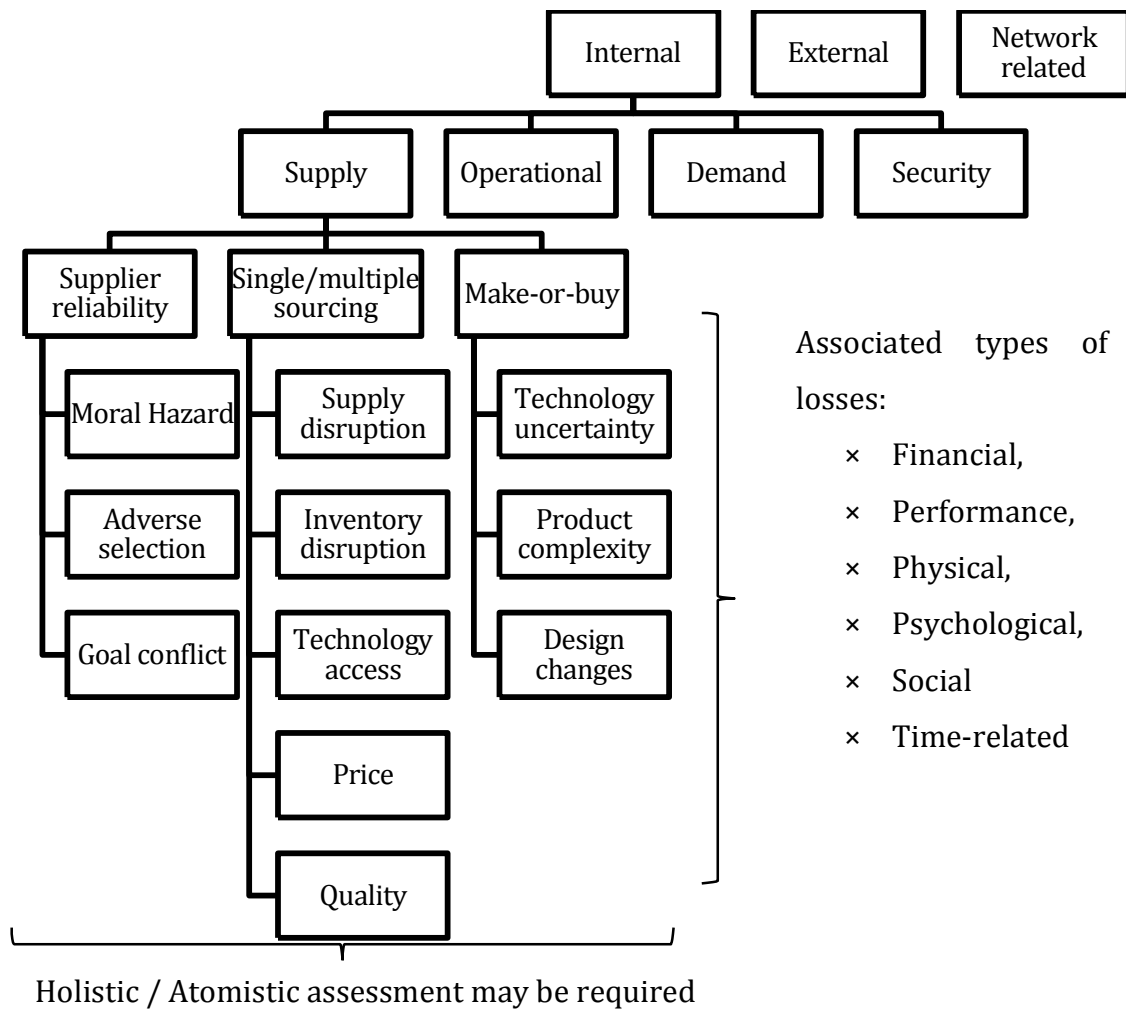
Those examples illustrate really well what has been written above: civil society players amplify the social risk exposure and it is clearly something firms have to take into account. Identifying the type of loss related to a specific risk is thus an important part of risk identification. On the next page, figure IV presents a summary of chapters 2.2.1.1 and 2.2.1.2:

2.3.3 Identification tools

In order to be able to perform this first crucial step, several tools are at the disposal of companies. Risk identification can be performed through multi-functional team brainstorming sessions (Harland et al., 2003; Norrman & Jansson, 2004; SCRLC report, 2011). Harland et al. (2003) go even further by advising to perform those brainstorming sessions with other supply chain partners. Another way to perform this step is to conduct surveys among the focal firm and across the supply chain (SCRLC, 2011). Firms having experience in the field of global supply chain could even use previous risk assessments and past experiences on realized risks to identify the ones that could still harm them today.

Harland et al. (2003) propose a more comprehensive tool to identify risks. According to the authors, the first thing companies should do is to graphically map their supply chain network. This map should include the whole length of the supply chain, from inbound supply to operational process and delivery. On this map, companies are invited to represent actors, borders, information flows and points of compliance along the supply chain. Once this map is drawn, the company should pick risks that could have a negative impact on their supply chain. For each identified risk, they should also identify the type of losses that the firm might be facing if it eventually materializes.

Figure IV: Supply chain-related risk classification, identification and types of losses



Manuj & Mentzer (2008) have developed a tool where the risk identification phase considers creating what they call a risk profile. In this profile, companies are invited to categorize risks according to their types (i.e. supply risks, operational risks, demand risks, security risks). For each type, they must identify a more precise source of risk and determine whether this risk necessitate a holistic or atomistic supply chain evaluation, whether it is considered as a quantitative or qualitative risk and whether this risk is to be considered at a global or at a domestic level.

Finally and for the purpose of being as complete as possible, Norrman & Jansson (2004), propose to use a Fault-Tree Analysis (FTA) for comprehensive risk identification. The FTA is a model “backwardly deducing the causes of an event”¹¹. It takes the form of a diagram, where the user (the company) indicates first the top event (e.g. quality issues, inventory disruptions) and then backwardly draws the contribution

¹¹ <http://www.hq.nasa.gov/office/codeq/risk/docs/ftacourse.pdf>

factors that led to that event. It highlights the relationships between the causes that ultimately led to the top event. Of course, it could be interesting for companies to use such a method. As supply chains are getting more complex, risks may be harder to identify than before. By using this method, they could have a better overall picture of risks that could affect them, as they would have a better understanding of the causes that led to the main event. By better understanding the causes of an undesired event, they would be able to better address the event (i.e. identifying biggest failure contributors, forecasting and prioritizing the use of resources).

2.4 Risk assessment and evaluation

When risks are identified, it is important for the buying company to be able to establish the extent of the potential losses but also to determine their potential likelihood of occurrence. Only when that step is performed will the company be able to rank risks according to their significance (Yates & Stones, 1992, cited by Zsidisin et al., 2004). Therefore the firm will be able to efficiently allocate resources and to prioritize risks that have to be handled first (Harland et al., 2003; Manuj & Mentzer, 2008).

2.4.1 Risk calculation

From a quantitative standpoint, risk can be estimated by two variables: (1) the probability of occurrence and (2) the impact this risk will have on the company it materializes. Therefore, risk can be expressed by the following equation (Wu et al., 2006; Harland et al., 2003; Manuj & Mentzer, 2008; Tummala & Schoenherr, 2011; Steele & Court 1996, cited by Zsidisin et al., 2004; Adams, 1995):

$$\text{Risk} = \text{Probability of occurrence} \times \text{Business impact}$$

The first variable companies can work on is thus the probability of occurrence of the undesired event. Probability distribution is often seen as a Normal distribution. However, Manuj & Mentzer (2008) have observed that it would be more accurate to consider a leptokurtic distribution when talking about extreme events. In such distribution shape, extreme events happen much more frequently than in the Normal distribution. Graphically, the classic bell curve representing the Normal distribution will have fatter tails. In order to be able to estimate the probability of occurrence, companies can use historical data, which will be the most accurate (Manuj & Mentzer, 2008). As a matter of fact, such type of data will enable the company to elaborate a forecasting model. However, historical data are not always available. In that case, companies could use other methods to estimate that probability. As a matter of fact, "...subjective

information, beliefs and judgements can be used to approximate distributions.” (Tummala & Schoenherr, 2011, p. 478). Zsidisin et al. (2004) have highlighted assessment tools that are used by companies to get information on supplier activity. They recommend the implication of a cross-functional team, which is the best way to incorporate as many facets of the business as possible (bearing in mind that “risk” is primarily based on individual perception). Those tools mainly aim at describing suppliers’ performances and include:

- ✓ Supplier scorecard
- ✓ Supplier self-assessment
- ✓ Certifying quality representatives
- ✓ Audits

A less objective method to attempt predicting the future is the Delphi method. This method relies on experts’ consultation on a specific subject (Manuj & Mentzer, 2008). It is an attempt to make a systematic and constructive use of intuitive judgements and opinions (Helmer, 1967).

The second variable considered above is the impact that the risk will have on the business if it eventually occurs. While the methods to obtain knowledge about the importance of the losses are the same than the ones described above (historical data, information on suppliers’ performance), the difference here is the type of loss to be considered. As abovementioned, 6 types of losses can be incurred to companies. Impact can thus be measured in terms of incurred costs, business interruption value (i.e. business recovery time plus extra costs) (Norrman & Jansson, 2004) but intangible assets such as credibility, trust and reputation must be assessed as well (Harland et al., 2003).

2.4.2 Assessment tools

As for the first step of identification, tools have been developed in order to assess risks. An interesting process for an end-to-end supplier assessment comes from a case studied by Zsidisin et al. (2004) and is provided in appendix 3. In this process, the risk manager initiates a scorecard, determine risk factors and criteria for success about that specific threat. He then compares both success criteria with supplier data and conducts an impact analysis. This method is interesting because it has an end-to-end perspective and provides clear guidance for the manager owning the process. It also takes into

account risk factors that may impact on intangible assets. Indeed, environmental impact is one of the risk factors that must be assessed by the manager.

Once data about probability and impact have been collected, Manuj & Mentzer (2008) propose a tool that has the characteristics of being both concise and comprehensive. They propose to draw a table (see Table II) following their risk identification method described above. In this table, a distinction between qualitative and quantitative is made for both variables of risk calculation. It also considers a worst case scenario if the risk materializes or lasts too long. The worst case acceptability refers to the risk tolerance of the firm (further explained in chapter 2.2.2.3) and decides whether or not the company must engage actions to reduce probability or impact of that specific risk. At the end of the exercise, the company will be able to give a final evaluation of the risk. This final evaluation is expressed in a qualitative form and is divided in four stages: Insignificant, Minor, Serious and Catastrophic. In an attempt to express this evaluation in a quantitative way, Tummala & Schoenherr (2011) propose to give an index on both variables of the equation:

- Probability Index – 4 (Often), 3 (Infrequent), 2 (Rare), 1 (Extremely rare).
 - Impact Index – 4 (Catastrophic), 3 (Critical), 2 (Marginal), 1 (Negligible).
- ➔ Risk Exposure Value = Risk consequence Index X Risk Probability Index.

With that evaluation to their sides, managers will exercise sound judgment to rank risks according to their importance and will first allocate time and efforts on risks that are considered to be catastrophic or serious before dealing with the ones being considered as minor or insignificant.

The method provided by Zsdisin et al. (2004) appears to have a more complete process and to encompass more managerial implications than the one provided by Manuj & Mentzer (2008). For example, this first method obliges the company to appoint a manager responsible for the process, where the second method does not. Even if they do not give managerial guidance and if they do not really explain the process to get there, the output (Table II) provided by Manuj & Mentzer (2008) appears to be much more comprehensive and will be preferred. Ideally, some combination of both methods seems to be the best way to have a comprehensive process and a high quality risk assessment and evaluation. The framework provided by Tummala & Schoenherr (2011) is interesting to express the final evaluation of the risk in a quantitative way.

Table II: A risk assessment tool

Potential Losses		Probability		Impact		Worst case scenario	Worst case acceptability		Other considerations	Final evaluation
Quanti	Quali	Quanti	Quali	Quanti	Quali		Yes	No		

Potential losses	Quantitative	Financial/Costs incurred
	Qualitative	Trust/Status/Reputation
Probability of occurrence	Quantitative	0 (impossible) – 1 (definite)
	Qualitative	From very unlikely to very probable
Impact	Quantitative	Financial/Costs incurred
	Qualitative	Trust/Status/Reputation

Adapted from: Manuj & Mentzer (2008).

2.4.3 Risk tolerance

Whatever the technique used to evaluate a specific risk, it has to be plotted against the risk tolerance of the company performing the assessment. As we have stated earlier in this paper, reaction to risk is based on past experience, individual perception and cultural filters. It is therefore a subjective concept (Rohrmann, 1998; Adams, 1995). As such, every individual and every company will have a different perception of what is considered to be an acceptable level of risk (Norrman & Jansson, 2004; SCRLC, 2011; Tummala & Schoenherr, 2011). The level of acceptability can be represented in the form of a matrix (see Table III). In this matrix, risks are plotted according to their indexes (Tummala & Schoenherr, 2011) or according to their qualitative description (Norrman & Jansson, 2004; SCRLC, 2011). The risk acceptability of a firm would be for example to initiate actions when risks are “very high” or “high” in order to bring them back to at least the “medium” level meanwhile a company with a bigger appetite for risk would set this limit between “very high” and “high”. Similarly, risk tolerance can also be represented as a graph or as a pyramid. Further actions performed by the company will always aim at reducing an unacceptable risk under a level considered to be acceptable. Firstly, the company will try to reduce the probability of occurrence. For uncontrollable risks, they will try to reduce their impact if they materialize (Harland et al., 2003). Actions to reduce probability or impact will be explained in the next chapter.

Table III: A risk matrix, expressed qualitatively and quantitatively

<i>Probability</i>	Very probable – 4	Medium – 4	High – 8	Very High – 12	Very High – 16
	Probable – 3	Medium – 3	High – 6	High – 9	Very High – 12
	Unlikely – 2	Low – 2	Medium – 4	High – 6	High – 8
	Very unlikely – 1	Low – 1	Low – 2	Medium – 3	High – 4
		Negligible – 1	Marginal – 2	Critical – 3	Catastrophic – 4
<i>Impact</i>					

Adapted from: Norrman & Jansson (2004), Manuj & Mentzer (2008), Tummala & Schoenherr (2011)

Even if this risk tolerance frontier can be mentally well implemented in the company's mind and behavior, it could be interesting to plot the findings of the assessment process against the table and the frontier representing the risk tolerance of the company. It could provide a much clearer view on risk prioritization.

2.5 Risk management and mitigation strategies

Once risks have been identified, assessed and evaluated, the company is ready to implement successful mitigation strategies. However, this is far from being a simple and systematic matter. Tang (2006), citing a CFO Research Services report, highlighted the fact that out of 247 studied companies, 38% of them recognized that their current risk management practices do not cover the entire list of risks they face. To our knowledge, no empiric research has been conducted on the reasons for not implementing mitigation strategies. Zsidisin et al. (2004), Tang (2006) and Harland et al. (2003) hypothesize that the lack of knowledge about supply chain risk management techniques alongside the inaccurate estimates of both probability and potential impact and therefore the difficulty to estimate the return on such investment may play a role in that lack of mitigation strategies. Moreover, personnel must have specific soft skills such as negotiation and problem-solving skills and the capability to speak different languages (Handfield & Nichols, 1999). At the end of the day, the goal of every supply chain management techniques is to make the supply chain more resilient (Tang, 2006). We have already defined resilience in the context of the supply chain above. As a reminder, the resilient

term refers to the “ability of a system to return to its original initial state or move to a new, more desirable state after being disturbed” (Christopher & Peck, 2004, p.4).

In this chapter, we will only cover the techniques a company can implement to proactively manage the risk (i.e. reduce the probability and/or impact of a certain risk before occurrence). Risk mitigation strategies generally aim at avoiding, reducing, transferring or sharing the risk. This can be achieved through formal or informal processes (Norrman & Jansson, 2004). For example, a very formal way of managing risk is to have detailed contracts. It allows the relationship partners to have a clear vision of risk and benefits sharing (e.g. through incentives and penalties, which will reduce both “goal conflict” and “moral hazard” risks described above). It is also supposed to address other issues such as rates and fees, conflict resolution, communication, management and control, confidentiality, audit rights... (Van Weele, 2010; Harland et al., 2003). Another way to hedge against risks is through higher buffers. However, high buffers leads to higher financial risks (Christopher & Lee, 2004). It is especially true today as today’s business world is characterized by a lower product life cycle, a higher product variety and high holding and obsolescence costs (Tang, 2006). However, many authors have worked on less formal type of relationships and we will describe them in the next chapter.

As a matter of fact, there is a tendency to move away from the traditional arms-length, classical relationships toward agreements that are partnership-oriented (Christopher & Lee, 2004). Moreover, some argue that effective risk management has to be holistic, which means that a combination of qualitative and quantitative methods should be applied (Harland et al., 2003).

2.5.1 Supplier improvement

Zsidisin et al. (2004) and Chen et al. (2013) propose to reduce risks by improving suppliers’ processes. One way to do so would be to implement the buying company’s SCRM process to the supplier or developing maturity path and quality management program. Those methods will help to close the gap in terms of infrastructures (e.g. improve quality and capacity) between the supplier and the focal firm. Moreover, the first-tier suppliers, having improved their process, could in turn educate their own first-tier suppliers and so on, which would improve the supply chain on a multiple-tier level. For example, Illy, a large Italian coffee producer, has successfully changed the coffee channel for Brazilian coffee, putting tremendous effort to develop its Brazilian

producers (e.g. by creating a university, where local producers could attend class to develop their production) and it ultimately led to a significant increase of the product quality. Another, less costly way to achieve this would be to send personnel to the supplier and train them to the quality standards of the buying company. With those techniques and types of relation, the buying company helps suppliers to improve their technical capacities, which in return improve supply chain performances and reduce supply risks (Chen et al., 2013).

By developing such a relationship, both parties walk in the same direction and goal congruence is promoted. It also reduces outcome uncertainty as there is less chance that the supplied part or product will not meet the buyer's requirements (e.g. quantity and quality).

