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Supply Chain Finance As A Sustainability Enabler

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EXECUTIVE SUMMARY	I
1 INTRODUCTION	1
1.1 Background & Motivations.....	1
1.2 Thesis Outline.....	4
2 LITERATURE REVIEW	6
2.1 Sustainability	6
2.1.1 Weak and strong sustainability.....	9
2.1.1.1 Weak Sustainability	9
2.1.1.2 Strong Sustainability	10
2.1.2 Triple Bottom Line.....	12
2.1.2.1 Economic sustainability	14
2.1.2.2 Environmental sustainability	17
2.1.2.3 Social sustainability	18
2.2 Supply Chain Management.....	21
2.3 Sustainability and Supply Chain Management.....	26
2.3.1 Sustainable Supply Chain Management	28
2.3.2 Corporate Social Responsibility as a Risk Management Tool	33
2.4 Supply Chain Finance	36
2.4.1 Supply Chain Finance background	36
2.4.2 Supply Chain Finance definitions.....	39
2.4.3 Supply Chain Finance framework.....	45
2.4.4 SCF actors.....	48
2.4.4.1 Macro-institutional actors	49
2.4.4.2 Micro-institutional actors	52
2.4.5 Supply Chain Finance solutions.....	52
2.4.6 Reverse Factoring solution	55
2.4.7 Supply Chain Finance benefits	57
2.4.7.1 Quantitative benefits	57
2.4.7.2 Qualitative benefits.....	58
3 OBJECTIVES AND RESEARCH PROCESS	60
3.1 Objectives	60
3.2 Research process	63
4 RESEATCH METHODOLOGY	65
4.1 Literature review	65
4.2 Secondary data	70

4.3 Case studies	71
5 PRELIMINARY RESEARCH FRAMEWORK	75
5.1 Research Framework	75
6 RESULTS&DISCUSSION	88
6.1 RQ1: How can a SCF programme be implemented with a sustainability orientation?.....	89
6.1.1 Archetypes definition	93
6.2 RQ2: Why would buyers and suppliers introduce a SCF programme with a sustainability orientation?.....	98
6.3 RQ3: What are the benefits for buyers and suppliers from a SCF programme with a sustainability orientation?	108
6.4 Discussion	118
6.4.1 Revised final research framework	126
7 CONCLUSIONS AND FURTHER DEVELOPMENTS	129
7.1 Theoretical contributions	130
7.2 Managerial contributions	131
7.3 Limitations and future research	132
APPENDIX A.....	134
APPENDIX B	135
APPENDIX C.....	136
APPENDIX D.....	178
BIBLIOGRAPHY	179

List of Figures:

Figure 1: Research process	IV
Figure 2: Preliminary Research Framework.....	VII
Figure 3: Final Research Framework	XII
Figure 4: 3BL overlapping circles	13
Figure 5: Cash conversion cycle (Lamoureux and Evans, 2011)	38
Figure 6: Collaborative C2C Cycle graph	42
Figure 7: SCF framework	45
Figure 8: SCF Cube Model.....	46
Figure 9: EVA Model	48
Figure 10: Classification of SCF solutions (Lamoureux & Evans, 2011)	54
Figure 11: Reverse Factoring functioning	56
Figure 12: Research Process.....	63
Figure 13: Paper sources	68
Figure 14: Distribution of articles per year	69
Figure 15: Preliminary Research Framework.....	76
Figure 16: Revised Final Research Framework	127

List of Tables:

Table 1: Interviewed firms profile.....	VI
Table 2: Suppliers' and Buyer's drivers	VIII
Table 3: Suppliers' and Buyer's benefits	IX
Table 4: SCF macro-archetypes	IX
Table 5: RQ2 cross-case analysis	X
Table 6: RQ3 cross-case analysis	XI
Table 7: Supply Chain Flows (Mathis & Cavinato, 2010).....	37
Table 8: SCF perspectives	40
Table 9: SCF programs dimensions	53
Table 10: SCF solutions classification	55
Table 11: Classification of the articles sources	69
Table 12: Interviewed firms profile.....	73
Table 13: Suppliers' and Buyer's drivers	79
Table 14: relevant variables for sustainability-oriented SCF programs	84
Table 15: Suppliers' and Buyer's benefits	87
Table 16: RQ1 cross-case analysis	92
Table 17: SCF macro-archetypes	93
Table 18: Macro-archetype 1 variables	94
Table 19: Archetype 1 variants variables	95
Table 20: Macro-archetype 2 variables	95
Table 21: Archetype 2 variants variables	96
Table 22: Macro-archetype 3 variables	97
Table 23: RQ2 cross-case analysis	101
Table 24: Archetype 1A drivers	103

Table 25: Archetype 1B drivers	104
Table 26: Archetype 2A drivers	105
Table 27: Archetype 2B drivers	106
Table 28: Archetype 2C drivers	106
Table 29: Archetype 3 drivers	107
Table 30: RQ3 cross-case analysis	111
Table 31: Archetype 1A benefits.....	113
Table 32: Archetype 1B benefits.....	114
Table 33: Archetype 2A benefits.....	115
Table 34: Archetype 2B benefits.....	116
Table 35: Archetype 2C benefits.....	117
Table 36: Archetype 3 benefits.....	117
Table 37: Program orientation – benefits graph	120

List of Abbreviations

A/P: Account Payable

A/R: Account Receivable

C2C: Cash-to-Cash

CFO: Chief Financial Officer

DCFs: Discounted Cash Flows

DD: Dynamic Discounting

DPO: Days of Payables Outstanding

DSO: Days of Sales Outstanding

EDI: Electronic Data Interchange

ERP: Enterprise Resource Planning

FSC: Financial Supply Chain

FSCM: Financial Supply Chain Management

ICT: Information, Communication & Technology

IT: Information Technology

LSP: Logistics Service Providers

SCF: Supply Chain Finance

SCM: Supply Chain Management

SME: Small Medium Enterprise

VMI: Vendor Managed Inventory

WC: Working Capital

SSCM: Sustainable Supply Chain Management

CSR: Corporate Social Responsibility

Abstract

Purpose, originality and value: this dissertation aims at bridging two major gaps detected in Sustainability literature. In particular, on one side, remedies to suppliers' scarce commitment to sustainability plans are missing in literature whereas, on the other side, no possible directions for deploying socially responsible actions are suggested. In the light of that, this work is to figure out a point of intersection between Sustainability and SCF by investigating whether the latter can act as a sustainability enabler.

Design, methodology and approach: a multi-step research process is adopted for this work. First, literature review has been performed to uncover theoretical gaps leading to three research questions. Then, drawing from literature and secondary data investigation, a preliminary research framework has been built up, representing the holistic theory-based answer to research questions. In accordance to the framework structure, semi-structured interviews have been run, applying the multiple case-study methodology. By comparing cases through cross-case analyses, a final research framework has been defined wherein different SCF archetypes, key for the thesis findings, are placed.

Findings: the dissertation main findings consist in the identification of some archetypes of SCF programs, each one responding to a set of triggering drivers and bringing along a set of benefits. Drivers and benefits are both related to sustainability area. Said differently, such solutions are found to act as sustainability levers by responding to the diverse issues encountered when deploying sustainability plans.

Theoretical and managerial implications: this work started analysing both SCF and Sustainability literature to figure out whether they could complement each other. To do that, a theoretical contribution was to precisely analyse faced issues when trying to deploy sustainability plans. Then, through this thesis, SCF is assigned a new valence, untied from basic financial perspective. Research findings, then, can be used by firms as vademecum to solve sustainability-related issues.

Limits and future research: the main limitations and related future developments of this work are concerned with the small sample of interviewed companies and the unique buyer's perspective on the selected sustainability-oriented SCF programs. A further limitation is the absence of benefits quantification.

Estratto

Scopo, originalità e valore: questa tesi di ricerca mira a colmare due lacune teoriche, identificati nella letteratura sulla Sostenibilità. In particolare, da un lato, viene riscontrata la mancanza di soluzioni alla scarsa partecipazione da parte dei fornitori a progetti di sostenibilità e, dall'altro lato, nessuna strategia d'azione è suggerita alle aziende che vogliono agire responsabilmente nei confronti della società nella quale operano. In tal senso, questo lavoro prende in esame i programmi di SCF e come questi possano rappresentare leve di sostenibilità.

Design, metodologia e approccio: questa tesi è sviluppata secondo un processo di ricerca a più fasi. Per prima cosa, tramite l'analisi della letteratura, sono stati individuati i gap teorici che hanno condotto alle tre domande di ricerca. In seguito, appoggiandosi alla letteratura e a dati secondari, si è costruito il modello di ricerca preliminare, rappresentante la risposta teorica alle domande di ricerca. In linea con la struttura del modello, si sono condotte interviste semi-strutturate applicando l'approccio dei casi di studio multipli. Infine, incrociando i dati raccolti, si è definito il modello finale di ricerca che ingloba diversi archetipi di programmi di SCF, funzionali ai risultati finali.

Risultati: i principali risultati consistono nell'identificazione di diversi archetipi di programmi di SCF, ciascuno dei quali scaturisce da determinate esigenze e porta a un insieme di benefici. Esigenze e benefici entrambi relativi all'area della sostenibilità. In altre parole, tali soluzioni si sono rivelate leve di sostenibilità andando a rispondere a criticità riscontrate nell'implementazione di piani di sostenibilità.

Implicazioni teoretiche e manageriali: si è partiti dall'analisi delle letterature di SCF e Sostenibilità per capire se queste potessero essere complementari. A tal fine, un contributo teorico è stato quello di riportare le difficoltà riscontrate nell'implementazione di piani di sostenibilità. Poi, tramite questo lavoro, alla SCF è stata assegnata una nuova funzione, slegata dalla mera prospettiva finanziaria. I risultati, inoltre, possono essere usati dalle aziende come vademecum per risolvere problematiche relative alla sostenibilità.

Limiti e ricerche future: i principali limiti della ricerca e relativi sviluppi futuri riguardano il ristretto campione di aziende intervistate e l'esclusivo punto di vista dell'azienda focale circa tali programmi di SCF. Un'ulteriore limitazione è l'assenza di quantificazione dei benefici arrecati.

EXECUTIVE SUMMARY

Introduction

In the last decades, sustainability emerged as a predominant topic in the business world, representing a key component in big firms' strategic business plans while constantly being at the centre of plenty of different governmental and non-governmental organisations meetings (Hutchins and Sutherland, 2008). The concept began to populate the business world since 1987 with the Brundtland Report definition of Sustainable Development: "*development that meets the needs of the present without compromising the ability of future generations to meet their own needs*". Such a report had the merit to indicate a sustainable path as the only way to fulfil humans' calls for a better life while taking care of long-term environmental and human rights safeguard. Over time, the Triple Bottom Line (3BL) principle came out as the main sustainability stream due to its wide and comprehensive spectrum of analysis, stating how firms have to simultaneously consider economic, environmental and social aspects when taking decisions (Carter and Rogers, 2008). Environmental and social dimensions are metaphorically added to the classic profit-bottom line as this intertwined consideration is deemed as the only way to guarantee full and long-term sustainability for the whole society. The 3BL principle applied to the supply chain dominium, characterizing the current business context, directly flows into Sustainable Supply Chain Management (SSCM) and Corporate Social Responsibility (CSR) streams. The former refers to the arduous task for brand companies to extend sustainability-sound practices along their supply chains (Seuring and Muller, 2007). The latter, instead, by acknowledging the interconnectedness of business networks, indicates the ought for brand firms to responsibly commit towards the society they interact with (Cruz, 2011). By reviewing related literatures, two major gaps have been detected. As regards for SSCM, big brands are said to severely struggle in implementing SSCM plans, whose failure is often due to lack of proactive commitment by suppliers. To this regard, the theory blames the absence of incentives for suppliers attached to sustainability plans, without, yet, reporting any remedy. Regarding CSR, the literature states how big brands must provide a concrete help to its supply base but, still, without reporting any suggestion nor direction to pursue in this regard.

Alongside increasing concerns for sustainability issues, another recent macro-event profoundly affected the business context, completely disrupting financial market dynamics (Gomm, 2010). The last decade financial crisis, still plaguing several industries, led, indeed, to alarming liquidity shortages as traditional financing players have been forced to drastically reduce the

granting of new loans (Hofmann and Belin, 2011). To this regard, the most damaged players were the small and medium-size enterprises (SMEs) whose poor capital and assets availability made the liquidity access very expensive and sometimes prohibitive (Pfhol and Gomm, 2009). In such a scenario, there was an urgent need for alternative and cheaper short-term financing systems with respect to what was currently available in financial markets. This is where Supply Chain Finance (SCF) comes in, by providing industries with innovative solutions aiming at globally optimising financial flows along the entire supply chain. Such cutting-edge programs work for coupling financial flows to operative flows, thus giving oxygen to smallest players.

Having underlined the prerogative for a brand firm to deal with sustainability in a supply chain scenario and the peculiar role of SCF in benefitting small players, the aim of this dissertation is to figure out a possible connection point between Sustainability and SCF. More precisely, the main goal is to investigate whether SCF can act as a sustainability enabler, able to provide a support to focal firms willing to deploy sustainability-oriented actions. In this respect, SCF is assigned a totally new valence, untied from the basic and more intuitive financial perspective.

Objectives

The main aim of this research thesis is to bridge two literature gaps detected, respectively, in SSCM and CSR topics by drawing on SCF. That is, this research work relies on SCF, intended as spectrum of innovative financial solutions, whose supportive function can represent a way out to implement sustainability in supply chains. SCF is, thus, framed as a sustainability lever, able to provide a concrete answer both to the absence of incentives for suppliers when taking on SSCM initiatives (first gap) and to big brands' will to support its own supply chain (second gap). To investigate whether SCF can represent an implementable sustainability lever, three research questions are detailed so as to guide the work proceedings in the desired direction:

RQ1: How can a SCF programme be implemented with a sustainability orientation?

SCF solutions can encompass a multitude of different programs, each one with its own scope of application, set of actors involved with related on-boarding methods, adopted technologies and different roles played by financial institutions and service providers (Wuttke et al., 2013). What this research question aims at finding out is how to structure and, then, implement SCF solutions so that they could positively affect sustainability-related performances. The same SCF program, indeed, can be declined in plenty of different ways by acting on different levers so as to respond to the diverse companies' needs (Lampe and Hofmann, 2014). The desired output is

the identification of different groups of SCF programs whose discrimination factors are the architecture variables of solutions.

RQ2: Why would buyers and suppliers introduce a SCF programme with a sustainability orientation?

By the means of this second research question, precise drivers and motivations pushing both suppliers and buyers (i.e. focal firms) to set up a SCF programme with a sustainability orientation are investigated. Said differently, the reasons why supply chain actors decide to embark on such kinds of financial programs, oriented to sustainability, are sought. This research questions aims, therefore, at uncovering and clearly stating primary and secondary drivers, whether they are related to sustainability area or not, which are determinant to guide suppliers and buyers in selecting these SCF solutions. The final objective is to hint a possible link between sets of drivers and the related most suitable kind of SCF program.

RQ3: What are the benefits for buyers and suppliers from a SCF programme with a sustainability orientation?

Once defined the possible architectures of SCF solutions and the drivers leading to the adoption of the latter, it is crucial to report and assess all the different benefits for the diverse actors involved. These kinds of sustainability-oriented SCF programs might, indeed, bring hoped benefits, strictly related to the drivers triggering the programs, but also collateral and unexpected ones. Again, the main aim is to group the diverse registered benefits and associate them with the previously characterized SCF programs, in turn linked to suppliers' and buyers' sets of drivers. In doing so, a research framework is put forward for companies to make the right choice: given the specific suppliers' and buyers' needs (i.e. drivers) and a certain set of desired benefits, a specific type of sustainability-oriented SCF program is suggested to best accomplish the required tasks. The theoretical framework can be, thereby, interpreted as a group of archetypes (i.e. the different SCF solutions), linking together sets of drivers to sets of benefits. In this sense, the framework graphically transposes the three research questions outputs, holistically connecting them. By building up such a theoretical model, this work tries to provide a concrete and practical remedy to the literature gaps in the sustainability dominium.

Research Process & Methodology

This section aims at showing how the research work has been conducted, highlighting the macro steps characterizing the structure of the thesis body and how they relate to each other. **Below** is a figure representing the multi-step process to conduct such a dissertation work.

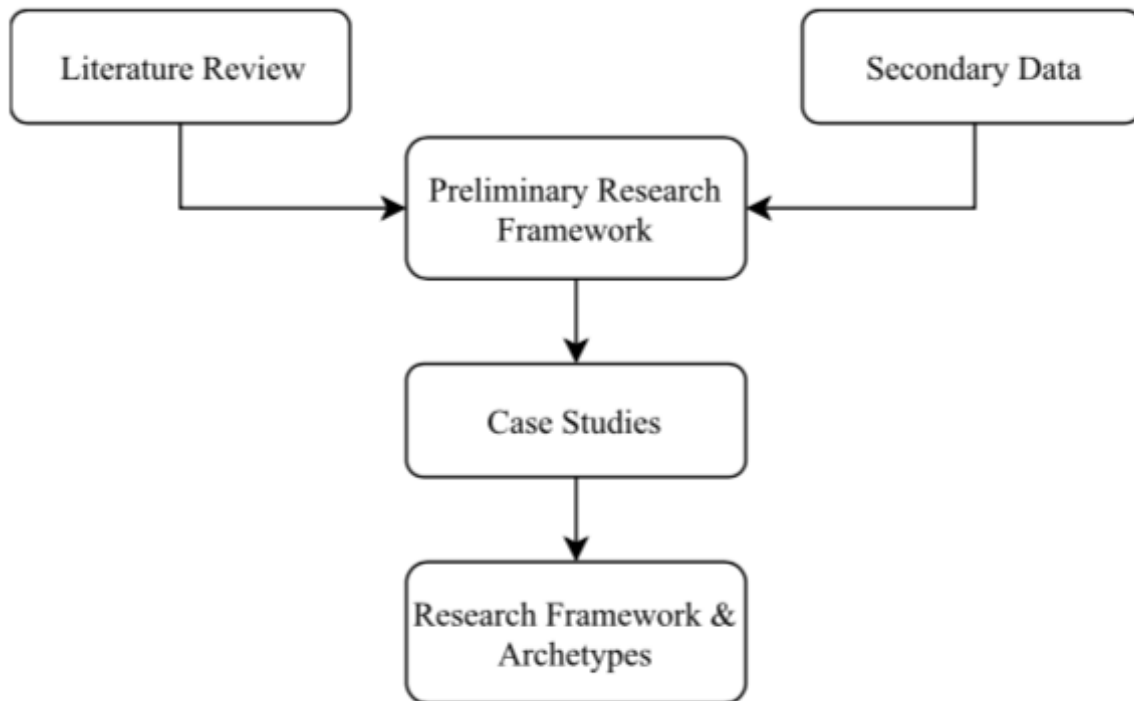


Figure 1: Research process

The research started with a massive data collection composing of two phases. In the first one, Sustainability and SCF literatures have been carefully analysed with the aim of first getting theoretical knowledge and, then, finding out eventual theoretical gaps; while going through the two literature streams, possible matches between these two apparently distant research areas have been constantly searched. The second phase, instead, is concerned with the gathering of secondary data in order to report concrete and real examples of innovative and sustainability-oriented financial programs applications.

The literature review has been key to determine the content of the three pillars (one for each research questions) composing the preliminary research framework structure with secondary data investigation contributing to fix and confirm literature insights for the central pillar, where diverse possible architectures of sustainability-oriented SCF solutions are put forward.

Once the preliminary research framework has been formulated, interviews to ten multinational companies have been carried out in order to apply the framework robustness and validity, integrating the related content so as to reflect stemming evidences and findings. To have meaningful information it has been decided to interview firms that had already implemented SCF programs whose adoption has been pushed, completely or partially, by sustainability goals. In accordance to the explorative and theory-building nature of this research work, the multiple case study methodology allowed to characterise each single case basing on a set of variables

aligned to the research questions purposes and, therefore, to the research framework structure. Subsequently, three cross-case analyses structurally compared the ten different case studies along the three research questions, in order to figure out possible patterns of SCF programs adoption. The main output of this combined analysis has been a revision and integration of the preliminary research framework with the identification of three archetypes, thus contemporary answering the three research questions.

Throughout the development of the dissertation work, several information sources have been drawn. Literature review articles, secondary data and case studies are three main categories.

As regards for the literature review, it has been performed through a meticulous data collection process, leveraging on plenty of different sources. A total of 158 articles, 95 on Sustainability area and 63 on SCF topic, have been selected as determinant to lay the theoretical foundations of this research thesis and identify the literature gaps.

For what concerns the secondary data collection methodology, the information gathering mainly occurred on websites by looking for business articles reporting successful applications of SCF solutions somehow linked to sustainability drivers. Other relevant information sources have been, then, sustainability-inserts of national newspapers and sustainability-imprinted magazines allowing to keep up with sustainability-related innovations. Such an investigatory phase allowed to identify and report three real applications of SCF solutions with a strong connection to sustainability themes. By analysing the cases, some architectural variables have been put forward as determinant and crucial for a sustainability-oriented SCF programs.

Finally, in line with the explorative and theory building characterization of this work, the multiple case study approach has been adopted as the ideal methodology to prove the supposed connection between Sustainability and SCF, depicted in the preliminary research framework.

Data collection occurred through semi-structured interviews based on a pre-defined scheme of questions so as to assure consistency between the multiple interviews, while keeping some space for further and case-specific information. More precisely, interviews structure is made of three macro-areas, each one dealing with one research question. To reach the potential interviewees, an engagement e-mail has been sent. In this regard, the boundaries of the firms' sample for interviews have been first set. Banks and financial providers have been excluded as the research thesis purposes revolve around supply chain actors' dynamics. Then, focal firms of the supply chains have been preferred over their suppliers as, most of the times, these kinds of SCF programs are buyer-driven with suppliers subsequently getting on-board.

As a final result, ten big firms have been interviewed and related case studies have been conducted, representing a crucial contribution for this research work findings. **Below** a table resuming the main profile information of the ten interviewed multinational firms:

INTERVIEWED FIRMS	INDUSTRY	TURNOVER	#EMPLOYEES	INTERVIEWEE
Puma	Clothing manufacturing	4.1 bln €	12000	Chief Financial Officer
Staff International	Fashion	400 mln €	700	Chief Financial Officer
CNMI	Fashion	\	\	Sustainability Project Manager
Fincantieri	Construction	4.2 bln €	19000	Chief Financial Officer
Azimut-Benetti	Construction	700 mln €	3000	Administration Manager
Group Engineering	System Integration	935 mln €	8500	Chief Financial Officer
Nice	Home automation	309 mln €	1575	Credit and Tresury Manager
Wind-Tre	Telecommunications	6.49 bln €	7525	Chief Financial Officer
Fastweb	Telecommunications	1.9 bln €	3500	Chief Financial Officer
Sonepar	Electrical material manufacturing	20.2 bln €	43000	Internal Control Officer

Table 1: Interviewed firms profile

Each single case has been analysed and characterised by the means of a within-case analysis, built on a pre-defined set of variables, in line with research questions. The next step was to compare the ten case studies by putting together the related within-case analyses. The result was the creation of three cross-case analyses aiming to compare the case studies along the three research questions. The output of this two-step analysis was the formation of archetypes of sustainability-oriented SCF programs (i.e. SCF programs architectures), wherein interviewed firms are collocated. Each archetype is characterized by a set of triggering drivers and a set of brought benefits, thus defining the final research framework connecting sets of drivers (RQ2) to the diverse SCF solutions architectures (RQ1), in turn connected to sets of benefits (RQ3). Lastly, firms and related SCF programs have been placed in a two-dimensions graph in order to characterize each case study with, on one side, the level of sustainability orientation of the SCF program and, on the other side, the supply chain player most privileged by the program.

Preliminary Research Framework

As previously mentioned, the framework is nothing but the structural representation of the three research questions outputs and of how they relate to each other. Being a graphical transposition of the thesis main objectives, the framework aims at showing the potential connections between SCF and Sustainability worlds. Indeed, after uncovering the two theoretical gaps in the sustainability literature, the research goal is to investigate whether SCF solutions can act as

effective sustainability levers, thus providing a concrete answer to hurdles encountered when applying sustainability concepts to the whole supply chain dominium.

Such an investigation is conducted by the means of the three research questions whose outputs represent the basis of the three pillars composing the research framework. Such outputs, in the first phase of the research, are theory-based as they completely ground on literature insights, except for the RQ1 content which draws also from secondary data investigation. Accordingly, the first pillar (on the left-side) deal with both suppliers’ and buyer’s drivers triggering the adoption of sustainability-oriented SCF programs while the third pillar (on the right side) reports both players’ benefits coming from the implementation of this specific kind of financial programs. The central pillar, instead, puts forward possible architectural dimensions deemed relevant for a sustainability-oriented SCF solution. To this regard, a two-step approach has been adopted: firstly, through the literature review some architectural variables are suggested as key for a SCF program; secondly, by collecting secondary data, the formerly selected variables have been confirmed or disproved in playing a key role.