2.5.2 Confidence improvement

Christopher & Lee (2004) argue that risks can be substantially mitigated through an improved confidence among supply chain partners. According to them, the high level of risks in modern supply chains leads to low level of confidence. This low level of confidence leads to inflexible supply chains. Ultimately, inflexible supply chains are not considered as competitive and thus become exposed to risks. Lack of confidence can be explained by the two following factors and techniques will be proposed to restore it:

- ✓ Lack of visibility: It is one of the major characteristics of today's supply chains. As they are getting longer and more complex, it becomes hard if not impossible to have a detailed vision about what happens in the supply chain of companies. To address this issue, the two authors propose to share information among key supply chain partners to reduce uncertainties and ultimately, risks. This statement leads us to the concept of alliances and collaboration, which has been studied by many other authors. As stated earlier, companies tend to move away from traditional relationships toward cooperation in order to gain competitive advantage that no individual company would be able to achieve alone. As such, supply chain risks should be managed as a whole from an end-to-end supply chain standpoint. (Harland et al., 2003; Chen et al., 2013). The rationale behind this argumentation is that supply chain risks are negatively correlated with cooperation. Supply chain collaboration reduces the lack of information and thus the uncertainties through the generation of knowledge-based supply chains. In a collaborative environment, key supply chain partners should share information, knowledge and expertise by implementing tools

to store, share and generate knowledge (Chen et al., 2013). In order to facilitate the flow of information in the supply chain, having operational metrics (e.g. on inventory, forecast, shipment, capacity...) accessible to supply chain members is a way to extend visibility (Christopher & Lee, 2004). Another topic to be addressed in long term collaborative relationships is the sharing of risks and rewards. It is a crucial topic, as steadily increasing investments are required in distribution centers, information systems, training and transportation in such type of relationships (Handfield & Nichols, 1999). This sharing can be achieved through measurement systems for risk realization, potential losses and benefits involving as many supply chain partners as possible. Furthermore, those partners have to agree on incentives and penalties (Harland et al., 2003). On the other hand, there is a trade-off to be made between the need of information flow along the whole supply chain and the risk that strategic information will fall in the hand of the competition. As a matter of fact, strategic info (e.g. on new product development) must stay within the supply chain network. Therefore, there is a high need for confidentiality when being part of this type of structure, which can be achieved by putting extra clauses on the contracts before being engaged in the relationship. The solution might come from Resilinc. We have already talked about this company who brings a solution for consistent mapping of the supply chain, allowing companies to look outside their tier 1 supplier base. Resilinc brings collaborative approaches to higher level, as information is not shared only within a single supply chain but within a whole network of buyers and sellers. It enhances the level of competitiveness between suppliers, which will lead to better price and/or better quality for the buyer. The only reproach we could make to this initiative is that they are not active in many sectors yet (i.e. High-Tec, Life Sciences and Automotive). Overall, bringing fluidity to the flow of information is an efficient way to mitigate risks, even though strategic information should be protected through formal contract clauses.

- ✓ Lack of control: It is the second factor that influences supply chain confidence. Control is defined as the ability to make changes and to respond on short notice. Long and complex supply chains are inclined to respond slowly to changes (Christopher & Lee, 2004; Tang & Tomlin, 2008). In an attempt to enhance control, several authors argue that having a flexible supply chain is paramount. A more flexible supply chain will ultimately help to deal with its high level of risks, as it will enable the company to recover faster than its competitors (Manuj & Mentzer, 2008).

Flexibility leans on the triple A principles: Agility (short term), Adaptability (medium term) and Alignment (long term). Alignment relates to goal congruence as it focuses on promoting trust and long term perspectives. Therefore, we can argue that it is closely linked to what has been said on the previous section. Adaptability relates to the capacity of a company to react to market dynamics, for example by building an international supply chain network. Agility relates to the ability to reduce the impact of short term changes (Tang & Tomlin, 2008). In order to bring more agility to the supply chain, developing a network with multiple suppliers (i.e. being able to choose between different locations if an unforeseen event happens which mitigates the risk of sole sourcing) or having flexible contracts with suppliers (i.e. being able to control the timing of delivery) are two of the techniques that are usually employed. Of course, a combination of both can bring even more flexibility to the supply chain (Tang & Tomlin, 2008). Other recognized techniques include postponement (i.e. delaying the point of product differentiation), strategic stocks location to be shared among key supply chain partners, make and buy, flexible transportation modes (e.g. being able to shift between sea and air transportation) and carriers are all techniques that are responsive and give agility to the supply chain and thus reduce the risk associated to it (Tang, 2006; Christopher & Lee, 2004). The main argument one could make against those types of techniques is the relation between costs and benefits as it is hard to measure the gains a company would make from being more flexible and thus more competitive than its competitors (Tang, 2006). However, Tang & Tomlin (2008) have empirically shown that only a low level of flexibility is required to benefit the most from it. For example, in order to hedge against uncertain supply costs, they have demonstrated that most of the gains are obtained when only a few suppliers to choose from are available. Ultimately, it means that investment on flexibility does not need to be important in order to mitigate risks.

As we have seen, there are many ways to proactively manage the risk. Of course, implementing those techniques is not free from hurdles. We have already mentioned the need for educated personnel, in both risk management and soft skills. We also have already mentioned the risk associated with intellectual property when working in a very collaborative environment and the issue associated with costs and benefits balance. Ultimately, the last hurdle we will talk about is related to what Tang (2006) called the strategic fit. He argues the fact that whatever the supply chain risk management strategy, it should match the overall strategy of the business. As an example, he remarks

that “postponement” cannot be an effective supply chain risk management strategy if the overall strategy aims at reducing the product variety. Overall, one can agree on the statement made by Harland et al. (2003) when saying that risk management need to be approached holistically. As a matter of fact, the best way to mitigate risks is to have formal and less formal, qualitative and quantitative strategies, the weaknesses of one strategy being compensated by the strengths of the others.

2.6 Risk contingency plans

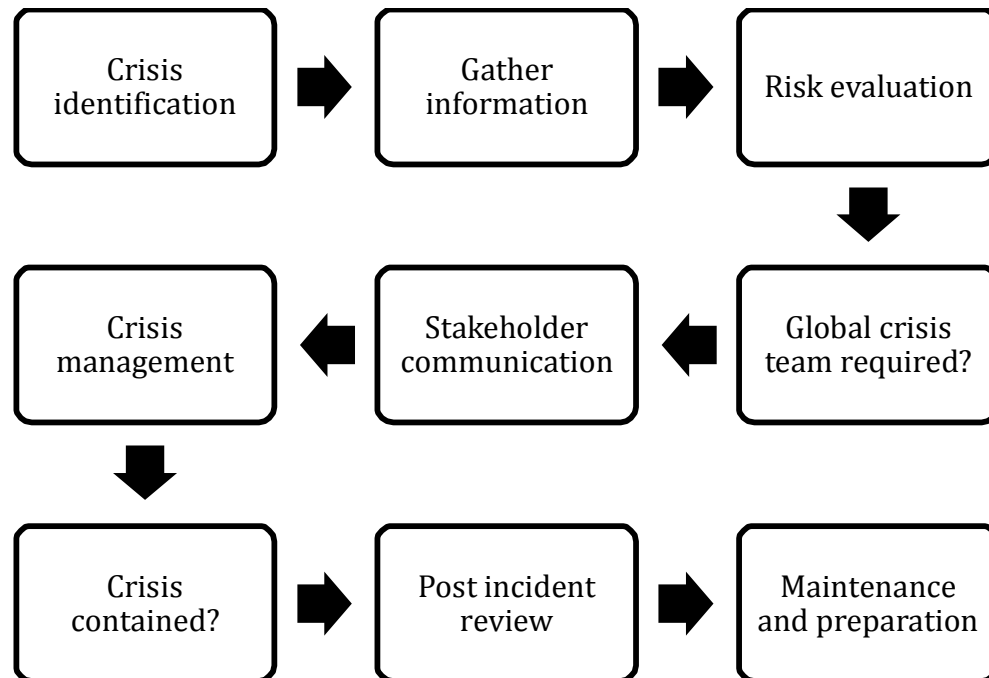
Even if a company implements proactive management strategies to reduce the likelihood of occurrence of undesirable event, we can argue that it is impossible to anticipate every single event that can negatively impact the supply chain. Supply chains are so long and complex, involving so many actors and realities that unforeseen events will eventually happen. We can sum this vision up with one simple question: *“Is it even possible to manage risks from this size and scope?”* (Handfield & Nichols, 1999. p.156). When avoiding risk becomes impossible, the firm needs to focus on impact reduction (Manuj & Mentzer, 2008).

In a sense, flexibility described above is a way to reduce impact of undesirable events. However, it is possible to go much further than that. The SCRLC report (2011) proposes a four-step model for proactively reducing impact of risks when they occur.

- I. Protecting the supply chain: Ensuring the security of the supply chain is a critical step. As a matter of fact, the company must be sure that its assets are safe. Measures to protect the supply chain include physical security, access control, IT security, business partner security and convoy security. The evaluation of supply chain security must be done through self-assessment, including questions on each of the aforementioned areas.
- II. Responding to crises: They propose to establish a crisis management structure, existing at all levels of the organization. According to the importance of the realized risk, different levels of the structure will be activated. For example, a very small risk will only activate the on-site crisis team meanwhile the corporate crisis management team or the executive crisis management team will be activated in case of a major crisis. They define major crisis as an “unstable condition, involving an impending abrupt or significant change that requires urgent attention and actions to protect life, assets, property, operations, environment and reputation.” (SCRLC report, 2011, p.20). They propose what they call an “ideal crisis response

process” which is detailed in figure V. If after the risk evaluation phase, the problem can be solved locally, the process will not go further. Equivalently, if the crisis is not contained, then the crisis team will need to go back to the crisis management phase.

Figure V: An ideal crisis response process



Adapted from: SCRLC report (2011). SCRM, a compilation of best practices, p. 24

- III. Business continuity: Business continuity management (hereafter BCM) refers to the ability of a company to identify vital components and activities, preparing set of measures and actions plans, that must be kept alive in order to assure a minimum customer service level without enduring fatal losses (Vancoppenolle, 2007). Business continuity plans propose to proactively implement actions to reduce the impact after an incident in order to keep the vital functions of the company alive. According to the latest survey (2013) on Business Continuity Management conducted by the Chartered Management Institute, 80% of the managers are familiar with the concepts of BCM and would qualify it as very important to the eyes of their respective senior management. However, only 63% of the survey population admits to have an implemented BCM even if the institute identified an upward trend since 2008. From this report, we can also highlight the fact that 87% of the 63% admit that having a BCM positively reduced the impact of disruption. Finally, 83% admitted that having BCM enabled their organizations to keep delivering key products to their customers. We can therefore assume that it helps

companies to diminish impacts due to supply disruptions. Specifically, a business continuity plan (BCP) helps to maintain the necessary level of supply after the incident occurred. This plan should be supported at every level of the organization and includes techniques such as the use of spare capacity, potential shutdown of unnecessary product lines, the transfer of key parts and products and the creation of transitory plants. BCP can even go further, by developing plans alongside competitors (e.g. assistance from competition, re-labelling of competitors products) (Norrman & Jansson, 2004).

IV. Testing and training: This last step is crucial to test the effectiveness of the first three steps. The SCRLC recommends performing at least one test per year, their main argument being that employees learn best by doing. There are three ways to test the three phases¹²:

- a. Table-top: Cross-functional team exercise where participants jointly review the plans and look for potential failures.
- b. Structured walk-through: With a specific crisis in mind, each participant individually identifies problems and weaknesses of the plan.
- c. Disaster simulation testing: the company simulates the environment of a particularly major crisis. Then, much like in a role-play game, all the initially identified resources are available to see if the company can still perform its vital activities.

Eventually, no matter the method used to test the plan, the company will have to answer those questions¹³:

- ➔ Did the contingency plan work efficiently?
- ➔ Did enough capacities and resources were deployed to deal with the crisis?
- ➔ How can it be improved?
- ➔ Are the employees educated enough?

By answering those questions, incorporating lessons from past incidents and tests, the company will be able to adjust the plan to find the right balance between being able to respond to crisis and allocate resources efficiently.

In the next chapter, we will take a deeper look into the emerging countries and particularly Brazil, the subject of this thesis, from a supply relationship standpoint.

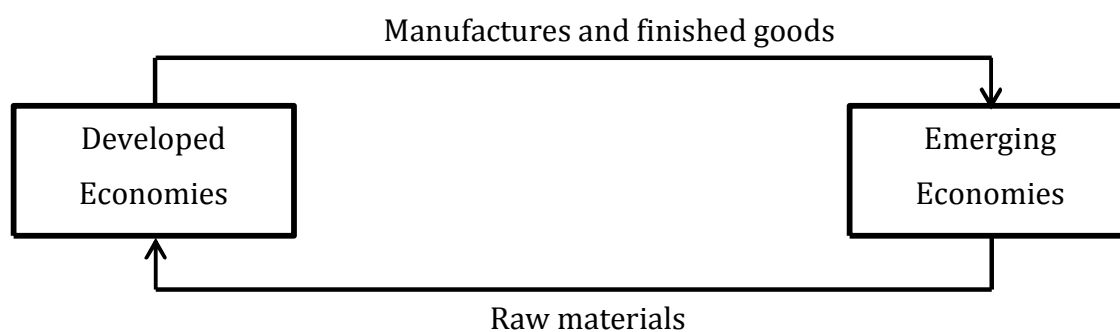
¹²Retrieved from <http://www.cio.com/article/2381021/best-practices/how-to-create-an-effective-business-continuity-plan.html> (Online), consulted on April 6th, 2015.

¹³SCRLC report (2011). *SCRM: a compilation of best practices*, p.27.

2.7 Supply relationships with emerging countries: the case of Brazil

With the tendency toward globalization and outsourcing, supply relationships from emerging markets to developed countries are at a higher level than ever. Nevertheless, one can argue that the way the flow of goods and products is organized today find its origins in the first wave of colonization. As a matter of fact, since the 16th century and in order to stimulate the development of European manufactures, colonies were forced to develop export-oriented industrial monocultures (e.g. sugar, banana, coffee, rubber...), providing cheap raw materials for a fast-expanding Europe. Even if most of the colonies, if not all, became independent and have developed huge industrialization programs, one can argue that the pattern (see Figure VI) of flow remains similar. Indeed, in his speech of January 20th 1949, recently elected U.S. President Harry Truman initiated the so-called development project, aiming at reconstituting the flow of goods on a global scale, selling the production surplus from the war and containing communism in the Cold War context. In the early 1980's, the World Bank even defined development as participating to the World market, which, alongside the financial liberalization of the late 1970's, are the two main triggers considered having induced globalization (McMichael, 2012; Rouquié, 1998). Globalization, promoted by powerful international institutions (e.g. World Bank, WTO...) is based on the free-trade ideology which is itself based on the Heckscher-Ohlin-Samuelson model (better known as the HOS model), an evolution of the famous comparative advantage model from Ricardo. According to the HOS model, each country should specialize its production in the sector using the most intensely the production factor the country is the most endowed with (Chang, 2008). Therefore, we can assume that Brazil, even if considered as one of the most advanced emerging countries, still mainly export raw materials or low added value transformed products to Western countries.

Figure VI: International Division of Labor



Adapted from: McMichael (2012), p. 42

In the context of this thesis, we will mainly focus on the bilateral relations between Brazil and Belgium. Next, a quick snapshot of the context of the Brazilian economy will be presented. The goal here is not to make an in-depth analysis Brazilian economy, but just to present some of the strengths and weaknesses of this market, in order to help the reader to situate the context. The rationale for choosing Brazil was simple: being the 5th biggest country in the world by its size, Brazil is the Latin American leading economic power. Thanks to its vast territory (more than 8 million square meters), the country can count on both natural resources and workforce (estimated at 107.3 million people in 2013) to develop its economy. Being mainly driven by their large interior market, they have developed their industrial (e.g. textile, chemicals, iron ore, steel, lumber...) and agricultural (e.g. coffee, soybean, orange, corn, rice...) bases¹⁴. This is has been well documented by the World Economic Forum, which ranks economies according to their competitiveness. In their latest report (2015), Brazilian economy's stage of development is ranked at the transition between being efficiency-driven (i.e. efficient production processes thanks to higher education, efficient labor market, efficient use of existing technologies...) and innovation-driven (i.e. competitiveness comes from unique products thanks to advanced existing production processes and the ability to create new ones), which correspond to the 4th stage out of 5. However, the same report classifies the nature of their competitive advantage in international markets as being rather the low-cost of labor and materials than the unique and innovative production. From a comparative standpoint, some leading emerging economies such as India, Russia and China are considered to propose more innovation in terms of products and processes in international markets. This indicator led us to believe that, even if booming, Brazil still exports mainly raw materials and low-added-value products to Europe. This first feeling is reinforced by the CIA World Factbook, which lists iron ore, soy beans, coffee and transport equipment as the main export commodities the Brazilian market offers.

However, Brazil possesses all the traits of a strong emerging economy. First of all, their political environment is considered to be quite stable, which is essential when doing business in emerging countries. As a matter of fact, Ducroire, a Belgian public credit-insurer, classifies the political risks of countries on a scale grading from 1 (best) to 7 (worst). In that category, Brazil obtained the grade of 2, which shows the stable political environment of the country. As a comparison, Brazil obtained the same grade

¹⁴ Retrieved from <https://www.cia.gov/library/publications/the-world-factbook/geos/br.html>, consulted on March 30th, 2015.

than Chile, being considered as the most stable country of the region (reflected by being the only Latin American country to this day to have joined the OECD in 2010¹⁵) and fares better than Argentina, being considered quite risky (5 out of 7). Moreover, Brazil has benefited from a strong economic growth, with an annual inflation adjusted growth rate of 3.37%¹⁶, even if this growth tends to slow down since 2012. This high growth, coupled with high interest rates, has put a high inflationist pressure on the country. With an inflation rate at 6.2% in 2013, Brazil ranks 180th out of 222 countries, still way behind Venezuela (56.20% of inflation for the same year), the second worst inflationist country in the world. Consequently, the exchange rate of local currency (Brazilian Real) has suffered from an upward pressure until 2012, when the government decided to cool down the exchange appreciation in order to remain competitive¹⁷. From an international buyer's perspective, uncertainty on prices is thus to be considered, at least in the middle term since the exchange rate is not free from political bias, tending to be naturally higher than its actual level¹⁸. Brazil is also characterized by a high level of social inequalities. As a matter of fact, if we consider the GINI index (a statistical distribution of incomes within a country ranking from 0 [equal] to 1 [unequal]) as an accurate measure of inequalities between social classes, Brazil is one of the most unequal countries in the world (0,519)¹⁹. High level of inequalities is a particular trait of almost every Latin American country, even if drastic improvements have been made in Brazil over the past decade. As a matter of fact, social programs (e.g. see "Bolsa Familia") and better access to education have had a positive effect on reducing inequalities (IMF, 2011). However, social unrest is still an issue, as demonstrated by the recent popular strikes before the 2014 World Cup. In early June 2014, days before the opening ceremony, more than 200,000 Brazilian went down the streets of the major cities to protest against the high costs incurred to organize the tournament and the inflation incurred in public services (e.g. public transportation), arguing that this invested money could be better used to develop healthcare, transportation and education system^{20 21 22}. Social unrest can lead to

¹⁵Retrieved from <http://www.oecd.org/fr/chili/ladhesionduchilialocde.htm>, consulted on March 30th, 2015.

¹⁶Retrieved from <http://data.worldbank.org/country/brazil>, consulted on March 30th, 2015.

¹⁷Retrieved from <https://www.cia.gov/library/publications/the-world-factbook/geos/br.html>, consulted on March 30th, 2015.

¹⁸ This trend can be graphically observed at <http://www.xe.com/fr/currencycharts/?from=BRL&to=EUR&view=10Y>

¹⁹Retrieved from <https://www.cia.gov/library/publications/the-world-factbook/geos/br.html>, consulted on March 30th, 2015.

²⁰Retrieved from <http://www.abc.net.au/radionational/programs/rearvision/protests-and-social-unrest-threaten-world-cup-kickoff/5512656>, consulted on March 30th, 2015.

major disruption problems in supply chains and thus is of importance. One of the most documented examples is the Longshoremen strikes in Californian ports back in 2002, which led to major disruptions for NUMMI (an American automobile manufacturing company) and is documented in Zsidisin et al. (2004). A quick search on the Internet inform us that this particular problem is still of actuality, as of February 2015²³.