These three blocks, as observable in the figure below, are mutually linked in a consequential fashion, thus making the three RQs an unicum: companies’ needs (i.e. drivers) should lead to select a certain type of SCF program (i.e. diverse SCF solutions architectures) which, in turn, are supposed to bring a set of advantages for the participating parties (i.e. benefits). In this sense, the framework aims at visually connecting SCF and Sustainability topics, intending SCF as a sustainability lever. This connection is made explicit by proposing some potential architectures of SCF programs, with each of them fitting a set of sustainability-oriented needs and brings to a set of sustainability-oriented benefits.

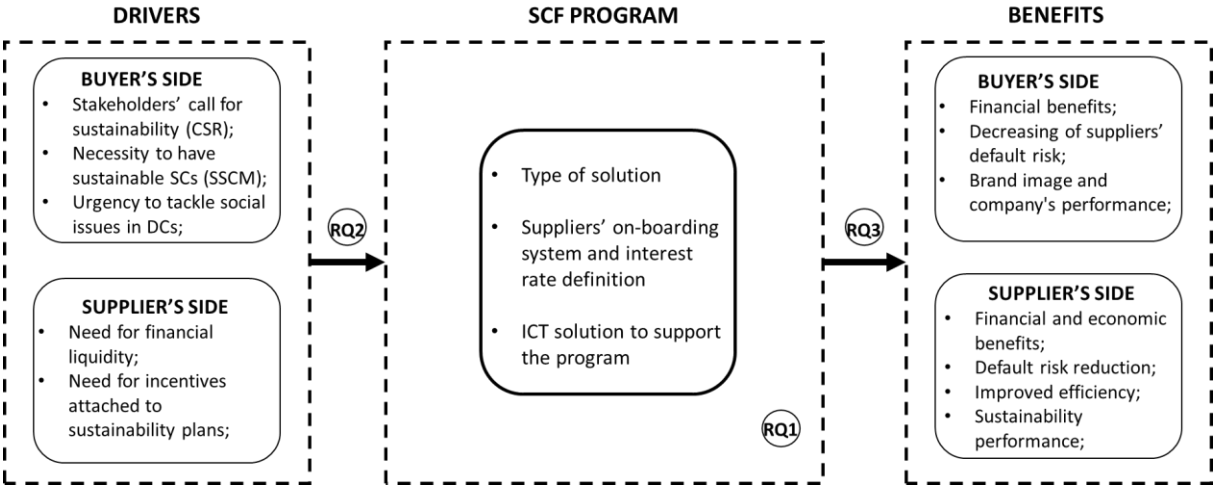


Figure 2: Preliminary Research Framework

1st Pillar – Drivers of SCF programs with a sustainability orientation:

Drivers of SCF programs with a sustainability orientation are split in two main areas: drivers for suppliers and drivers for buyers, to take into account the perspective of both the main actors involved in a SCF program. Below is a table resuming each driver key indicators, the definition and the literature sources.

MACRO-VARIABLE	VARIABLE	INDICATORS	DEFINITION	SCF REFERENCES	SSCM REFERENCES
BUYER'S DRIVERS	Stakeholders' call for sustainability (CSR)	Call for social-oriented actions in favour of smaller business partners	Big firms are called by stakeholders to deploy socially sensitive actions		Kerkhoff et al., 2010; Carter and Easton, 2011; Seuring and Muller 2007; Markley and Davis, 2007
	Call for Sustainable Supply Chains (SSCM)	Suppliers' in compliance to social and environmental global standards	Focal firms are considered responsible for all their supplier's sustainability performances.		Windsor, 2007; Vachon and Klassen, 2006; Koplinet al., 2006; Klassen et al.; Walker and Jones, 2012
	Urgency to tackle social issues in developing countries	Alarming living conditions Rampant corruption Child Labour	Focal firms are called to identify tools and systems to cope with social issues.		Awaysheh and Klassen, 2009; Carter, 2000; Andersen, 2005; Delavallade, 2006
SUPPLIERS' DRIVERS	Need for financial liquidity	High costs of traditional financings Shortage of liquidity to run the business	Small suppliers are evermore cash-constrained, with direct repercussions on the business	Wuttke et al., 2013; Hoffmann, 2005; Pfohl and Gomm, 2009	
	Need for incentives attached to sustainability plans	Absence of monetary rewards for sustainability commitment	Small suppliers are not keen on investing resources for sustainability without rewards		Hillary, 1999; Crals and Vereeck, 2005; Catusus et al., 1997; Barchard, 1998; Holt et al. 2001

Table 2: Suppliers' and Buyer's drivers

2nd Pillar – Relevant architectural variables of a sustainability-oriented SCF program

The research framework second pillar aims at figuring out the architectural variables deemed relevant when setting up a SCF program that has to respond to sustainability-oriented needs.

A two-step approach has been adopted to build up such a pillar: firstly, through the literature, strategic variables for SCF programs have been put forward and related relevance in structuring a sustainability-oriented solution has been, then, confirmed or disproved by analysing the three real-life cases. Hereunder, the architectural dimensions crucial for a sustainability-oriented SCF program, showing both their theoretical foundation and the key relevance for the real-life cases: Type of solution: there are several SCF solutions, each one with its own way of operative functioning, its scope of application, specific players involved and set of triggering needs and related brought benefits. Advance Reverse Factoring solution, with its specific functioning, resulted to be key, for all the three examined real cases, in allowing all the involved players to satisfy their own sustainability-related needs.

ICT solution to support the program: in SCF solutions ICT platforms are crucial to enable fast and seamless types of financing and payment arrangements between the supply chain partners. In the analysed cases, the platform plays a key role in that it allows the buyer to constantly monitor suppliers' performances, thus allowing for a dynamic interest rate attribution.

Suppliers' on-boarding system and interest rate definition: the selection of the prerequisites to access the program and the financial conditions definition are two strategic decisions for the buyer to imprint the financial solution, arbitrarily distributing benefits to involved parties. In the real-life cases, these levers have been crucial to push supplier in the sustainability direction.

3rd Pillar – Benefits of SCF programs with a sustainability orientation:

Principal benefits drawn by SCF programs with a sustainability orientation can be divided in two main categories: drivers for suppliers and drivers for buyers so as to take into consideration the perspective of both the main actors involved in a SCF program. Below is a table resuming each benefit key indicators, the definition and the literature sources.

MACRO-VARIABLE	VARIABLE	INDICATORS	DEFINITION	SCF REFERENCES	SSCM REFERENCES
BUYER'S BENEFITS	Financial benefits	Working capital optimisation More efficient use of liquidity	Possibility for the focal firm to optimise its working capital through SCF programs implementation	Wuttke et al., 2013; Randall and Farris 2009	
	Decreasing of suppliers' default risk	Financially-secured suppliers Guarantee of supply continuity	Concret risk for the focal firm of strategic suppliers' default with direct repercussion on its own business	Garcia-Teruel and Martinez-Solano; Seifert and Seifert, 2011	
	Brand image and company's performance	Enhanced firm's reputation Increased sales	Having the own supply chain fully sustainability compliance benefits the focal firm's image		Christmann, 2004; Drumwright, 1994; Carter and Dresner, 2001; Klassen and Vachon, 2003
SUPPLIERS' BENEFITS	Financial and economic benefits	Working capital optimisation Cheaper financing costs	Through SCF solutions suppliers get access to cash in a faster and cheaper way	Dyckman, 2009; Hofmann and Kotzab 2010; Klapper, 2006	
	Decreasing of default risk	Long-term business continuity	Due to the untrapped liquidity the risk of failure is by far mitigated	John Liebl, Evi Hartmann, Edda Feisel, 2016	
	Improved efficiency	Waste reduction Higher productivity Costs cutting	Adopting social and environmental-sound practices have positive reflections on operations		Clarkson, 1991; Fabien 2000; Golcic and Smith, 2013; Carter et al., 2007
	Sustainability performance	Sustainability as competitive advantage	Excellent sustainability scoring can represent a competitiveness and differentiation lever		Carter and Rogers, 2008; Green et al., 2011; Polonsky and Jevons, 2006

Table 3: Suppliers' and Buyer's benefits

Results & Discussion

RQ1: How can a SCF programme be implemented with a sustainability orientation?

For the case studies to act as effective tools to apply the research framework, the ten firms have been first interrogated on the relevance of the previously identified architectural dimensions to pass, then, reporting further sub-variables deemed crucial. In this respect, the three formerly stated architectural dimensions have been furtherly decomposed so as to best grasp commonalities and differences between patterns of program adoption of interviewed firms.

By running the cross-case analysis, three macro archetypes of sustainability-oriented SCF programs are identifiable and needed to embrace the ten interviewed firms and related solutions. To characterise the archetypes, not all the reported architectural variables have been relevant as some have been found either not to play a key role to orient the program towards sustainability or to be equally set up along the cases. Accordingly, below is a table presenting the macro-archetypes, discriminating from each other based on the relevant architectural dimensions:

Architectural dimension	SCF solution	#financial players	Access criteria	Responsible for supplier's entrance	In-Out system	Payment term renegotiation	Interest rate defintion
Archetype 1	Reverse Factoring	1	Eligible suppliers	Firm	Yes	No	Firm+Bank
Archetype 2	Reverse Factoring	>1	All suppliers	Bank	No	Yes	Variable
Archetype 3	Saving Factoring	1	Potentially all suppliers	Firm	Yes	No	\

Table 4: SCF macro-archetypes

RQ2: Why would buyers and suppliers introduce a SCF programme with a sustainability orientation?

The second research question goal was to find out all the primary drivers pushing both suppliers and buyer to launch a SCF program with a sustainability orientation and link them with the previously identified archetypes. To this purpose is a macro section of the interview interrogating firms on what have been their own and suppliers' drivers attached to these programs, starting from theory-based drivers to enlarge, then, the investigation to further ones. Based on cross-case analysis (figure ..), interest results emerged. Archetype 1 programs are strongly pushed by sustainability needs, being focused on bringing concrete benefits to all the supply chain with no direct economic return for the big brand buyer. More precisely, archetype 1B programs act in a SSCM perspective as the main goal is to make sure the entire supply chain is compliance to global sustainability standards; archetype 1A program, instead, responds to CSR call as it aims to financially sustain small suppliers composing the backbone of the supply chain, without bringing any financial nor economic advantageous for the buyer. For what concerns, instead, archetype 2, SCF programs, still framed in a CSR perspective, are also intended by focal firms as powerful risk management strategies. Indeed, by contributing to the survival of their supply bases, the firms automatically secure their own competitiveness. In archetype 2A the risk management function prevails over the CSR one while archetypes 2B and 2C are globally more directed towards CSR wave. However, both these variants present architectural elements pushing the program in a risk management orientation. Indeed, 2B and 2C have some totally buyer-oriented functioning dynamics leading to both financial and economic benefits. Archetype 3 program presents the lowest orientation to sustainability, being strongly buyer-oriented. As regards for suppliers, the need for financial and economic improvements are completely transversal drivers.

Why would buyers and suppliers introduce a SCF programme with a sustainability orientation?											
Player	Drivers	Staff Int.	Puma	CNMI	Fin.	Azimut	Group Eng.	Nice	Wind-Tre	Fastweb	Sonepar
Buyer	Stakeholders' call for sustainability (CSR)	X	X	X							
	Necessity to have sustainable SCs		X	X							
	Urgency to tackle social issues in DCs		X								
	Need to assess and monitor suppliers' performances	X	X	X							
	Will to financially help the supply base	X	X	X	X	X	X	X	X	X	X
	Safeguard the national know-how and specific competences	X		X							
	Make sure of the supply (pdt/service) continuity	X	X	X	X	X	X	X	X	X	
	Need to standardise and optimise invoices payment process					X	X	X	X		
	Working capital regularization and optimisation					X	X	X	X	X	
Costs control					X	X	X	X		X	
Suppliers	Need for financial liquidity (WC improvement)	X	X	X	X	X	X	X	X	X	X
	Need to reduce financial costs	X	X	X	X	X	X	X	X	X	
	Possibility to focus on operative business	X		X							
	Need for incentives attached to sustainability plans		X	X							
Archetypes		1A	1B		2A		2B		2C		3

Table 5: RQ2 cross-case analysis

RQ3: What are the benefits for buyers and suppliers from a SCF programme with a sustainability orientation?

Through this third research question, the thesis aims to definitely report and comment registered benefits across the ten real cases, trying to link them with the identified archetypes, in turn connected to programs triggering drivers. Specular to RQ2 procedure, interviews third macro-section, interrogated firms on what have been their own and suppliers' benefits attached to these programs, starting from theory-based benefits to enlarge, then, the investigation to further ones. Referring to cross-case analysis output (below shown), interesting results came out. Archetype 1 programs have been found to bring, for buyer's side, non-economic benefits, completely in line to the sustainability-oriented drivers triggering the program activation. More precisely, archetype 1B programs led to SSCM-related benefits, such as a proved improvement in supply chain sustainability performances, while financially securing the long-term survival of the firm's supply chain. The latter kind of benefits is registered in archetype 1A program too. Stick to the buyer's side, SCF programs composing the archetype 2, instead, have been all found to bring relevant financial benefits while economic and efficiency savings have been registered for those programs whose activation has been due also to economic efficiency reasons (2A and 2B). Another key benefit for the buyer was the consistent reduction of the suppliers' default risk, responding to the CSR-related drivers. Archetype 3 program, due to its atypical architectural configuration, brought as main and consistent buyer-related benefit, consistent economic savings. As regards for suppliers, financial benefits and the drastic reduction of default risk represent completely transversal benefits.

What are the benefits for buyers and suppliers from a SCF programme with a sustainability orientation?											
Player	Benefits	Staff Int.	Puma	CNMI	Fin.	Azimut	Group Eng.	Nice	Wind-Tre	Fastweb	Sonepar
Buyer	Financial benefits (WC optimisation)				X	X	X	X	X	X	
	Decreasing of suppliers' default risk	X	X	X	X	X	X	X	X	X	X
	Brand image and company's reputation	X	X	X							
	Sustainability performances		X	X							
	Improvement of supply base performances	X	X	X							
	Effective monitoring of suppliers' performances	X	X	X							
	Valorization of national know-how	X		X							
	Efficient credit management and paym process					X	X	X	X		
Economic savings					X	X	X	X		X	
Supplier	Financial benefits (WC optimisation)	X	X	X	X	X	X	X	X	X	X
	Decreasing of default risk	X	X	X	X	X	X	X	X	X	
	Improved efficiency				X	X					
	Financial costs savings	X	X	X			X	X			
	Continuity of operations	X				X	X	X			X
	Additional financing alternatives	X				X					
Sustainability performance		X	X								
Archetypes		1A	1B		2A		2B		2C		3

Table 6: RQ3 cross-case analysis

The main acknowledged objective of this explorative work was to figure out whether SCF can represent a potential lever to concretely help companies in implementing sustainability. To this purpose, after developing case studies and answering the three research questions, a final revised research framework is built up so as to graphically and holistically resume the main findings and contributions of this explorative work. To assure consistency throughout the dissertation, the final framework grounds on the preliminary one structure. What make this final framework insightful is the highlighting of evidence-based types of connections between SCF programs and Sustainability.

To this regard, the framework presents the use of three different colours to emphasize how each archetype is triggered by a set of drivers and leads to a set of benefits. To explain, the yellow box drivers push the adoption of the archetype 1, yellow-circled, which in turn brings along benefits in the yellow box. The same holds for the other colours, representing the other two macro-archetypes. A final evidence-based framework is, thus, built up, representing a powerful tool for companies to select the most suitable type of sustainability-oriented SCF program given own specific and suppliers' needs (i.e. drivers) and a set of desired benefits for both parties.

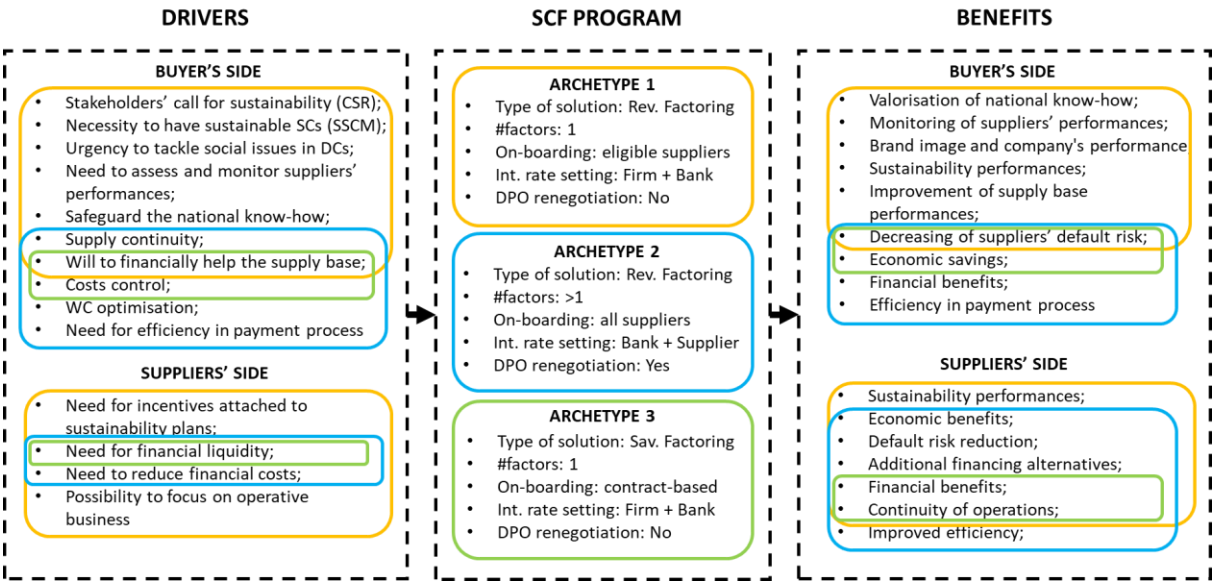


Figure 3: Final Research Framework

Conclusions and further developments

Thesis summary

The main acknowledged objective of this dissertation work was to find out possible connections between two research areas, namely SCF and Sustainability, figuring out whether the former can represent a lever for the latter by filling up two uncovered theoretical gaps. To follow, three research questions have been built up so as to guide the proceedings of the work in the desired

direction. Then, preliminary theory-based answers to three research questions have been provided by grounding on both sustainability and SCF literatures while backing also on secondary data collection. Such temporary results have been, then, graphically transposed in the preliminary research framework, thus visually reporting the holistic theoretical answer to the thesis research questions. In this respect, the framework puts forward a supposed connection between SCF and Sustainability topics, intending SCF as a sustainability lever. Such a framework has been, then, applied and integrated by the multiple case-study methodology, resulting in a revised final research framework wherein main findings of this dissertation are presented. Three macro-archetypes, composing the framework central pillar, are identified as diverse financial programs adoptable by companies to deal with sustainability-related issues. Each archetype is triggered by a set of pushing drivers and leads to a certain set of benefits.

Theoretical contributions

Such a research work started by analysing both SCF and Sustainability literatures with the aim of figuring out whether they could complement each other. To this purpose, the two literatures have been contemporarily tackled searching for potential connections. As a result, two theoretical gaps have been detected in the sustainability literature, with SCF thought to potentially represent a cure in filling them up, thanks to its supportive function. In line with that, this dissertation work novelty resides in providing a concrete remedy to gaps found in the sustainability theory. Stick to that, this thesis shows how SCF can, thus, be framed and leveraged in a sustainability direction, freeing it up from the mere financial concept. To do that, a first relevant theoretical contribution was to list and analyse issues registered by companies when trying to deploy sustainability-related action plans. In the same way, all the benefits stemming from enhancements in sustainability performances have been still reported, highlighting how in such a complex business scenario it is crucial to carefully mind sustainability indicators. Lastly, SCF has been assigned a new powerful function as, thanks to its peculiar features, it is framed as a bridge allowing to cope with sustainability-related issues.

Managerial contributions

In the light of the proved connection between SCF and Sustainability topics, such evidence-based findings can be easily generalised, thus inferring some precious insights for whichever focal firm of a supply chain. By the means of the identified SCF archetypes and their suitability to respond to some defined needs, the program fitting the specific sustainability-related obstacles is suggested to the focal firm that will, then, likely enjoy equally-defined benefits.

More precisely, the generalised validity of these findings particularly applies for eventual companies struggling to implement actions and plans related to the considered sustainability streams (SSCM and CSR). Accordingly, a firm dealing with one of these categories of sustainability-related impediments can leverage and exploit the findings and evidences of this dissertation work to overcome experienced obstacles and, thus, reaching initial sustainability goals. To this purpose, indeed, a specific SCF architecture is suggested to best accomplish the required tasks. To conclude, it is clear how each real-life case presents peculiar characteristics making it different from whichever other case. In this sense, it is very unlikely that a specific SCF program architecture can be applied in the exactly same way for more companies and related supply chains. Amendments and additions will be always necessary to make the program perfectly address case-specific characteristics and criticalities. Nevertheless, the thesis findings, assume key and strategic relevance in representing practical guidelines to follow when clashing with sustainability-related issues.

Limitations and future research

A first work limitation, is concerned with the lack of direct suppliers' perspective regarding the analysed SCF programs. Indeed, by solely running interviews with buyers, there is a plausible risk to get a bit distorted vision of what actually pushed suppliers in adhering to such financial programs and of related benefits for them. In accordance to that, a promising future development of the research is to enlarge the data collection by running interviews also with suppliers, trying to better figure out what drive them in participating to such kinds of sustainability-oriented financial programs. A second limitation concerns the small sample of cases out of secondary data investigation. This is due mostly by the highly innovative component of such programs. Then, the sample of interviewed companies still represents a limit as the risk of not having covered the complete spectrum for all the possible architectures of SCF programs with a sustainability orientation exist. To this regard, therefore, a possible way to enrich and develop such a dissertation could be to increase the sample of companies to interview. Finally, a last identified limitation regards the absence of benefits quantification: registered benefits miss a quantitative assessment, being solely based on qualitative data. In this sense, it has been impossible to measure and quantify how much SCF improve sustainability performances, only limiting to state whether it does it or not. Hence, a particularly interesting research development would be to try to measure sustainability performances, before and after the program implementation, thus assessing more precisely the SCF lever effect.

1 INTRODUCTION

1.1 Background & Motivations

In the last decades, sustainability, often also referred to as sustainable development, emerged as a predominant topic in the business world, representing a key pillar in both big firms' strategic business plans and operative programs of governmental and non-governmental organisations (Zhang et al., 2016). As examples, the environment preservation became very rapidly the founding element of many national and international institutions while several international agreements have been signed so as to tackle incumbent social, economic and environmental threats, such as climate change, global poverty, social justice and child labour (More and Basu, 2012).

Accordingly, the Triple Bottom Line (3BL) principle recently came out as the principal approach to tackle sustainability issues thanks to its wide and comprehensive spectrum of analysis (Carter and Rogers, 2008). Such an approach, introduced by John Elkington's "Cannibals with Forks" (1997), referring to the metaphorical addition of environmental and social dimensions to the classic profit-bottom line, implies companies to not only seek for economic returns but to ethically behave with respect to environmental and social issues (Linton et al., 2007).

This is the only way, according to this theory stream authors, to guarantee full and long-term sustainability for the whole society (Mani et al., 2014).

In this respect, firms, beyond law requirements, are evermore called to operate in accordance to ethical and social values while safeguarding the environment. A huge pressure on companies is, indeed, exerted by all the stakeholders (e.g. final consumers) that consider sustainable-sound behaviour as a fundamental prerequisite for whoever willing to do business in nowadays context. A firm incurring in episodes of sustainability in compliance would inevitably suffer huge damages in terms of image, reflecting in heavy economic losses.

In order to keep up with the unrestrained pace of change characterizing the nowadays world, the 3BL principle evolved over time so as to fit current dynamics and contingencies.

To this regard, two recent and breakthrough phenomena completely disrupted the last-century business context, forcing companies and institutions to update their strategies. Outsourcing trend, caused by several factors (e.g. an ever-increasing level of competition in the market, a drastic reduction of product life cycle, a massive widening of product variety, a fierce price

war, etc.), entailed a totally new business paradigm with many firms concurring to the creation process of a product or service: the so-called supply chains configuration (Seuring and Muller, 2007). All the activities previously performed by one unique firms (totally vertical structure) are, now, disaggregated and distributed along several players, aiming at gaining flexibility and enhancing specialization (Seuring and Sarkis, 2008).

Globalisation process, then, added up to extend supply chains across several countries, regardless of geographical, cultural and social distances. That is, big companies started expanding over several countries and, consequently, setting up business relationships with world-wide located players (Klassen and Vachon, 2005). The consistent lowering of previously-relevant barriers made it possible, indeed, for big brands to grasp new and unexplored business opportunities (Silvestre 2016).

All of that has strong implications when it comes to deal with sustainability (Maloni and Brown, 2007). Speaking about a nowadays manufacturing brand company, its supply chain may extend over several different countries implying the focal firm to make sure the entire supply base is compliance to sustainability standards along the 3BL dimensions (the so-called SSCM) while deploying social responsible actions towards smaller business partners (Carter and Rogers, 2008).