Other data and rankings to assess Brazilian business environment and that could potentially affect supply chains include the following:

- × Supplier quantity: According to the Global Competitiveness Report 2015, Brazil ranks 21st/144 worldwide and first in Latin America.
- × Supplier quality: From the same report, Brazil ranks 54th/144, behind Chile (43rd) and Colombia (41st).
- × Infrastructure: Are considered as underdeveloped, which can be a major hurdle for international buyers (ranked 120th/144 in GCR 2015). Especially, road and port infrastructure are in very bad conditions. According to the Logistics Performance Index (LPI) developed by the World Bank, Brazil performs worse than Chile and OECD countries in indicators such as infrastructures, international shipments and logistic competences (their methodology and a comparative graphic are available in appendix 4).
- × Corruption: Even if better than some of its neighbors (e.g. Argentina, Venezuela), Brazil is still considered as quite corrupted. According to a public survey, corruption is still considered at a high level and the enforcement on the OECD convention on combating bribery (2011) is poor. In the private sector particularly, 70% of Brazilian top managers identified corruption as one of the major threat in their business environment²⁴.
- × Counterfeit and Black market: According to Havoscope, an international association publishing global information on counterfeit and black market, the Brazilian counterfeit industry represents more than \$15 billion per year, ranking 8th worldwide. This of course could lead the international buyer to have counterfeit

²¹Retrieved from <http://world.time.com/2013/06/18/brazils-protests-social-inequality-and-world-cup-spending-fuel-mass-unrest/>, consulted on March 30th, 2015.

²²Retrieved from <http://www.dailymail.co.uk/sport/worldcup2014/article-2644995/Brazil-World-Cup-chaos-social-unrest-threatens-overshadow-football.html>, consulted on March 30th, 2015.

²³Retrieved from <http://www.dailymail.co.uk/wires/reuters/article-2956221/West-Coast-ports-dispute-stretches-ahead-U-S-labor-secretary-intervention.html>, consulted on March 30th, 2015.

²⁴Retrieved from http://www.transparency.org/country#BRA_DataResearch, consulted on March 30th, 2015.

goods, products or parts in their supply chain. This risk has thus to be addressed by the buying firms.

- × Intellectual property rights: Protecting intellectual property is of importance when managing supply chain risks. This statement is especially true when working in very collaborative environments, as discussed above. According to the Global Competitiveness Report (2015), Brazil is ranked 92nd/144 even if above some of its neighbors. Indeed, Colombia (96th), Argentina (136th) and Venezuela (144th) are all considered to protect intellectual property less than Brazil. Only Chile (56th) ranks ahead of Brazil.
- × Quality of education: Having a highly educated workforce can contribute to enhance supplier reliability and we can argue that consequently, associated risks are diminished. On the other hand, a too educated workforce can lead to higher wages, therefore increasing prices to be paid and eventually be detrimental to the competitive advantage of Brazil described earlier. As a matter of fact, a recent study on growing income inequalities in the U.S. has demonstrated that wages are partially determined according to the marginal productivity of the workforce, which is increased if better educated (Goldin & Katz, 2010). Still according to the Global Competitiveness Report (2015), Brazil's education system does not meet very well its need for being competitive. They only rank 126th/144, above Venezuela (131st) but behind Argentina (113th), Colombia (90th) and Chile (71st).
- × Technological readiness: Finally, Brazil ranks 59th/144 in terms of firm-level technology absorption, an indicator measuring how well businesses from a specific country adopt new technologies. Even if behind Chile (39th), they fare quite well by being well above Colombia (89th), Argentina (115th) and Venezuela (122nd).

Even if considered as one of the wealthiest emerging countries in the world, allowing companies to take advantage of tremendous opportunities, doing business with Brazilian suppliers is not free from hurdles. In a more global context, doing business with emerging countries imply taking into account different realities, opportunities and threats. Those indicators can give us early leads about what risks are specific to the Brazilian economy and that can be considered by Belgian firms when managing supply chain risks. Those are summarized in table IV.

Table IV: Strengths and weaknesses of the Brazilian business environment

Strengths	Weaknesses
Economic stability	Mid-term uncertainty on prices
Political stability	Social unrest
Low labor and material costs	Infrastructure
Extensive supplier base	Corruption
Rather good supplier quality	Counterfeit
Technological readiness	IP rights
	Quality of education

3 Case-study selection and methodology

In this section, we will document the methodology used for this thesis. It will encompass the selection of our case-studies, the design and the interview protocol. In order to answer to the research question, a qualitative approach has been developed. This type of approach suits particularly well to management studies. Indeed, many authors have developed their theories using qualitative approaches (Lejeune, 2014). It seemed to be the best method in the context of this thesis, as the objective of qualitative approaches is to evaluate causal relationships, answering both “how” and “why” questions. Qualitative approaches possess other attributes that are relevant for the present paper: proximity, ability to pursue holistic analyses, signification gathering and hypotheses development (Miles & Huberman, 1994). To guide my research, previous works on SCRM have been analyzed before data analysis, enhancing internal validity (Yin, 2003). In order to be comprehensive, data collection methods and analyses will be explained in chapter 3.3. On the other hand, qualitative methods rely strongly on personal understandings and interpretations, which might incur bias. In order to back up findings, arguments must be strong, plausible and fair (Yin, 2003).

Having a well-explained methodology will enhance reliability of the study, as it will provide documentation on the procedure in order to hopefully find the same results by replicating the case-study in the same conditions (Yin, 2003).

3.1 Design and case-study selection

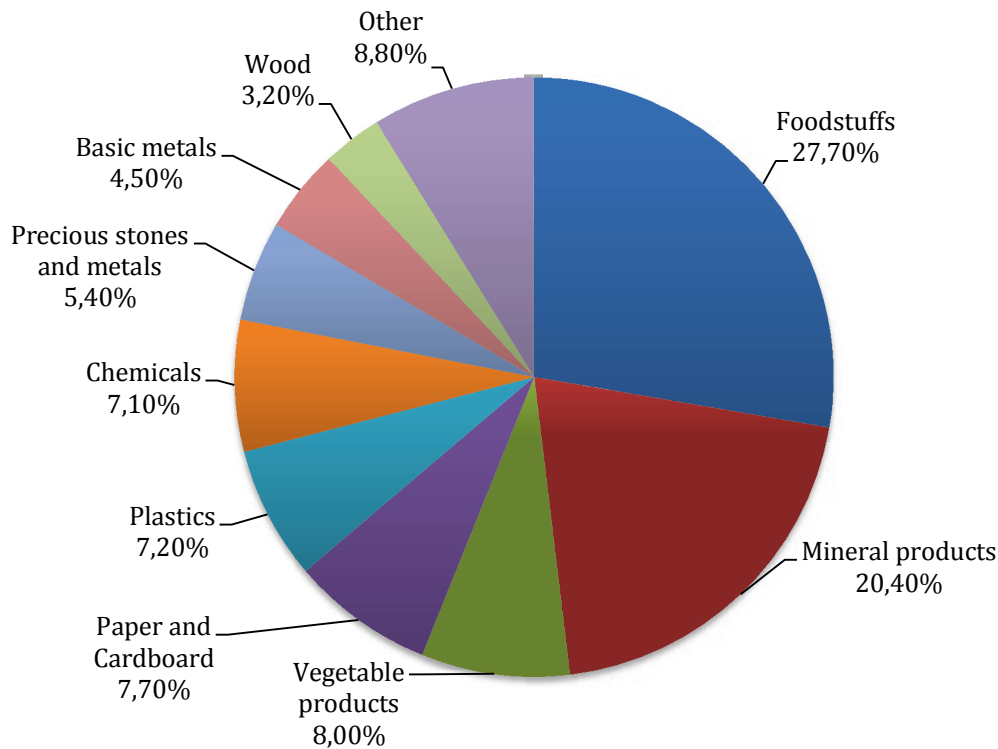
In order to answer our questions, I have chosen a multiple case study design. To have more relevant findings, four cases will be analyzed. The choice of conducting four cases is purely judgmental but it will provide the opportunity of direct replication, meaning that it will be possible to test findings from a specific case to other ones. Of course, this selection step implies subjectivity. But what is objectivity if not the convergence of subjectivities (Lejeune, 2014)? Even if selection is subjective, having a multiple case-study allows to answer “how” questions about the way managers from the selected companies deal with supply risks in emerging markets (Yin, 2003).

The unit of analysis will be the focal firms, the Western companies (implemented in Belgium in a matter of feasibility) sourcing in Brazil. Keeping Brazil as a unit will help to enhance reliability of cross-case analysis. The term “emerging countries” encompasses a wide range of realities and every single country has strengths and weaknesses. Reality

in Brazil is probably not the same that the one in India or in Russia and thus it will be more relevant from the cross-case analysis perspective, as cases must be selected on replication logic (Yin, 2003).

In order to sample the cases, I have decided to start from the trade data between Belgium and Brazil. According to the export helpdesk website implemented by the European Union and displaying statistics on international trade, Belgium has imported €2,360,698,980 from Brazil in 2014 and is by far the first Latin American supplier of our country. Going a little bit deeper into a sectorial breakdown, we learn that this amount is divided as displayed in figure VII.

Figure VII: Brazil, a raw materials exporter for Belgian companies in 2014

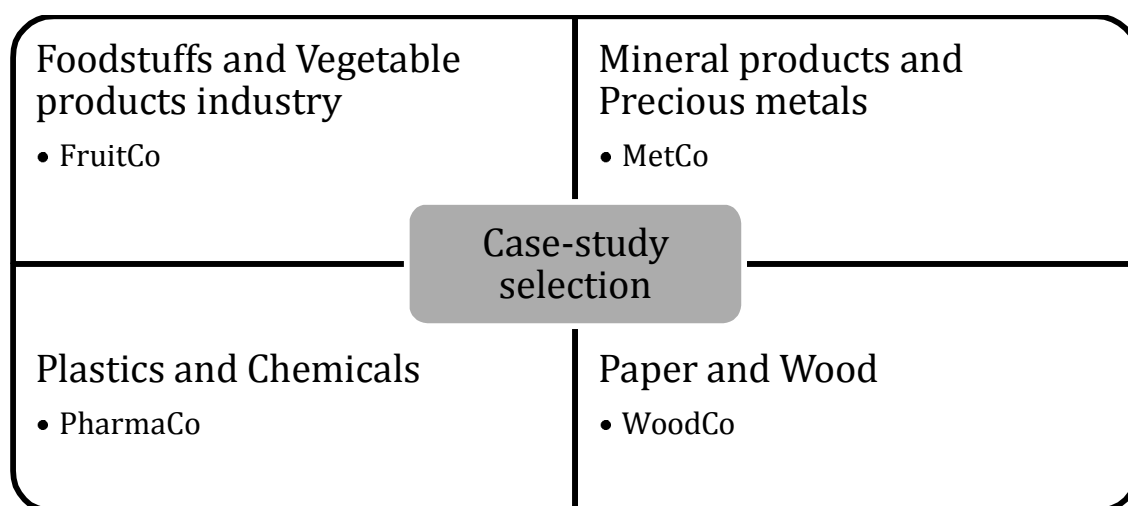


Source: Belgian Foreign Trade Agency. (2015). Trade relations of Belgium with Brazil.

From this same report, we learn that the leading industry in the foodstuffs sector is the orange juice industry, Belgium importing orange juice more than 2 times other commodities such as coffee. This is not a surprise, as Brazil is the worldwide leader in orange production, controlling 50% of the world trade (Belgian Foreign Trade Agency, 2010). The mineral products industry is dominated by the iron ore imports. At the end of the day, and even if every industry has its own characteristics, I found it relevant to group some of the industries together in order to have a better overview on totally different sectors. As a matter of fact, we can argue that the risks encountered by the foodstuffs industry can be quite similar with the risks encountered in the vegetable

products industry. Case-study selection must be based on teleological principle (i.e. depending on the purpose of the study) and thus having the widest possible view on Brazilian suppliers enhances internal validity (Miles & Huberman, 1994). Figure VIII displays what I propose to get the broader perspective on Brazilian suppliers. Generalization of future propositions to other emerging markets must be conducted with alertness, external validity being ensured only by clearly describing the single cases (Yin, 2003). In that sense, having a broad perspective on sector sourcing in Brazil is also an attempt to enhance external validity (Yin, 2003). Unlike other previous researches on SCRM, I will not make a further distinction according to the size of the companies. Moreover, it has been challenging to gather information about the state of their SCRM on beforehand, especially for the SME's. Of course, reliability of the study would have been enhanced with more than one company per sector and if only companies recognized for having best-practices in the field of SCRM were selected. However, due to a lack of resources and negotiating power to get access to key informants, it has been challenging to build a better sample. Specifics about each selected company (e.g. number of employees, annual revenue...) will be displayed at the case-study analysis level. For confidentiality matters, real names will not be disclosed and will be replaced by generic nicknames.

Figure VIII: Case-study selection



3.2 Data collection and analysis

Evidences will mainly be based on two types of information: Interviews with managers from focal firms and internal documentation/archival records to corroborate and augment evidences obtained via the interviews. By using those two types, I hope to be able to triangulate data and thus to be able to give more robust findings, enhancing

internal validity (Yin, 2003). As a matter of fact, findings cannot be based on interviews only, as the unit of analysis is the entire focal firm. Including external and internal documentation should therefore help to partially solve this issue. In order to enhance reliability, a chain of evidence has been maintained through the creation of a case-study database, containing personal notes, interview reports and documentation (Yin, 2003).

3.2.1 Interviews

Interview with key informants is a flexible instrument to obtain information from the field and therefore particularly relevant for the aim of this thesis, enhancing validity of the construct (Yin, 2003). They took place with procurement or sourcing managers, supply chain risks managers or enterprise risk manager, if access to other people was too restrictive. More or less 30 companies in the selected sectors were contacted by e-mail during the month of March 2015 after being sure that they were actually engaged in supply relationships with Brazilian suppliers via their website or phone calls. Only one company (WoodCo) responded positively after this initiative. Given the lack of respondents, I have decided to contact them back via phone calls, also contacting new ones. Thanks to this initiative, I could get the other interviews (PharmaCo, MetCo and FruitCo, respectively). Those key contacts were firstly introduced to the project, and then asked for an interview. Interviews took the form of semi-structured face to face interviews. Having a semi-structured interview gives us the flexibility wanted to approach the topic while providing perceived causal inferences (Yin, 2003). The interview guide (appendix 5), common to the four cases, was not provided on beforehand, which enhances reliability of the study (Yin, 2003). Interviews were conducted in English, lasted between 45 and 60 minutes and were recorded, in order to transcribe them later. No additional notes were taken during the interviews, as I wanted to focus on the interaction between both parties. Interviews were transcribed in the form of a report and recordings were stored. Moreover, I kept open the opportunity for a second, more precise interview if specific research questions were needed. All the participants agreed to stay reachable if necessary. This consistency of instrument, instructions and conditions under which the interviews were performed are paramount to ensure reliability, allowing replications (Yin, 2003). The four interviews were conducted within a period of two months, threatening internal validity (Yin, 2003). However to my knowledge, no major event (e.g. natural disaster, political crisis) in

Brazil has homogeneously affected the four interviews within that time period (Yin, 2003).

3.2.2 Documentation

In order to triangulate information obtained via interviews, I will get internal and external documentation. Internal documentation refers to the material provided by the interviewee (e.g. specific legislation, corporate guidelines for supplier selection and/or evaluation, global sourcing strategy, supplier relationship strategies, purchase conditions...) meanwhile external documentation refers to the documentation available on the internet, such as annual report and public guidelines.

3.2.3 Data analysis

Reports from each interview and documentation will be used to create a single case description and analysis. Triangulate interviews and documentation will make the findings of the case-study more robust, enhancing internal validity (Yin, 2003). The single case analysis will be divided in five parts: (1) presentation and rationale for sourcing in Brazil, (2) supplier selection, (3) SCRM practices, (4) reflection on improvement and (5) personal analysis. Developing single cases help to maintain a chain of evidence, enhancing construct validity (Yin, 2003). After the single-case analysis, a word table will be created in order to facilitate the cross-case analysis and be able to identify similarities and differences across individual cases. Propositions will then be generated through the analyses of similarities and differences across single cases. According to Yin (2003), cross-case analysis is relevant for this type of research, enhancing internal validity.

4 Research findings

4.1 Case-study A: WoodCo

4.1.1 Presentation and rationale for sourcing in Brazil

WoodCo is a medium-sized company based in Harelbeke, Belgium. They also sell their products in the Netherlands, France and Germany. The interviewee is the purchase manager of the tropical wood division. They manufacture a whole range of products made of wood and from Brazil they mainly import two types of tropical woods, called Massaranduba and Ipé, which are used for heavy constructions, patios and industrial application. Those two types of woods are only available in Brazil, and they are by far the best for outside constructions. It would be impossible to do the same with other woods and doing business with Brazilian supplier is thus mandatory.

4.1.2 Supplier selection

There are a lot of suppliers available in Brazil, which gives WoodCo a certain negotiation power and the opportunity to perform a strict supplier selection. However, only a few of them respects their standards and regulations. The most important criterion to verify is the license of the supplier. In Brazil, each supplier must have a license to exploit a part of the rain forest. This license is only granted for a certain period of time and if it is about to expire, they do not start a business relationship with them. Also, they feel concerned about the ecological and social factors. Before engaging the relationship, they make sure that the supplier works ecologically and is free from bond and/or child labor. That is why they do not do business with small familiar Brazilian suppliers, as there is a bigger chance that ecological and social standards will not be met. Financial sturdiness is also verified, but has a lesser importance in the selection procedure. The particularity from doing business with suppliers coming from emerging countries is the degree of due diligence that has to be performed on beforehand. Given the size of WoodCo, they do not have the possibility to do it all by themselves, that is why they call out to independent agents, based in Brazil, to participate in this process of due diligence. Of course, it does not mean that WoodCo controls everything perfectly, and errors might happen. For example, no later than early 2015, one of their containers was blocked at the Antwerp customs because of a license problem with one of their Brazilian supplier. This information became public and WoodCo, along with two

competitors, were cited in a Flemish newspaper, which does not give a good impression to the public and is damaging to their image.

A common technique WoodCo uses to reduce risk in the supplier selection phase is to try to find suppliers with European owners which is, according to the interviewee, more and more frequent. By doing so, WoodCo feels a lot more confident about the supplier's business standards, adverse selection risk being reduced. According to the purchase manager, Europeans have a better and more anchored culture for quality and they will put the emphasis on infrastructure development. Moreover, knowing the European market and regulation helps to save a lot of time and efforts for both parties.

4.1.3 SCRM practices

Attitude toward risk

WoodCo qualifies its risk tolerance as thin to none. As a matter of fact, the wood industry is very sensitive and thus cannot be exposed to a lot of risks. Even though it is impossible to hedge against every single risk, their job is to minimize them as much as possible. This brings the debate of defining "as much as possible". According to the interviewee, part of it is learning by mistake, and part of it is complying with the European regulation on "due diligence" (Timber regulation 2013²⁵), which obliges European firms in the wood sector to take all the necessary measures to exclude illegal wood from the European market.

Risk identification

According to the interviewee, the most important risk WoodCo is threatened by is that the supplier does not have its license, which might be classified in the adverse selection category (i.e. misinterpretation of supplier's capability). If the container is controlled, then it will be confiscated at the custom. This is the worst case scenario for WoodCo, as its margin for errors is very thin. Given their size, the loss of an entire container will represent a heavy financial loss. As stated earlier, it will also damage their image and reputation in case this information goes public.

Financial losses might also be incurred randomly, as wood is a natural product, and that it is almost impossible to guarantee a perfect product quality, even if the supplier is considered as being good. It might happen that the log is rotten but in such case, the financial loss is not as substantial. As a matter of fact, they always have the possibility to use part of the log for other purposes and other type of works. As far as the interviewee

²⁵http://ec.europa.eu/environment/eutr2013/index_fr.htm, Consulted on April 21st, 2015.

could remember, WoodCo has never lost an entire shipment due to poor quality. It also happens that the product they ask for is legally cleared, is of good quality, but does not meet the exact requirement of WoodCo. As a matter of fact, the required thickness of the log is not always what is expected, they would have to use it for other purposes that it was primarily intended for.

Given the fact that labor is not as protected and regulated than in Europe, WoodCo also wants to make sure that Brazilian workers work in safe and human conditions. It has never happened yet, but if an accident occurs and goes public, it could be detrimental to their image and incur social and psychological damages. The interviewee goes further by arguing that in such case (which also prevails for the ecological risk of illegally importing wood), the whole sector would be impacted and not only WoodCo, as this industry is very sensitive to that type of risks.

However, those short term risks have to be balanced against an even more threatening long term risk: not having raw materials. If it materializes, it would threaten the existence of WoodCo and similar companies. According to the interviewee, if they stop buying wood from emerging countries, there will be a risk that companies coming from countries where practices are less scrupulous (China was mentioned by the interviewee as such a country) will take over the whole supplier base.

They do not feel exposed to macro-economic risks in Brazil. However, corruption is taken into account. WoodCo views Brazil as highly corrupted, which will impact their risk mitigation techniques.

Risk assessment

WoodCo does not have any formal risk assessment tool as described in the theory. However, they do perform supplier evaluation through self-assessment and external audits, which helps them to highlight any red flags at a given supplier's site. They perform self-assessment on a regular basis and audits are performed by WoodCo employees. The interviewee itself goes two or three times a year in Brazil in order to check if the supplier meets all WoodCo's requirements. It is usually done twice a year, but given the lack of resources to perform those audits, they only have the possibility to visit a few number of suppliers.

Risk management and mitigation

WoodCo uses a mix of formal and less formal risk management techniques and actively works with third parties to help them in the process of risk management and mitigation.

✓ Formal:

They are acting proactively by performing audits, as explained above. However, they cannot control every single supplier which makes it impossible to solely count on that method to manage and mitigate risks. Being aware of that fact, they implemented a reward and penalty system into their contract for suppliers they regularly work with. If, for example, the supplier does not provide the right quantity, WoodCo will deduct the amount on the next order. The reward takes the shape of promise of future business. Of course, the promise is just made of words but WoodCo try to respect what they say to their local suppliers. When a substantial problem occurs with one of their suppliers (e.g. expired license), the only solution WoodCo has is to stop working with that supplier. They would like to take legal actions, but as of today, it is almost impossible in emerging countries.

✓ Informal:

WoodCo does not participate in any specific supplier development program and do not share common metrics with trusted suppliers. They do not feel the need for having a very collaborative approach. This is partly because of the EU legislation, which obliges wood importers to be very formal in order to get the necessary documents to cope with the legislation. It is also because Brazilian level of corruption is considered as too high by WoodCo, and they fear that suppliers might be tempted to abuse their trust if they were not as strict.

However, WoodCo thinks doing business with emerging countries is a win-win situation and therefore, participates indirectly to supplier development. We have already tackled the WoodCo point of view on that matter but according to the interviewee, Brazilian suppliers benefit from it as well. In that sense, buying from those suppliers supports their development as they will have to improve their processes, production methods and infrastructure to cope with European legislation. If, as feared by the interviewee, China was about to take over the whole sector and given their way of doing business (bringing their own workers, chopping as much as possible and then leave), there will not be as many positive ripple effects for the Brazilian economy, infrastructure and local people. Overall, coping with a strict EU regulation helps WoodCo to sustain its business and the Brazilian suppliers to keep developing their business. The same idea has been said in different words by the EU itself. According to them, this Timber Regulation is a crucial step to achieve the so-called triple-bottom line. Economically, the enforcement of the law will result in fewer losses for legitimate

operators. Environmentally, it will prevent deforestation and climate changes. Socially, it will prevent the disempowerment of local communities.²⁶

✓ Collaboration with third parties:

As stated above, WoodCo does not have the power to engage legal actions against its Brazilian suppliers. What WoodCo does is to notify the Belgian Timber Importers Federation²⁷ (WoodCo being member of it). Once the Federation is aware of the issue with the supplier, it spreads the word to the other members. According to the interviewee, this red flag is generally followed by all the members. He seemed to praise this Federation a lot, as it providing great cooperation, improving the sector as a whole. Moreover, they do not disclose vital business information, which eradicates fears of strengthening other members. We cannot deny that if it is actually the case, being member of it and joining forces helps to mitigate the risk of sourcing in emerging countries.

WoodCo also tries to work hand in hand with NGO's, such as WWF. The interviewee thinks that even if their purposes are different, they are on the same side of the ball and that cooperation between both is a plus for the whole sector. Those NGO's act like a partner working on the field for them and help WoodCo to get information about doubtful practices at suppliers' site. As abovementioned, WoodCo has already been cited by Greenpeace for importing illegal wood from Brazil. In October 2014, Greenpeace also released a report denouncing the common practice of wood bleaching in the Brazilian rain forest. Of course, WoodCo knows the sector is sensitive on this topic, but they think that having that type of pressure helps the company to rethink their process over and over. WoodCo also has the Forest Stewardship Council (FSC) certification. In order to have that certification, WoodCo is audited every year in order to know if they respect the traceability rules along the supply chain. Having the FSC accreditation is essential for WoodCo and for their customers. However, this FSC label has been criticized by Greenpeace itself. In a report issued in 2011, and even if they think that the FSC label still offers the best guarantee of responsible origin, Greenpeace is worried about the multiplication of FSC accreditations, a lot of them being questionable. As a result, we will not put much faith in this FSC accreditation, and given the report accusing WoodCo of illegally importing wood from Brazil, we might assume that they are not totally

²⁶Retrieved from http://ec.europa.eu/environment/eutr2013/why-do-we-need-a-new-law/index_en.htm, consulted on May 2nd, 2015.

²⁷<http://www.houtimportbois.be/fr>

protected against that risk. Therefore, we can be doubtful about the collaborative approach the interviewee praised.

4.1.4 Reflection on improvement

Even though the interviewee thinks WoodCo manages its risks fairly well, he is aware that the company could improve its SCRM process, and especially given the high pressure from NGO's, which make them rethink their process every day. As concrete measures, he thinks that having a better risk assessment process will put WoodCo on a more proactive track. Going more often to Brazil to perform audits would be the best solution to his eyes, but WoodCo cannot afford to allocate that much of resources into it. What he proposes then is to have a closer and tighter collaboration with third parties.

4.1.5 Personal analysis

The regulation in the wood industry has been recently strengthened, particularly in Europe. Therefore, one can assume that it will help to raise the quality standards, closing the gap between Europe and emerging countries. The best way to mitigate supply chain risks is probably to proceed to a rigorous supplier selection, thus reducing the probability of adverse selection even before engaging any supply relationship. As a matter of fact, and according to what is seen by the purchase manager as the major risk (i.e. the supplier not having a license to exploit the forest), it is probably too late to reduce the impact of that risk if it materializes. It seems like WoodCo focuses more on supplier selection than on SCRM. Resource constraint might play a role in the fact that a company who chooses to focus on supplier selection will be less focused on SCRM. As such, it appears that WoodCo is not concerned by the risks of the Brazilian business environment. Contextual factors lead to make more efforts on supplier selection than on SCRM. One of them is the need for collaboration. In case a company does not want to focus on partnerships (e.g. WoodCo), the focus is generally made on supplier selection. It will have the specific purpose of reducing the overall supply risk. If suppliers are rigorously selected, there might be a tendency of not performing a strict risk analysis for every product (Micheli et al., 2008).

As WoodCo is a medium-sized company, they do not have the possibility to make a rigorous and methodological verification at every single supplier's site and reasons for not developing closer partnerships with suppliers are understandable. Therefore, strengthening efforts with third parties might be a suitable solution to increase visibility in WoodCo's supply chain.

4.2 Case-Study B: PharmaCo

4.2.1 Presentation and rationale for sourcing in Brazil

PharmaCo is a large and fast-growing MNE, specialized in immunology and neurology, representing 81% of their total turnover (€3.5 billion in 2014). They employ 9.000 people in 5 continents and 40 countries. The interview took place in their headquarters with the head of global distribution logistics. He had been working at PharmaCo for 8 years and is very active and knowledgeable on the SCRM topic. From emerging countries, they mainly import low added-value products, even though specific information about sourced products from Brazil was not provided. The rationale for importing from emerging countries is twofold: access to raw materials as PharmaCo often does not have the luxury to choose from a wide range of providers and financial incentive for commodity products.

4.2.2 Supplier selection

No matter the country of origin, the main criterion to be verified is quality. In the pharmaceutical industry, every step of the production process is strictly controlled. Every product PharmaCo put on the market has to be filed, meaning that they must be able to precisely document how it was produced (e.g. steps, processes, controls, quality level...). "Filing" as it is called at PharmaCo, is a long and formal process, which can take years to modify. In that sense, even if there is a financial rationale for sourcing in emerging markets, potential new suppliers will never be contracted if they do not meet the quality standards of the industry during the supplier selection phase. In order to ensure quality, PharmaCo dig into the history of the supplier. First, they look at the references (i.e. other Western Europe/American manufacturers they sell to). Every supplier must go through inspections by local authorities and receive certifications. Having valid certifications at the time of the selection is mandatory, but having good reports from previous inspections is even better. Usually, PharmaCo will not contract a company which encountered issues in the recent past. Other requirements that stand no matter the country of origin include technical capabilities of the new supplier (i.e. their production process and methodology, their flexibility regarding demand fluctuations...), financial sturdiness and ownership structure.

When it comes to selecting suppliers in emerging countries, PharmaCo is more demanding regarding every abovementioned criteria, especially quality. Moreover, they look at economic and social stability of the country. To PharmaCo, security of supply is

of primary importance. Given the fact that the choice is sometimes restricted to a few suppliers worldwide, it is something they have to keep an eye on even though they cannot always proactively reduce that macro-economic risk.

The process of selecting a new supplier is formal and methodological. When a list of potential suppliers has been established, they gather a first set of information through self-assessment. Then, PharmaCo performs its own due diligence. According to the experience of the interviewee, those two measures are restrictive enough to narrow the base of potential suppliers to a manageable number for the final step of the selection process: supplier audit. PharmaCo sends a quality team (i.e. specialists who are selected according to the purpose and importance of the commodity) at the supplier's site. It results in a report with three possibilities: disapproval, conditional approval and approval.

4.2.3 SCRM practices

Attitude toward risk

Overall, the interviewee thinks that PharmaCo is not exposed to many risks, but that those risks have major consequences if they materialize. The supply side is highly regulated but the demand side is also regulated. If PharmaCo runs out of supply and cannot provide the market, they will have to make a special reporting to authorities and will be penalized. Given that fact, the interviewee described PharmaCo as intolerant to risk. This risk aversion is a prelude to how PharmaCo manages its supply chain risks. The SCRM process that is put into place is standardized and methodological. Every employee who somehow might deal with any aspect of SCRM has to be especially trained to its specific process, methodology and language. Having standardized methods gives PharmaCo the possibility to benchmark findings and to make comparisons.

Risk identification

The major risk PharmaCo feels threatened by is the quality risk. This is especially true when working with Brazilian suppliers, even though the interviewee argued that this statement is true for every emerging country. To illustrate that fact, he asserts that certifications PharmaCo requires might be quite old. In such case, a deeper investigation will be conducted by the company and they expect from the suppliers to be fully cooperative during the process. Given the fact that inspections to receive those precious documents are conducted by public authorities, PharmaCo has to take corruption into account, and especially in emerging countries. This is why they look at the references of

the supplier. Usually, an honest supplier will have other clients in the industry. Even if corruption is a risk, the interviewee does not recall any corruption issue. According to him, this might be explained by two factors: the high level of due diligence performed at PharmaCo and the high importance of the pharmaceutical sector, even for politicians. To exemplify, he argues that public health is highly regulated in almost every country in the world. Moreover, there is a strict international legislation from the World Health Organization which oversees national legislations. International laws are submissive to the sovereignty of individual states, which brings a question the table: Is the international law binding? The World Health Organization²⁸ answers positively by arguing that there is a strong consensus among member states, even if compliance to it remains voluntary.

Security has also to be reinforced in those countries. The interviewee experienced more thefts in emerging countries. They also try to see how they secure their plants and warehouses. No later than last year, PharmaCo has been confronted to robberies and as they were not able to provide the market with the right quantity of medications, they have been exposed to authorities, which led to financial losses. The interviewee goes further by explaining the extent of the robberies, explaining that they were related to organized crime and perfectly executed.

To a lesser extent, a specific risk PharmaCo is threatened by, especially in emerging markets is the social risk. More specifically, he mentioned the risk that suppliers have an unethical behavior regarding employees and/or environment. Even though it has never materialized so far, he feels that it is part of their civic duties to be proactive on that matter.

Those risks results from adverse selection. This adverse selection might lead to supply disruption and even worse, to inventory disruption. The interviewee views inventory disruption as the risk which has the biggest impact if it materializes. As a matter of fact inventory disruption is more than likely to be the trigger to materialize the demand risk. As abovementioned, not being able to supply the market with essential drugs will result in a twofold financial loss: Not getting turnover from sales and penalties inflicted by public authorities. In that sense, the financial loss coming from quality issues or robberies will possibly be amplified in case the subsequent risks materialize. Besides the financial loss, PharmaCo will endure time-related losses.

²⁸ <http://www.who.int/trade/glossary/story061/en/#>, consulted on May 18th, 2015.

Risk assessment

Risk assessment is a central part of PharmaCo SCRM process. It is typically done twice a year and is very standardized. It is performed by a cross-functional team, with representative from every involved department (e.g. supply chain, production, board...). During this process, they establish a single score for every supplier. The weighted scoring system contains probabilities, KPI's but other soft, qualitative elements. KPI's are often quantitative and include lead time, lead time variability, lead time reduction, quality, contract compliance, profit margin, price inflation... As example of soft elements taken into consideration, the interviewee pointed out collaboration. As a matter of fact, collaboration is evaluated by the willingness to propose improvement. Even though they use a mix of hard and soft elements, everything ends up in numbers according to the weight of each criterion. At the end of the process, every supplier gets a single score and is mapped on a 3X3 matrix taking into account probability of occurrence and business impact. Depending on where the supplier ends up on the matrix, PharmaCo decides to take action or not to reduce the risk, as each bloc is associated with a specific risk profile. In the worst case, they can decide to simply stop working with a specific provider. It is a difficult decision for PharmaCo to take and the situation would have to be severe and irreversible. As a matter of fact, it might take years to file new suppliers. Besides risk assessment, PharmaCo also holds quarterly business reviews. During those, the cross-functional team looks at the KPI's, the overall performance and the evolution of joint projects, if any.

In this case, the risk assessment phase is consistent with what has been found in the theory. It is a systematic process, with a standardized framework and methodology. It would be tempting to attribute this characteristic to the fact that PharmaCo is a large organization, with financial and human resources to support the process. As a matter of fact, the interviewee stated that it is an operation taking time and effort, nevertheless essential to their overall SCRM process.

Risk management and mitigation

To manage its supply chain risks, PharmaCo uses a mix of formal and informal techniques, counts on its peers and use a single mitigation technique.

✓ Formal:

If a supplier has passed the selection phase, it is that they have the capacity to provide the required quality in good conditions. However, it does not restrain PharmaCo to put extra clauses in their base contract. In that sense, they recently implemented a "bonus-

malus” system, taking the form of financial incentives or penalties. According to the experience of the interviewee, this has been well accepted by the suppliers and the method has been paying off since implemented. PharmaCo also has a clause that authorizes them to proceed to follow-up inspections. Those inspections are usually performed every 2 or 3 years by PharmaCo’s quality team. In case the risk assessment or the business reviews revealed red flags, they have the possibility to move the inspection forward. As an example, they encountered sudden problems with a supplier coming from an emerging country. When they inspected the supplier, they discovered that the management had been completely modified, and same were the processes. Having the possibility to visit that supplier helped to restore communication and realign requirements. In order to manage social risks, they also include their own CSR policies into their contracts, and it is something PharmaCo claims to verify when auditing suppliers.

✓ Informal:

Given the required resources to approve a new supplier, PharmaCo tries to build long term relationships with their strategic suppliers, coming from emerging countries or not. To do so, PharmaCo and the suppliers agree on improvement programs. Ideas for improvement might come from both parties: PharmaCo asks their suppliers to improve specific issues but they are also willing to hear ideas coming from the suppliers themselves. As abovementioned, the willingness to bring new ideas to the table is also part of the risk assessment phase. Improvements concern both products but also processes (e.g. lead time reduction). Establishing partnerships is especially important when PharmaCo does not have multiple sourcing options. Since vertical integration is not part of their strategy, they have recently made a lot of progress in that area, by devoting a lot of resources to develop second, or even better, third sourcing option.

Therefore, developing strategic partnerships is essential to develop processes, services and products. Even though he thinks it always depends on the negotiation power against the supplier, improvement programs are widely accepted by the whole supplier base. First of all, the industry is known for attributing higher margins than in other industries, though the requirements are also much higher. Moreover, as they know selecting new suppliers might take years, there is the incentive of having business for a long period of time. This incentive is perceived to be big enough to encourage suppliers to follow PharmaCo recommendations and to be proactive on improvement programs. According to the experience of the interviewee, a lot of suppliers, even in Brazil or in any

other emerging countries, have understood the importance of investing money into equipment and into people understanding what “quality” means in the pharmaceutical world.

✓ Peers:

PharmaCo attends to a lot of international conferences as well. They learn a lot from interactions with other manufacturers. At these conferences, they try to keep their eyes and ears open. Sharing ideas is seen as beneficial for PharmaCo, even if some hurdles might be associated to it (e.g. business intel disclosure). PharmaCo also uses TIC to gather information about what happens in the pharmaceutical industry, including suppliers but competitors as well.

✓ Mitigation:

PharmaCo mitigates risks by having safety stocks. Those safety stocks are more important for crucial goods, or for goods coming from single sourcing. Of course, having safety stocks is not an optimal though necessary solution for PharmaCo to avoid inventory disruption. As a matter of fact, safety stocks depend on the shelf life of each product, which is not infinite. Moreover, stocking products incur a certain level of costs. So far, having safety stocks is the only solution PharmaCo can really count on.