Stick to macro-events strongly impacting the business scenario, the recent financial crisis, mainly triggered by the collapse of the asset and mortgage-backed markets, profoundly affected the financings availability in the market.

Banks and all the other traditional financial players, in fact, have been forced to drastically reduce the granting of new loans with a significant increase in the cost of corporate borrowing (Pezza, 2011).

In such a contingency of liquidity shortage, derived also by a concatenation of further elements, the most damaged players were often the small and medium enterprises (SMEs) whose poor capital and assets availability, on one hand, seriously threatened the day-to-day operations and, on the other hand, contributed to rise up interest rates of bank-issued financings (Camerinelli, 2008).

As a consequence, these players tried to extend trade credit terms from upstream suppliers in order to supplement other forms of financing and give continuity to the operative part of the business (Wuttke et al., 2016). Big players, instead, were much less affected by this financial crisis as their financially solid structure allowed them to keep on running their business and still borrow money from banks at reasonable costs (Fellenz et al., 2009). Hence, they took the role

of liquidity providers, accepting an increase in payment terms by their downstream customers (Wuttke et al., 2013).

Referring, therefore, to a typical supply chain, there was a continuous extension of payment terms, needed to survive such a liquidity scarcity, going upstream the chain, with the result of heavily compromising the survival of the small players, usually placed at the upper part of any transformational process (Hofmann, 2009).

In such a scenario, there was an urgent need for alternative and cheaper short-term financing systems with respect to what was currently available in the financial market.

To this purpose, banks were constantly required to come out with innovative financial products and services that could cope with this financially unsustainable contingency (Camerinelli, 2008). One of the most notable output was the Supply Chain Finance (SCF) approach, so defined: “*SCF deals with financial arrangements used in collaboration by at least two supply chain partners with the aim of improving the overall financial performance and mitigating the overall risks of the supply chain*” (Steeman, 2014). SCF consists in a variety of solutions with the ambitious goal to improve the working capital of the supply chain as a whole, meaning that they aim to be beneficial for all the players involved (Gelsomino et al., 2016). Put differently, SCF aims at coupling financial flows with material and information flows by leveraging companies’ interconnections within supply chains, thus reaching a global financial optimisation (Wuttke et al., 2013) A key factor in the success of SCF solutions is the complete cooperation and integration between business players, financial actors and service providers as such financial programs ground on full commitment and trust by all the involved parties. In line with that, Pfohl & Gomm, 2009 define SCF as “*the inter-company optimization of financing as well as the integration of financing process with customers, suppliers, and service provider, in order to increase the value of all participating companies.*”

Having underlined the prerogative for a big brand company to deal with sustainability issues in a supply chain scenario and considering the novelty of SCF to come in support of small and medium-size players, it is believable that SCF programs can represent a powerful tool in this regard. SCF spectrum of solutions, indeed, could act to both facilitate the implementation of sustainable-sound practices along the supply chain and concretely sustain small and medium-size suppliers struggling with financially weak positions. In line with that, this dissertation work aims at figuring out a possible point of intersection between Sustainability and Supply Chain Finance worlds. More precisely, the main objective is to verify whether SCF can represent a sustainability enabler, able to provide a concrete support to big brand firms willing to deploy sustainability-oriented actions.

Hence, SCF programs could be conceived as levers in the hand of focal firms to practically apply sustainability concepts to the supply chain dominium. That is, supply chain players registering some sustainability-related needs can build up a bespoke SCF program, jointly with financial and service providers, with the aim of getting desired outputs and advantages.

Seen this way, SCF topic could assume a totally new valence, untied from the basic and more intuitive financial perspective. To this purpose, three research questions have been structured aiming at investigating whether SCF can act as a sustainability enabler. Firstly, a preliminary theory-based research framework has been constructed, depicting the supposed connection between SCF and Sustainability. Later, such a framework has been applied and integrated through the multiple case-study methodology, leading to final results and main thesis findings.

1.2 Thesis Outline

This dissertation work is composed of six chapters. The first one presents the theoretical background and the drivers responsible for the development of such a research, highlighting the drawn research areas and the main thesis objective. The second chapter reports the carefully performed literature review, revolving around both Sustainability and Supply Chain Finance. Sustainability has been tackled, first, from a high-level perspective to turn, then, analysing two particularly relevant internal streams, applied to supply chain dominium: Sustainable Supply Chain Management and Corporate Social Responsibility. While reviewing the respective theoretical foundations, two major literature gaps have been detected. In parallel, Supply Chain Finance has been thoroughly studied and analysed, focusing on the concrete and direct advantages for companies, especially in a supply chain context. Once the two theoretical gaps, key for the work proceedings, have been detected in sustainability literature, SCF papers review went on being particularly devoted to providing an answer to such gaps. Chapter 3 starts presenting the objectives of the dissertation work to pass, then, to introduce the related three research questions deriving from the identified theoretical gaps and the consequent supposed connection with SCF. Such research questions drove all the subsequent analysis characterizing the main corpus of the work. The main part of the third chapter is, however, dedicated to present how the entire research has been conducted, carefully detailing the methodology followed to perform every step of such a dissertation work.

The kind of data used to perform the subsequent analysis is also explained, reporting the different sources. In this sense, this chapter is so structured: literature review, secondary data and case studies.

The following fourth chapter is aimed at precisely reporting and describing the preliminary research framework, representing the graphical transposition of the theory-based outputs of the three research questions, putting forward testable connections between SCF and Sustainability worlds.

The content of the three pillars composing the framework and corresponding to the three research questions has been presented, underlining the theoretical and empirical foundations.

The research went on by conducting interviews to ten firms and developing follow-up case studies. The fifth chapter is, indeed, dedicated to present the main research thesis results and findings, stemming out of case studies analyses whose main aim was to test and integrate the preliminary research framework, thus figuring out evidence-based SCF-Sustainability connections.

The results presentation has been structured according to the three research questions, thus providing the respective final answers combining theoretical and empirical insights. The discussion of the inferred results is the protagonist of the sixth chapter: here the final revised research framework is presented and discussed in the light of the dissertation main findings, representing the final combined answers to three research questions. In so doing, the proved holistic connection between Sustainability and SCF is put forward.

The subsequent chapter is the conclusions section resuming, firstly, the developed research and, secondly, presenting the main theoretical and managerial implications of such a dissertation work. The final subsection of the chapter deals with inherent limitations of the work and related possible future research developments.

The present research thesis has been developed and conducted by the author in collaboration with School of Management Engineering of Politecnico di Milano.

2 LITERATURE REVIEW

2.1 Sustainability

The concept of sustainability, as it is intended nowadays, began to populate public opinion and business world since 1987 with the publication of Brundtland Report), a document released by the Brundtland Commission whose aim was to push countries to sustainability commitment (Kuhlman and Farrington, 2010). The most relevant contribution of the Commission meeting was to provide the first definition of sustainable development:

“development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (Brundtland Report, 1987).

Nevertheless, the term sustainability appeared much earlier, as in forestry domain, meaning to not harvest more than the capability of the forest to re-generate (Wilderer, 2007). A similar meaning is associated to the word *Nachhaltigkeit*, the German term for sustainability, starting from 1713 (Wiersum, 1995). More generally, the understanding that the preservation of natural and animal resources is essential for present and future generations gets back to Palaeolithic ancestors who were afraid for their preys' extinction as well as were early farmers for the fertility of soil. Over the history, however, this tendency to preserve and take care of what can be considered the nature as a whole has always collided to the conviction that nature has to be conquered and consequently manipulated at will by humankind (Meadows, 1972). Passing to the economic field, sustainability has always been a crucial topic as it deals with the scarcity of resources and its management, which represents a pillar of neoclassical economics. Turning to what is still very relevant today, a theory on the optimal rate of exploitation of non-renewable resources has to be mentioned as one of the first attempts to treat and discuss the hot-topic of natural resources and their perishability (Harold Hotelling, 1931). Related to this, the report of the Club of Rome (1968) was crucial to draw the world attention to how natural resources might definitely expire very soon, putting the human survival at risk (Kates, 2005). Such threatening alarm was sceptically welcomed by the public opinion as it was perceived too pessimistic and hopeless: no possibility to recover and ensure a decent future was indicated, prefiguring a deadly prospect. In response to this apparently irremediable contingency, plenty of publications, official documents and reports started to appear, aiming to first analytically observe facts and, then, propose remedies. (e.g. Conference on the Human Environment, 1972, World Conservation Strategy, 1980) (Adams, 2006). The most important contribution came

from the United Nations World Commission on Environment and Development which, in 1987, released the abovementioned Brundtland Report, still dealing with scarcity of resources issue but representing a discontinuity with Rome document in that several hints and possible actions are suggested for public policy to improve and manage the alarming situation. More precisely, according to the Commission members, a sustainable development, defined as above, may represent what is needed to fulfil humans' calls for a better life while taking care of long-term environmental safeguard. The long-term orientation, especially applied to environmental, economic and social dimension, as explained in the following, is what clearly differentiate the output of the commission, representing a novelty with respect to what occurred earlier that was, too often, focused, on the current situation and related remedies (Klassen and Vachon, 2010). The Brundtland definition grounds on the assumption that a society dominated by poverty and inequality would lead to never-ending ecological crises. In this respect, development and environment are taken as inseparable in a mutual reinforcing fashion (Seuring and Gold, 2012). Governments of both developed and developing countries, should, therefore, promote social and economic development whose twofold goal is human needs satisfaction along with the preservation of environmental conditions (Hutchins and Sutherland, 2008). Of course, developed and developing countries governments are asked different degrees of participation and commitment: developed ones are required to provide a much greater effort given the number and kind of resources at their disposal (Brodhag and Taliere, 2006). In setting up recovery and emergency plans, some divergences might occur, especially when it comes to discuss and fix threshold values, but a certain degree of consensus among countries on what are the fundamental natural resources to preserve and the basic human needs to guarantee is required (Brundtland report, 1987). To sum up, the definition highlights two key points: the crucial need for development to tackle poverty and misery and the observation of how economic growth strictly gets along with environmental degradation (Vachona, 2008). Nevertheless, different scholars and practitioners have argued how the so-defined concept of sustainable development might be a bit too vague. Indeed, lots of different definitions, each with a different declination and interpretation, have been presented over the time, making it quite impossible to assign a clear and univocal meaning to the concept itself. Several authors argue how it is the context in which sustainability is approached and discussed that characterizes the content and meaning of the concept. However, many field experts state how this vagueness is the real strength of the sustainability topic as the latter covers every aspect of human life, ranging from natural resources protection to any social and economic activity. In this sense, having a very flexible and malleable understanding of what sustainability and sustainable development

represent allows to include any incoming situation which is thought to be of concern for policy makers, governments and institutions, such as social issues and in particular child labour (Ciliverti et al. 2008). What made the Brundtland report definition so successful is, indeed, its opacity (Akam and Muller, 2011). In the last decades, sustainability, often referred to as sustainable development, gained more and more attention of the business world until becoming one of the hottest and most present themes in CEOs agendas, as well as in national government planning and non-governmental organisations programs, each time differently framed and interpreted according to the diverse contexts (McCormick, 1992). In particular, the environment became very rapidly the founding element of many national and international institutions and plenty of laws have been issued to regulate companies misconduct in this regard (Adams, 2001). From 1987 on, other international meetings have been held with sustainability as a focal point. The United Nations Conference on Environment and Development in Rio de Janeiro, 1992 (the so-called Earth Summit) declared a series of sustainability principles with a detailed set of desired and needed actions. In addition, some international agreements were signed with the aim of regulating issues such as climate change and biodiversity (Lopez et al., 2008). In 2002, the World Summit on Sustainable Development, held in Johannesburg, restated how the full commitment to a sustainable development is crucial to guarantee a liveable present and future world (Vereek, 2005). Since these international meetings, the sustainability concept evolved over time in plenty of different directions, each with its own declination and contextualization, but two of them prevailed over the others: on one hand, sustainability discussion is framed within the dilemma of weak versus strong sustainability; on the other hand, sustainability started to be approached as being composed by three dimensions (environmental, social and economic) which have to simultaneously coexist and be nurtured (Seuring and Muller, 2007). In the following these two main theory streams of sustainability are presented.

2.1.1 Weak and strong sustainability

Sustainability has been long discussed also with a central focus on the degree of substitutability between the economy and environment or differently put, between natural resources and manufactured capital (meant as man-made capital). Based on the degree of substitutability that the man-made capital is believed to have with respect to the natural capital, two quite different but related theories have been developed over time: weak sustainability and strong sustainability (Seuring and Gold, 2012). These two views could be briefly summarized with the following statement by Pearce et al., 1990:

weak sustainability: That the next generation should inherit a stock of wealth, comprising man-made assets and environmental assets, no less than the stock inherited by the previous generation;

strong sustainability: That the next generation should inherit a stock of environmental assets no less than the stock inherited by the previous generation.

Below is a much more detailed and explicative presentation of these two opposite but related theories.

2.1.1.1 Weak Sustainability

According to Brekke, 1997:

“A development is ... said to be weakly sustainable if the development is non- diminishing from generation to generation. This is by now the dominant interpretation of sustainability.”

This theory is, therefore, clearly and strongly related to the concept of intergenerational equity, often used in the place of sustainable development in the economic growth theory, meaning how current generations must leave to future ones at least the same amount of welfare, intended as the total amount of natural and man-made capital (Solow, 1974). In other words, future generations must not be negatively impacted by decision made by current generations (Seuring and Sarkis, 2008, Neumayer, 2003).

Here, the underlying assumption is that there is complete substitutability between natural and manufactured capital and what really matters is the amount of welfare transferred to coming generations and not how such an amount is composed, in line with the neoclassical capital theory which tries to maximise the net utility for consumers without minding the composition of factors (Pearce et al. 1990). Indeed, the same level of stock of capital and welfare can be

obtained with different combinations of human and manufactured capital (Ekins et al., 2003, Neumayer, 2012). In this perspective, technological solutions represent powerful levers to offset environmental degradation, caused by increasing consumption of natural resources over time (Ekins et al., 2003).

As pointed out in Hartwick and Solow approach, the population of a certain area where a complete forest is cut can be better off if a new housing block is built up, bringing new value. Fundamental to this theory is the availability of tools and metrics to precisely account for the natural depletion and the environmental decay (Seuring and Beske, 2013, El Serafy, 1997).

Such a paradigm, however, might lead to contestable propositions since, theoretically, every environmental catastrophe or unregulated use of natural resources can be perfectly compensated by an enhancement of man-made resources (e.g. roads, bridges). In this respect, also monetary pay-offs could be considered as compensators of natural resources depletion (Leppelt et al., 2011).

2.1.1.2 Strong Sustainability

According to Brekke, 1997:

“The second interpretation, known as ‘strong sustainability’, sees sustainability as non-diminishing life opportunities. This should be achieved by conserving the stock of human capital, technological capability, natural resources and environmental quality”

The conception of strong sustainability is based on biophysical principles, especially on thermodynamics and biological growth laws. Translated in the dilemma of substitutability of natural and man-made capital, this theory requires the total natural stock be constant over time, denying the compensating function of man-made capital (Daly, 1991, Brekke, 1997). Indeed, there are some environmental assets, also called ecosystem services, which are deemed essential for the integrity and the survival of future generations (Hediger, 1998) and, therefore, cannot be substituted by manufactured capital (Baumann, 2002). Natural capital is thus considered as an evolving system of biological resources whose function as enabler of human life cannot be replaced by other forms of capital (Noël and O’Connor, 1998). To support this statement, Ekins (Ekins et al., 2003) argue how manufactured and natural capitals cannot qualitatively offset each other as the former, once consumed, can be, most of times, re-built and re-used while the latter is going to run out after consumption, without any possibility of regeneration. Furthermore, it is clear how manufactured capital can never be considered as a complete substitute of natural capital as it is derived somehow by natural resources (El Serafi,

1996). To further delineate how strong sustainability differs from weak sustainability, Daly in 1995 stated that natural and man-made capitals are complementary, and not substitutes as it is for weak sustainability. The author, basing on the notion of complementarity, argue how the element in shortage poses constraints; historically the element lagging behind was always the man-made capital whereas, starting from last decades, the situation got reversed with great challenges to prevent that such alarms will definitely compromise the life on the earth. Along the literature, there are several different versions of such a theory, ranging from very strong sustainability, which entails that every natural resource must be perfectly conserved (Pearce and Atkinson, 1995), to lighter versions where only certain natural resources, the so-called ecosystem services, are said to be crucial to the human survival on the earth and, therefore, require a special and bespoke monitoring; whereas, other natural assets are not deemed as essential to world population and, thus, may be more subject to the unrestrained human consumption (Costanza and Daly 1992)]. Based on the relative importance of these crucial natural assets, related human consumptions have to be carefully assessed through sustainable practices (Brand, 2009, Dedeurwaerdere, 2013). The strictest forms of strong sustainability are receiving nowadays very little consensus by international organisations and governments as imposing a-priori stringent and inflexible regulations on the use of any natural resource is anachronistic and not in line with the advancement of technological progress that, drawing from natural assets, may bring additional and un hoped long-term benefits (Stoddart, 2011).

2.1.2 Triple Bottom Line

The sustainability discussion started revolving around environmental, social and economic dimensions with John Elkington's "Cannibals with Forks" (1997) that presented an innovative approach for businesses, based on the so-called Triple Bottom Lines principle. Such name is due to the metaphorical addition of environmental and social dimensions to the classic profit-bottom line (economic dimension). According to the author, every company, in order to be fully sustainable in the long run, has to simultaneously take into consideration all these three dimensions when doing business: a perspective based on the intertwining of the three must represent the basis of any decision-making process. Put differently, Elkington intends the 3BL approach as a way for companies to effectively apply the so-called Corporate Social Responsibility (Seuring and Muller, 2007) whose definition is still open to different interpretations but it implies companies to not only seek for economic returns but to ethically behave with respect to environmental and social issues (International Organization for Standardization Advisory Group on Social Responsibility, 2004). In this sense, firms, beyond law requirements, are asked to operate in accordance to ethical and social values, respecting and taking care of all the stakeholders. (Carroll, 1991, Linton, 2007). The author, then, underlines how it is fundamental to give equal weights to the three dimensions without tending to favour, as it is often the case, the economic one at the expense of the others, in a short-term oriented strategy: "we need to bear in mind that it is not possible to achieve a desired level of ecological or social or economic sustainability (separately), without achieving at least a basic level of all three forms of sustainability, simultaneously". That is, only a company considering at the same time all the three perspectives is able to perfectly estimate the full cost of running business and, based on that, making the most out of it (Elkington, 2002).

Nevertheless, in the real world it is often unfeasible to take actions that positively affect the three dimensions at the same time: improvements in one direction usually entail worsening in the other directions, making it difficult to state whether to accept and endorse certain policy initiatives (e.g. reducing CO₂ emissions or investing in renewable resources implies further expenses for the entire population, including poor people) (Beske and Seuring, 2013). Hence, when setting up strategic action plans, policy makers have to deal with the sophisticated balancing of trade-offs among these three dimensions of sustainability as the complexity of the modern era allows for the optimization of one objective at a time (Strong, 1997).

Such strict interconnection between economic, social and environmental dimension is usually represented with either concentric spheres or overlapping circles.

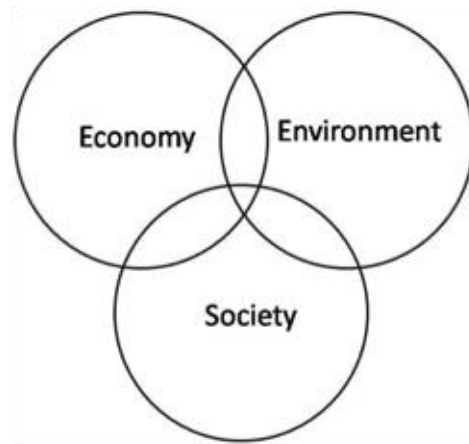


Figure 4: 3BL overlapping circles

The former conveys the idea that the three pillars mutually reinforce each other with economic and social dimensions that are influenced and constrained by the environment (Forestry Commission of Great Britain, Green Economics, Scott Cato). The latter, more recent and better centred on how sustainability is meant nowadays, presents three partially overlapped circles whose intersection represents where real sustainability lies. In this respect, equal weights and importance are given to all the dimensions which need to be perfectly integrated and aligned in every activity to make the company sustainable and thus competitive in the long-term (Vachona and Maoc, 2008).

Regarding, instead, the content and application area of each single dimension, authors and academics presented, over time, these three dimensions as quite distinct but with some linkages and interconnections representing the effective deployment of global sustainability (Akamp and Muller, 2011). Stick to that, environmental and economic sustainability have been often approached together finding out strong linkages, while there has been quite a relevant negligence on social dimension and its bi-directional relation with the other two (Seuring and Muller, 2008).

The Triple Bottom Line principle went through the last decades as the predominant approach to tackle sustainability issues thanks to its wide and comprehensive spectrum of analysis (Carter and Rogers, 2018).

In the next paragraph, a more thorough and detailed description of all three sustainability dimensions is reported, especially highlighting their evolution, the connections among each other along with the related issues of balancing trade-offs when taking actions.

2.1.2.1 Economic sustainability

This dimension historically revolved around the preservation of the economic capital, intended as the set of input physical factors, the production process and the final outputs, in order to best satisfy both current and future humans' consumption (Koplin and Seuring, 2006). Indeed, according to the most prominent economists, the economic capital must be maintained stable in order to allow everyone to be as good off as before consuming a goods, thus guaranteeing the stability of the economic system (Lawson, 2007). More precisely, Hicks, whose *Value and Capital* (1939) represents a seminal work in this domain, introduces the income as the economic reference to be kept steady over time, providing the following definition: "the amount one can consume during a period and still be as well off at the end of the period".

At the dawn of this theory stream and for quite a long time afterwards, no attention was given to natural capital as the availability and subsequent exploitation of natural resources, the so-called ecosystem services, was thought to be unlimited. Thus, related human consumption was never given any constraint (Brandenburg, 2013). In this perspective, economic growth was supposed to be the cure to the poverty and inequality, totally trusting the market for the efficient allocation of resources and assigning to the technology the role of fully re-generating or replacing natural resources used in the production process (Gold and Beske, 2009). Until recently, indeed, no economic models centred on resource scarcity and pollution-related damages had been developed. [18(freeman 1973)].

However, in the last decades, the rising concern for the massive consumption of natural resources, especially the non-renewable ones, and the consequent awareness that the current depletion rate of the latters might represent serious challenges for future planet liveability led economic sustainability discussion to not only focus on economic capital but to consider the other capitals, especially the natural one (Vachon and Klassen, 2005).

Put differently, the economic sustainability can be reached and maintained in the long term as long as the consumption of natural capital is regulated and monitored (Gavronski et al., 2010). The human consumption at that time was, therefore, heavily questioned, foreseeing how the natural supply of ecosystem services would not soon be able to keep the pace with such an unrestrained depletion. The economic growth, as intended up to that moment, began, then, to be considered as really dangerous for future economy and society with classical market mechanisms that proved not to guarantee the conservation of natural capital (Hong et ., 2011). Accordingly, the public attention and consequently all the scientific community felt the urgency to devote much more attention on how economic sustainability relates mainly with

environmental dimension and, to a lesser extent, also to social sustainability (Akamp and Muller, 2011).

In parallel, many economic theorists sensed how investing in environmentally-oriented projects might have fostered the innovation rate of countries, generating a surplus of economic outputs. In this respect, a virtuous circle would have been triggered by this new environmentalist wave (Leppelt et al., 2011). As an example, reduction of pollution and wastes stemming from the production process have a positive impact on the environment while boosting the firms' productivity as recovery costs are dramatically cut down (Porter and van der Linde, 1999).