When a crisis occurs, PharmaCo gathers a cross-functional crisis team. The leader of the crisis team is always chosen according to the type of crisis and of products. The interviewee does not recall any crisis occurring in Brazil, but a crisis that has had a high influence on PharmaCo is the volcano eruption in Iceland back in 2010. They encountered a lot of problems and they learned a lot from it. As a matter of fact, they then asked to their most strategic suppliers to have a mitigation plan of their own. For example, everything being equal, they would rather choose a supplier having multiple locations, with the ability to move their production to other plants in case of unforeseen events.

4.2.4 Reflection on improvement

The interviewee thinks that, given the importance of the pharmaceutical industry in the society, PharmaCo has already done a lot on the SCRM topic. However, improvements are always possible. What he would like to see is improvement on the security risk. Actually, they are in the verge of launching a supply chain security council to form people to this particular issue and hopefully reduce the risk of robbery and misappropriation. Another point of emphasis is the fact that, as PharmaCo is expanding;

they do not have affiliate and trusted partners in every country. He thinks that no matter the qualification process, there will always be mistakes. He then would like to see improvement on risk mitigation but once again, it is difficult to come with innovative and feasible solutions others than having safety stocks.

4.2.5 Personal analysis

After analyzing PharmaCo's processes, one can argue that their processes are much more consistent with the theory. As a matter of fact, each step of the SCRM is systematic and standardized. Moreover, there is a strong willingness from the company to train their people to those specific issues of supply chain risks. They also commit a lot of resources in their supplier selection process, which is understandable given the fact that approving a new supplier might takes year. One can argue that the strong focus on both supplier selection and SCRM can be explained by the fact that PharmaCo is a large, financially healthy company, which reduces the problem of resource constraint (Micheli et al., 2008). The interviewee found it difficult to isolate examples regarding Brazilian suppliers and consequently does not think that macro-economic risks play a big role in their SCRM process when talking about Brazil. Instead, he would rather encompass all emerging countries when talking about the associated hurdles. Most of the risks they might face in their supply chain come from the industry and its regulation. As such, the interviewee thought that, other things being equal, risks are just higher, not different when doing business in emerging countries. Overall, their attitude toward risk will mostly depends on the importance of the product in their production process than on the country where the supplier is located. If their attitude towards risks in emerging countries could be resumed in two sentences, it would be the followings: Doing business with suppliers coming from emerging countries does not generally bring new issues to the table and therefore, there is no reason to implement specific measures. Other things being equal, the level of risk is just higher and therefore, the existing measures of supplier selection and SCRM must be more strictly executed.

4.3 Case-Study C: MetCo

4.3.1 Presentation and rationale for sourcing in Brazil

MetCo is a large Belgian company active in the material technology industry. This technology-focused company is divided into four groups: Energy materials, Recycling, Catalysis and Performance materials. Within those groups operate 15 business units (see appendix 6 for a complete breakdown), benefiting from a quite high degree of

freedom, as it will be further explained. They are present on about 60 different locations worldwide and spread on 6 continents. They also employ 14.000 people at the group level and had a turnover of €8,8 billion in 2014. The interview took place, in their headquarters with the Vice President Purchasing & Transportation. According to him, their rationale for sourcing in emerging market is threefold:

- ✓ Financial: As a big company, MetCo needs to buy big volume. Sourcing from emerging markets is interesting in that sense, as materials are less costly.
- ✓ Commercial: A lot of their clients are also located in emerging countries, making it vital for them to reduce the distance between suppliers, MetCo and its clients.
- ✓ Accessibility: Some of their materials are only produced in certain markets.

The interviewee also admits that MetCo knows that buying in emerging countries brings other considerations for the company (e.g. logistics, quality, stricter risk management...) in the sense that they only decide to source from emerging markets if they can justify the resources that have to be dedicated to those specific considerations.

4.3.2 Supplier selection

No matter the country of origin of the potential new supplier, MetCo put the emphasis on three main criteria: price, quality and technology. The business model of MetCo induces that each business unit is responsible for the sourcing and procurement of their raw materials. Even though the corporate level puts the objectives and standards to be achieved, each business unit has the freedom to organize their due diligence the way they want. As a matter of fact, the corporate level does not think that it would be efficient to interfere with the way business units evaluate the quality and technology of potential new suppliers. Other general criteria include size, structure, location and type of products. Decisions on location and types of products are strategic for the corporate level, as it is a way to reduce market risks for MetCo. Supplying from various locations and having a diversified product portfolio mitigate the risk of being over-exposed to a specific market.

When it comes to emerging countries, MetCo puts more attention to sustainability, as they know that the gap in that area might be substantial. Therefore, they have developed a sustainability procurement charter and make it signed by a steadily growing number of partners (see appendix 7 for details on the charter). As of today, 74% from a total of 1.226 strategic suppliers have signed the charter. Even though they expect that the supplier having signed the charter transmits the values of it to its own supply chain, it is

not always controllable. In order to verify those criteria and to bring consistence across business units, they have developed an internal tool for the buyer. This tool weighs in all the aforementioned criteria and the buyers are invited to insert a score between 1 [very bad] and 5 [very good]. If the overall score is lower than 3, then MetCo needs further assessment before engaging a relationship. Of course, in case of single sourcing, the corporate level will eventually take the decision to work or not with a risky supplier.

Overall, the due diligence process, even if not totally standardized, is core in MetCo's SCRM process. When engaging new relationships with strategic suppliers, they will take their time to investigate them thoroughly.

4.3.3 SCRM practices

MetCo SCRM is driven by a bottom-up approach. As a matter of fact, as each business unit is quite independent, they have to look into the risks they face, and identify the substantial one in order to report them to higher hierarchical levels.

Attitude toward risk

MetCo is willing to take risk but they always try to take informed decision. This is particularly true in their due diligence process, and even more when it comes to sustainability issues. As a matter of fact, their reputation is one of their main assets and therefore they do not want to gamble it.

Risk identification

As each business unit is responsible for the procurement of their raw materials, they also have to proceed to their own risk identification phase. Therefore, the interviewee could not provide a detailed list of the risks faced by MetCo, whether in developed or emerging countries. Nevertheless, he could provide information about risks that are of concern at a corporate level. As such, dependency is quite a challenge for MetCo, as it reduces flexibility in their supply chain. By dependency, they especially think about strategic products available in one or few countries. It becomes even more important when the local market is controlled or corrupted, which happens more frequently in emerging markets than in developed ones. Supply and/or inventory disruption is also of concern and might be a consequence of their dependency problem. No matter the business unit, having to stop and restart the production process is extremely long and costly and is a materialization they cannot afford. Other than that, there is always the risk of misinterpretation of the supplier's ability. Therefore, they closely look into the criteria that are of importance during the selection process (i.e. quality, technology,

price and sustainability). When asked about specific risk regarding Brazilian suppliers, the interviewee could not identify a single one. To back up his assertion, he thinks that Brazil is quite safe comparing to other markets, citing Africa as an example.

When it comes to losses, the interviewee feels that financial, physical, psychological and intellectual property are the ones the company is most concerned about. As a matter of fact and other than their physical possessions, they think that their reputation is one of their most important assets. In that sense, they know that have to be attentive to what happens in emerging markets, and the sustainability procurement charter is a good example of that fact. Intellectual property is paramount in their industry and they must protect it at all costs. Further, we will see how it influences their management techniques.

At the business unit level, they have implemented a process in order to identify risks. They have developed an internal evaluation tool, where every buyer is invited to rate suppliers and to report problems such as quality/price issues, wrong invoicing and late/early supplies. Using the information from this tool, each business unit must fill in a risk card. This tool takes into consideration the potential losses and the probability of occurrence. Normally, this process takes place every three months, even if the agenda might differ according to the circumstances.

Risk assessment

Once risk cards have been filled in, every business unit performs a risk assessment phase of their own. The tool they use is the same across all business units and is in line with the theory. As a matter of fact, they use a matrix with two axes: probability of occurrence and business impact. The interviewee could not provide any other insights, as every business unit has the liberty to determine its risk tolerance, as long as they achieve their annual objectives. It is interesting to mention that, following this risk assessment phase, business units must decide on the risks they can handle themselves and the ones that exceed their expertise. For those, they must transfer their analyses to the corporate level who will handle the risks. Once a year, the internal audit department will select the most important risks and transmit them to the board in order to have an overview of the most important risks MetCo faces at a corporate level. Once again, it is a bottom-up philosophy.

Risk management and mitigation

MetCo's risk management techniques can be divided in five distinct pillars: strategic, formal, informal, 3rd party collaboration and mitigation.

✓ Strategic:

As already mentioned, the corporate level takes strategic measures to manage supply risk. Specifically, they want to reduce dependency by avoiding over exposition to a specific market, increasing flexibility of their supply chain. Concretely, avoiding over exposition means having an extensive geographical presence as well as having a diversified portfolio. Additionally, they try to promote closed loops relationships. The finality here is to secure a certain level of demand and supply with the same partner. For instance, MetCo could agree on terms to sell one of its products to a client meanwhile agreeing on recycling end of life products with the same partner. MetCo also aims at reducing the complexity of its supply chain, in order to provide more visibility. Last year, they had about 20.000 suppliers worldwide and according to their estimation, they could divide this number by 2. According to the interviewee, having that many suppliers lead to an inefficient use of resources, a lot of them counting for a very low turnover. However, they are fully aware that this cannot be done boldly. They are in the process of categorizing the suppliers, and the reduction will be done only among suppliers not providing strategic products. In an attempt to ensure a certain level of supply and to be closer to their clients, they have also decided to proceed to vertical integration. In Brazil, MetCo possesses 3 plants, representing 8 of their business units with one of those sites serving as corporate office for the country. Even though it has undeniable benefits, this strategy also brings its own problems. For instance, they have bought their biggest Brazilian site in 2003. After having bought the site, they discovered that part of the soil was polluted, and that the company would have to put a substantial amount of money to sanitize it. Overall, they cannot solely count on vertical integration to avoid their risks, as benefits might not balance the incurred costs.

✓ Formal:

They try to be as specific as they can when writing down contract clauses, so that both parties clearly understand what the expectations are. There is no bonus/penalty system, but if a specific contract requires that system, it can be discussed. As part of the contract base, MetCo retains the right to send their own assessment team to visit suppliers' sites. As this method is quite costly, they only do that with their most strategic suppliers and are usually performed once a year, even if exceptional circumstances might change the timetable. For highly strategic emerging markets (e.g. Asia), MetCo has a corporate procurement evaluating and auditing suppliers. It allows the company to scrutinize more carefully their important suppliers in those countries.

✓ Informal:

MetCo is willing to build long term relationships with its suppliers and is tolerant regarding occasional errors. It is especially true in Brazil, as well as in any emerging countries, as standard differential might be substantial. The company is giving suppliers a second chance and tries to educate them to move in the right direction and bring them to the company's standards, enhancing visibility of the supply chain. Therefore, they do not hesitate to give guidance and advices. Even though the company does not send their own people to suppliers' sites, it might happen for their most strategic partners. Visibility must be improved but cannot come at the cost of intellectual property leakage. It might be an issue in emerging countries, and MetCo has to be very careful regarding that topic. Given that the company has high standard regarding intellectual property protection, they try to implement the same standards to their strategic suppliers. However, leakage is a risk that prevents MetCo from being too close from its suppliers.

✓ Collaboration with third parties:

MetCo is also member of several federations, the biggest one being Agoria, which represents the interests of 1.700 companies active in the technology industry. MetCo thinks that being part of that federation helps the sector to bring higher standards by sharing best practices and contacts, even though they do not beneficiate from their help directly in their SCRM process. In an attempt to enhance visibility among supply chain partners, MetCo also contracts an external auditor, EcoVadis, in charge of verifying that principles of the sustainable procurement charter are respected. Out of the 1.226 strategic partners, EcoVadis has audited 100 of them last year, selected according to their importance for MetCo, the length of the relationship and the associated spending. EcoVadis bases its report on four pillars: Environment, Social relations and human rights, Commercial integrity and Supply chain, each one of them getting a score from 1 [worst] to 100 [best]. It is of importance to notice that, from those four pillars, the one that has the lowest overall score is "Supply chain", 37/100, which shows the efforts that the partners still have to do to secure their own supply chain. Usually, a supplier having been through the selection process will not score less than 30/100. For suppliers having an overall score between 30 (i.e. few basic measures to ensure sustainable development) and 60 (i.e. appropriate measures to ensure sustainable development), MetCo will look into details where the supplier performed less. They will then engage discussions and select together areas that must be improved through a detailed an action plan, with clear objectives and evaluations.

✓ Mitigation:

In order to prevent unforeseen events, MetCo has decided on a certain level of strategic stocks for specific products they cannot run out of. However, incurred costs might be quite high. Firstly, maintaining stocks raises costs in terms of warehousing and shelf life. Secondly, MetCo produces metals that are quoted to the London Metal Exchange (e.g. Zinc, Cobalt) and expose the company to a drop of the prices.

When a crisis occurs at an important supplier's site, business unit gather multi-functional team with someone representing every affected departments. Then, a person is designated to be responsible for the process. They try to establish the context of the event, and establish different scenarios to come up with the best solution. Overall, they try to stay positive and see crisis as a source of opportunities. For example, they have experienced flooding in Thailand, affecting their local suppliers. They have seized the opportunity to develop a second sourcing option, and therefore enhanced flexibility.

4.3.4 Reflection on improvement

Even though the interviewee thinks that MetCo has a well-developed SCRM process, he knows that improvements could be made. The first area of improvement is crisis management. As a matter of fact, he thinks it would be better to have a procedure that clearly describes the steps that have to be followed when a crisis occurs. As of today, crisis management is sometimes too fuzzy. Secondly, MetCo would like to bring more consistency across business units and is currently developing standard tools. As business units have freedom, it is complicated to benchmark and compare SCRM performances of business units.

4.3.5 Personal analysis

MetCo's SCRM process is very much in line with what is found in the theory. They have developed tools for every step of the framework and SCRM related activities are performed on a regular basis. They engage a lot of resources in their supplier selection process and even though there is no particular risk related to Brazilian suppliers, sustainability is checked more strictly in emerging markets in order to protect their reputation. As a matter of fact, sustainability is the only criteria set at the corporate level, evidenced by the internal tool they have implemented and by the increasing number of suppliers having signed the charter. They are aware that currently, their global supply chain lacks flexibility and visibility and therefore apply a diversified set of measures to secure their supply chain. As flexibility remains the biggest issue, they have

decided to develop multiple sourcing options when possible and have integrated vertically some of their suppliers. To enhance visibility, they are in the process of reducing their supplier base for other than strategic products, but do not participate that much in supplier development programs, as they must protect their intellectual property asset. Third parties such as EcoVadis seem to play a role to enhance visibility, performing tasks that MetCo could not do.

4.4 Case-Study D: FruitCo

4.4.1 Presentation and rationale for sourcing in Brazil

FruitCo is a global merchandizer of commodities, established since the middle of the 19th century. They are also one of the biggest processor of agricultural goods, owning assets in five continents and shipping 80.000.000 tons of commodities on a yearly basis. Their portfolio is divided in 13 platforms (see appendix 8), each one being more and less independent from each other. As a matter of fact, they all have different objectives and even though they operate within the company's general framework and guidelines, they are responsible for the sourcing and procurement of their raw materials. Their vision has recently changed, as they have moved from a simple trading to a trader/producer company, enhancing their presence across the value chain. Their sourcing strategy is thus a mix between vertical integration and purchase from farmers. Brazil represents an important market for both supply and demand, evidenced by their 12.900 employees at peak season, representing over 58% of their worldwide employment and by being the second most important region (Brazil representing a region itself) in terms of tangible and intangibles assets owned. The interview took place with the plant manager of their Gent office and transportation center, which serves as an important hub for the company.

FruitCo is in the top 3 of the worldwide juice producers and as 80% of the global production comes from Brazil²⁹; FruitCo had no choice but being present on that market. Out of the 12.900 employees working in Brazil, 9.500 of them work under the orange juice platform, which make it the most important platform of the country. Another 10% of the worldwide production comes from the US and even though they also have operations related to that platform, the required volume FruitCo needs to satisfy its demand make its presence in Brazil essential. Besides that fact, they expect orange juice

²⁹Retrieved from <http://www.aijn.org/publications/facts-and-figures/sourcing-of-raw-materials-1/>, consulted on June 21st, 2015.

demand to grow in emerging markets such as Brazil, and being close to their clients is a sizeable assets.

4.4.2 Supplier selection

The first criterion of importance is quality. It is obvious, as nobody will buy FruitCo's products if the quality level is poor. As such, the price parameter is also important, but given the fact that orange is a natural product, the price might fluctuate with the law of supply and demand. However, suppliers must be able to ask for reasonable prices. As FruitCo faces large volumes in terms of demand, they also need from their suppliers to be able to supply large volumes. Suppliers being able to supply that level of volume are few, and it is in the interest of both parties to work together. As a matter of fact, suppliers producing large volume need big clients to sell their production. Those first three criteria are essential in any given country.

Other criteria are of importance, especially in emerging markets. First of all, financial sturdiness of the potential suppliers will be analyzed in depth. Indeed, FruitCo does not want to be trapped in a relationship with a supplier facing going concern. Secondly, sustainability is verified. As a matter of fact, they are convinced that to work efficiently, people must have decent salaries and work in good conditions. The interviewee did not deny the fact that peer and social pressure is becoming more and more important. From their clients' standpoint, many of them ask for certifications proving that measures are taken to ensure sustainability. For example, their biggest client mandates an external auditor, Sedex, to audit FruitCo on a yearly basis. Sedex is a company performing audit as well as providing tools (e.g. databases, tools to analyze responsible principles in supply chains...) to promote ethical principles in global supply chains³⁰. In order to be accepted by its biggest client, FruitCo must audit its own supply chain, and therefore potential suppliers will be audited by Sedex as well. Finally, safety is a major concern at FruitCo. It is especially true in Latin America, as it represents the highest frequency and severity of accidents among FruitCo's regions. They have developed a new safety program, and they expect their suppliers to comply with it.

4.4.3 SCRM practices

They have recently implemented a risk management committee, composed of senior executives and operating at a corporate level to ensure that all the qualitative and

³⁰Retrieved from <http://www.sedexglobal.com/fr/a-propos-de-nous/ce-que-nous-faisons/>, consulted on June 21st, 2015.

quantitative risks are identified, managed and monitored. Other than that, each platform is responsible for managing its own risks.

Attitude toward risk

The interviewee described the attitude of FruitCo as very risk averse. They do not want to gamble their money and their intangible assets by taking bold decisions.

Risk identification

No matter the country of origin, FruitCo has identified a certain number of risks related to the supply side of its supply chain. The first one is market-related. As stated before, orange is a natural product and negotiation power might shift between suppliers and buyers on a yearly basis. In 2014, crops have not been great in Brazil, so we might assume that the price paid to suppliers would tend to go up. However, it has not been the case, and the reason would be explained in the risk management chapter. Other than price, market-related risks include quality and timing.