Reporting Michael Porter's words: "by stimulating innovation, strict environmental regulations can actually enhance competitiveness" (Porter and van der Linde, 1995). In this perspective, taking care of the environment is, then, no more put in trade-off with the economic growth as the preservation of the nature gets along with the profit generation; this view calls the environment protection as an enlightened self-interest: it is fully convenient and productive for human beings to safeguard and nurture natural resources, preventing the technological progress to excessively hitting on ecosystem services (Dernbach J. C., 1998). Some luminaires argue that this win-win relationship is what lies at the basis of the concept of sustainable development, formally theorised in the so-called Brundtland Report, and what gives to the concept a practical meaning, clearly stating how growing sustainably can be beneficial for everyone (Cruz, 2011). Another totally different kind of response to the uncontrolled economic growth is the economic, social and political paradigm of the so-called de-growth, which indicates how the only credible and feasible way out of this alarming situation is to drastically reduce the pace of economic growth, if not halt it (Shevchenko, 2014). What drives the main theorists of this theory stream is the conviction that the structure and the configuration of the economic development, based on the mass-scale production of goods and its fast-related consumption, is the key factor causing the ever-alarming environmental decay, and adjustments or limitations to the growth rate will not solve anything (Carbone et al., 2012). The current consumption rate, indeed, is not sustainable at all in that natural resources are getting heavily compromised without being given the time and the possibility to regenerate (Klassen, 2009). Hence, small and incremental amendments to such a human behaviour does not tackle the problem at roots: what is desperately needed, according to these theorists, is a completely new re-thinking of politics, economy and society (Luthra, 2010). Products life cycle is getting shorter and shorter forcing to continuously market new ideas and solutions to satisfy the mutable consumers' needs. The result is the over-stressing of natural assets which intervene somehow in the production process of any product or service and the abuse of the nature capacity (sink function) to absorb wastes

coming from the disposal of used materials (Shevchenko, 2014). In this sense, the model of neoclassic economy is heavily questioned as it proposes the maximization of utility function by everyone without minding how resources are gathered and consumed (Carter and Jennings, 2002). This unregulated run for the single own satisfaction completely disregards the environment and the integrity of the community as everyone is only looking for her personal interest at nature's and anyone else's expenses (Shevchenko, 2016). Another element adding up to this worrying picture is the exponential demographic growth, especially in developing countries, which, according to many experts, will seriously threaten human survival on the earth (Campbell, 2007). Indeed, regardless of how economic growth is structured, such a steady and consistent increment of global population is thought to lead to the end of human presence on the planet as the availability of natural resources will definitely not be enough (Strong, 1997). To reverse the current dangerous situation and get back to a sustainable ecosystem, de-growth theorists put forward a complete renewal of the economic system, backed by a new structure of society along with new political and social institutions (Brown, 2007). All these changes should aim at establishing a new scale of values within a society no more based on the affirmation of the single individuality but characterized by a strong sense of communitarism and mutual help between its members (Strong, 1997). In such a context, an economy founded on the sharing of goods and services could perfectly replace the current one and build up a "new world" where social inequalities will disappear and people will differently approach the nature (Carter and Jennings, 2002). Indeed, the new set of values brought by this mind-set revolution totally overrides human priorities: environmental integrity, social equity and the related quality of life will substitute the maximization of the single individual's or small elites' utility (Carter and Jennings, 2001). This new hierarchy will make the entire population better off in that, as above mentioned, new parameters, like quality of life or level of participation on society life will be taken as reference of well-being. Economic measures, like GDP (Gross Domestic Product), have indeed proved not to be effective nor representative of the entire population health. Finally, the de-growth paradigm has been translated in diverse fields and applications which however go out of scope for what concerns the thesis main focus.

Having clearly recognised, then, the fallacy of old economic models in sustainability domain and started developing different kind of responses, quite a consistent body of literature was born to deeply analyse how economic and environmental sustainability complement each other, with the social dimension apparently playing a minor role in the discussion (Sutherland, 2008). In the meantime, policy makers started to figure out and then set up environmental regulation aiming to not only halt the natural resources depletion but also to push technology advancement

and innovation rate (Vachona and Maoc, 2008). In line with this view, companies should look at environmental restrictions not as further burdens on their operative processes but as incentives to become more efficient and improve their image at consumers' eye (Cooper & Vargas, 2004).

2.1.2.2 Environmental sustainability

Plenty of different definitions of this sustainability dimension have been formulated in last decades but, trying to embody the majority of them, environmental sustainability can be defined as the “maintenance of natural capital” over time (Goodland, 1995). Such maintenance must aim at preserving the ability of the nature to both provide inputs, under the form of natural resources, on a continuous basis (source function) and absorb wastes deriving from human consumption (sink function) (Daly, 1973, World Bank, 1986). Put differently, the aim of environmental sustainability must be the one of keeping intact the resilience ability of nature, which strongly depends on the presence of different animal and vegetal species helping each other to survive (Beske and Seuring, 2013, Pearce et al., 1990).

This nature ability is seriously put at risk by, on one hand, the ever more increasing consumption of natural resources, which is beyond the regeneration rate, and, on the other hand, the actual inability to limit wastes and to effectively leverage renewable resources. (Pearce and Redclift, 1988, Pearce et al., 1990). Hence, as reported in the previous paragraph, the worldwide attention on these environmental themes and the subsequent proliferation of related international meetings and academic researches is mainly due, on one side, to the huge threats looming on global natural conditions and, on the other side, the definitive acknowledgement that the technology advancement cannot offset the environmental degradation (Koplin and Mesterharm, 2006).

Indeed, the exponential growth, both demographic and economic, is thought, by many experts of the field, to excessively stress the nature, with the result of compromising the future availability of the so-called ecosystem services, vital for human life on the earth (Holling, 1994). Such life-support systems are available and prosperous as long as human beings operate without constantly exceeding a set of natural thresholds. Ever since, the idea of such natural limits has been the centre of discussion for ecologists and physical scientists who, with diverse degrees of prevention, always recognised how the nature automatically sets some threshold above which the survival on the earth can be heavily threatened (Holling, 1994). In particular, three of them (climate change, rate of biodiversity loss and changes to the global nitrogen cycle)

are considered by many scientists as already overcome and compromised with irreversible and alarming damages on planet survival. In such domains, the recommended action plan is to stop harming further and seek for innovative solutions tackling the problems at roots (e.g. circular economy) (Pasi Heikkurinen and Sari Forsman-Hugg, 2011).

Some experts consider environmental resources as public goods in that they are non-excludable and non-rivalrous and, like any public good, they can lead to externalities (Awaysheh and Klassen, 2009). Accordingly, people, under the umbrella of public sector, are responsible of the preservation and the correct fruition of such resources (Bernardes, 2010). It is in this directions that several market-based mechanisms, artificially projected by governments, are supposed to act by pushing market players to internalize consumption damages (Brandenburg and Govindan, 2013). These policies are framed in that theory stream, reported in the previous paragraph, that mainly conceives the new attention around the environment as a big opportunity for market actors.

However, this set of action strategies and, more generally, the path towards environmental sustainability may vary a lot country by country as each one presents its own peculiarities and related environmental emergences to cope with (Gray, 2003). Nevertheless, there is a universal commitment and consensus in devoting the maximum political and public effort to prevent further degradation and respect biophysical rules (Hong et al., 2011).

2.1.2.3 Social sustainability

As mentioned previously, this third dimension has been too often overlooked by academic researchers and scientists as the mainstream sustainability literature has always been devoted to the other two dimensions, sometimes approached as two separated entities and other times as complementary in a holistic and long-term vision of sustainability. However, the acknowledged failure of such a choice in creating a sustainable and liveable world definitely led to bring in the social dimension when approaching and discussing the sustainability topic (Seuring and Muller, 2008).

Indeed, as primarily pointed out in the Bruntland report, a sustainable development can be pursued and achieved as long as humans' basic needs are fully satisfied, with a particular focus on all those social issues typical of developing countries (e.g. poverty, child labour, social inequity). Only once such humans-related concerns are faced, the proper attention on environmental and economic issues can be deployed. In this respect, the social sustainability role is framed within the strong intersection with the other two dimensions, in a long-term

oriented strategy (Reuter et al., 2011). Indeed, working to allow everyone to have the basic needs satisfied goes along, not only with a world-wide enhanced economic situation, but also with the preservation of the environment and its services, thus linking the three dimensions indissolubly (Schiele, 2007). More precisely, the causal relationships between these three dimensions are perfectly mutual; that is, any action on one dimension have an impact on the other dimensions and vice versa (Lipton, 1997, Scherr, 1997).

Putting the three dimensions together, Durning (Durning,1992) suggests a world where strong and coherent social institutions set limits to the economic growth in order to preserve the environment while working on assuring a fair distribution of the economic outputs, so that the poorest countries will hopefully reduce the still-relevant gap with developed ones.

Back to the focus on the social dimension of sustainability and citing UK Sustainable Communities document (Pagell, 2009), sustainable communities are defined as *“places where people want to live and work, now and in the future. They meet the diverse needs of existing and future residents, are sensitive to their environment, and contribute to a high quality of life. They are safe and inclusive, well planned, built and run, and offer equality of opportunity and good services for all”*.

According, instead, to Stephen McKenzie *“social sustainability is a life-enhancing condition within communities, and a process within communities that can achieve that condition”*.

In this sense, the last decades witnessed a strong consensus among countries in extending the sustainability commitment and debate to the social issues that may threat and affect human lives (Pagell, 2009).

The social dimension themes range from macro-level criticalities, mainly dealing, as previously reported, with remarkable economic disparities between developed and developing countries to micro-level issues which are often country-specific (Seuring and Gold, 2012). In this regard, when it comes to investigate internal dynamics leading to economic disparities between members (firms and people) of a certain society, the strict interconnection between the social and economic dimensions of sustainability clearly comes out as the key turning point to come to a solution (Schmidt and Schwegler, 2008).

Such social-related issues are usually concerned with how a national (or, more widely, the global) wealth is created and then distributed among the population, whether there is an unbalanced allocation of power in business affairs or in firms-government relationships (Georgiadis and Besiou, 2008). Too often, indeed, a great mismatch of financial resources characterizes the markets composition: few giant players, transversal to several countries thanks to the globalization process, enjoy unlimited financial power and, as a consequence, privileged

relationships with financial and national institutions, given the high bargaining power and their relevance for the national economies (Vachon and Klassen, 2005). The output of these dynamics is the creation of polarized markets (Italy is an emblematic example): on one side, few players keep on growing through a virtuous circle allowing them to exploit favourable business and government relations and, on the other side, plenty of small and medium companies severely struggle to remain in the market with a competitive position, suffering a dangerous vicious circle (Tsoufas and Pappis, 2008). Their weak initial financial position, in fact, often keeps banks and financial institutions from offering financings at a reasonable cost with the result of further compromising these SMEs long-term survival (Kovacs, 2008).

In this sense, the role played by the society overall, governments, institutions and large firms, is crucial in guaranteeing to all market players, even the smallest family-run companies, fair treatments by third parties and acceptable business conditions so that the whole population is no longer threatened by sudden firms' failures and related lay-offs, with heavy consequences on society (Seuring, Martin Muller, 2008).

As it will be better specified in the following, large firms are very often greatly incentivised to mind and preserve the stability of national small players as their business is evermore connected to a network of several other firms, sometimes very small, and related products and services (Seuring and Sarkis, 2008). This is to testify how the border between social and economic sustainability is really blurry: big brands, while committing to social-oriented practices, are investing to make sure their competitive position is safeguarded in a long-term view (Koplin, Seuring and Mesterharm, 2006).

So far, some definitions and applications of social sustainability have been presented with its implications on the business world but, however, when it comes to clearly specify what social sustainability actually comprises and what are the metrics and parameters through which it is possible to get to sustainable communities, there is still a lot of confusion and disagreement (Beske and Seuring, 2013). The cause of these misalignments and lack of common vision are principally attributable to social scientists who are often said to consider an excessively wide range of themes in the discussion, thus making the concept of social sustainability and its measurement so vague and blurry (Carter and Rogers, 2008). Such divergences in the definition of clear criteria often slowed down the operative implementation process of several socially-oriented practices, which are more and more present in countries policy agendas (Carter and Jennings, 2002). The final result is the creation of country-specific practices which further emphasise the absence of universal and common social standards, transversal all over the world (Sarkis and Hervani, 2010).

Some authors made the effort to provide quite a comprehensive list of social issues that countries are usually called to cope with (Campbell, 2007). Pagell and Shevchenko, 2014 put forward education, training, inter- and intra-generational social justice, participation and local democracy, health, wellness, social equity, active communities, safety, fairness in wealth redistribution, high employment, active social networks, poverty reduction and childhood protection as some of the main pillars every government policy have to guarantee.

Yet, the quite recent development of social sustainability discussion may justify the absence of a universal understanding of this sustainability dimension (Sarre et al., 2000). Conversely, some researchers observe how this lack of universally accepted definition can be seen positively as it allows the discussion to be flexible and open enough to embrace every incoming social issue thought to be of concern for the future (McKenzie, 2004). It is fundamental, in this regard, to set up and monitor an efficient and proper process aimed at identifying and subsequently dealing with any new social challenge (Johnson, 2004).

2.2 Supply Chain Management

As previously said, the Triple Bottom Line approach became the principal stream in sustainability literature as most of the academics and researchers have recognised and appreciated over the years its wide and exhaustive spectrum of analysis (Leppelt et al., 2011). Considering simultaneously economic, environmental and social perspectives represents, indeed, the winning strategy to face the huge complexity surrounding the sustainability topic in the modern era. The interconnectedness characterizing the world of today makes it impossible to tackle, in the case of sustainability theme, one dimension at a time, whether it is economic, environmental or social (Seuring and Gold, 2013).

Nevertheless, such a fast-changing world forces every concept and research area to continuously evolve and innovate so as to keep up with times and fit current dynamics and contingencies.

One of the most recent and breakthrough changes in the business world is the outsourcing phenomenon: firms have started to outsource most of the non-core activities to external suppliers and providers in response to radical market transformations which completely disrupted the previous business context (Seuring and Muller, 2007). More precisely, the ever-increasing level of competition in the market, the drastic reduction of product life cycle, the massive widening of product variety (mass customization) and the fierce price war led companies to completely rethink their business models with the main aim of gaining flexibility,

needed to survive such a tough arena (Seuring and Sarkis, 2008). In this respect, externalizing all the collateral and non-core activities allow firms to solely focus on their central and value-adding operations, developing and enhancing specialized competences and routines (Tsoufias and Pappis, 2008). As a consequence, by running quite a restrict set of operations, firms achieve a twofold objective: on one hand, it is possible to leverage learning economies with the result of lowering costs and, indirectly, selling prices; on the other hand, the acquired flexibility, thanks to a leaner structure, permits to quickly and dynamically adapt to business fluctuations (Georgiadis and Besiou, 2008). The latters, being more and more frequent and disruptive, augmented the outsourcing trend in the last decades leading to the so-called supply chains phenomenon: several companies strongly concur to the whole value process, from raw materials extraction up to the final product delivery (Kovacs, 2008). Thus, the business context is often characterized by several suppliers' suppliers that are strongly specialized in a restricted set of activities and therefore highly efficient and productive in providing products and services to the big brand companies (Kotec et al., 2008). In this sense, the outsourcing phenomenon brings efficiency and savings for the focal companies but, at the same time, management skills are required to effectively synchronize all the chain: the whole conglomerate of linked companies should resemble as much as possible a unique firm where material, information and financial flows are perfectly integrated (Vachona and Maoc, 2008).

Of course, lots of different supply chain layouts exist according to the industry, the focal company strategy, and the consequent diverse kinds of relationships between actors (Seuring and Muller, 2008). Brand companies can, indeed, depending on the kind of product or services provided, sign exclusivity partnerships with suppliers, forcing the latter to work only for them, or spot contracts with the cheapest suppliers (Akamp and Muller, 2011).

The totally opposite paradigm dominating most of the last century was Ford's vertically integrated structure where all the activities, ranging from raw materials treatment to final car delivery to customers, were performed by the same company (Johnston and McCutcheon, 2004). An enormous area in Detroit, wherein thousands of workers commuted among several plants and equipment, was the unique operative centre of the company. Such a rigid structure and organization represented the key success factor for Ford and made the company a benchmark for every player in the automotive sector for several decades on. That layout was so successful as the perfect stability of the market with very few other players, a very long product life cycle along with an almost null product variety allowed the firm to make huge capital investments, paying them back in short time, and, subsequently, leverage economies of scale.

In a scenario with no differentiation requested by customers, the efficiency lever was stretched at the maximum, representing the real competitive advantage.

The famous quote by Henry Ford (the founder and the owner of the car-maker firm) is emblematic to signal the perfect stability of the demand at that time: “Any customer can have a car (Ford T) painted any colour that he wants so long as it is black.”

As previously highlighted, the turbulence of nowadays context, completely absent in the past, makes it impossible to pay back huge expenses in fixed assets and a vertically integrated structure, like Ford one, cannot cope with the market volatility, leading to the creation of supply chains (Krause, 1997).

In every supply chain there is usually a focal firm that, beyond performing its more or less narrow set of core operations, coordinates the entire physical, information and financial flows along the chain, assuring the proper final delivery of products or services (Ittner and Larcker, 1999). Indeed, besides the most intuitive physical movement of goods, other two types of flows occur along the connected companies: the first one is concerned with the information transfer needed to synchronize and coordinate the required activities; the second one regards all the payments that every company owes to upstream ones and receives from downstream ones, with the intermediation of some financial players (Reuter and Hartmann, 2010).

In such a scenario, the competition is no longer played between different single firms but between different supply chains: focal companies, as briefly mentioned before, try to establish exclusive relationships and partnerships with their suppliers in order to keeping other competitors from benefitting the same technological know-how (Carter and Pullman, 2009). Being able, indeed, to leverage the interfaces with suppliers and customers through an effective and efficient exchange of goods, information and financials, the so-called supply chain management, represents a key competitive advantage for any company willing to make profits in such market conditions (Donaldson, 2002). In this regard, to properly manage and leverage connections with suppliers and customers, companies are often required to modify routines and practices also within its boundaries, making themselves more flexible and open to absorb new knowledge from outside, the so-called open innovation (Akamp and Muller, 2011).

To make the management of these supply chains even more difficult and complex to manage is another recent and break-through trend, somehow correlated with outsourcing development: geographical, economic and social barriers between countries are no more as relevant as in the past leading to the so-called globalization phenomenon (Klassen and Vachon, 2005). Such a macro-trend would deserve a complete and thorough presentation and discussion but here, in order not to deviate from the main topics of this research, only the implications on supply chains

are presented. That is, as geographical distances represent no more an obstacle for plenty of different reasons, big firms started to considerably expand over several countries (the so-called multinational companies) while setting up cross-countries supply chain as a consequence (Silvestre, 2016). Geographical, cultural, social and economic diversity obviously renders the management of interfaces between one company and another one of the same supply chain ever more complex and, hence, risky for the brand company business (Carter and Rogers, 2008).

For what strictly concerns the literature around the topic of supply chain management (SCM), an exponential growth of articles and scientific papers deep-diving this research area can be noted in the last decades, signalling how crucial this business evolution is for companies (Cooper et al 1997).

This consistent body of literature tried first to propose definitions of what is meant by the term Supply Chain (SC), giving rise to plenty of different interpretations.

La Londe and Masters (1994) defines the SC as a group of firms exchanging goods from upstream to downstream generating a flow of in-process materials.

Lambert, Stock and Ellram (1998) add to the flow of materials the information flow, needed to synchronize all the players' activities, which is considered as important as the physical transfer of goods and vital to assure the proper customer's satisfaction. Christopher (1992) enriches the two former definitions by putting the emphasis on the progressive creation of value all along the chain by the different players linked to each other in a supplier-customer relationship.

Mentzer et al. 2001 proposes a classification of SCs based on the number of players involved, going to categorize three archetypes: the Direct SC, the Extended SC and the Ultimate SC. The first one is the simplest as it is made of just one focal company, one supplier and one final customer, directly served. The second one is more structured and complex as it incorporated both multi-tier suppliers (suppliers' suppliers) and multi-tier customers (customers' customers) meaning that very often the focal company of the SC does not directly serve the final consumer. The Ultimate SC, instead, is intended to be composed not only by the players concurring to the physical transformation of goods but by all the entities participating in the information and financial flows. It is with this last definition that the focus starts to be placed on the management of these interconnected flows (physical, information and financial) which makes the difference between an effective and efficient SC and one struggling in the business. To this regard, the literature presents a wide analysis of the concept of supply chain management and how a proper application of the latter, in its physical, informational and financial declinations, can incredibly improve companies' performances (Metz, 1998).

Several definitions have been suggested over the last decades, all having, as a common point, the key role played by SCM in determining the success or the failure of any firm willing to do business in such a frenetic environment (Ross, 1998). A holistic and exhaustive definition of SCM is the one provided by the Council of Supply Chain Management Professionals (CSCMP): “Supply chain management is an integrating function with primary responsibility for linking major business functions and business processes within and across companies into a cohesive and high-performing business model. It includes all of the logistics management activities, as well as manufacturing operations, and it drives coordination of processes and activities with and across marketing, sales, product design, finance and information technology”. As clearly expressed by this definition, a complete new way to do business is put forward, revolutionizing how a company is structured internally and how it spans externally to connect with other players, both upstream and downstream (Langley and Holcomb, 1992).

Back to Ford example, it is possible to witness, over the last century, a radical transformation from a complete vertically integrated and product-centred company to an information-based and customer-centred one, taking charge of only managing and coordinating the processes performed by its suppliers and partners. Such case perfectly represents the evolution of the way to do business over the years: a company directly managing the entire manufacturing process turned into a supply chain orchestrator, making sure that all the stakeholders (e.g. suppliers) in the manufacturing process are properly aligned with customer’s requests (Seuring and Brandenburg, 2013). The result of adopting this kind of operative configuration is a firm incredibly responsive and reactive to any business mutation as the main asset is the information managed and shared along the chain (Gavronski and Klassen, 2010).

This kind of configurations, based on very long supply chains, may present, however, some drawbacks and criticalities: there is quite a severe risk to lose competences and know-how alongside an inevitable decrease of control over the quality of the entire transformational process performed by suppliers (Seuring and Muller, 2007). To cope with that, firms sometimes, when outsourcing entire functions, keep inside some control teams aiming to carry out periodic controls on suppliers’ outputs and thus immediately solve issues that otherwise would later turn into serious problems (Schmidt and Schwegler, 2008).

Nevertheless, the strong forced reliance that focal companies have on their supply chains might anytime lead to unpleasant and unexpected situations to manage for brand companies (Akamp and Muller, 2011).

This is especially true when it comes to sustainability: companies, given the high attention final customers put on this topic, are more and more keen on conveying a perfect sustainability-sound image, both socially and environmentally (Maloni and Brown, 2006).

In light of this and the high interconnectedness between the firm and its suppliers, it is pretty much clear how scarce attention on sustainability issues by either brand companies or its suppliers might bring disastrous damages in terms of brand image, heavily compromising profits (Amjed and Harrison).

What is required to convey a sustainability-sound image will be discussed in the next paragraph, which explores how a brand company has to tackle sustainability issues, in its broadest meaning, along its supply chain. In response to this new need to extend the company commitment to its supply chain, new literature started to emerge with the aim of analysing and investigating what is required to have completely sustainable supply chains.

A famous example of how suppliers' behaviour can have tremendous impacts on brand company reputation is Nike child labour scandal. The famous multinational firm operating in the apparel and sports accessories industries was accused several times to have child labour manufacturing their products in the so called "sweatshops", standing for places characterized by poor and socially unacceptable conditions. Such accusations were made public with enormous negative effects on company's brand reputation and, indirectly, on international sales. Nike, being tremendously hit by these scandals, decided to start carefully auditing and monitoring all its manufacturing suppliers, especially the ones located in poor and developing countries, by setting up codes of conducts and strict regulations to respect.

2.3 Sustainability and Supply Chain Management

What has been reported so far clearly highlights how the performances of the focal company in the supply chain strongly depend on the behaviour of the other linked companies, both upstream and downstream (Schmidt and Schwegler, 2008). Especially, suppliers of manufacturing companies play a crucial role for the overall quality of final products since, as already mentioned, a big portion of added value comes from them (Seuring and Muller, 2007).

All of that has strong implications for focal companies that have to take responsibility for suppliers' output in front of the final customers and are, thereby, asked to closely monitor suppliers' operations and related outputs, whether they are products or services (Cotec et al., 2008).

As briefly mentioned in the previous paragraph, themes like sustainability and its repercussions on the company can no longer be tackled with an isolated action plan as it was in the past, where every firm was used to approach such topics by intervening only within its boundaries with standalone strategies (Hutchins and Sutherland, 2008). Given the strong dependence every firm has from its suppliers, such a kind of internally-oriented strategies would end up only limiting the negative consequences of the various problems with the risk of re-incurring in similar dangerous situations in the future (Windsor, 2006).

In this respect, the sustainability of brand companies' supply chains started to emerge in the last decades as a key topic in business and management literature (Kovacs, 2008). Despite the growing recognized importance of such a theme, the body of literature is still limited in quantity of papers given the novelty of such a topic and some gaps can be identified, as it will be shown in the following (Seuring and Sarkis, 2008).

Given the wide meaning of the term sustainability itself, as deeply discussed in previous paragraphs, its application by focal firms on their supply chains can be declined in plenty of different areas of intervention, each of them with diverse objectives and therefore diverse actions and practices to implement.

Nevertheless, two main streams of sustainability applications to supply chains can be identified: the first one is the so-called sustainable supply chain management while the second one frames the sustainability applied on supply chains in the wider topics of corporate social responsibility and risk management.

A proper sustainable supply chain management plan is of paramount importance to prevent world-wide scale scandals, like the above discussed case of Nike, which seriously threaten the firms' survival in the markets (Searcy, 2013). Such a plan, indeed, becomes crucial when it comes to multinational manufacturing companies which have to guarantee all its supply chain actors be compliant according to environmental and social standards (Carter 2004). This stream literature, therefore, explores all the practices and techniques to have sustainable-sound supply chains (Schmidt and Schwegler, 2008).