The second source of risk is related to legal and compliance issues. As a matter of fact, developed countries, especially European and North American, are strengthening their legislation and regulations. For example, the US regulation has recently increased their requirements in terms on compliance and due diligence programs. The latest change in the orange juice legislation is the use of fertilizers, some of them not being authorized in Europe anymore. The problem is that the harvest from the previous year might still contain traces of unauthorized substances. The interviewee noticed that when there is a significant change in the legislation in the US or in Europe, it is very probable that other markets will follow in the upcoming years and that is the base of the solution they develop to manage that specific risk. As they are expanding in size and in geographical areas, there is a need for constant adjustments in order to bring FruitCo's employees and suppliers to the highest standards of legislation. As a consequence, they have developed e-learning modules on compliance.

Thirdly, sustainability is also considered as a great risk, and besides the increasing client pressure described earlier, FruitCo is aware of the losses in terms of intangible assets such as reputation and image that social pressure might bring. As an example, a recent edition of the French TV show "Envoyé Spécial"³¹ does not hesitate to target the biggest player in the orange juice sector, Cutrale, for the unethical trade practices (i.e. accusing the three top players of forming a cartel in order to drive the price of supplies

³¹Available stream : <https://www.youtube.com/watch?v=Kk-lsUii4LQ>

down, with the intention of controlling the integrity of the supply base) and working conditions under which harvesters perform (i.e. low wage, unsafe, extensive use of pesticides...). They respond to the first accusation by insisting on the fact that prices are given by the supply and demand relationship, and that noncompetitive players are “naturally” eliminated from the market. To the second accusation, the interviewee responds that a lot of harvesters are temporary, working about 6 months per year and insisting to work as much as possible in order to earn more money. FruitCo’s job is to be sure that those harvesters do not work more than legally accepted, but as Brazilian standards on that matter are different than what we know in Europe, it will still convey a negative image on FruitCo.

Finally, FruitCo also considers the country risk, measured through country grading. Unfortunately, information on specific tools or sources used to identify and measure country risk could not be provided. In the same vein, it is impossible to know in details what is their position regarding the Brazilian macro-economic risks. However, it has been possible to detect a few elements of context that is important for FruitCo. First of all, they have observed an increase of the production costs, impacting negatively the competitive advantage of the Brazilian business environment. Similarly, inflation is a factor that has to be monitored, as raise of prices have to be compensated by FruitCo. Secondly, FruitCo admits that logistics remains a problem. According to them, big investments are needed to connect production and consumption areas. As an example, a severe drought³² affected river shipments, which had a double negative impact on FruitCo: Delays, as ships were unable to navigate on rivers and higher energy costs (i.e. 80% of the Brazilian consumption comes from hydroelectric power). Finally and to end up on a more positive note, the company expects a significant grow of the internal demand. Even though the interviewee admits that the Brazilian environment carries some risks, he thinks that some regions are much worse and therefore necessitate much more efforts.

Unfortunately, information on tools and/or procedures for systematic risk identification could not be provided, as it is the responsibility of each platform.

Risk assessment

Information on the risk assessment phase was very scarce, and it is impossible to know whether platforms perform a systematic risk assessment. In the case of the

³²Retrieved from <http://www.theguardian.com/weather/2014/sep/05/brazil-drought-crisis-rationing>, consulted on June 21st, 2015.

interviewee, he must report problems that are too important to be handled in their Belgian plant to higher hierarchical levels. He imagines that the same bottom-up approach is done at the platform level, but cannot assert it.

Risk management and mitigation

If their strategy to manage and mitigate risks could be resumed in one sentence, it would be the following: FruitCo wants to secure long-term origination, with a mix of owned farms, joint ventures and partnerships and is committed to achieve sustainable growth following scrupulous compliance with ethical procedures. In order to do so, they use the following techniques:

✓ Strategic:

The first measure they take concerns the training of its staff to risk management issues. They have recently launched an e learning module related to that topic. They also spread the risk of supply and/or inventory disruption across parties. They partly rely on vertical integration, owning big orange farms and count on key partners. Together they must cover about 80% of the supply. The remaining 20% are ad hoc suppliers to respond to immediate needs. FruitCo also develops price models and scenarios in order to maximize its procurement decisions. To counter legal risks, they have the possibility to diversify the destination of shipments, in order to avoid losing an unsaleable stock to more regulated markets. Finally, they have developed a four-pillar strategy to prevent sustainability issues: safety, community (i.e. promoting long term partnerships), environment (i.e. implementing measures to reduce their footprint) and partners (i.e. being involved with suppliers, NGO and federations).

✓ Formal:

FruitCo tries to establish long term contract with its key partners, as the objective is to secure long term origination. Even though they do not apply a bonus and penalty system on a regular basis, penalties are intended when wrong quality or quantity is received and when delays are observed. They also retain the right to perform regular audit. When problems are detected, they engage conversation and decide on action plans.

✓ Informal:

Once again, FruitCo's approach is mainly driven by long term commitment and discussion between parties. Of course, willingness to comply with action plans depends on the negotiation power, which is supposed to be set on a yearly basis, even though accusation of cartel cannot be denied. Apart from the diversification of shipments, they

also engage procedures with suppliers to bring them to the highest standards of regulation in order to reduce legal risk. FruitCo must be sure that their suppliers understand the new rules and adapt their processes appropriately. Other than that, they do not participate in supplier development programs. The interviewee has never experienced cases where FruitCo dispatched its own people to suppliers' plants or financially helped them without contractual bonding.

✓ Collaboration with third parties:

In order to prevent sustainability issues, they are even more proactive by implementing multi-stakeholder approaches. Consequently, they try to participate in appropriate roundtable, often initiated by NGO's. As an example, they have recently implemented new internal policies and standards on palm oil production following participation with the Roundtable on Sustainable Palm Oil, an NGO aiming at *"Transforming the markets by making sustainable palm oil the norm"*³³. Likewise, FruitCo is member of the European Fruit Juice Association (AIJN)³⁴. The role of AIJN is multiple. Firstly, they lobby the European Union in order to find agreements on legal issues, which help to reduce and/or postpone legal risks. They also organize workshop and meetings on supply chain topics, where every company of the sector has the possibility to give its opinions and suggestions. Jointly, they decide on new standards and guidelines, which help companies to enhance the control of their supply chain, according to the interviewee.

✓ Mitigation:

Diversifying the sourcing type (i.e. own farms and suppliers) is their way to mitigate risks. Owning part of the production process help them to secure a certain level of stock. They also use stock as a hedging method against price fluctuations. As described earlier, crops have not been great in 2014, but as it owned a certain level of stock, FruitCo has been able to reduce the effect of that increase. However, and due to the ever changing legislation and a quite short shelf-life, FruitCo cannot possess indefinite level of stocks, as it would incur financial losses. Unfortunately, the interviewee could not provide information on crisis management. On that topic, he knows that people are in charge of preparing scenarios and action plans and that when a crisis occurs; final decision is taken by the top management.

³³Retrieved from <http://www.rspo.org/about/who-we-are>, consulted on June 21st, 2015.

³⁴Retrieved from <http://www.aijn.org/about/aijn-aims-and-objectives/>, consulted on June 21st, 2015.

4.4.4 Reflection on improvement

According to the interviewee, long term contract with suppliers could be more and better implemented. However, he argues that as oranges are given by nature, it might be difficult to control the supply and demand relationship and that consequently, having long term agreements might be difficult.

4.4.5 Personal analysis

After having analyzed FruitCo's case, the following findings can be drawn: Even though evidence on every steps of a complete SCRM process could not be found (i.e. tools, risk assessment phase, mitigation techniques), one can argue that their procedures are to a certain extent in line with what is described as best practices in the theory. Moreover, it appears that FruitCo pays much attention to the Brazilian macro-economic and business environment risks. As a matter of fact, FruitCo shows concerns about inflation, increasing production costs and logistics. Exception made of macro-economic risks, the interviewee could not identify specific risks related to Brazilian suppliers only, which is supported by the fact that other major concerns (i.e. market risk, legal risk, sustainability risk) are tackled at the corporate level, no matter the country of origination. The only hint on differentiation between developed and emerging markets comes from the fact that sustainability is more scrutinized in emerging markets. As a matter of fact, FruitCo is especially concerned by the growing demand of its clients for certifications and it motivates the company to be more and more proactive on that matter. As FruitCo is purely B2B, social pressure plays a lesser role on sustainability. Their strategy to manage supply risks greatly relies on differentiation of sourcing type, allocating risks between different parties. Being geographically close to their key partners also reduces the visibility risk and consequently they do not have the need to participate in particular supplier development program, exception made of training on new regulations. Collaboration with AIJN seems more important on that matter, as they will lobby for the whole sector in order to get room for maneuver. Collaboration with third parties also seems important to implement higher standards. Once again, the relative absence of constraint added to the relatively low collaboration with key partners are factors that lead to a focus on both supplier selection and SCRM (Micheli et al., 2008).

4.5 Cross-case analysis

Assessing the state of gaps

Companies sourcing natural products from Brazil (i.e. WoodCo and FruitCo) argue that quality cannot always be controlled, as there is a certain degree of natural variation that must be taken into account, consequently focusing more on technical capacities of local suppliers.

Tropical woods imported from Brazil are the best for outside constructions, and even if ensuring a constant quality is impossible due to the nature of the product, quality gaps cannot be highlighted. As a matter of fact, the interviewee stated that it would be impossible to produce high quality outside constructions with different types of wood. In order to ensure technical capacities, WoodCo tends to choose suppliers with European owners. The argument behind that surprising choice being that European owners have a better understanding of quality and will implement the necessary measures to extent their technical capacities.

Such as WoodCo, FruitCo sources natural product from Brazil, bringing a certain degree of quality variation. However, Brazil is the only market able to supply the volumes FruitCo needs to satisfy its demand. As an example, if the country is impacted by severe droughts, as it has been the case in 2014, it will negatively impact the product quality. Nevertheless, it is impossible to extend their geographical scope of sourcing, as no other region is able to provide as much as Brazil. In that case, their scope of possible actions is relatively thin. Besides being the only country able to supply sufficient volumes, Brazilian oranges are also considered to be the best in terms of quality, being sweeter than its American or Spanish counterparts. Therefore, quality gaps are impossible to highlight neither. On the other hand, FruitCo must be sure that their suppliers are able to supply sufficient volumes, and must assess technical capacities more strictly than quality. Therefore, a visit of suppliers' facility is a method used to assess technical capacities.

It highlights the fact that the concept of quality gaps between developed and emerging markets cannot be applied in those first two cases. As a matter of fact, one can argue that natural products quality is supposed to be present, as it is given by the intrinsic nature of the Brazilian climate and characteristics. Single cases have highlighted the fact that WoodCo and FruitCo have no choices but sourcing in Brazil to produce high quality outputs, Brazilian suppliers not facing international competition.

For those firms, the focus is more on assessing technical capacities of local suppliers, evaluating criteria such as price and flexibility.

On the other hand, gaps might be highlighted for companies sourcing non-natural products. PharmaCo is particularly concerned by the quality and technical capacities gaps. However, this concern is not given by the intrinsic gaps between European and Brazilian standards, but by the strict legislation the company must comply with. From the single case, we have observed that quality, through the obtainment of public certifications and technical capacities, through the analysis of the processes and of the flexibility the supplier could offer were the two major criteria for being accepted by PharmaCo. As a reminder, the legislation is such that an inventory disruption would incur twofold financial losses: revenues from sales and penalties by public authorities. More than in other sector, the materialization of a supply-side risk would affect the demand delivered to the customers. Therefore, PharmaCo must mitigate that risk at all costs, by performing a strict supplier selection but also by performing regular follow-up inspections by their quality team and by engaging improvement programs and quality paths. In that sense, they enforce the abovementioned measures with more strictness when sourcing from emerging countries. Given the strict regulation and the level of due diligence that has to be performed in the pharmaceutical sector, the gap in terms of quality and technical capacities tends to reduce. As a matter of fact, the process of being approved is so long and complex that suppliers know they will have business for a long time if they respond positively to the standards asked by European and North American firms.

Even though MetCo recognizes that gaps in terms of quality and technical capacity exist, they do not feel the need for implementing as many measures as PharmaCo. To ensure those two criteria, business unit-related quality teams perform audits and discuss on improvement programs when errors are detected or when processes can be improved. During their risk identification phase, they closely look at quality and technology issues, through their internal evaluation tool, filling risk cards on a three months basis. However, the interviewee stated that suppliers coming Brazil and emerging countries in general were providing a fair quality.

Quality and technical capacities gaps still exist, but PharmaCo and MetCo argue that they tend to reduce. In a world where the international flow of goods and services increases on a yearly basis, bringing competition to a worldwide level, it is in the interest of the suppliers coming from emerging countries to increase their own

standards, extending their potential customer base. It is an incentive for complying with the highest level of standards and regulations. Consequently, proposition 1a and 1b can be generated.

Proposition 1a. *Companies sourcing natural products in Brazil do not experience quality gaps between developed and emerging markets, focusing their attention on technical capacities of local suppliers. Criterion such as price and flexibility are overriding.*

Proposition 1b. *Companies sourcing non-natural products in Brazil admit the existence of quality and technical capacities gaps. The increasing requirements force local suppliers to raise their standards, consequently reducing gaps. Implementation of quality team is helpful to maintain high quality inputs.*

On the other hand, the four companies agree that the gap existing in terms of social and environmental standards between emerging and developed countries are substantial and must always be taken into account. As a matter of fact, they all recognize that reputation and image are important intangible assets, and implement measures to protect themselves against social and psychological losses.

PharmaCo seems to be the firm taking sustainability issues the less into account. As a matter of fact, the interviewee recognized that PharmaCo is a little bit late compared to other firms of the sector. They have recently included CSR policies into their contracts but as of today, no additional action is undertaken.

WoodCo asserts that materialization of such type of risk would incur reputational and financial losses to the whole sector and not only to the company itself. WoodCo must ensure that its supplier work ecologically and free from child/bond labor. The company is regularly putted under the microscope of NGO's such as Greenpeace. The organization regularly accuses WoodCo of not complying with the European Timber regulation on due diligence, importing illegal wood to the European market. To counter that risk, the company excludes small suppliers, as they will be more tempted to falsify their certification and more likely to employ children, per the interviewee. They also prefer supplier having accreditations such as the FSC label. Moreover, WoodCo contracts independent third parties to audit sustainability of local suppliers.

MetCo has experienced huge reputational damages in the past, having to change their whole business plan and even their name. Their reputation is therefore one of their most important asset, and sustainable issues are at the center of their SCRM approach. It is particularly true in emerging markets, as the interviewee recognizes that gaps are

substantial and therefore sustainability is more strictly verified. As an example of the importance of sustainability at the corporate level, the implementation of their procurement charter, signed by a growing number of key partners. Those suppliers are also required to implement the same standards to their own supply chains, reducing the risk of reputational damages on a multiple-tier level. The implementation of an internal tool to evaluate suppliers' social and environmental capacities during the selection phase is another example of the importance of sustainability in MetCo's SCRM. To complement their process, they also call out to an external auditor to make a thorough verification of the supplier's societal capacity. This auditor also verifies the supply chain of the supplier. Globally, those measures help to reduce the risk of suffering losses due to non-sustainable practices on a multiple-tier base.

FruitCo also considers that sustainability gaps between Brazil and developed countries are substantial. Aside from the civil society pressure, evidenced by the recent documentary denouncing the social practices of the Brazilian orange juice industry, FruitCo is concerned by the growing importance of sustainability at its biggest clients. As explained in the related single case, its biggest client mandates an external auditor to verify sustainability of FruitCo's supply chain. Without this approval, FruitCo will not be accepted as a supplier any longer. Therefore, they must engage resources to replicate measures on their own supply chain. The recently implemented four-pillar strategy and the multi stakeholder approach are two other evidences of that growing concern for sustainability in emerging countries.

The four analyzed firms have recognized the existence of substantial gaps in terms of social and environmental capacity and all of them have, to a certain extent, implemented new measures to protect their global supply chains from unethical practices and behaviors.

Proposition 1c. *Sourcing in emerging countries endanger reputation and image of firms. Actions such as implementing sustainable procurement charter, CSR policies in contracts and audits by 3rd parties specialized on sustainability are efficient measures to reduce related risks.*

The primacy of the supplier selection phase.

The four companies admit committing a lot of resources in the supplier selection phase, all arguing that this step is at the center of their SCRM process.

WoodCo argues that the best way to manage its most important risks is to proceed to an accurate and rigorous supplier selection. If a supplier is approved and WoodCo orders logs from an illegitimate supplier, which is more probable in emerging countries, it will be confiscated at the customs, incurring unaffordable financial losses. Moreover, sourcing in emerging countries exposes the company to higher reputational risks (i.e. environmental, child labor). Even though they engage a lot of resources into their selection process, the interviewee admits that having a perfect control is impossible and that consequently errors might occur. Although it is not always possible due to its resource constraint, the company tries to visit potential suppliers when possible.

PharmaCo provides more details about their supplier selection process. They first gather a first set of information through self-assessment. Then, they perform their own due diligence, looking for quality certifications and references. After having narrowed the supplier base to a manageable number, they conduct supplier audits through a quality team and base their decision according to their findings on suppliers' site. The interviewee argues that the supplier selection is the key starting point to reduce supply chain risks. It is particularly true in emerging countries, as the mandatory quality certifications might be old. It forces PharmaCo to perform a stricter selection process. The interviewee argues that if a supplier is approved, most of the risks are eliminated on beforehand, hence reducing the risk of adverse selection but also the supply/inventory risk. Nevertheless, the interviewee recognizes that whatever the implemented qualification processes, it is impossible to have a perfect safety net.

MetCo commits resources to the supplier selection process, the interviewee stating that it is a core step of their overall SCRM process. When engaging actions to select a new supplier, they will take their time to investigate their options. MetCo is organized such as every business unit has a certain degree of freedom to perform its own due diligence, the internal sustainability evaluation tool being the only corporate implemented measure. For the Asian market (i.e. their most important one), they have implemented a corporate procurement team investigating new suppliers on a more regular basis. Nevertheless, it is a key part of their overall SCRM. FruitCo's analysis is very similar. They engage a lot of resources into their selection process even though the independency of the platforms prevents to highlight a common supplier selection process. As abovementioned, price and flexibility will be the two major criteria to be verified through supplier visit when engaging a new relationship with orange farms.

Out of the four companies, three of them (i.e. WoodCo, PharmaCo and FruitCo) mentioned legislation as an important factor influencing their supplier selection. It is understandable in the case of PharmaCo, as approving suppliers might take years due to the legislation obligating the company to “file” its production process. When it comes to emerging countries, they will perform a stricter due diligence to avoid adverse selection. This is why they dig into the potential supplier’s history, looking for past issues and contracts with other pharmaceutical manufacturers. Regulation in the pharmaceutical world on both the supply side, by obligating companies to document every step of the production process and on the demand side, by penalizing firms not able to provide the market with the right quantity of medication, compels PharmaCo to act on the supplier selection phase but also on their SCRM process (e.g. employees and suppliers education). The Timber Regulation compels WoodCo to be more proactive on its supplier selection process. As already mentioned, the company would incur heavy financial losses if the supplier is wrongly selected. Therefore, due diligence became a central part of their supplier selection process. Given the resource constraint, they call out to independent agents to participate in this effort.

Finally, FruitCo is facing constant changes in regulations. Whether initiated in Europe or in North America, an acted change in regulation will generally be replicated to other markets. The US has recently increased its regulation on due diligence. Consequently, FruitCo has to take actions in its risk management phase such as education of employees and suppliers through the implementation of e-learning modules but also has the possibility to diversify its destination of shipments.