The second one, instead, is a wider-scope topic as it is concerned with the support given to all the small and medium players of the supply chain by the focal companies and, then, to society overall, in a social-oriented approach (Amjed and Harrison). In this sense, not only the small and medium actors in the supply chain strongly benefits from these aids but also the risk for the focal companies to incur in supply chain disruptions is by far mitigated with positive consequences on everyone's business (Silvestre, 2016).

In the following paragraphs these two streams will be further presented and detailed.

2.3.1 Sustainable Supply Chain Management

As previously reported, the outsourcing wave and an ever-more pervasive globalisation process led to the formation of very long and complex supply chains spanning all over the world (Pagell and Shevchenko, 2014). Speaking about a nowadays manufacturing brand company, its supply chain may extend over several different countries as, very often, the production is off-shored in developing countries, where the labour is very cheap, while value-adding activities are usually based in the Western world (Linton and Klassen, 2007). It is especially in poor and developing countries that major criticalities occur as these are two-speeds nations where the wealth is concentrated in few ones' hands with the big majority of population severely suffering in poverty (Cruz, 2011). Furthermore, working conditions are too often extreme and dangerous as no regulations exist (Leppelt and Reuter, 2011). All of that implies the corporate management to take responsibility of their suppliers' and partners' behaviours, as it is, by now, very clear how environmental and social problems do not stop at the borders of the single brand firms but they may arise all along the material and information flows with heavy repercussions on downstream actors' business. (i.e. the supply chain) (Klopper, 2003).

It is, therefore, acknowledged how, in an increasingly interconnected world, economic, social and environmental sustainability challenges can only be addressed in joint efforts, after being comprehended from a system perspective (Seuring and Gold, 2013).

As already explained, brand firms are also called to commit in a social responsible way in response to lots of pressures coming from several stakeholders, more and more attentive to such themes (Handfield, 2005). In particular, two groups of stakeholders are most relevant: on one hand, customers who are the ones accepting the product or service placed on the market and, on the other hand, all the types of government control, be it local, national or multinational governments that must guarantee for the society integrity and safety (Seuring and Muller, 2008).

All of that becomes crucial for those firms under a close scrutiny by the public opinion that, being increasingly aware of supply chains composition, strictly observe the entire transformational process leading to the final product or service. If any environmental or social-related issue comes out publicly, brand equities and sales of these corporations could be heavily impacted (Bates, 2003).

In the light of these incumbent threats, companies' strategies can be placed along a continuum whose extremes are, on one side, a reactive response and, on the other side, a proactive attitude aiming to prevent that such situations might re-occur in the future. That is, reorganizing its own

supply chains with the end of preserving the natural environment and respecting the local communities (Vachona and Maoc, 2008).

Such sustainable-sensitive reconfiguration of supply chains might imply different degrees of organizational effort and commitment by the focal firms as it varies a lot depending on several variables characterizing the supply chain layout, its composition and the extent to which the focal company is under the consumers' observance. (Kogg, 2003) The span of activities and remedies put in place by the focal company may be, indeed, very wide: introducing a firm-tailored code of conducts to be followed by suppliers, imposing fair labour practices, developing alongside suppliers environmental-sound practices, working with local institutions and non-governmental organisations (NGOs) to guarantee social justice and social equity, training suppliers in implementing environmental and social-oriented practices etc. (Bowen, 2001).

In this sense, the direct intervention by focal companies to tackle social and environmental issues in their supply chains mostly occurs when it comes to poor and developing countries where a consistent part of world-wide manufacturing activities is placed. Apart from these emergency situations, focal firms usually set up monitoring and control systems to make sure their supply base is compliant with environmental and social standards (Magnan, 2002). This could imply suppliers to adhere to industry voluntary guidelines or to international standards (e.g. ISO regulations). (Flynn, 2013)

As it can be easily inferred, nowadays, having a sustainable-sound supply chain, compliant to the diverse environmental and social standards, represents for a company the *conditio-sine-qua-non* to remain competitively in the market (Maloni and Brown, 2006).

This awareness indissolubly bonds the three dimensions of sustainability, environmental, social and economic, translating the triple-bottom-line principle to the supply chain dominium (Carter and Easton, 2011). A focal firm, indeed, can instil full sustainability in its economic outputs and so be profitable as long as its entire supply base is respecting environmental and social standards (Vachon and Klassen, 2005).

Such three dimensions, as already seen when describing 3BL approach in general terms, nurture each other in a mutual fashion, simultaneously allowing every player of the supply chain to competitively do business (Sarkis, 2005). One player's misconduct in environmental or social area might bring huge economic backlashes for all the other downstream players as well as a compromised reputation for the focal firm (Melnik, 2002).

Moreover, not only does this sustainability commitment fulfil consumers' requests, but such collaboration between focal firms and their suppliers on sustainable practices often leads also

to technology advancement and more efficient ways to carry out operations along the value chain with great improvement in the whole productivity (Seuring et al., 2007)

In this respect, in nowadays context where sophisticated customers dictate the market conditions, a proactive environmental and social management of the supply chains becomes a way either to differentiate the products or services or to be more cost competitive (Mesterharm, 2009).

Summing up, as anticipated in the previous paragraphs, the so-called sustainable supply chain management is meant as an application of the sustainability concept, especially declined in the 3BL approach, to fit the current business context, characterized by very long and cross-borders supply chains.

Here is quite an exhaustive definition of this literature stream in (Seuring and Sarkis, 2008) words: *“we define sustainable supply chain management as the management of material and information flows as well as cooperation among companies along the supply chain while taking goals from all three dimensions of sustainable development, i.e. economic, environmental and social, and stakeholder requirements into account. In sustainable supply chain management, environmental and social criteria need to be fulfilled by supply chain members to remain within the supply chain, while it is expected that competitiveness would be maintained through meeting customer needs and related economic criteria”*.

This definition highlights three key main points. The first one is concerned with the crucial role played by sustainability in every supply chain: nowadays no supply chain, intended as all its members, disregarding sustainability commitment, in any of the three dimensions, can survive in any market for long time (Seuring and Muller, 2008).

The second point stresses out how acting sustainably can really be a competitive weapon in the hands of all the supply chain actors as consumers are more and more rewarding social and environmental-sensitive behaviours (Nijhof, 2015). Such conviction should represent a big incentive for focal companies to go through all the activities and efforts to push all the chain to implement sustainability-oriented practices (Dey, 2006).

The third and more hidden point refers to the need for focal companies to reach beyond first-tier suppliers when committing to sustainability. This represents a novelty with respect to conventional supply chain management wherein the focus is on the closest suppliers to whom the management of further tiers is delegated (Sturm 2008). Dealing, instead, with such a delicate and resonant topic forces focal firms to directly take charge of the whole supply chain practices and behaviours, aligning all the actors in one single sustainable direction (Foran, 2014). This implies to develop closer relationships with suppliers and not mere arm length relations, as it is

often the case of classical supply chain dynamics (Seuring and Muller 2008b, Ashby et al. 2012).

More generally, the involvement of all the stakeholders (e.g. NGOs, governments, etc) in the process of implementing sustainability is fundamental to develop and feed up environmental and social standards and related measurement and monitoring systems (Faber et al., 2001). Such a wide and systemic view to approach sustainability management leads to enhanced performances in the environmental, social and economic dimensions for the whole supply chain (Downie and Stubbs, Azevedo et al).

So far, the genesis and the main theoretical principles of sustainable supply chain management have been presented along with some guidelines that focal companies should follow in order to successfully transfer sustainability along the supply chain.

However, most of the times, big companies incredibly struggle to get sustainable supply chains despite providing full organisational and economic commitments. There are, indeed, some supply chain-specific barriers and obstacles complicating the deployment of what can be considered effective and smooth sustainability plans on paper. In this regard, the literature puts forward some recognised impediments to such plans, dividing them between focal firm's side ones and supplier's side ones (Cotec et al., 2008).

In the first category, high upfront costs to make suppliers more sustainable and problems of communication lack plus scarce coordination at the interfaces with upstream players represent the main hurdles focal companies have to deal with, especially when it comes to suppliers based in developing and poor countries (Schmidt, 2007). Such issues could discourage the big brand companies to even begin implementing sustainability plans for their supply chains (Montanari, 2012). Nevertheless, these barriers are not as relevant as the second category ones in that, as already explained, focal companies may draw enormous economic advantages from having all their suppliers compliant with sustainability standards and are, therefore, most of the times, willing to go through high initial costs and big efforts (Cotec et al., 2008).

The obstacles of the second category, typical of small and medium suppliers, are related to the absence of incentives and direct economic returns attached to sustainability initiatives which, thus, end up being disregarded by these players (Norton, 2009).

Suppliers, indeed, are called to cooperate with focal companies to deploy new sustainability-oriented activities, abandon old routines and figure out new ways of working in order to respect social and environmental standards (Carter and Easton, 2011). Hence, they are required to dedicate a considerable amount of time and financial resources to such projects, perceived as

collateral to their core business (manufacturing a product or providing a service), without being given any clear economic reward (Papadopoulos, 2015).

Put differently, the direct correlation between a strong commitment in sustainability and an economic return holding for focal companies is not so linear for upstream players, especially small and medium ones (Cotec et al., 2010). As a matter of fact, sustainability plans aiming to extend sustainable practices to all the upstream part of the supply chain often clash with the scarce collaboration of suppliers who prefer allocating resources and efforts to their core set of operations, the main responsible for their economic success or failure (Bondy, 2007). As these players are usually small corporations struggling with financials, their main concern is, first of all, dealing with all the expenses directly related to their business (e.g. operative and labour costs) to close the year with a satisfying bottom line (Vachon and Klassen, 2006). This is for them the priority for guaranteeing a business continuity in the long-term SSCM.

Accordingly, all the managerial efforts are dedicated to providing their customers with a cutting-edge offer and, thus, extra-costs and resources for sustainability projects mainly represent a further burden for these suppliers' income statements (Bowen, 2002).

This totally opposite conception of sustainability projects, a non-value adding and time-consuming activity for suppliers and a competitive advantage for big brand firms, is often the key issue preventing a well-architected plan from reaching the initial sustainability goal (Cotec et al., 2008).

Hence, focal companies are called to find out innovative ways to implement these sustainability-oriented plans with the aim of having suppliers actively working on such projects (Besiou, 2013).

To this purpose, however, the literature has not provided yet any relevant contribution nor practical application as it has mostly limited to underline how the absence of incentives for suppliers to follow up on these projects is one of the main causes stopping the sustainability implementation process on supply chains.

In this respect, after having analysed and reported the main pillars and contents of the literature on sustainable supply chain management, a theoretical gap is identified: how focal companies can stimulate and push suppliers to actively cooperate in the deployment of long-term plans aiming to extend sustainable practices and standards along the entire supply chain.

This research thesis aims at closing this literature gap by documenting real cases of big brand firms that set up innovative systems pushing all their suppliers to commit in a social and environmental direction.

2.3.2 Corporate Social Responsibility as a Risk Management Tool

Big brand firms have been receiving for some decades an incredibly high pressure to take care of the overall society when doing business, evaluating and monitoring the impacts of their actions on the well-being of current and future generations (Gold, 2014). That is, companies have to consider as a final objective of any strategic action plan not only a direct economic return but also an improvement in the living conditions of the social community they work in (Dalkey, 1997).

Such enhancement in living conditions regards any aspects of human life such as guaranteeing minimum wages to all the population, taking care of the cultural and social growth of nations, preserving the natural environment and its scarce resources and working for social equity and social justice (Bakker, 2006).

These pressures to deploy an ethical and social-sensitive behaviour may come from plenty of different actors representing the big companies' stakeholders: shareholders, potential investors, managers, employees, customers, business partners, contractors or suppliers, national governments, international institutions and non-governmental institutions contribute to shape the success or failure of any company (Aitken, 2015). The underlying assumption pushing these entities to ask for such a kind of companies' commitment is, indeed, the conviction that firms have to leverage and rely on lots of different subjects to effectively run their business since even the most innovative and advanced firm can never succeed in the long-term without the help and cooperation of external entities, whether they are business, national or single physical entities (Hutchins and Sutherland, 2008). Big companies are, therefore, called to give something back to the overall society, intended as the whole set of subjects they interact with, providing a sort of reward (Jolley, 2006).

In line with this concept of mutual help, scholars have defined this new theory stream with the name of Corporate Social Responsibility (CSR) which further stresses how the big companies should take responsibility towards the society they build their success on (Ciliberti et al., 2008). Here is a definition of CSR by (Georgiadis, 2008) summarising the principles so far highlighted of this literature stream: *“corporate social responsibility is the continuing commitment by business to behave ethically and contribute to economic development while improving the quality of the life of the workforce and their families as well as of the local community and society at large”*. It is worth to mention, here, how ethically and responsibly committing leads to overall economic development: by nurturing and preserving the society where operating,

companies automatically work for preparing a better own business future. In light of this, business and society are intertwined in a mutual reinforcing fashion (Crane, 2004).

Using Shevchenko's (Shevchenko and Pagell, 2014) definition *CSR is concerned with treating the stakeholders of the firm ethically or in a responsible manner. 'Ethically or responsible' means treating stakeholders in a manner deemed acceptable in civilized societies. Social includes economic responsibility. Stakeholders exist both within a firm and outside. The natural environment is a stakeholder. The wider aim of social responsibility is to create higher and higher standards of living, while preserving the profitability of the corporation, for peoples both within and outside the corporation.* The indissoluble bond between economic success of companies and the wellness of society, here extended also to the environment, is remarked (Campbell, 2010).

Another important feature of this theory is the one underlined in the following definition by ([1], p. 7): *'the voluntary integration, by companies, of social and environmental concerns in their commercial operations and in their relationships with interested parties'*. Companies deliberately decide to get involved in such a kind of actions: there are no enforcements guiding the implementation of social-oriented practices by companies (Shevchenko and Pagell, 2014). Discussions around Corporate Social Responsibility got much higher attention in last decades, until becoming one of the hottest point in corporates agendas, as the business context, as already reported, completely changed (Cruz, 2011).

The supply chain phenomenon, widely presented in the previous paragraphs, further augments how much a company is depending on the performances of connected business partners and thus on the wellness of the whole society (Muller, 2012). It clearly comes out, therefore, how socially acting leads to a win-win situation for both the big brand company and its partners as virtuous actions in favour of suppliers have an immediate positive reflection on big companies' performances (Davies et al., 2005).

CSR here is intended as the preservation by focal companies of the long-term health, mainly financial, of the actors composing their supply chains (Carter and Rogers, 2008). This kind of social help is of crucial importance when it comes to supply chains characterized by a high presence of small and medium nationally-based enterprises which very often incredibly struggle to give continuity to their operative business due to weak financial positions (King and Rankin, 2001).

In this respect, focal firms take charge of guaranteeing sustainability to their entire supply chain, making sure all suppliers can survive in the long-term while competitively providing their services needed to all the supply chain actors (Yang and Ma, 2000).

Seen this way, such social-oriented support to own business partners can be conceived also as a risk management tool in that providing such a supportive function to suppliers, especially the strategic ones, contributes to prevent the so-called supply chain disruptions (Giannakis and Papadopoulos, 2015). The latter ones may, indeed, disastrously impact the firms which are downstream the actor experiencing the issue (e.g. interruption of operations due to financials lack) (Carter and Rogers, 2008).

Being risk management strategies, such supplier-oriented actions imply a certain amount of financial expenses by focal companies to develop and set up a well-sound plan aiming at lowering the risk of suppliers' default (Vachon and Klassen, 2005). Simultaneously big firms enjoy big and remunerative returns in terms of brand image (Klassen et al., 2007).

However, in the literature there are no concrete examples of how a big brand can put in place social actions aiming to support its supply chain in day-to-day activities and thus bringing a direct positive return for the entire supply chain.

This thesis, therefore, tries to bridge such a theoretical gap by providing practical implementations, transversal to different industries, of what can be considered social-oriented projects aiming to financially sustain big companies' supply chains.

2.4 Supply Chain Finance

2.4.1 Supply Chain Finance background

Supply Chain Finance (SCF) is quite a recent literature stream mainly originating from the intersection of Supply Chain Management and Trade Finance (Hofmann & Belin, 2011). Despite some practical applications, later classified as SCF solutions, began populating the business context some decades ago, the first appearance of the term SCF as a new structured topic in literature papers and management magazines gets back to the turning of the new millennium (Camerinelli, 2008). This theory field, however, remained almost unknown until it became a hot-topic in business literature after the entire world has been heavily hit by the financial crisis started in 2007 (Klapper, 2006). The latter, caused by several factors whose discussion exceeds this research thesis scope, has long been afflicting companies as it brought along a massive credit crunch and a consequent increase in the cost of financing (Caniato et al., 2015). Banks and the other traditional financial intermediaries, in fact, have been forced to drastically reduce the granting of new loans, whose interest rates, on average, considerably surged (Hofmann, 2011).

In such a contingency of liquidity shortage, which was also derived by other factors (e.g. the collapse of the asset- and mortgage-backed markets), the most damaged players were often the small and medium enterprises whose poor capital and assets availability, on one hand, seriously threatened the day-to-day operations and, on the other hand, contributed to rise up interest rates of bank-issued financings (Bowman, 2005).

As a consequence, these players tried to extend trade credit terms from upstream suppliers in order to supplement other forms of financing and give continuity to the operative part of the business (Wuttke et al., 2013).

Big players, instead, were much less affected by this financial crisis as their financially solid structure allowed them to keep on running their business and still borrow money from banks at reasonable costs (Randall, 2009). Hence, they took the role of liquidity providers, accepting an increase in payment terms by their downstream customers (More, 2013).

Contemporary, banks have been required to innovate their products and services in order to meet the needs of more competitive and prudent markets (Gelsomino et al., 2012).

Turning to supply chain environment, which is characterizing the nowadays business context, three flows occur along the connected players: material, information and financial flows (Pfohl and Gomm, 2009). The first two have long been optimised and synchronized as they were

always supposed to be the key to excel in competitive markets (Lundin, 2012). Whereas, the financial flow, composed by all the money transfers involving supply chain players and financial actors, has always been neglected and temporally misaligned to product and information flows SCF. (Pfohl and Gomm, 2009; Wuttke et al., 2013).

Flow	Description
Physical	The actual movements and flows within and between firms; it includes the activities of transportation, service mobilization, delivery movement, storage inventories and logistics.
Financial	Flows of cash between organizations and consumers, incurrance of expenses, A/R and A/P processes and systems, DPO and DSO managements.
Information	Processes and electronic systems, data movement triggers, access to key information and knowledge, capture and use of data, enabling processes and market intelligence.

Table 7: Supply Chain Flows (Mathis & Cavinato, 2010)

The world-wide financial crisis made such a fracture between, on one side, the material and information flows and, on the other side, the financial flow even more evident in that, as said above, companies, in response to liquidity shortage, started asking for extension of payment terms to upstream players, so as to keep the working capital (WC) levels controlled (Popa, 2013).

The latter along with cash-to-cash (C2C) cycle, its temporal translation, are considered the most important indicators of efficiency and management of the entire supply chain (Hofmann & Belin, 2011).

The Working Capital (WC) is a financial metric representing the operating liquidity of a firm, comprising all those current asset items that turn into cash within one production cycle, usually coinciding with one solar year (Manatsa, 2008).

The Net Working Capital (NWC) derives from the WC and it is a metric commonly used in validation techniques to compute the Discounted Cash Flows (DCF), calculated as the difference between the current assets and the current liabilities (Vachon, 2008). The amount of a company’s NWC represents the liquidity needed to run the operative part of the business. Theoretically, NWC is suggested to be maintained as low as possible, preferably with low

components too, in that companies usually have to finance such required liquidity (Lampe and Hofmann, 2014). In practice, however, persistent negative values of NWC are not sustainable as they indicate that companies' current assets are less than current liabilities (the so-called working capital deficit) (Spekman, 2014).

An important reference to examine how a company's cash flow is managed and better monitor the NWC value within the company, as well as within the supply chain, is the Cash- to-Cash (C2C) cycle, calculated as follows:

$$\begin{aligned}
 \text{C2C cycle} &= \text{average turnover period} + \text{period of receivables} - \text{period of payables} \\
 \text{Average turnover period} &= \text{Days of Inventory Holding (DIH)} \\
 \text{Period of receivables} &= \text{Days of Sales Outstanding (DSO)} \\
 \text{Period of payables} &= \text{Days of Payables Outstanding (DPO)}
 \end{aligned}$$

The C2C cycle is the time span occurring between the reception of goods from suppliers and cash collection from customers (Randall and Farris, 2009). Put differently, it represents how many days a company has to wait before having back the money invested to acquire input materials (Shao, 2012). As it was for NWC, companies' performances excel with low values of C2C cycle as that implies that liquidity is soon freed up and available to be reinvested in other profitable investments (Weiss, 2012).

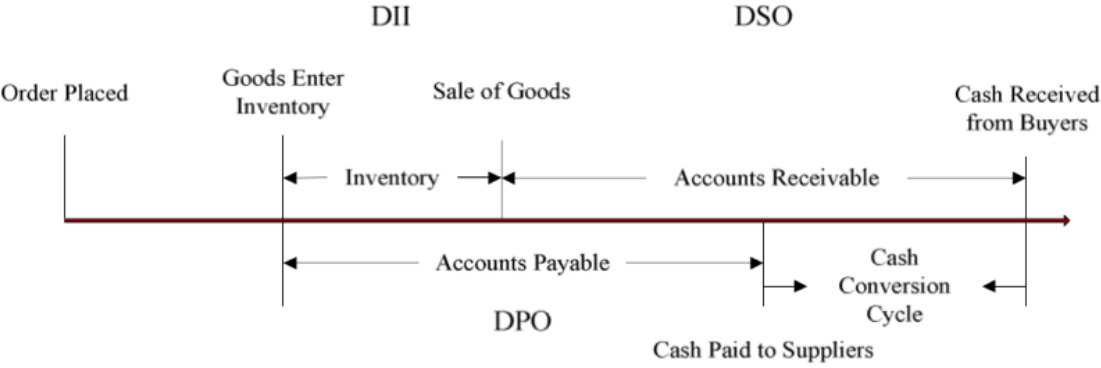


Figure 5: Cash conversion cycle (Lamoureux and Evans, 2011)

C2C optimization at a supply chain level is enabled especially by the integration and automation of all the three flows (material, information and financial) above reported. (Camerinelli, 2009). Referring, therefore, to a typical supply chain, there was a continuous extension of payment terms, needed to maintain a decent working capital position, going upstream the chain, with the

result of heavily compromising the survival of the small players placed at the beginning of any transformational process (Vachon, 2008).

In such a scenario, there was an urgent need for alternative and cheaper short-term financing systems with respect to what was currently available in the financial market (Weems, 2001). This is where SCF comes in as its main function is, indeed, to provide additional financing opportunities by leveraging the strengths of supply chain links to optimize working capital, thus representing concrete alternatives to banks for what concerns short-term financing (Gelsomino et al., 2012).

2.4.2 Supply Chain Finance definitions

In practical terms, SCF can be defined as the implementation of solutions that aim at increasing and optimizing the value of two or more companies which belong to the same supply chain through an approach that provides alternative means of financing, besides the traditional ones, by leveraging the companies' interconnections within supply chains (Caniato et al., 2015).

Whereas, when formally defining what SCF really consists in, academic researchers, field experts and management professionals still struggle to get to a consensus as the boundaries of this new topic are not well-defined yet, especially when it comes to state its spectrum of applications and the role played by financial intermediaries (Pfohl, 2009). Camerinelli (2009) defines it simply as a set of financial solutions, while Wuttke and colleagues (2013) strictly limit the scope defining SCF as a more modern form of Reverse Factoring, thus giving rise to the so-called "buyer driven" perspective. Indeed, some authors focus in particular on the optimization of days sales outstanding (DSO) and days payable outstanding (DPO), such as Camerinelli (2009) and Lamoureaux and Evans (2011), who adopt a "finance oriented" perspective (Gelsomino, Mangiaracina, Perego, & Tumino, Supply chain finance: a literature review, 2016); other researchers expand the scope to include also days inventory holding (DIH), in order to have a complete overview on the company working capital needs. Nonetheless, SCF definition can be amplified to take into consideration also fixed asset financing (Pfohl & Gomm, 2009; Hofmann & Belin, 2011), thus following a broader "supply-chain oriented" perspective (Gelsomino, Mangiaracina, Perego, & Tumino, Supply chain finance: a literature review, 2016).

Perspective	Focus	SCF definition
Finance oriented	Company's financial position and its ability to finance the operative business; the financial institution plays a key role	Set of innovative short-term financial solutions commonly provided by financial institutions, which have proven to have a positive effect on the financial performance of supply chain players.
Buyer-driven	Company's C2C cycle optimization by working on DSO and DPO	Evolved form of Reverse Factoring by the means of new technologies involved in the process enabling a broader portfolio of customers which can access capital at a lower rate, enhanced transparency, flexibility improvements and a higher involvement of new players as third-part logistics providers.
Supply-chain oriented	Supply Chain C2C cycle optimization by working on all its three components	Set of solutions that include supply chain processes, inventories, fixed asset financing (i.e. through a pay per production solution), for instance in Vendor Management Inventory (VMI) solutions; financial institutions may not be involved.

Table 8: SCF perspectives

Nevertheless, what everyone agrees on is that SCF differs from the so-called Financial Supply Chain (FSC), despite they could seem to coincide at a first glance: while the FSC is the set of the processes and information that determines the value of liquidity, the accounts and the company's working capital, the SCF is the set of products and services that a financial institution offers to facilitate the management of the physical and information flows of a supply chain (Camerinelli, 2008).

As previously observed (also by Camerinelli (2009)), the contingency of the current crisis further augmented the asynchrony of the financials with respect to material movement and information transfer along the supply chain.

In this regard, firms and financial institutions, being aware that the continuous extension of payment terms could not be sustainable in a long-term perspective, sought for innovative solutions aligning operational flows to the respective financial flows and, thus, allowing companies to gain liquidity in a faster and more efficient way (Wuttke, Blome, Foerstl, & Henke, 2013).

SCF is aimed, thereby, at aligning financial flows to product and informative flows and optimizing them at an inter-organizational level (Hofmann & Belin, 2011) by leveraging a stronger coordination and cooperation (Wuttke, Blome, Foerstl, & Henke, 2013) between supply chain players, financial institutions and technology providers. As a consequence, the SCF approach often results in an increase of trust, commitment, and, thus, profitability through the chain (Randall and Farris II, 2009).

For SCF solutions to be effective, banks, in fact, are required to play an active role by working alongside companies and technology providers so as to design and then implement tailored solutions fitting the diverse supply chain-specific needs (Wuttke et al., 2016).

SCF programs, indeed, can be categorized in pre-defined sets of solutions but an adaptation process is always needed so that the whole supply chain can benefit an improved working capital position with a consequent reduction in the overall necessary liquidity (Hofmann, 2013). What is, then, common to the majority of SCF applications is the complete and synchronized integration between firms and financial actors by the means of state-of-the-art ICTs platform, making the entire transaction system extremely flexible and fast (Gomm, 2010).

Such strong technological component, besides rendering all the operative procedures of the programs smooth and efficient, brings along full transparency all along the chain actors, thus eliminating classical information asymmetry issues (Gomm, 2010).

Hence, supply chain information can be timely and effectively shared among companies and banks, thus decreasing investment risks and, consequently, the capital costs of financing projects (Pfohl & Gomm, 2009).

In the following are some definitions resuming the main principles of SCF concept so far presented:

Pfohl and Gomm highlight how the collective commitment of all the involved actors is key to reach full financing optimisation so as to bring added value to all the program participants:

“Supply Chain Finance is the inter-company optimization of financing as well as the integration of financing process with customers, suppliers, and service provider, in order to increase the value of all participating companies.” (Pfohl & Gomm, 2009)

The need for a systemic approach to SCF is remarked in Hofmann’s definition which adds up to the previous one how two or more companies are required to strictly collaborate on financial flow optimisation in order for a SCF project to be effective:

“Located at the intersection of logistics, supply chain management, collaboration, and finance, Supply Chain Finance is an approach for two or more organizations in a supply chain, including external service providers, to jointly create value through means of planning, steering, and controlling the flow of financial resources on an inter-organizational level.” (Hofmann, 2005)

While the former two definitions depict as main SCF goals the optimisation of financial flows along the supply chain and the consequent enhancement of value for involved companies, the

definition by Steeman underlines how such improved financial situations directly leads to a concrete risk mitigation:

“SCF deals with financial arrangements used in collaboration by at least two supply chain partners with the aim of improving the overall financial performance and mitigating the overall risks of the supply chain” (Steeman, The power of Supply Chain Finance, 2014).

One element common to the majority of the reported definitions is the consideration of how SCF solutions lead to financial improvements for all the actors, mainly intended as sensible reduction of working capital levels and, thereby, economic and financial savings. It could be, however, counter-intuitive that all the supply chain players are financially better off from the implementation of SCF solutions as a C2C lowering of one actor inevitably leads to a C2C cycle rise of its upstream partner and vice versa: a lengthening in buyer’s DPO implies an increase in supplier’s DSO as well as a shrink in supplier’s DSO turns into a decrease in buyer’s DPO (Hofmann, 2007).

Nevertheless, what SCF is aimed at is a massive reduction in the overall supply chain C2C cycle, meant as the mathematical sum of all the linked players’ C2C (Hair, 2011). Hence, regardless of apparently conflicting positions of adjacent players in the supply chain, both suppliers and buyers, as it will be shown in the following, enjoys consistent C2C cycle reductions (Swink, 2007). Said differently, there is a great improvement of the so-called Collaborative C2C Cycle

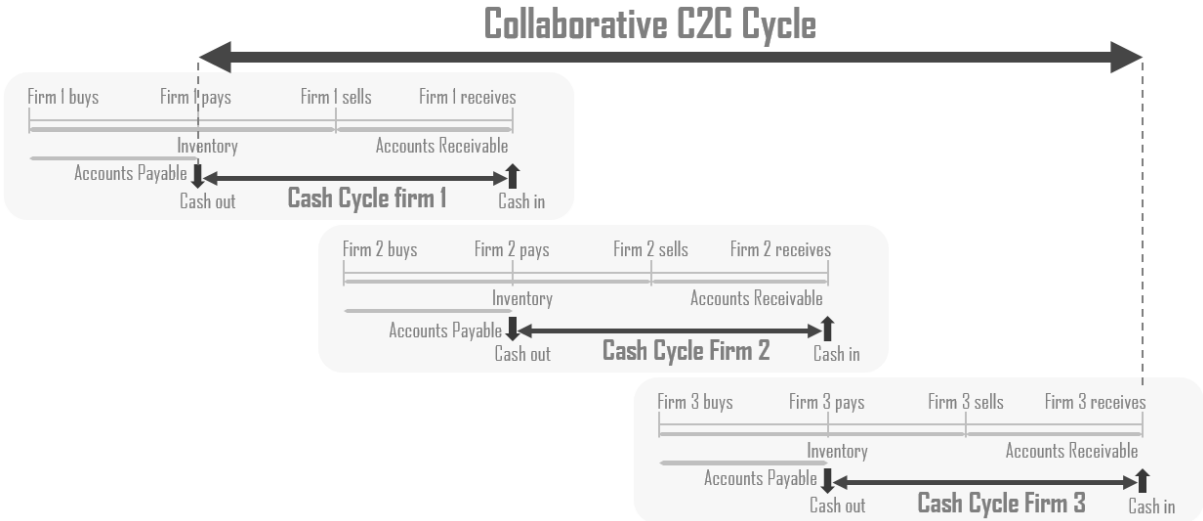


Figure 6: Collaborative C2C Cycle graph

As regards for the abovementioned debate about the scope of analysis covered by SCF, Gelsomino et al., while still acknowledging the crucial importance of working cooperatively for reaching global optimisation, conceive SCF as both a financially-oriented optimizer and an innovative approach to smooth out operations at the supply chain interfaces:

“SCF can be defined as a mix of models, solutions, and services aiming to both optimise the financial performance and control working capital within a supply chain, exploiting a deep knowledge of supply chain relations and dynamics.” (Gelsomino, Mangiaracina, Perego, & Tumino, Supply chain finance: a literature review, 2016)

In line with this twofold function attributed to SCF, Wuttke et al. place the SCF field of study at the intersection of logistics and finance: *SCF “focuses on the organizational structure to be implemented between the involved parties to achieve visibility and control and to recurrently take cash flow optimizing actions”* (Wuttke, Blome, Foerstl, & Henke, 2013).

Summing up the main concepts of the different definitions here reported, flows alignment and synchronization, working capital global optimisation, inter-companies collaboration and active involvement of third parties represent the founding pillars of SCF applications. To further strengthen this direction of analysis, Wuttke et al. emphasize how SCF main aim is to couple operative and financial flows so that companies, while leveraging a stricter collaboration and cooperation, can reduce by far their working capital with a consequent decrease in financial costs. Closer to the financial dimension, instead, is the definition provided by Zhao et al. that consider SCF as *“a short-term credit to optimize the cash flows and working capitals of collaborating firms within a specified supply chain”* (Zhao, Yeung, Huang, & Song, 2015). Cooperatively working on the C2C cycle reduction, indeed, automatically leads to a drop in the cash outflows needed to finance the operations (Spekman, 2006). On the same page of a lightened financial outcome, the Euro Banking Association (EBA) define SCF *“as the use of financial instruments, practices and technologies to optimize the management of the working capital and liquidity tied up in supply chain processes for collaborating business partners.”* (Euro Banking Association (EBA), 2014).

Liquidity is, therefore, supposed to be locked and dispersed within the connections between one player of the supply chain and the other, resulting in a much higher need for all the players (Hofmann and Kotzab, 2010). That is, the inability to keep the financial flow in line with the operative flows along the several interfaces, characterizing a typical supply chain, entails inefficient levels of required liquidity and related economic costs to finance it (Kotzab, 2008).

This is the so-called finance-oriented perspective, above reported, conceiving SCF a set of products and services that a financial institution offers to facilitate the management of the physical and information flows of a supply chain, binding them logically and temporary to cash inflows and outflows. (Camerinelli, 2009)

Such stream of SCF is characterized also by a strong technological component as the development of cutting-edge ICTs to track, automate and control events in the physical supply chain brings huge opportunities to efficiently bundle the three flows together with big economic and financial savings (Camerinelli, 2014).

So far, plenty of different definition of SCF topic have been presented, each one with a diverse point of view, content and background, in order to provide the widest possible theoretical coverage for this quite new research area which is still being developed and modelled. Obviously, for the sake of clarity and brevity, other notable interpretations and presentations of what SCF is about have been excluded from this research thesis.

To the purpose of this work, the definition by Osservatorio Supply Chain Finance is taken as the reference given its exhaustiveness and wide perspective:

“Supply Chain Finance is the set of models, solutions and services with the aim to optimise financial performances – especially the working capital position - along the supply chain, leveraging a company specific characteristics, its role and relationships with the players in the chain.” (Osservatorio Supply Chain Finance, 2016).

2.4.3 Supply Chain Finance framework

According to Pfohl and Gomm 2009, SCF programs structuring can be framed and depicted in the following scheme:

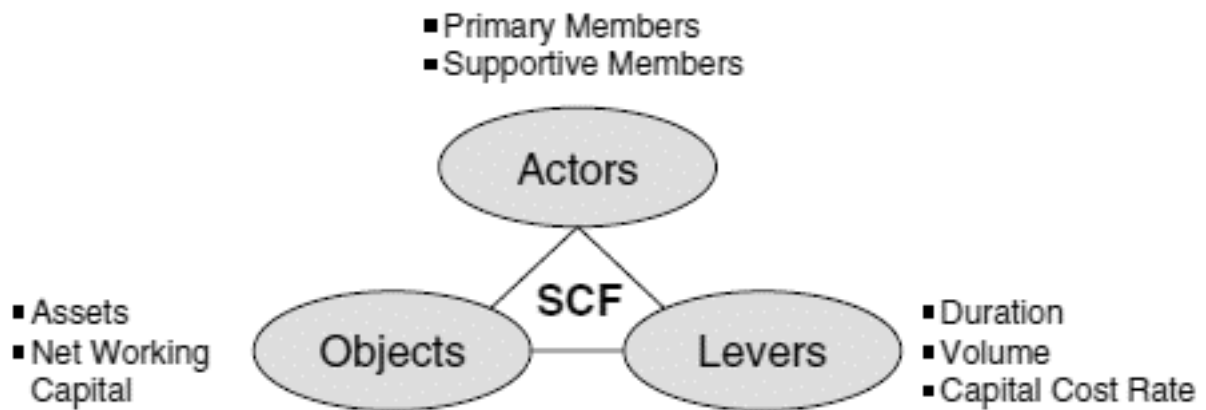


Figure 7: SCF framework

While actors will be detailed in the next paragraph, objects and levers are here tackled in order to clearly understand how SCF brings real value to participating companies and financial intermediaries. To this purpose, through a representation of the so-called Economic Value Added (EVA) model, a clear connection between SCF impacts and company's value is, then, established.

Objects of SCF regards the financial figures these innovative solutions may have an impact on: as already discussed in previous paragraphs, the financial statements figures touched by SCF solutions are either company's fixed assets, within which are production facilities, equipment, physical connections and stocks building the logistics network, or the working capital, and hence C2C cycle, representing the variable financial need to run day-to-day operations (Yang, 2013).

Working capital amount (and automatically C2C cycle) can be drastically reduced by proper applications of the diverse SCF solutions while a company's fixed assets, whether they are inventory, equipment or production facilities, can be financed through innovative and flexible ways allowing the owning firm to better manage the related cash outflows (Vachon, 2008).

For what concerns, instead, the SCF levers, that is to say the way these innovative financing solutions impact on company's financial indicators, Pfohl and Gomm put forward the so-called Cube Model (also called SCF Cube), based on the capital-cost view, to best characterize what SCF solutions work on to bring concrete value.

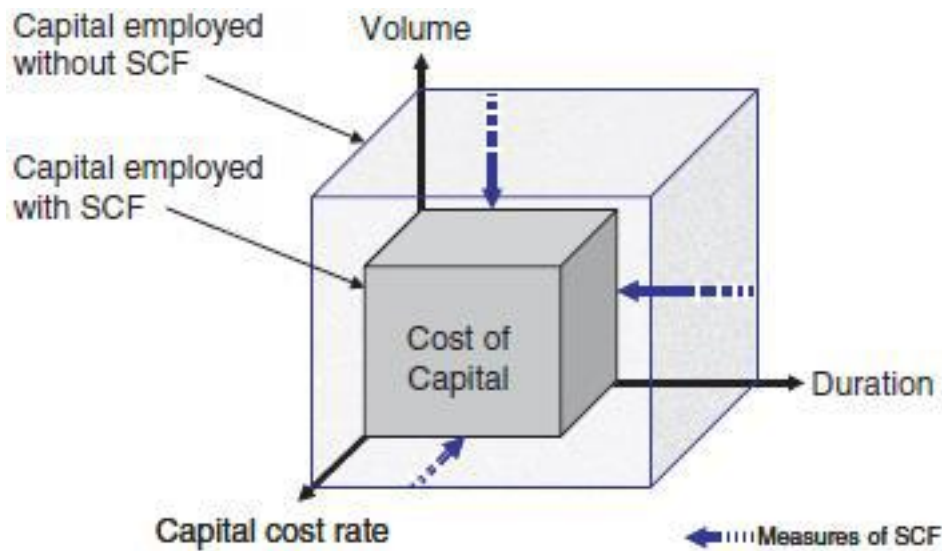


Figure 8: SCF Cube Model

The model conceives the financing drawn by a general SCF solution as made of three components: which amount of assets (volume of financing) needs to be financed for how long (duration of financing) at which capital cost rate. By multiplying these three factors with each other a firm can get to the total cost of capital to bear for a certain kind of investment.

This three-dimensional representation of companies' financial costs is helpful in understanding the diverse SCF impacts on each single dimension. Company's financial requirement is calculated as the product of duration (e.g. days) and volume (e.g. stocks or fixed assets) of the financing; then, multiplying that by the cost of capital per day, the cost of financing either the fixed capital or the working capital is obtained (Gomm, 2010):

$$\text{Capital costs (€)} = \text{Volume (€)} * \text{Duration (time)} * \text{Capital Cost Rate (\%time/)}$$

As already explained, SCF solutions can lead to strong reductions both in volume (e.g. WC amount) and in duration (e.g. C2C cycle) of financing by aligning operative flows (material and information) to financial flow, thus consistently decreasing financial requirements (Popa, 2013).

However, what SCF is supposed to bring the strongest impact on is the capital cost rate dimension. This is the so-called capital cost view (2010) formulated by Gomm.

According to this theory, finance, and more precisely the capital cost rate, are two areas where SCM still has a lot of potential to be turned into practice.

The high-level concept driving this SCF research direction is the strong and powerful role played by both the information, hidden in supply chain connections, and the different financial

positions of suppliers and customers to considerably lower the financing costs for single companies and supply chain as a whole (Wagner, 2008).

Typically, inventory and other firms' assets are financed by general credit lines whose interest rates are calculated basing on the general risk of the company asking for the loan, and not taking the asset-specific risk into account (Hofmann and belin, 2014).

This assumption, sometimes, can lead to wrongly judge an asset potentiality and its direct economic return, being the interest for any credit or equity a reward for the underlying risk (Dada, 2008). Indeed, assets can have different risk profiles depending on the markets (e.g. finished and unfinished goods, mobile assets, warehouses) or acquire a specific value when involved in a certain kind of business relationship (Swink, 2007). Taking the example of a big focal company acquiring components by a medium-size supplier, it is evident how the big firm knows much more about the risk profile of its business partner's investments than does the bank since the likelihood that the supplier will repay its debt is directly related to the payment of goods by the focal company itself (Schneider and Bremen, 2013).

In the supply chain above, a principle-agent problem exists when it comes to the provision of capital (Shao, 2012). The supplier (agent) asks for money lending from banks or the capital market in order to finance its assets. The providers of capital (principles) normally are not aware of specific supply chain dynamics and functioning, thus always having less information than the firms composing the supply chain (Lee, 2010). An intuitive way out to decrease this information asymmetry would be to use the information in the supply chain and give it to the providers of capital to better evaluate the risk and thus reduce the principle-agent problem (Buzacott, 2004). However, supply chains are characterized by tacit and confidential knowledge (e.g. routines, specific ways of carrying out activities, production plans, inventory data, point-of-sale information, forecasts) that cannot be communicated externally (Henseler, 2014). Thus, only the owner of these pieces of information can leverage them to evaluate and lower the risk related to the specific business. If these companies themselves provided financings, they could offer better interest rate than what would external lenders (Ringle, 2011). The principal-agent problem is reduced, and information in the supply chain is efficiently turned into value as it is used to reduce the risk and thus the interest rate for supply chain players (Hofstede, 2010). Of course, this sort of supply chain internal finance is convenient as long as the banking rating of the company providing the capital (usually the focal firm) is significantly better than the company obtaining the capital (usually SMEs). Put differently, the player with the best rating in the supply chain should finance all the other players' assets, especially if consistent difference between players' ratings exists. In this sense, the information about risks

related to the assets in a supply chain can be used to optimise its financing by lowering the overall cost of capital rate (Caniato et al., 2015).

Having reported how SCF can sensibly and positively impact the way supply chain firms can finance their assets, the well-known Economic Value Added (EVA) model is below presented with the aim of clearly linking SCF effects to the shareholder and company's value. Such a model grounds on the value-based management which strictly correlates a firm's long-term value with its financial prosperity: a company with high profits but in liquidity shortage, indeed, cannot competitively survive in the market (Grosse-Ruyken et al., 2011).

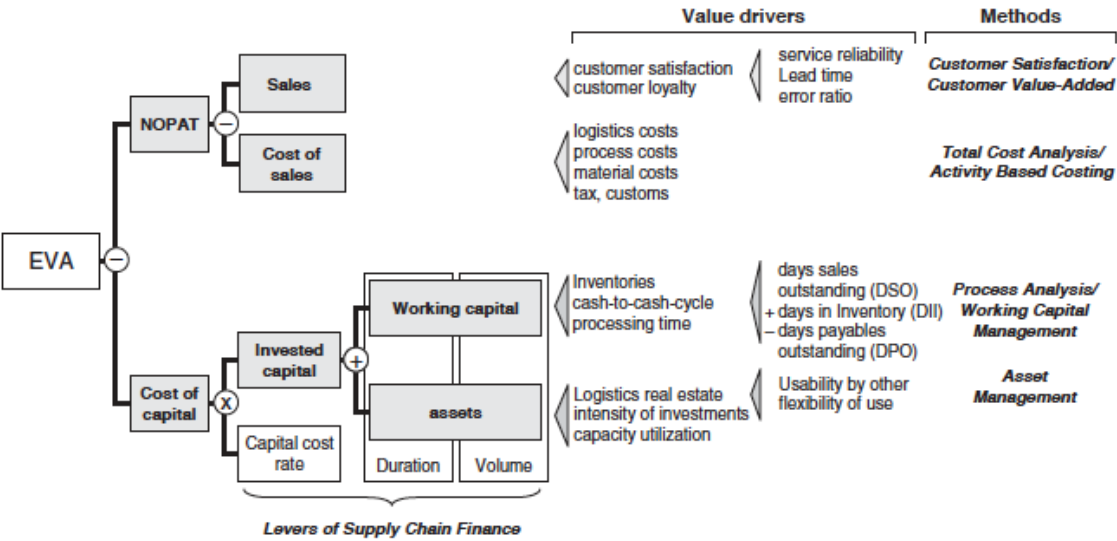


Figure 9: EVA Model

By looking at the chart, SCF solutions, by bringing, on one hand, to low and competitive interest rates and, on the other hand, to controlled levels of invested capital, directly enhance companies' financial positions and consequently company's value.

2.4.4 SCF actors

Contrary to classical supply chain dominium, mainly characterized by several and sequential supplier-buyer dyads, the spectrum of different actors involved in a SCF program is much wider (Silvestro & Lustrato, 2014). Indeed, besides the more-intuitive buyers and suppliers, considered as primary members belonging either to industrial or commercial sectors, SCF programs embrace many other so-called supportive actors, such as financial institutions and investors, logistics service providers and technology providers. All these players are key to

enable and successfully implement SCF solutions given their heterogeneous nature (e.g. financial, technological and operational) (Hofmann and Belin (2011).

Various classifications and categorizations of SCF players have been proposed in the last decade, each one considering its own range of entities playing a significant role in SCF projects. For the sake of this research thesis, the most widespread high-level categorization of SCF players, developed by Hofmann 2005 and then recalled by Pfohl and Gomm 2009 in their SCF framework, is taken as reference: SCF actors are primarily divided in macro-institutional actors and micro-institutional ones.

The former category includes the abovementioned primary and supported players, intended as single and separated entities interacting to each other in SCF programs functioning. The latter category, instead, is concerned with the internal functions and departments of the different SCF actors.

Within each category a description of the respective belonging entities is provided by drawing insights from SCF literature.

2.4.4.1 Macro-institutional actors

Focal firm: it is the big brand multinational corporation, active in the industrial or commercial sector, at the centre of any SCF solutions. Such a company usually has a very long and complex supply chain entailing plenty of strong and diverse international trade relationships to deal with (Kok and Kristofik, 2011);

Suppliers: they represent the national or international supply base providing goods and services to the focal firm which collects all the incoming inputs in order to process them and perform the delivery of the final product or service to the downstream customers (Berger, 2006). Given the incredibly vast variety of types of supplier, the focal company is called to put in place plenty of different collaboration strategies, both on the operative and financial level (Klapper, 2011).

Logistic Service Providers (LSPs): they are external actors traditionally providing a wide range of logistics services to their clients (Camerinelli, 2008). In SCF context the role played by these third parties becomes crucial as they expand their scope of activities beyond the pure logistics services (Reindorp, 2014). In fact, they may add to the traditional financing players by positioning in-between banks and companies to finance inventory (e.g. inventory finance solution), thus bringing additional value to supply chain players (Seifert, 2011). They may also

carry out, especially on behalf of small and medium companies, administrative procedures so as to consistently smooth the operative SCF process (Pfohl & Gomm, 2009). Such considerable enlargement of their offerings until including innovative financial solutions is the reason why academics and researchers consider LSPs as supportive actors for SCF programs (Osservatorio Supply Chain Finance, 2016)

Financial intermediaries: they are all the actors, principally banks and private investors, providing a financial service fitting the different supply chain-specific needs (Camerinelli, 2008). Pfohl and Gomm (2009) attribute the function of financing actors also to insurances, leasing and factoring companies, private equity and investment companies as they are more and more replacing traditional players when it comes to provide highly-innovative and short-term financings. Banks are strongly committing to offer innovative financing solutions too, especially in the area of SCF solutions, as a way to remain attractive to the market and, at the same time, to keep an acceptable risk profile (Della Iacono et al., 2014). The latter, indeed, would be seriously compromised if banks provided only the classic lending of money given the current economic contingencies (Hofmann & Belin, 2011).

As in the case of LSPs, beyond the funding, banks offer complementary and value-adding services. As examples, they facilitate the gathering of procurement and operative information to be shared with SCF involved firms, they propose risk-sharing strategies for specific kinds of financial investments and they may also act as mediators between banks buyers and suppliers in order to build a better relation as

their privileged role allows them to foster collaboration, cooperation, information sharing and visibility all along the supply chain (Silvestro & Lustrato, 2014).

Furthermore, while providing financing by the means of the different products offered, banks often provide companies with an advisory function, helping them in selecting the adequate solution, managing the accounting structure, choosing the most convenient tax scheme and managing other delicate issues by leveraging their expertise and specialized services (Fairchild, 2005).

Finally, as regards for the composition of financial market targeting SCF solution, it can be noticed how large and cross-countries banks are almost always preferred to minor players as their financial availability and consolidated experience lead to cutting-edge solutions, perfectly tailored to the constantly changing business needs (Wilson, 2002).