Having stricter regulations seems to enhance the risk of adverse selection and complying with new rules requires modifying SCRM practices in those firms. Thus, a strict regulation seems to have an impact on supplier selection: the stricter the regulation, the higher is the focus on due diligence. Overall, and whether initiated in a matter of compliance or of business strategy, performing a thorough supplier selection seems to be the best way to reduce supply chain risks, especially the adverse selection risk resulting from a lack of visibility. As a matter of fact, all the firms argue that producing a supplementary effort in this phase, especially of due diligence, helps to save resources for the future. By ripple effect, it also reduces the quality risk, the supply and/or inventory disruption risk. Moreover, regulation compliance and implementation of the necessary measures help to reduce the risk of adverse selection. The process proposed by PharmaCo seems to be the most complete.

Proposition 2. *It appears that investing more resources on the selection process is the best way to proactively reduce the probability of risk materialization in emerging countries, enhancing visibility on Brazilian suppliers. The focus on due diligence also seems higher when regulations are stricter.*

Investigating the implemented risk management techniques.

Exception made of WoodCo, the four companies use a mix of formal and informal techniques to manage their supply chain risks and implement techniques to mitigate the impact of risk materialization. However, analyses also highlight the existence of another pillar commonly investigated by companies to manage their risks: strategic measures. Table V summarizes the management and mitigation techniques used by the four firms.

Once again, the stronger focus of WoodCo on supplier selection and the resource constraint might explain the absence of strategic and informal techniques. Therefore, their main management techniques are formal: self-assessment, supplier audit and a reward/penalty system. Having a certain level of safety stock also hedges WoodCo against inventory disruption.

PharmaCo strategically extends its supplier base and engages resources into SCRM training of its employees. To enhance visibility, they have strategic partnerships and decide jointly with their important suppliers on improvement programs. Those are especially important when the company is in a single sourcing situation, as the supply and/or inventory disruption will be triggered faster. In the same vein, they urge their strategic suppliers to implement crisis management plans. To mitigate the risk of supply disruption, they have also decided to maintain a certain level of strategic stock.

Strategically, MetCo counts on its extensive geographical presence, on its diversified product portfolio and on vertical integration to be able to respond to market dynamics. Aside from suppliers' self-assessment and audits, they have developed a sustainable procurement charter to proactively protect their reputation. They also develop strategic partnerships and improvement programs, though limited due to the IP protection. To mitigate risk materialization, MetCo maintains levels of safety stocks and has implemented a crisis management team.

FruitCo has implemented e-learning modules on SCRM and sustainability issues. They also count on vertical integration to reduce the risk of adverse selection. To ensure a decent level of supply, they develop long time partnerships, keeping a buffer of 20% with ad-hoc suppliers in order to beneficiate from better prices and maintain safety

stocks. They do not participate in particular improvement program, exception made of legal compliance. As a matter of fact, they must be sure that their suppliers respect their regulation standards.

The interlocking between strategic, formal and mitigation techniques seems to be well implemented in the mind of people managing global supply chains. However, more informal techniques such as a deeper collaboration between supply chain partners do not seem to interest the studies companies.

Table V: Management and mitigation techniques implemented in studied firms

	WoodCo	PharmaCo
Strategic	None	-Internal training on SCRM -Extension of strategic supplier base
Formal	-Self-assessment -Supplier audit -Reward/penalty	-Self-assessment -Supplier audit -Reward/penalty -Detailed contractual clauses -CSR contractual clauses
Informal	None	-Strategic partnerships -Improvement programs: products and processes, especially important when single sourcing option
Mitigation	-Safety stock	-Safety stock -Crisis management: cross-functional team and implementation of 1 st tier mitigation plans.
	MetCo	FruitCo
Strategic	-Extensive geographic scope -Diversified portfolio -Vertical integration -Close loop relationship -Reshape of supplier base: extend strategic options, reduce other.	-Internal training on SCRM -Vertical integration -Sustainability program
Formal	-Self-assessment -Supplier audit -Detailed contractual clauses -Sustainable Procurement Charter -Regional corporate procurement	-Self-assessment -Supplier audit -Safety programs
Informal	-Strategic partnerships -Improvement programs -1 st tier IP protection measures	-Strategic partnerships -Ad-hoc suppliers -Improvement programs, limited to legal compliance.
Mitigation	-Safety stock -Crisis management: cross-functional team owned by owned by designated leader.	-Safety stock -Shipment diversification -Crisis management: no details provided.

Even though empirical studies have demonstrated the negative correlation between collaborative approaches and supply chain risks (Christopher & Lee, 2004; Harland et al., 2003; Chen et al., 2013), none of the abovementioned company brings collaboration to its highest level. We can argue that the new paradigm proposed by Chen *et al.* (2013) of competition not being between organizations but between integrated supply chains remains somehow an abstract concern for the analyzed firms, as evidenced by the table VI.

Table VI: A closer analysis on the state of collaboration

	WoodCo	PharmaCo	MetCo	FruitCo
Key suppliers	No	Yes	Yes	Yes
Development programs	No	Yes: processes and products	Yes: processes	Yes: guidance on regulation changes
Financial help	No	No	No	No
Dispatch of personnel	No	No	No	No
Accessible operational metrics	No	No	No	No

The four companies agree that the best approach is to contractually protect themselves. As evidence by table V, they all protect their tangible and intangible assets through strict contractual clauses (e.g. self-assessment, supplier audit, sustainability clauses...). However, contextual factors may lead to a certain degree of collaboration. The case of WoodCo is distinctive, as the lack of resources prevents the company to develop informal practices, even if they were willing to do so. For the three other firms, informal measures are enforced when there is a legal constraint (i.e. FruitCo training its key suppliers on regulation changes), to develop a stronger partnership in case of single sourcing (i.e. PharmaCo's inventory disruption risk) and when it does not threaten other more valuable assets. However, the four companies assert that their assets might be endangered if closer partnerships were developed. The main reasons for that being corruption and trust abuse, which will be further investigated. However, we can already argue that within the context of emerging markets, the studied firms seem to be reluctant to implement informal measures to manage their supply chain risks in emerging markets. Hence, the following proposition can be generated:

Proposition 3. *To protect their supply chain risks related to Brazilian suppliers, companies favor formal and strategic measures instead of informal ones. Being afraid of endangering valuable assets, collaboration is not developed beyond business and legal obligations.*

Effect of macro environment on SCRM practices

The four firms feel somehow threaten by the risks carried within the Brazilian business environment. Even though taking different forms, corruption seems to be the major problem that prevents companies to develop quality path or development action plans. This comes as no surprise, as corruption has been cited earlier as a weakness of the Brazilian business environment.

At WoodCo, corruption takes the form of trust abuse, specifically regarding legal certificates. They fear that their Brazilian suppliers would be tempted to lie about their certifications in order to keep exporting to WoodCo. As presented in the related single case, a confiscated container at the Antwerp custom would represent a financial loss WoodCo cannot afford. This lack of trust influences WoodCo SCRM approach. As a matter of fact, they are unwilling to develop collaborative relationships with Brazilian suppliers partly because of that corruption problem. As such, they do not have implemented any informal technique to manage its Brazilian suppliers and prefer to keep the traditional arm-length between buyer and supplier, even if it exacerbates their lack of visibility problem.

At PharmaCo, corruption takes the form of trust abuse as well. As a matter of fact, the company must have the public certification of the supplier in order to start doing business with it. In emerging countries, those certifications might be quite old, and corrupted public authorities might not be always impartial. This problem has an impact on their supplier selection, as they would have to perform a higher degree of due diligence. The interviewee also argues that the level of risk faced by its company is higher in emerging countries and therefore, existing measures must be enforced more strictly.

At MetCo, corruption takes the form of IP leakage, which is an asset they want to protect at all costs. They have a collaborative approach with privileged suppliers and do not hesitate to give guidances and advices to their Brazilian suppliers. However, collaboration is limited due to this fear of IP leakage. In order to diminish IP leakage risk and beneficiate at the same time from benefits of collaborative environment, they have recently decided to implement the same standards on IP protection at their strategic

suppliers. But as of today, it still prevents MetCo to develop extensive collaborative approaches. Corruption also takes the form of an extensive dependency to one market or geographical area. To counter that risk, they have developed strategic measures. As a matter of fact, geographical scope extension and having a diversified portfolio help to respond to certain market dynamics, and enable the firm to choose between different suppliers, locations and materials.

From the four analyzed firms, FruitCo seems to be the one paying the most attention to Brazilian environment. As a matter of fact, it is the only firm taking into account costs factors and seems to be really concerned about logistics issues. In Brazil, they have experienced an increase of energy costs, mainly due to the severe droughts that affected the country in 2014. Inflation is also closely monitored. As FruitCo is a US\$ company, inflation will have to be compensated. Those two factors negatively impact the competitive advantage of Brazil. Moreover, logistics remains a major problem in Brazil. In the case of the orange juice platform, it has only little impact on their SCRM approach. Indeed, FruitCo depends on Brazil to sustain the large volume they need to satisfy their demand. However, it might play a role for platforms that are less dependent from the Brazilian market. As an example, their grains and oilseeds platform, the production scope being geographically spread. For a fact, we know that they consider the country risk through a country grading though it has been impossible to know their exact position regarding Brazil. This special attention paid to the country risk is probably due to the fact that, out of the four companies, FruitCo is the one owning the most assets in Brazil.

Interestingly enough, WoodCo, PharmaCo and MetCo assert that the Brazilian environment is quite free from distinctive hurdles regarding other emerging markets. They argue that sourcing from even less developed markets, especially Africa is much more risky than sourcing in Brazil. It is evidenced by the fact that MetCo and PharmaCo could not identify a single risk related only to Brazilian environment. As such, corruption and IP leakage are two phenomena that impact SCRM practices whatever the emerging country. As a matter of fact, the unwillingness to develop extensive collaborative approaches, extension of the geographical scope when possible and a stricter enforcement of due diligence measures are actions taken by the studied firms to respond to those market-related risks. Hence, the following proposition can be generated:

Proposition 4. *Corruption, IP protection and logistic are contextual factors related to the business environment in emerging countries that impacts European firms' SCRM approaches and measures. Limited collaborative approaches, stricter enforcement of due diligence process and geographical scope extension are actions chosen to respond to those factors.*

Exploring third party collaboration

According to the interviewees, the lack of visibility is the major problem of global sourcing. However, we have demonstrated that within the context of emerging markets, it is not always possible to generate data and information through supplier collaboration. The most glaring evidence comes from WoodCo, being the only one suffering from a real resource constraint. To offset this lack of collaboration with suppliers, the company counts on collaboration with their sectoral federation. According to the WoodCo's manager, any firm experiencing trouble with a supplier notifies the federation. The federation then notifies the rest of its associated companies. The interviewee stated that those notifications help them to create a database with all suppliers causing troubles to Belgian firms. Intra-sectoral cooperation seems to provide benefits to a whole sector. It contributes to the generation of knowledge and it brings fluidity to the flow of information by making supplier-related information available to the whole sector. Even though authors have analyzed the benefits of collaborative approaches within a supply chain, it appears possible to benefit from similar effects through other channels than through own supply chains (Chen et al., 2013; Christopher & Lee, 2004). Given the adopted sampling, it has been impossible to generate a concrete proposition demonstrating the benefit of sectoral federations under resources constraints. However, it could be interesting for future researchers to further investigate the benefits of sectoral federations in the context of emerging countries.

5 Recommendations

Even though gaps between Brazil and Europe/North America exist, especially in terms of sustainability and quality standards, the four analyzed companies have implemented tools that seem to reduce vulnerability of their supply chain. For some industries, SCRM processes are influenced by legislation, and it seems that compliance efforts tend to reduce gaps between markets. It is especially true when clients are important, as suppliers will be keen to comply with stricter European/North American laws. As proposed by the theory, the companies have identified lack of visibility and of control as hurdles related to global supply chains (Christopher & Lee, 2004). In this section, a discussion about what seems to represent the best techniques to manage risks associated with sourcing in emerging countries, particularly in Brazil.

Without resource constraints, implementing both strong supplier selection and SCRM process is obviously the best way to reduce global supply chain risks. Under resource constraint, we might assume that a choice between supplier selection and SCRM must be made. Companies must be aware that, by not developing one, they will be exposed to certain risks or will not take advantage of opportunities: Not having comprehensive SCRM process may lead to the inability to engage collaborative approaches. Not performing a strong supplier selection may increase the adverse selection risk. Overall, the four companies agree that the supplier selection phase is a key process to reduce adverse selection risks. PharmaCo's process, even though imposed by a legal necessity, seems to be the most effective to reduce ensuing risks (i.e. Self-assessment → Due diligence → Supplier audit). However, having a rigorous supplier selection should never be considered as a perfect safety net and SCRM should not be neglected.

It seems that the Brazilian business environment have an impact on SCRM processes, firms spending more resources on enforcing existing measures, especially due diligence rather than developing new ones. Corruption and sustainability are two hurdles commonly related to emerging countries. Corruption takes different forms, bringing different management techniques. Specifically, it seems to prevent companies to develop deep collaborative approaches. Sustainability seems to be a focal point of the analyzed firms, as they all identify reputation as an asset they want to proactively protect. Depending on the resources and negotiation power, supplier procurement charter imposing 2nd tier compliance, the informal willingness to engage action plans or calling for external 3rd parties specialized on sustainability matters seem to be good techniques

to proactively protect reputation. However, sourcing from Brazil presents the advantage of getting access to specific raw materials in large volumes and at reasonable prices. Therefore, companies willing to expand their supply chain scopes should consider this country, total risk avoidance is thus not recommended.

To properly manage risks, comprehensive SCRM approaches must be standardized, systematic and include every phase that the theory proposed (i.e. identification, assessment, management and mitigation) when sourcing abroad, and especially as global supply chains lack of visibility (Christopher & Lee, 2004). As a matter of fact, only a thorough identification and assessment phases can lead to the best management and mitigation decisions.

Even though each technique must be implemented after having assessed risks, those are common techniques that seem to reduce Brazil sourcing risks, independent of the sector: First of all, SCRM must be supported by the top management. Implementing trainings on both SCRM and soft skills is a good technique to standardize languages and metrics, especially for companies having business units in different geographical areas. Regional procurement teams are a plus, as proximity will enhance visibility. Second, reshaping the supplier base, reducing complexity for non-strategic products and increasing flexibility for strategic ones will increase visibility of global supply chains. When sourcing abroad, detailed contractual clauses, including CSR policies, right of self-assessment and follow-up inspections is paramount, especially given the divergences between legislations. Third, close collaboration with key partners, including improvement programs will reduce supply chain risks, especially in situation of strategic single sourcing. However, it seems more difficult to fully trust a Brazilian supplier, and firms should be aware that highly collaborative approaches might lead to losses of assets such as money, intellectual property and reputation. In order to enhance visibility, getting help from 3rd parties (e.g. sectoral federations, external auditors...) seems to be efficient to reduce adverse selection risks. Particularly, sectoral federations appear to be very helpful, especially for firms under resource constraint, benefiting from external resources and knowledge to improve their SCRM processes. Finally, mitigation strategies such as safety stocks and implementation of crisis strategies are common, even though none of the four companies confessed having a very efficient crisis management process.

6 Limitations and future researches

Every research contains limitations, and this paper does not make exception to this rule. As an exploratory-oriented research, the choice of the case-study was purely judgmental, incurring bias. Limitations mostly concern construct validity and external validity, providing at the same time future research opportunities (Yin, 2003):

Construct validity: As focal point of the study was the selected firms, it would have been better to get access to more than one manager per firm. Source triangulation has not been always possible, especially for the WoodCo case. As a small company, it is understandable that available external documentation was scarcer. Finally, information from interviews has not always been equal across the cases in terms of quality and quantity, as strategic knowledge of key informants depends on their hierarchical position and organizational structure. As an example, it would have been better to get access to a higher manager in the FruitCo case, who could not answer to every question of the interview guide. However, due to resource constraints and a lack of negotiating power, it has not been possible.

External validity: Case-study researches aims at achieving analytical generalization by linking data to propositions (Yin, 2003). Even though the conduct of four cases is academically accepted, it would be presumptuous to draw assertive conclusions out of those four cases only. As such, it would be beneficial to replicate this study, for example by conserving a specific sector as a focal point or by having multiple cases per sector. Generalization to other emerging markets would also be presumptuous, even though cases evidenced the fact that most managers thought that their experience with Brazilian suppliers can be generalized to other emerging countries.

Reliability was ensured by explaining the rationale behind the case-study selection and by describing and consistently applying the methods to collect evidences, allowing replication (Yin, 2003). Internal validity was ensured by building causal inference through pattern matching across the four analyzed cases (Yin, 2003).

As this study aimed at detecting perceived causal inferences between SCRM practices and Brazil, generalizations to other emerging markets should be performed with alertness. Therefore, a replication to other strong emerging countries is advisable. This study also paved the ground for statistical verification of the propositions. As case-study researches do not base their findings on statistical generalization, further empirical researches can be undertaken to verify propositions (Yin, 2003).

7 Conclusion

Exploring the link between supply chain risk management researches and emerging countries within the context of Brazilian suppliers, several propositions have been generated, contributing to the scientific knowledge on SCRM.

First of all, it has been demonstrated that the commonly accepted notion of quality gaps between developed and emerging countries cannot always be highlighted, especially when sourcing natural products. In that case, the focus of the procurement team will mainly be pointed toward technical capacities. Mainly, the flexibility and the ability to supply sufficient volumes are the major criteria taken into account for those firms. Visits of suppliers' facility seem to be the most objective measure to assess those criteria. For companies sourcing non-natural products, quality gaps remain problematic, even though they tend to reduce. Overall, MetCo and PharmaCo acknowledged that Brazilian suppliers were generally supplying a fair quality. To ensure high quality inputs, the implementation of quality teams performing regular inspection at suppliers' sites and of quality path in case of single sourcing are commonly used techniques. The argumentation underlying the tendency toward gap reduction is that, for sectors facing international competition, it is in the interest of the suppliers coming from emerging countries to raise their own quality standards in order to keep a wide customer base.

Unanimously, the interviewees stated that sustainability standards differential was a major threat when sourcing in Brazil and more generally in emerging countries. It is more relevant than ever, as the growing importance of pressure groups and societal activism amplify the risk of hurting reputation and image (Harland et al., 2003). Being aware that Brazilian suppliers represent a greater risk than their European/North American counterparts, firms have implemented measures at different levels of their SCRM process. Selecting suppliers having sustainable accreditations, implementing CSR policies in contracts, calling out to an external auditor specialized in sustainability assessment or implementing an internal tool to evaluate sustainability are efficient techniques used by the analyzed firms to protect their supply chains against unethical behaviors.

It also seems that the supplier selection phase is of major importance to minimize risks related to Brazilian suppliers, even though it is inconceivable to implement measures constituting a perfect safety net. Still, producing more efforts to find a supplier that meets the firms' expectations is essential to eliminate subsequent major risks,

particularly adverse selection, reputational and supply/inventory disruption risks. The case study revealed that self-assessment and supplier site audits were commonly used techniques to assess supplier capacities. Having a regional corporate procurement, such as MetCo, seems to be an efficient technique to consistently assessing potential new suppliers. The analysis has also revealed that the strict regulation faced by European firms helps to reduce the risk of adverse selection, as they generally perform a higher degree of due diligence during the supplier selection phase.