Technology providers: this category of actors is crucial for the effective implementation and functioning of almost every SCF solution as ICTs are one of the key components driving the world-wide success of such SCF programs (Caniato et al., 2015). Technology, indeed, makes the practical use of any SCF program extremely flexible and fast. This usually occurs by seamlessly connecting all the SCF participants on a web-based platform where all the financial and operative information are exchanged and simultaneously shared with financial actors (Camerinelli, 2009). Accordingly, More and Basu define technology providers simply as third-party SCF platform providers, assigning them a fundamental supportive function to all the players involved, especially to SMEs which often struggle to go through the digitalization process. Technology providers' function is particularly effective in smoothening and boosting SCF programs deployment when a partnership with large financial players is established and nurtured over time (More & Basu, 2013). In this respect, similarly to financial players, technology providers could be seen as B2B operators whose mediating and connecting function is crucial to timely and effectively link supply chain players' transactions (Osservatorio Supply Chain Finance, 2016).

Specialized SCF service providers (i.e. SCF pure-players): they are becoming more and more wide-spread and requested in the market as, very often, large financial institutions' rigid structure may limit finance-oriented innovation, forcing them to take cue from these new and usually small players (Hofmann & Belin, 2011). These players, instead, with no more than five years of age, are born just with the intent of providing the market with extremely flexible and innovative financing solutions (Caniato et al., 2015). Given their typical nature, they can afford to continuously experiment new ways to satisfy customers' financing needs, thus representing a concrete and serious alternative to banks (Yang, 2013). This is especially true for supply chains characterized by companies which are very small and, therefore, unable to negotiate acceptable conditions with large banks. Sometimes, these new players can also add to traditional banks in providing complementary financial services along SCF solutions processes (Osservatorio Supply Chain Finance, 2016).

Fintechs: they are new players, most of the times young start-ups, playing the role of both financial and technology providers (Caniato et al., 2015). That is, specialist financial technology companies providing platforms and software-based services to support SCF operations (McKinsey on Payments, 2015); these players started entering the market few years ago with a consistent growth in market share, until having around 15% of SCF market. They

found their incredible success on a total focalisation and adaptation on customers' mutable needs and requests, rapid feedback-driven innovation, which efficiently addresses the operational and technology challenges typical of SCF programs (Lampe and Hofmann, 2014). Beyond providing SCF services, these players are continuously expanding their offerings in the financial market by stretching at the maximum the potentiality of ground-breaking ICTs to provide customers with additional value, thus seriously threatening the long-term survival of traditional banks in the market (Camerinelli, 2008).

2.4.4.2 Micro-institutional actors

According to SCF actors' classification by Hofmann (2005) considering only the players reported in the former paragraph is not sufficient to best depict the functioning of a general SCF program. What is missing is an internal-oriented view of the different players participating in SCF solution. Hence, turning to analyse the internal departments and functions (i.e. micro-institutional) of each single SCF actor, trying to figure out the several settings of internal organizations and processes, is crucial to understand how a SCF is structured so as to improve it. Contrary to a classical supply chain management dominium, the SCF internal actors comprise all the traditional operative departments (e.g. purchasing, production, distribution and logistics units) (Hofmann, 2005), and also all departments dealing with financial activities (Pfohl, Hofmann, Elbert, 2003). As a consequence, the real key to effectively manage SCF programs functioning is the proper management of the intersections between the several departments, being the latter ones of both operative and financial nature (Randall and Ferris, 2009). All of that implies a timely and synchronized coordination of the several participants plus a proper allocation of tasks and responsibilities that should be achieved following the guidelines of the top management (Serrano, 2014).

2.4.5 Supply Chain Finance solutions

Despite the literature mainly focus on providing the business community with general concepts of SCF along with the presentation of main benefits brought to firms, there is a small set of authors extending the SCF literature coverage to comprise the detailed description of the several SCF solutions and programs (Wuttke, Blome, Foerstl, & Henke, 2013), which are numerous and differ greatly from each other (Osservatorio Supply Chain Finance, 2016).

Hofmann and Belin (2011) propose a classification of the SCF solutions currently present in the market based on four different variables: (1) geographical aspects, (2) payment methods, (3) players involved and (4) different kinds of platform used.

Geographic boundaries	Payment methods	Market players	Platform types
<ul style="list-style-type: none"> - Domestic trade - Crossover-border trade 	<ul style="list-style-type: none"> - Letter of Credit (L/C) - Open Account (O/A) 	<ul style="list-style-type: none"> - Focal company - Supplier/buyer - Funder/risk taker - SCF service provider 	<ul style="list-style-type: none"> - L/C and O/A platforms - Risk management systems - Third-party financing platforms

Table 9: SCF programs dimensions

Another famous and more high-level framework for SCF solutions categorization is the one developed by Williams: SCF programs are divided in buyer-led solutions and supplier-led solutions (Williams, 2010). The majority of SCF applications belong to the first category, consisting of suppliers’ payment programs wherein a financially strong buyer enables its suppliers to faster access cash at its cost of capital, which is much lower than what suppliers could get if they went through traditional channels. (Lamoureaux & Evans, 2011). This is possible in that the buyer takes the risks of supplier’s insolvency, guaranteeing the refunding of money to the financial intermediary (Williams, 2010). Such group of solutions is also named as receivables financing since it embodies all those supplier-oriented solutions leveraging the financially better-rated buyer to provide SMEs with relatively cheap liquidity borrowing (Silvestro& Lustrato, 2014). In the supplier-led programs, instead, the insolvency risk is only up to the supplier (Williams, 2010). Consequently, given the currently tightening of money lending and the usually poor suppliers’ rating, such set of solutions did not register a flourishing development (Mathis & Cavinato, 2010).

Further classifications have been provided in the literature, such as the production-stage based grouping of SCF solutions by He & Tang (He & Tan2012). Different notable authors, instead, agree on a wide-spread classification dividing SCF programs in pre-shipment, in transit and post-shipment financing solutions (Lamoureaux and Evans (2011), More and Basu (2013), Silvestro and Lustrato (2014))

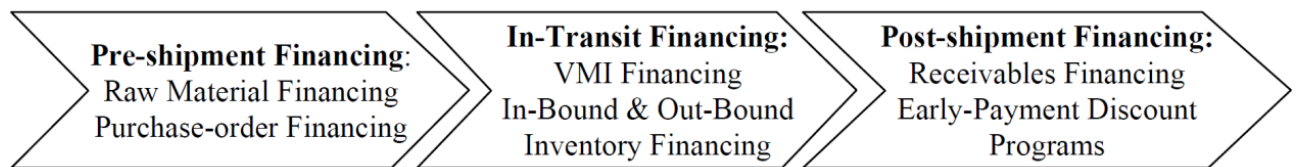


Figure 10: Classification of SCF solutions (Lamoureaux & Evans, 2011)

Pre-shipment financing: these solutions, typically requested by suppliers, back on purchase orders as the guarantee of refunding and not on the usual invoice (Camerinelli, 2009). This is why they are also called purchase-order financing (Silvestro & Lustrato, 2014); raw-material financing is an example of this kind of solution. The effectiveness of these delicate programs is tied to the operative and financial stability of all the companies composing the supply chain, especially the focal firm and its standing toward banks (More & Basu, 2013).

In transit inventory financing: these SCF programs allow a manufacturing firm to get finance by providing its inventory as a collateral; vendor-managed inventory (VMI) financing and support to exporters or importers' activities fall into this category (Lamoureaux & Evans, 2011). Such set of solution is highly innovative and not so wide-spread in the market as it requires a perfect collaboration between involved parties. Often, inventory is owned also by a third party, usually the bank or even logistics providers, before being definitely legally transferred to the acquiring actor (Silvestro & Lustrato, 2014).

Post-shipment financing: these solutions are the most wide-spread and requested by companies in the market. Reverse Factoring and other early payment discount programs belong to this category (Silvestro & Lustrato, 2014). Once the invoice is formally approved by the buyer, the supplier can immediately receive cash from the bank, discounting the invoice at the buyer's capital cost rate. At the due date, then, the buyer pays back the bank (Lamoureaux & Evans, 2011). Usually all the money transactions among the involved players occur on a ICT platform, making these programs extremely fast and flexible (Aberdeen Group, 2006).

Finally, an innovative and multi-dimensional classification by Osservatorio Supply Chain Finance of Politecnico di Milano is here presented. SCF solutions are grouped along three axes: (1) impacts on working capital, (2) innovation level of the service and (3) extent of digitalization.



Table 10: SCF solutions classification

SCF, as previously discussed, can impact working capital either on DSO and DPO or on DIH affects depending on the kind of implemented solution.

The service innovation level, characterizing the second axis, leads to a further classification: traditional and innovative solutions. The former ones have been present in the market for quite a long time, still be highly requested by companies but not as efficient and technology oriented as the innovative ones which strongly leverage on ICTs potential to revolutionize the way firms can get financings.

Lastly, the third axis refers to the extent to which a certain SCF program exploits the technology potential to render any solution fast, flexible and suitable for the specific supply chain. The common pattern of companies is usually characterized by the adoption of traditional solutions in initial phases to pass, then, to more innovative programs once collaborative mechanisms are run in.

2.4.6 Reverse Factoring solution

For the sake of brevity and in line with the following of this research work, one solution, the Reverse Factoring, is further discussed and detailed.

Before deep-diving such a solution, it is worth mentioning its antecedent: Factoring (Liao, Zhao, & Feng, 2015) is the discounted selling of a company's short-term account receivables to a specialized company – called “factor”, who assumes also the credit risk of the account debtors and receives cash as the debtors settle their accounts (Silvestro & Lustrato, 2014). It is one of the most mature solutions that typically serves ordinary goods, financed up to 80-90%

of their value. Contrary to conventional factoring approaches Reverse Factoring is a financial instrument, applied to supply chain dominium, triggered by the buyer in the customer-supplier relationship and supported by financial institutions and, as the case may be, a platform provider (Dyckman, 2009). The main aim is to improve and optimize financial flows all along the chain; Klapper, 2005). In contrast to, RF is Through this SCF program suppliers profit from lower interest rates and faster access to cash when deciding to discount their invoices (Pezza, 2011). Such a cheaper financing for supplier is possible as the interest rate at which invoices are anticipated by banks is calculated according to the excellent banking rating of the buyer, the focal company of the supply chain. The buyers is indeed the guarantor of supplier’s financial solvency. The buyers, instead, may use Reverse Factoring as a negotiation lever since payment terms toward banks can be further extended while benefitting from a financially more stable supplier base (Seifertand Seifert, 2011). As a matter fact, such a financial solution brings strategic advantages for the buyers as the supplier default risk is considerably reduced. The long-term continuity of supply is, therefore, no longer at risk with positive repercussions on all the supply chain (Liebl et al., 2016).

Banks, then, play an important role in Reverse Factoring functioning by providing advanced methods for financing receivables as well as IT platforms, which increase the transparency of the working capital of the parties involved (Klapper, 2005). In return, banks are able to address a large supplier base with comparably low sales effort (Seifert and Seifert, 2011).

In this respect, RF may be defined as follows: “In a reversed factoring arrangement, a corporation and its supplier work together with a bank, in order to optimize the financial flows resulting from trade” (Tanrisever et al., 2012).

Below is a graphical representation of how SCF works by showing the transaction occurring among the involved parties.

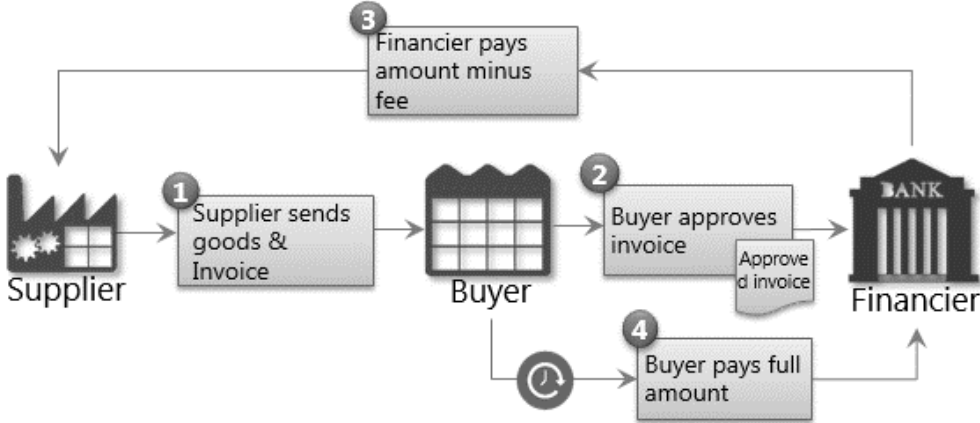


Figure 11: Reverse Factoring functioning

2.4.7 Supply Chain Finance benefits

Even though throughout the former paragraphs the various SCF upsides have been presented and discussed, this last section of SCF literature review aims at resuming the main and acknowledged benefits brought by these innovative financial programs.

Supply Chain Finance solutions bring along several kinds of benefits, representing either direct or indirect impacts, for all the involved companies, whether they are buyers or suppliers (More and Basu, 2012). Indeed, these benefits might seem to be targeted at one single company, but at the same time they improve the efficiency and working capital of the supply chain as a whole. Such SCF advantages exceed single company's boundaries, enhancing the enterprise value and, simultaneously, augmenting the efficiency of the entire supply chain (Farris, 2002).

One way to cluster such benefits is to divide them in quantitative aspects, immediately leading to tangible economic returns, and qualitative ones, impacting on supplier-customer relations and indirectly bringing to economic enhancements.

2.4.7.1 Quantitative benefits

Funding, liquidity and working capital savings

Innovative SCF solutions allow any kind of firms, even the smallest ones, to finance assets investments at a cost significantly lower than either the company's WACC (average cost of capital) or the marginal cost of debt. The companies' advantage is not stopping here as the saved money can be allocated for other more strategic investments (e.g. equipment purchase, plant building) (Palliam 2005).

By the means of a SCF solution the supplier can receive money by the financial institution earlier with respect to the standard collection times, whereas the buyer can extend its payment terms towards the bank. Both these actions have strong positive impacts on the respective financial situation. The vendor's financial stability, representing most of the times a risk for the downstream actors, is, therefore, no longer depending on customer's behaviour: payment will be received from the funder exactly when specified under the terms of the SCF program. This enables better and long-term cash flow planning allowing both the players (supplier and buyer) to minimise operations-related risks and to cut hedging costs aiming to limit supply chain disruptions damages.

Moreover, as widely discussed in former paragraphs, one of the main SCF solutions' benefit is to drastically reduce the overall working capital, both at the single company's level and at the

supply chain level. This is brought by a massive elimination of the excessive working capital, generated by the inefficiency at the interfaces, thanks to the flows alignment and the speeding up of order cycle management.

Risk cost savings

The enhanced transparency all along the chain, achieved through a total process digitalization and a stricter collaboration between business partners and financial players, leads to a clear and unbiased investments' risk evaluation, especially for what concerns supplier's assessment. The funding player is, indeed, given a complete and real-time picture of the supply chain operative and financial flows with related business relationships. This can encompass credit rating as well as the day-to-day operational and payment performances of the buyers. Such visibility contributes to lower the risk premium paid by suppliers with positive effects on the bottom line. Moreover, as said above, in many SCF solutions, the investment risk is calculated on the basis of the buyer's banking rating, which is usually excellent given the strong financial solidity of these big brand firms. This further reduces financial costs charged on suppliers as the risk of their insolvency is transferred to the buyer.

Administrative cost savings

SCF solutions provide costs cutting on plenty of administrative and procedural activities belonging to the several transactions all along the supply chain, such as reconciliation and credit limit management. This is mainly due to the strong technological component embedded in SCF solutions. With ground-breaking IT systems salient information is shared among all the actors in a cheaper, faster and more effective way.

To contribute to bring further efficiency in procedures management, service providers mass up lots of different information and financial flows, coming from different supply chains, in order to scale up web-based platforms and offer cheaper and cheaper services. Such platforms, then, allow to carry out credit risk assessments and real time financial analyses at ridiculous costs.

2.4.7.2 Qualitative benefits

Transparency and relationship management: the transparency of data, as mentioned above, provide further relevant benefits to the entire supply chain, beyond pure enhancements in SCF programs functioning. In fact, a perfect visibility and transparency of all the operative and financial processes occurring along the entire supply chain can represent the starting point for

establishing profitable and durable business relationships both between companies and between companies and financial institutions. In this respect, such ICT-enabled transparency and seamless connection could be really the edge of a new operational excellence in the supply chain, impacting all the operative functions of a company (e.g. logistics, sales, procurement, finance, production, etc.) and marking the way toward effective operative partnerships. As regards for the specific relations with banks and financial institutions, new and unexplored bespoke financing systems can follow the successful implementations of basic SCF solutions, representing a key success factor for any supply chain.

All of that can really be turned into a critical competitive advantage with respect to other supply chains.

Enhanced compliance: SCF forces the participating companies to stick to financial and operative standards, to go through audit processes and to adhere to fiscal parameters. Such required and strict observance of regulations indirectly leads to an augment business attractiveness for the companies involved in SCF alongside a consistent reduction in future disputes with financial and fiscal institutions.

3 OBJECTIVES AND RESEARCH PROCESS

3.1 Objectives

The main aim of this research thesis is to bridge two literature gaps detected in the wide area of sustainability topic.

More precisely, when going through the theoretical foundations of that literature stream extending and applying the general sustainability principles to the whole supply chain (i.e. Sustainable Supply Chain Management), it clearly comes out how a comprehensive analysis of all the supply chain actors' perspectives is missing. Too often, indeed, only the buyer's point of view is taken into consideration to detail both the drivers of sustainable supply chain plans with related advantages and the difficulties encountered to effectively deploy the required actions.

In this regard, the literature highlights how, nowadays, focal firms are ever-more pushed to operate in accordance to social and environmental standards as consumers and society overall are extremely attentive to such themes, considered as a basic requirement for any company, especially when it comes to multinational ones (Kovacs, 2008). Hence, a particularly proactive commitment by big brand corporations on guaranteeing full sustainability along all the operative processes may represent a strong boost for the company's brand image, automatically reflecting in a sales increase (Carter and Dresner, 2001). Such considerable benefits are the stimuli making big focal firms go through the initial obstacles typical of these strategic plans, especially in the first stages of implementation (Balaa et al., 2008). In this respect, the literature carefully details the various barriers and hurdles a focal firm may clash with in the process of deploying these sustainability-oriented projects. Scarce collaboration between business partners and poor coordination at the interfaces, due to plenty of different reasons (e.g. geographical and cultural distances), plus a considerable initial economic effort are some of the most recurrent issues that may prevent these plans from reaching a successful conclusion (Hayes, 1996). Instead, as regards for the setbacks coming from suppliers, lack of incentives and direct economic rewards pushing them to actively commit alongside the focal firm represent serious issues which, very often, are the main responsible for the anticipated failure of these sustainability projects (Cotec et al., 2008). In fact, as suppliers of these long supply chains are usually SMEs, sometimes based in developing countries, all their managerial efforts are devoted to efficiently running their businesses and time-consuming activities requiring upfront expenses without clear economic advantages end up being disregarded (Seuring and

Muller, 2007). Literature, here, as previously noted, does not provide any practical remedy for focal companies to apply so as to incentivize suppliers.

The second theoretical gap is identified in that literature stream associating the sustainability applied to the supply chain to the Corporate Social Responsibility area.

Big brands are, indeed, called to put in place social-oriented actions aiming to support their own supply chains, usually composed of several SMEs, deemed fundamental to guarantee the success of the final product or service (Kolk, 2012). Such suppliers often severely struggle with liquidity shortage due to the recent financial crisis which particularly hit small-size companies with low assets value (Gomm, 2005). As a consequence, operative business is put at serious risk with direct repercussions on all the downstream players (Pagell and Shevchenko, 2006). The literature stresses how big firms should provide a concrete help in these contingencies as it is of paramount importance to guarantee the continuity of supply (Petersen, 2000) but, again, no practical suggestion nor successful cases have been reported yet.

Having underlined such theoretical gaps, this research work aims at filling them by drawing on SCF topic, intended as its spectrum of innovative financial solutions whose supportive function can represent a practical way out to successfully implement sustainability to the whole supply chain. In this regard, SCF is framed as a sustainability lever, able to provide an effective answer both to the absence of incentives for suppliers when taking on SSCM initiatives and to the focal firm's will to concretely support its own supply chain.

Hence, this thesis is to investigate the effectiveness of SCF projects to fill the gaps found in the literature, thus helping companies in their sustainability-oriented projects.

Accordingly, the three research questions are below detailed so as to guide the proceeding of this work.

RQ1: How can a SCF programme be implemented with a sustainability orientation?

SCF solutions can encompass a multitude of different programs, each one with its own way of functioning, scope of application, set of actors involved with related on-boarding methods, technologies adopted and different roles played by financial institutions and service providers. What this research question aims at finding out is how to structure and, then, implement SCF solutions so that they could positively affect sustainability-related performances. The same SCF program, indeed, can be declined in plenty of different ways by acting on different levers so as to respond to the diverse companies' needs.

The desired output is the identification of different clusters of SCF programs whose discrimination factors are the architecture variables of solutions.

RQ2: Why would buyers and suppliers introduce a SCF programme with a sustainability orientation?

By the means of this second research question, precise drivers and motivations pushing both suppliers and buyers (i.e. focal firms) to set up a SCF programme with a sustainability orientation are investigated. Said differently, the reasons why supply chain actors decide to embark on such kinds of financial programs, oriented to sustainability, are sought. This research questions aims, therefore, at uncovering and clearly stating primary and secondary drivers, whether they are related to sustainability area or not, which are determinant to guide suppliers and buyers in selecting these SCF solutions.

The final objective is to define a clear link between sets of drivers and the related most suitable kind of SCF program.

RQ3: What are the benefits for buyers and suppliers from a SCF programme with a sustainability orientation?

Once defined the possible architectures of SCF solutions and the drivers leading to the adoption of the latter, it is crucial to report and assess all the different benefits for the diverse actors involved. These kinds of sustainability-oriented SCF programs might, indeed, bring hoped benefits, strictly related to the drivers triggering the programs, but also collateral and unexpected ones.

Again, the main aim is to cluster the diverse registered benefits and associate them with the previously characterized SCF programs, in turn linked to suppliers' and buyers' sets of drivers. In doing so, a research framework is put forward for companies to make the right choice: given the specific suppliers' and buyers' needs (i.e. drivers) and a certain set of desired benefits, a specific type of sustainability-oriented SCF program is suggested to best accomplish the required tasks.

The theoretical framework can be, thereby, interpreted as a group of archetypes (i.e. the different SCF solutions), linking together sets of drivers to sets of benefits.

By building up such a theoretical model, this work tries to provide a concrete and practical remedy to the literature gaps in the sustainability dominium.

3.2 Research process

This paragraph aims at showing how the research work has been conducted, highlighting the macro steps characterizing the structure of the thesis body and how they relate to each other.

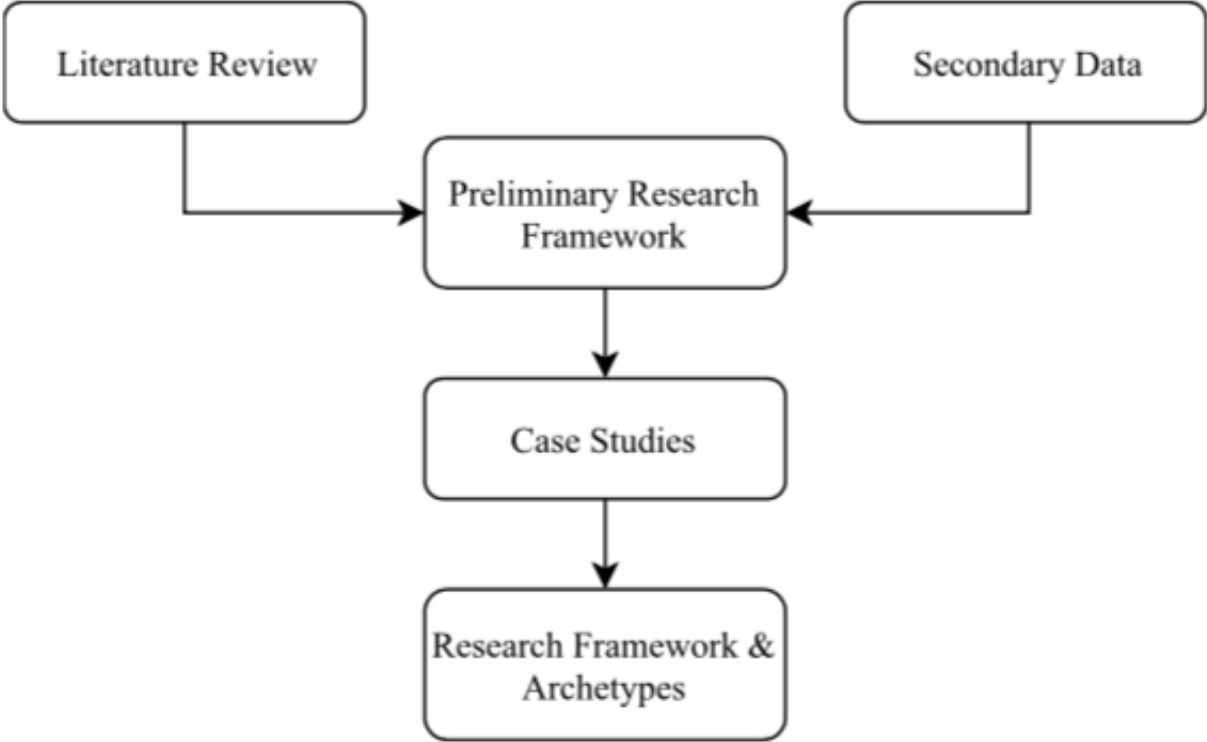


Figure 12: Research Process

The research started with a massive data collection composing of two phases. In the first one articles and papers of sustainability and SCF topics have been carefully analysed with the aim of first getting theoretical knowledge and, then, finding out eventual theoretical gaps; while going through the two literature streams, possible matches between these two apparently distant research areas have been constantly searched. The second phase, instead, is concerned with the gathering of secondary data in order to report concrete and real examples of innovative and sustainability-oriented financial programs applications.