In terms of risk management techniques, the commonly developed pillars are strategic and formal. As such, firms always protect their tangible and intangible assets through contractual clauses allowing self-assessment and follow up inspections, through the implementation of CSR policies at the corporate level, through internal training on SCRM and through certain levels of safety stocks. It has also been demonstrated that firms are not keen to develop as much collaboration as the theory propose. As a matter of fact, it has been highlighted that those are not developed beyond business and legal obligations, firms being afraid of endangering other valuable assets. As such, it does not appear that financial help, dispatch of personnel or developing accessible operational metrics are popular measures (Christopher & Lee, 2004; Chen et al., 2013). This phenomenon is mainly due to the Brazilian business environment, as corruption and IP protection are two characteristics influencing SCRM approaches and measures. Moreover, those two factors also implicate a stricter due diligence process during the selection phase and the exploration of geographical scope extension when possible.

Finally, a compilation of best techniques found from the cases have been highlighted in order to guide managers in their sourcing decisions in Brazil and generally in emerging markets. Even though single cases have evidenced that measures to protect supply chains from Brazilian suppliers can generally be extended to other emerging market, this thesis is based on exploration and generalization must be performed with alertness.

8 References

Adams J. (1995). *Risk*. London: UCL Press

Agence Wallone à l'Exportation et aux Investissements Etrangers (AWEX). *Brésil: Le pays en bref*. Online <http://www.delcredereducroire.be/fr/risques-pays/#focusCountry=BR&focusContinent=&filter=WarRisk&min=0&max=7&tab=1>, consulted on March 30th, 2015.

AIJN European Fruit Juice Association. (2015). *Facts and figures, sourcing of raw materials*. Online <http://www.aijn.org/publications/facts-and-figures/sourcing-of-raw-materials-1/>, Consulted on June 21st, 2015.

Aydin, G., Babich, V., Beil D. & Yang Z. (2009). *Decentralized supply risk management*. Unpublished document, University of Michigan. Online <http://www-personal.umich.edu/~dbeil/Decentralized%20Supply%20Risk%20Management.pdf>

Belgian Foreign Trade Agency. (2015). *Trade relations of Belgium with Brazil*. Online http://www.abh-ace.be/en/binaries/Brazil_tcm450-263592.pdf, consulted on March 30th, 2015.

Belgian Timber Importers Federation. (2010). *Who are we?* Online <http://www.houtimportbois.be/>, Consulted on April 21st, 2015.

Beverly, R. & Rodysill, J. [Accenture] (2007). Supply Chain Management – Risky Business. *Outlook, the Journal of High-Performance Business*, No. 2, pp. 1-8.

Blome, C. & Schoenherr, T. (2011). Supply chain risk management in financial crises – A multiple case-study approach. *International Journal of Production Economics*, 2011. doi:10.1016/j.ijpe.2011.01.002

Börsch, A. (2007). *Global pressure, national system: How German Corporate Governance is changing*. Ithaca, New York: Cornell University Press.

Central Intelligence Agency (CIA). *The World Factbook – South America: Brazil*. Online, <https://www.cia.gov/library/publications/the-world-factbook/geos/br.html>, consulted on March 30th, 2015.

- Chang, H-J. (2008). *Bad Samaritans: The guilty secrets of rich nations and the threat to global prosperity*. London: Random House Business Books.
- Chartered Management Institute. (2013). *Weathering the storm. The 2013 Business Continuity Management Survey*. Unpublished document. Online <http://www.bcifiles.com/CMI-Weatheringthestorm.pdf>.
- Chen, J., Sohal, A. & Prajogo, D. (2013). Supply chain operational risk mitigation: a collaborative approach. *International Journal of Production Research*, Volume 57, No. 1, pp. 2186-2199. doi:10.1080/00207543.2012.727490
- Chopra, S. & Sodhi, M. (2004). Managing risk to avoid supply-chain breakdown. *MIT Sloan Management Review*, Volume 46, No. 1, pp. 53-61.
- Christopher, M. & Lee, H. (2004). Mitigating supply chain risk through improved confidence. *International Journal of Physical Distribution & Logistics Management*, Volume 34, No. 5, pp. 388-396. doi: 10.1108/09600030410545436.
- Christopher, M., Mena, C., Khan, O & Yurt, O. (2011). Approaches to managing global sourcing risk. *Supply Chain Management: An International Journal*, Volume 16, No. 2, pp. 67-81. doi:10.1108/13598541111115338
- Christopher, M. & Peck, H. (2004). Building the resilient supply chain. *International Journal of Logistics Management*, Volume 15, No. 2, pp. 1-14. doi:10.1108/09574090410700275.
- Delcredere-Ducroire. (2015). *Risques pays: Brésil*. Online <http://www.delcredere Ducroire.be/fr/risques-pays/#focusCountry=BR&focusContinent=&filter=WarRisk&min=0&max=7&tab=1>, consulted on March 30th, 2015.
- Draper, R. (2014). *Brazil World Cup could be chaos as social unrest threatens to overshadow the football*. The Daily Mail. Online <http://www.dailymail.co.uk/sport/worldcup2014/article-2644995/Brazil-World-Cup-chaos-social-unrest-threatens-overshadow-football.html>, consulted on March 30th, 2015.

- Eisenhardt, K. (1989). Agency theory: an assessment and review. *The Academy of Management review*, Volume 14, No. 1, pp. 57-74. doi:10.2307/258191
- Envoyé Spécial: Jus d'orange, une réalité acide* [Video]. (2013). France : France 2 Télévision. Online <https://www.youtube.com/watch?v=Kk-lsUii4LQ>.
- European Commission. *Export Helpdesk: statistics*. Online <http://exporthelp.europa.eu/thdapp/display.htm?page=st%2fst%2fStatistics.html&docType=main&languageId=en>, consulted on March 30th, 2015.
- FXB Center for Health & Human Rights, Harvard University. (s.d.). *What we do*. Online <http://fxb.harvard.edu/what-we-do/>, consulted on March 10th, 2015.
- Goldin, C. & Katz, L. (2010). The race between education and technology: The evolution of U.S. educational wage differentials, 1890 to 2005. *The National Bureau of Economic Research, working paper 12984*. Online <http://www.nber.org/papers/w12984.pdf>
- Greenpeace. (2010). *Greenpeace dénonce Nestlé, qui contribue à la déforestation en Indonésie* [Video]. Online <https://www.youtube.com/watch?v=hgcHTHGu5tA>.
- Greenpeace. (2011). *VW: The Dark Side* [Video]. Online <https://www.youtube.com/watch?v=nXndQuvOacU>.
- Greenpeace. (2011). *Barbie's rainforest destruction habit revealed* [Video]. Online <https://www.youtube.com/watch?v=Txa-XcrVpvQ>.
- Greenpeace. (2011). *Crise pour le FSC dans le Bassin du Congo ?* Unpublished document. Online <http://www.greenpeace.org/africa/Global/africa/publications/French.FSC%20Crisse%20Bassin%20du%20Congo.FINALE.pdf>, consulted on May 2nd, 2015
- Greenpeace. (2014). *La crise silencieuse de l'Amazonie : la nuit, tous les crimes sont permis*. Unpublished document. Online <http://www.greenpeace.org/belgium/fr/presse/rapports/The-Amazons-Silent-Crisis-Night-Terrors/>, consulted on May 2nd, 2015.
- Gréga, P. (2014). *Spécificités de la gestion dans les pays du Sud: Mondialisation et développement*. Syllabus, ICHEC Brussels Management School.

- Gupta, G. (2013). *Brazil's protests: social inequality and World Cup spending fuel mass unrest*. The Time. Online <http://world.time.com/2013/06/18/brazils-protests-social-inequality-and-world-cup-spending-fuel-mass-unrest/>, consulted on March 30th, 2015.
- Handfield, R. & Nichols, E. (1999). *Introduction to supply chain management* (2nd edition). New York City, Pearson Education.
- Harland, C., Brenchley, R. & Walker, H. (2003). Risk in supply networks. *Journal of Purchasing & Supply Management*, Volume 9, pp. 51-62. doi:10.1016/S1478-4092(03)000044-9
- Havoscope. (2014). *Black market crime in Brazil*. Online <http://www.havoscope.com/tag/brazil/>, consulted on March 30th, 2015.
- Helmer, O. (1967). *Analysis of the future: The Delphi method*. Santa Monica, California: The Rand Corporation.
- Hendricks, K., Singhal, V & Zhang, R. (2009). The effect of operational slack, diversification, and vertical relatedness on the stock market reaction to supply chain disruptions. *Journal of Operations Management*, Volume 27, No. 3, pp. 233-246. doi:10.1016/j.jom.2008.09.001.
- IBM Commerce. (2014). *IBM supply chain risk management* [Video]. USA: IBM. Online <https://www.youtube.com/watch?v=dN8VtHgiew>.
- IBM. (s.d.). *IBM Emptoris Strategic Supply Management Solutions*. Online <http://www-01.ibm.com/software/info/emptoris/>, consulted on February 27th 2015.
- International Monetary Fund. (2011). All for one: why inequality throws us off balance. *Finance & Development: A quarterly publication of the International Monetary Fund*, Volume 48, No. 3.
- International Organization for Standardization. (2009). *ISO31000:2009, Risk management: Practices and guideline*. Online <https://www.iso.org/obp/ui/fr/#iso:std:iso:31000:ed-1:v1:en>, consulted on February 27th 2015.

- Kara, S. (2014). Tainted Carpets: Slavery and child labor in India's hand-made carpet sector. *FXB Center for Health and Human Rights, Harvard University*.
- Kotler, P., Keller, K., Manceau, D. & Dubois, B. (2009). *Marketing management* (13th edition). Paris: Pearson Education.
- Lary, H. (1970). Imports of manufactures from less developed countries. *Economics Development and Cultural Change, Volume 18, No.4*, pp. 634-640.
- Leamer, E. (1995). *The Heckscher-Ohlin Model in Theory and Practice*. Princeton, N.J.: International Finance Section, Department of Economics, Princeton University.
- Lejeune, C. (2014). *Méthode Qualitative Partie 1* [video]. Belgium: Louvain School of Management. Online
<https://www.youtube.com/watch?v=fig1rOWYrO8&feature=youtu.be>.
- Lindros, K & Tittel, E. (2013). *How to create an effective business continuity plan*. Online
<http://www.cio.com/article/2381021/best-practices/how-to-create-an-effective-business-continuity-plan.html>.
- Malone, R. (2006). *Growing supply chain risks*. Online on the Forbes website
http://www.forbes.com/2006/09/25/accenture-supply-chain-risks-biz_logistics_cx_rm_0925risks.html, consulted on March 10th, 2015.
- Manuj, I. & Mentzer, J. (2008). Global supply chain risk management. *Journal of Business Logistics, Volume 29, No. 1*, pp. 133-155. doi:10.1002/j.2158-1592.2008.tb00072.x.
- McMichael, P. (2008). *Development and social change: A global perspective* (4th edition). Thousand Oaks, California: Pine Forge Press.
- Micheli, G., Cagno, E. & Zorzini, M. (2008). Supply risk management vs supplier selection to manage the supply risk in the EPC supply chain. *Management Research News, Volume 31, No. 11*, pp. 846-866. doi: 10.1108/01409170810913042
- Milliken, F. (1987). Three types of perceived uncertainty about the environment: state, effect and response uncertainty. *Academy of Management Review, Volume 12, No. 1*, pp. 133-143. doi:10.5465/amr.1987.4306502

- Mitchell, V-W. (1995). Organizational risk perception and reduction: a literature review. *British Journal of Management*, Volume 6, pp. 115-133. doi:10.1111/j.1467-8851.1995.tb00089.x
- Miles, M., Huberman, M. (1994). *An expanded sourcebook, qualitative data analysis*. Thousand Oaks, California: Sage Publications.
- Narasimhan, R & Talluri, S. (2009). Perspectives on risk management in supply chains. *Journal of Operations Management*, Volume 27, pp. 114-118. doi:10.1016/j.jom.2009.02.001
- Norrman, A. & Jansson, U. (2004). Ericsson's proactive supply chain risk management after a serious sub-supplier incident. *International Journal of Physical Distribution & Logistics Management*, Volume 5, No. 5, pp. 434-456. doi:10.1108/09600030410545463
- Organization for Economic Co-operation and Development. (2010). *Chile's accession to the OECD*. Online <http://www.oecd.org/chile/chilesaccessiontotheoecd.htm>, consulted on March 30th, 2015.
- Organization for Economic Co-operation and Development. (2011). *Convention on combating bribery of foreign public officials in international business transactions and related documents*. Online <http://www.oecd.org/corruption/oecdantibriberyconvention.htm>, consulted on March 30th, 2015.
- Phillips, K. (2014). *Protest and social unrest threaten World Cup kickoff*. ABC News. Online <http://www.abc.net.au/radionational/programs/rearvision/protests-and-social-unrest-threaten-world-cup-kickoff/5512656>, consulted on March 30th, 2015.
- Prakash, S. & Mittal, S. (SD). Handling supply chain risks for sustainability: a review of key issues. *Malaviya National Institute of Technology (MNIT), JLN Marg, Jaipur*.
- Quivy, R. & Van Campenhoudt, L. (2006). *Manuel de recherche en sciences sociales* (4th edition). Paris: Dunod.

Resilinc,. 2015. 'Global Supply Chain Risk Management Solution Overview| Resilinc'.
<https://www.resilinc.com/solutions/for-supply-chain-risk-management-overview/>,
 consulted on April 5th, 2015.

Regulation No 995/2010 of the European Parliament and of the Council of 20 October 2010 laying down the obligations of operators who place timber and timber products on the market. (2010). *Official Journal of the European Union*, 12th of November. Online
<http://eurlex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2010:295:0023:0034:EN:PDF>, Consulted on April 21st, 2015.

Reuters. (2015). *West coast ports dispute stretches on ahead of U.S. labor secretary intervention*. The Daily Mail. Online
<http://www.dailymail.co.uk/wires/reuters/article-2956221/West-Coast-ports-dispute-stretches-ahead-U-S-labor-secretary-intervention.html>, consulted on March 30th, 2015.

Rohrmann, B. (1998). The risk notion: epistemological and empirical considerations. In: M. Stewart & R. Melchers (Eds.), *Integrated Risk Assessment* (pp.39-46). Rotterdam: Balkema.

Roundtable on Sustainable Palm Oil. (2015). *Who we are*. Online
<http://www.rspo.org/about/who-we-are>, Consulted on June 21st, 2015.

Rouquié, A. (1998). *Amérique latine: Introduction à l'Extrême-Occident*. Paris: Edition du Seuil.

Schwab, K. & Sala-i-Martin, X. (2014). The global competitiveness report 2014-2015: full data edition. *World Economic Forum*. Online
http://www3.weforum.org/docs/WEF_GlobalCompetitivenessReport_2014-15.pdf

Sedex, Empowering responsible supply chains. (SD). *What we do*. Online
<http://www.sedexglobal.com/about-sedex/what-we-do/>, consulted on June 21st, 2015.

Simchi-Levi, D. (2010). *Operation Rules*. Cambridge, Massachusetts: MIT press.

- Supply Chain Risk Leadership Council. (2011). *Supply chain risk management: A compilation of best practices*. Unpublished document. Online [http://www.scrclc.com/articles/Supply Chain Risk Management A Compilation of Best Practices final\[1\].pdf](http://www.scrclc.com/articles/Supply Chain Risk Management A Compilation of Best Practices final[1].pdf).
- Supply Chain Risk Leadership Council. (2013). *SCRLC Emerging Risks in the Supply Chain*. Unpublished document. Online <http://www.scrclc.com/articles/Emerging Risks 2013 feb v10.pdf>.
- Supply Chain Risk Leadership Council. (2013). *SCRLC Supply Chain Risk Management Maturity Model*. Unpublished document. Online <http://www.scrclc.com/>.
- Tang, C. (2006). Robust strategies for mitigating supply chain disruptions. *International Journal of Logistics Research and Application: A Leading Journal of Supply Chain Management, Volume 9, No. 1*, pp. 33-45. doi:10.1080/13675560500405584
- Tang, C. & Tomlin, B. (2008). The power of flexibility for mitigating supply chain risks. *International Journal of Production Economics, Volume 116*, pp. 12-27. doi:10.1016/j.ijpe.2008.07.008
- The World Bank. (s.d.) *Country data: Brazil*. Online <http://data.worldbank.org/country/brazil>, consulted on March 30th, 2015.
- The World Bank. (2014). *Logistics performance index. Country score card: Brazil 2014*. Online <http://lpi.worldbank.org/international/scorecard/radar/254/C/BRA/2014#chartarea>, consulted on March 30th, 2015.
- Transparency International. (2014). *Corruption by country: Brazil*. Online <http://www.transparency.org/country#BRA DataResearch>, consulted on March 30th, 2015.
- Tummala, R. & Schoenherr, T. (2011). Assessing and managing risks using the Supply Chain Risk Management Process (SCRMP). *Supply Chain Management: An International Journal, Volume 16, No. 6*, pp. 474-483. doi:10.1108/13598541111171165

- United Nations World Commission on Environment and Development. (1987). *Our common future*. Oxford: Oxford University Press.
- Van Weele, A.J. (2010). *Purchasing and supply chain management* (5th edition). Andover: Cengage learning
- Vancoppenolle, G. (2007). What are we planning for? In A. Hiles (Ed.), *The Definitive Handbook of Business Continuity Management, Second Edition* (pp. 3-25). Chichester, England: John Wiley & Sons Ltd.
- Vanloqueren, G. (2014). *Le projet de la globalisation*. Syllabus, ICHEC Brussels Management School.
- Vesely, B. (s.d.). *Fault Tree Analysis (FTA): Concepts and Applications*. Unpublished document. Online
<http://www.hq.nasa.gov/office/codeq/risk/docs/ftacourse.pdf>.
- Watts, J. (2014). *Brazil drought crisis leads to rationing and tensions*. The Guardian. Online <http://www.theguardian.com/weather/2014/sep/05/brazil-drought-crisis-rationing>, consulted on June 21st, 2015.
- World Bank. (2014). *Logistics Performance Index: International scorecards*. Unpublished documents. Online <http://lpi.worldbank.org/international/scorecard>,
 Consulted on March 30th, 2015.
- World Health Organization. (2015). *International Law*. Online
<http://www.who.int/trade/glossary/story061/en/>, consulted on May 18th, 2015.
- Wu, T., Blackhurst, J. & Chidambaram, V. (2006). A model for inbound supply risk analysis. *Computers in Industry, Volume 57*, pp. 350-365. doi:10.1016/j.compind.2005.11.001.
- Yin, R. (2003). *Case Study Research: Design and methods* (3rd edition). Thousand Oaks, California: Sage Publications.
- Zsidisin, A., Ellram, L., Carter & J., Cavinato, J. (2004). An analysis of supply risk assessment techniques. *International Journal of Physical Distribution & Logistics Management, Volume 5*, No. 5, pp. 397-413. doi:10.1108/09600030410545445