As illustrated in the graph, the review of the literature has been key to determine both the drivers pushing supply chain players to search for this kind of SCF programs (RQ2) and the benefits drawn by the latters (RQ3), thus building up two of the three pillars composing the preliminary/testable research framework.

The last pillar of the framework, connecting the other two, deals with the diverse possible architectures of sustainability-oriented SCF solutions (RQ1), taking as a reference some real-life applications, found through secondary data investigation.

Once the preliminary research framework has been formulated, interviews to ten multinational companies has been carried out in order to apply the framework robustness and validity. To have meaningful data/information it has been decided to interview firms that had already implemented SCF programs whose adoption has been pushed, completely or partially, by sustainability goals.

Interviews followed a pre-defined questionnaire, mainly aimed at figuring out, on one side, buyer's (i.e. the interviewed firm) and suppliers' drivers and benefits attached to the SCF program (RQ2 and RQ3) and, on the other side, the operative functioning of the solution (RQ1). In this regard, case studies are perfectly aligned with research purposes, thereby testing and integrating the preliminary research framework.

All the data stemming from the different interviews have been, then, precisely analysed and detailed by the means of a within-case analysis aiming to characterize each single case study according to a set of variables.

Subsequently, by putting together the within-case analyses, three cross-case analyses have been performed to structurally compare the ten different case studies along the three research questions. Commonalities and discrepancies between the interviewed firms have been highlighted so as to figure out possible patterns of SCF programs adoption.

The main output of this combined analysis has been a revision of the preliminary research framework by adjusting the three pillars content in accordance to the interviews findings. Then, different archetypes (i.e. types of SCF program), each one characterized by its own architecture, have been identified, basing on the set of drivers triggering their activation and the set of brought benefits. The result is the definition of the final research framework representing an evidence-based tool for companies to select the most suitable sustainability-sensitive SCF solution, given their diverse needs and desired benefits.

4 RESEATCH METHODOLOGY

This section of the work is aimed at clearly showing how the different phases, reported in the graph of the previous paragraph (the research process graph), have been structured and developed, alongside their precise contribution to the progression of the research work.

As regards for the data collection, in turn dividing in literature review and secondary data gathering, the methodology used to build up the research framework pillars is carefully described, reporting all the informative sources and the techniques adopted to classify and treat data in order to take the most out of them. More precisely, one paragraph is destined to the presentation of how sustainability and SCF academic literatures have been analysed so as to infer gaps and points of conjunction, reporting and grouping all the articles and working papers according to some macro theoretical categories.

A second paragraph describes how secondary data have been collected and used to provide a basis for the central pillar of the research framework. Different and disparate informative sources have been here drawn, aiming to find out the widest spectrum of real applications of SCF programs with a sustainability orientation.

Lastly, the structuring of case studies and follow-up analyses is thoroughly presented and detailed. The main goal of case studies analysis is to test the validity of the preliminary research framework, principally based on theoretical evidence, and, in the case of some divergences, to bring some modifications and additions so as to obtain a robust and evidence-based model. Such confirmatory and corrective function has been deployed through repetitive within-case analyses (one for each interviewed firm) and three following cross-case analyses (one for each research question). In parallel, the protocol of the semi-structured interviews has been presented, reporting the content of the macro-areas composing the interview line-up plus the structuring of the engagement e-mail sent to all the potential companies satisfying the research prerequisites.

4.1 Literature review

This section presents how SCF and sustainability literatures have been reviewed and analysed to lay the theoretical foundations of this research work.

Firstly, SCF theoretical foundations have been thoroughly studied by reviewing main articles and working papers on SCF area provided by the Supply Chain Finance Observatory of the

Politecnico di Milano, the university therein this research thesis has been launched, to continue, then, revising other SCF founding papers.

The main aim of such preliminary theoretical investigation was to get to know the state-of-the-art of the research in SCF dominium along with an overview of all the different approaches by which SCF topic have been tackled over the years. Once the fundamental theoretical pillars of this quite recent literature stream have been deeply studied, a further investigation of the multiple aspects characterizing SCF has been conducted. In this regard, an overview of theory regarding the role played by financial institutions, service, technology and logistics providers plus an attentive analysis of all the SCF solutions present in the market have been carried out. While reviewing the different articles and papers, the main focus has always been on identifying all the concrete and immediate advantages SCF spectrum of solutions bring to the involved companies, especially in a supply chain context.

In the meanwhile, literature on sustainability has been thoroughly reviewed, always trying to make connections with the parallel analysis of SCF literature. As such a topic is a vast theoretical area, it has been decided to start analysing general concepts and genesis of sustainability field of study, passing, then, to some of the most relevant and famous streams of the sustainability theory.

More precisely, after the initial preamble on sustainability concept as a whole, triple-bottom-line (3BL) approach to sustainability and the weak and strong sustainability concepts have been presented and discussed in that, nowadays, they represent a substantial portion of sustainability literature. Other equally important streams of sustainability concepts do exist in the literature but, for the sake of clarity and brevity, have not been reported. The review went on by furtherly exploring the 3BL approach, deemed as the most significant stream for the research purposes, by tackling down its three components: economic, environmental and social sustainability.

Quite a complete dissertation on Supply Chain Management (SCM) has been, then, carried out as this topic profoundly affected the 3BL theory, leading to the formation of Sustainable Supply Chain Management (SSCM) topic. The latter has been accurately presented with the identification of one theoretical gap.

Subsequently, another declination of sustainability concept in the literature has been reported and discussed: Corporate Social Responsibility (CSR) area has been reported as a concrete way for companies to commit to sustainability principles. Here, a second theoretical gap has been identified.

Once the two theoretical gaps, key for the work proceedings, have been detected in sustainability literature, SCF papers review went on being particularly devoted to providing an answer to such gaps.

As a final result of reviewing both literatures, the preliminary research framework has been built up: supply chain players' (i.e. suppliers and the buyer) drivers for launching a sustainability-oriented SCF programs and related drawn benefits, representing two of the three pillars of the framework, have been identified.

For what concerns, instead, the central pillar, that is the relevant architectural variables of the SCF programs, it was possible, through the literature, to put forward some potentially determinant architectural variables, to be tested in the work proceedings.

The analyses of both literatures have been performed through a meticulous data collection process, leveraging on plenty of different sources. To this regard, the main research tool adopted have been databases, such as Scopus, Google Scholar and ISI Web of Knowledge, and search engines, such as Google, combined with the Supply Chain Finance Observatory database of reports and documents and the Politecnico di Milano lectures notes and books.

The principal keywords for running the literature analysis have been multiple and ... For SCF side here are the most recurrent ones: Supply Chain, Supply Chain Finance, Working Capital, Working Capital Management, Supply Networks, Supply Chain Integration, Collaborative Supply Chain, Financial Supply Chain Management, Financial Supply Chain, Supply Chain Financing, SCF, Supply Chain Finance literature review, Supply Chain Finance state-of-the-art, cost of capital, Service providers, Value Creation, Financial Collaboration, Reverse Factoring, Finance, Cash Flow, Financial Institutions, Cash-to-Cash Cycle, Trade Credit, Principle-Agent problem, Asymmetric Information.

For sustainability side the most relevant and present keywords have been: Sustainability, Well-Being, Welfare, Triple-Bottom-Line, 3BL, Weak and Strong Sustainability, Intergenerational Discount Rate, Bruntland Report, Sustainable Development, Environmental Sustainability, Economic Sustainability, Social Sustainability, Social Capital, Natural Resources, Sociology, Justice, Social Equity, Safety, Risk Mitigation, Corporate Social Responsibility, CSR, Sustainable Supply Chain Management, SSCM, Ethics, Corporate Environmental Sustainability, Life Cycle Assessment, Green Supply Chain Management, Reverse Logistics, Environmental and Social Standards, Sustainable Supplier Relationship Management, Supplier Management, Supplier Selection And Evaluation, Supplier Monitoring, Supplier Development, Sustainable Practices, Risk Management.

Nevertheless, not all the collected papers have been entirely analysed as some of them, by examining the abstract, have been deemed as too collateral with respect to the research thesis scope. As an example, on sustainability literature side, papers dealing with a detailed report of the several environmental and social regulations as well as, on SCF literature side, sources dealing with a particular focus on roles played by service and logistics providers have been discarded.

After this phase, further relevant papers have been identified and analysed by referring to the references of that set of papers particularly aligned to the research scope. As a result, a total of 158 papers (95 of them are around sustainability area and 63 on SCF topic) have been selected as determinant to lay the theoretical foundations of this research thesis and identify the literature gaps.

Overall, the literature phase took quite a long time as lots of different papers have been taken into account and the continuous research for sustainability and SCF points of intersections often entailed to get back to already processed papers to establish further connections between these two theory areas.

Below are a pie chart showing the different sources of papers with related weights and a table reporting the major supply chain finance, finance, supply chain management and sustainability journals providing the strongest theoretical basis for this work, plus the indication of which literature review (SCF and/or sustainability) have been consulted for.

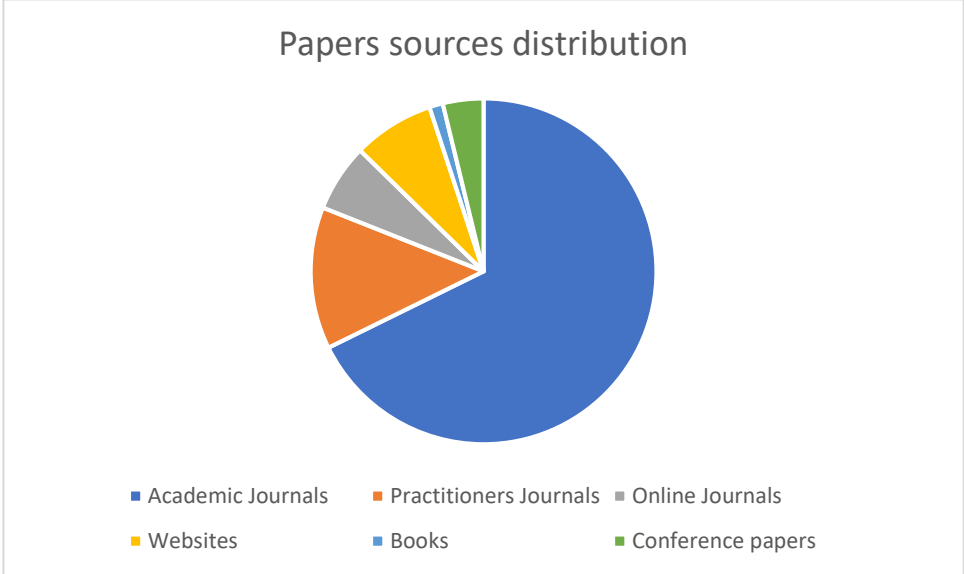


Figure 13: Paper sources

Journal	SCF	Sustainability
International Journal of Operations & production Managment	X	X
International Journal of Physical Distribution & Logistics Management	X	X
Journal of Corporate Finance	X	
European Journal of Operational Research	X	X
Journal of Business Finance & Accounting	X	
Journal of Small Business and Enterprise Development	X	
Journal of Banking & Finance	X	
Journal of Entrepreneurship Perspectives	X	
Journal of Cleaner Production		X
Journal of Business Ethics		X
Journal of Supply Chain Management	X	X
International Journal of Production Economics	X	X
Journal of Management Studies		X
Supply Chain Management: An International Journal	X	X

Table 11: Classification of the articles sources

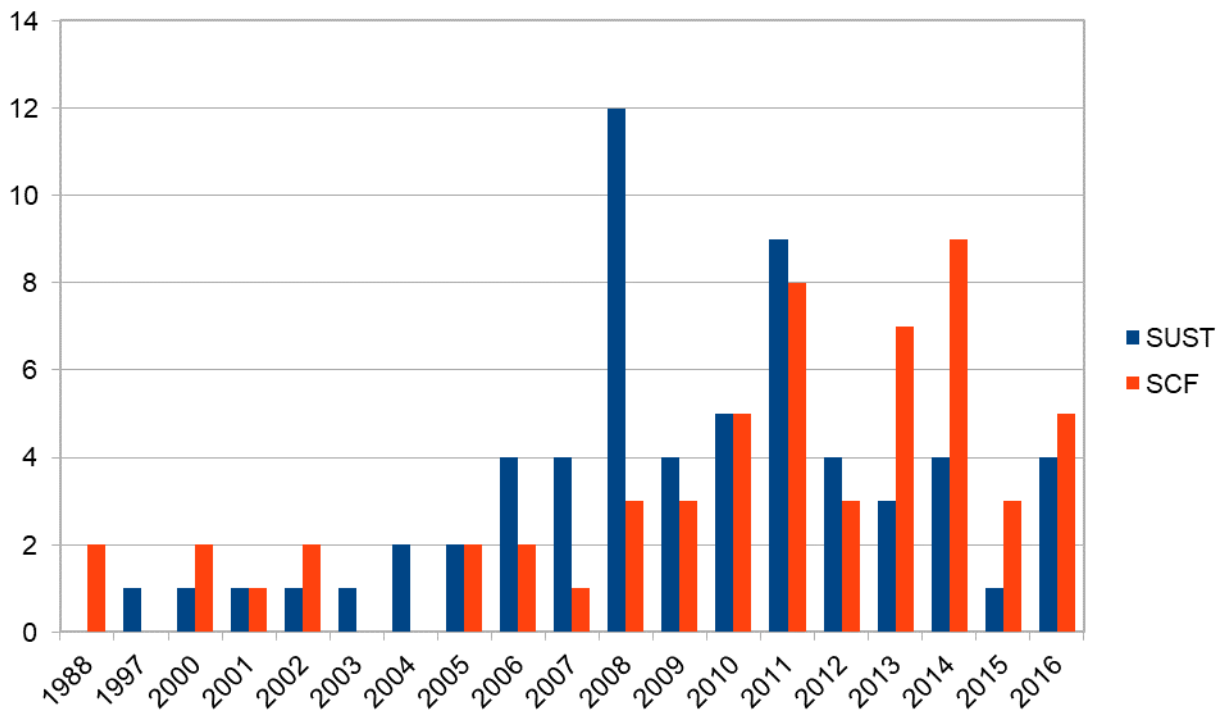


Figure 14: Distribution of articles per year

4.2 Secondary data

As already reported in literature review dissertation, both sustainability and SCF literatures provide very few concrete and real-life examples of SCF applications in a business context aiming to support a company's supply chain. This shortage of practical examples is further accentuated when turning to financial solutions with an explicit sustainability orientation: no cases at all are presented in the literature. In this respect, SCF literature, still limited in papers quantity due to its quite recent birth, can be used only to suggest what could be the relevant architectural variables for a SCF solution, whether it is a "classic" SCF solution or a sustainability-oriented one.

The purpose of the secondary data investigation was, therefore, to figure out real and practical applications of programs linking together SCF and sustainability worlds so as to state what are the relevant architectural dimensions for a sustainability-oriented SCF programs, thus confirming or disproving literature insights in this regard.

Secondary data make their best when searching for fact-based information within business context. As such data may stem from a wide range of different public sources, this way of collecting information proved to be much faster and easier with respect to primary data investigation (i.e. literature review) (Cowton, 1998).

The gathering of information mainly occurred on websites by looking for business articles reporting successful applications of SCF solutions somehow linked to sustainability drivers.

Other relevant information sources have been, then, national newspapers, with related inserts dealing with sustainability issues, and sustainability-imprinted magazines by which it is possible to keep updated on business initiatives revolving around sustainability themes. Such latter informative tools, as shown in the following, turned out to be crucial when it came to search for companies to interview.

Once a real application of SCF solution with a connection to sustainability dominium has been found out, the general proceeding was to further investigate the specific case on other available informative sources so as to gather as many information as possible.

Such an investigatory phase allowed to identify and report three real applications of SCF solutions with a strong connection to sustainability themes. By analysing these three cases, some architectural variables have been put forward as determinant and crucial for a sustainability-oriented SCF programs.

Below a short resume of the three cases of real-life applications of sustainability-oriented SCF program, fundamental to build up the central pillar of the theoretical research framework (a more detailed presentation in the appendix):

Puma and Levi's:

- They partnered with BNP Paribas and International Finance Corporation (IFC-World Bank private sector arm) within its Global Trade Supplier Finance program;
- Brand companies offer an Advanced Reverse Factoring to those suppliers who meet the firms' social and environmental standards;
- Interest rates for to discount invoices are so defined: the better are the environmental and social performances, the lower are the interest rate;
- GT Nexus is the shared cloud-based and seamless platform therein all the money transactions and information transfers between all the involved parties occurred.

Only The Brave (Staff International):

- CASH Program (Credito Agevolato Suppliers Help): agreement with BNL Ifitalia to offer Italian SME's suppliers an Advanced Reverse Factoring solution;
- Suppliers can enter the program if they meet some operative standards composing the company suppliers' rating (i.e. quality, reliability and partnership)
- Participating suppliers can discount invoices with 2,5% as interest rate, receiving cash 2 weeks after the invoice issuing;
- Mediana is the bank web-based and seamless platform therein all the money transactions and information transfers between all the involved parties occurred.

4.3 Case studies

Given the qualitative structure of this theory-building dissertation work, it has been decided to opt for the multiple case study approach as one of the most recurrently adopted methodology to tackle these kinds of business dynamics (Johansson, 2003). Applied to this research thesis, such an approach is thought to best gather information needed to test and integrate the previously identified preliminary research framework (Gillham, 2001). The explorative case study methodology, indeed, allows to collect and study a very wide spectrum of different information so as to completely capture the complexity of the single case, thanks to its flexible and malleable building scheme (Zach, 2006). To this regard, many notable academics affirmed

how the case study methodology represents a proven tool for achieving a deep understanding of a specific phenomenon, in contrast with earlier critics about its apparent lack of scientific rigor with respect to quantitative methodologies (Stake, 1998). Replicating, then, such an analysis on different cases (i.e. multiple case study approach) allows to clearly figure out commonalities and discrepancies so as to identify shared behavioural patterns of companies (Creswell, 1998). The latter represents the ideal and desired output of this dissertation work.

Data Collection

Regarding the way to collect data for building up case studies, as already mentioned above, semi-structured interviews have been chosen as the best methodology to gather qualitative data for this theory-building research. Such interviews have been based on a pre-defined scheme of questions, thus assuring consistency between the multiple interviews, while keeping some space for further and case-specific information. More precisely, interviews structure is made of three macro-areas: the first one dealing with drivers and motivations that led the focal firm (i.e. the interviewed company) and its suppliers to activate the SCF program, the second one investigating the program architecture with related operative aspects (e.g. functioning, access criteria, information flows, etc.) and the third one focusing on the diverse types of benefits brought to both suppliers and focal firm. As it can be inferred, interviews macro-areas strictly relate to the three research questions: each macro-area derives from a decomposition of each research question in many shorter-scope questions (in the appendix the entire questionnaire is reported).

For what concerns the engagement e-mail sent to the diverse identified multinational companies embarked on a sustainability-oriented SCF program, it has been structured in three macro-blocks: the first one introducing myself (the research thesis author) and my current studies and in particular my research thesis content and objectives, the second one reporting why the firm has been contacted and the main points covered by the potential interview, the third one informing about interview details and data treatment. (the entire engagement e-mail text can be found in the appendix).

Case Studies Sampling

Before starting to collect data for the multiple case studies, the boundaries of the sample of potential subjects to interview have been set. First of all, it has been decided to exclude banks and financial providers as the research thesis purposes revolve around supply chain actors' dynamics. Then, focal firms of the supply chains have been preferred over their suppliers as,

most of the times, these kinds of SCF programs are buyer-driven with suppliers subsequently getting on-board. Accordingly, cases of multinational firms engaged in SCF solutions with a sustainability orientation have been searched through several information sources, such as websites, business magazines and inserts of national newspapers treating sustainability themes, banks' press releases and word-of-mouth. Once found out a case of a sustainability-sound SCF solution, the engagement mail has been sent to the focal firm's contacts, found on company's website or through people directly connected to the firm. By the means of this searching process several companies have been sent the interview request: some of them positively replied while others rejected to be interviewed as their firm policy does not allow to externalize sensitive data.

As a final result, ten big firms (focal companies of their own supply chain) have been interviewed and ten related case studies have been conducted, representing a key contribution for this research work findings.

Below a table resuming the main profile information of the ten interviewed multinational firms.

INTERVIEWED FIRMS	INDUSTRY	TURNOVER	#EMPLOYEES	INTERVIEWEE
Puma	Clothing manufacturing	4.1 bln €	12000	Chief Financial Officer
Staff International	Fashion	400 mln €	700	Chief Financial Officer
CNMI	Fashion	\	\	Sustainability Project Manager
Fincantieri	Construction	4.2 bln €	19000	Chief Financial Officer
Azimut-Benetti	Construction	700 mln €	3000	Administration Manager
Group Engineering	System Integration	935 mln €	8500	Chief Financial Officer
Nice	Home automation	309 mln €	1575	Credit and Tresury Manager
Wind-Tre	Telecommunications	6.49 bln €	7525	Chief Financial Officer
Fastweb	Telecommunications	1.9 bln €	3500	Chief Financial Officer
Sonepar	Electrical material manufacturing	20.2 bln €	43000	Internal Control Officer

Table 12: Interviewed firms profile

Case Studies Analysis

To test the research framework validity and bring possible modifications and corrections, the multiple case study approach has been selected as the best one, given the mainly qualitative nature of this research study. Analysing in detail different case studies allows, indeed, to gather a huge amount of both qualitative and quantitative data which could strongly help in proving the robustness of the research framework, based on literature insights and secondary data. Such an exploratory approach is particularly effective in that, as its name suggests, it replicates a structured data collection on several case studies (i.e. the different interviewed firms), thus

eliminating some biases originating from case-specific peculiarities. In this way, each single case has been first analysed and carefully detailed and, then, compared to the other selected case studies so as to infer commonalities and discrepancies between them. The main purpose of this combined analysis was to form groups of case studies, characterized by internal homogeneity and external heterogeneity according to some key variables. Said in theoretical terms, a within-case analysis (**RIFERIMENTO A DOVE è**) has been performed for each single case aiming at deeply detailing it. The related information has been gathered by setting up semi-structured interviews allowing, first, to provide a general overview of the company and, then, to characterize each case study along some key pre-defined variables. The latter are completely in line to what the three research questions aim at finding out: interviews can be logically divided in three areas, each one dealing with one research question, as shown in the following.

In doing so, a full consistency between collected data and the research scope is guaranteed. The next step was to compare all the processed case studies by putting together the related within-case analyses. The result was the creation of three cross-case analyses (**RIFERIMENTO A DOVE è**) aiming to structurally compare the different case studies along the three research questions (one cross-case analysis for one research question). As an example, the RQ1 cross-case enables to compare all the case studies according to a set of dimensions responding to RQ1 purposes.

The main output of this two-step analysis of the case studies was the formation of some archetypes of sustainability-oriented SCF programs, wherein interviewed firms are collocated. Each archetype is characterized by a certain set of triggering drivers and a certain set of brought benefits, thus defining the final research framework linking together drivers (RQ2) to the diverse SCF solutions architectures (RQ1), in turn connected to benefits (RQ3).

Later, firms and related SCF programs have been placed in a two-dimensions graph in order to characterize each case study with, on one side, the level of sustainability orientation of the SCF program and, on the other side, the supply chain player most impacted by the program.

5 PRELIMINARY RESEARCH FRAMEWORK

In this section of the work, the preliminary research framework, developed by reviewing SCF and Sustainability literature and gathering secondary data, is presented. First, the main purpose of such a theoretical framework is explained, clearly highlighting how it represents the joining link between the initial phase of collecting data and the subsequent part of empirical analysis. Second, a detailed description of its structure and the way the three composing pillars have been built up is reported.

To follow, each pillar content is carefully described and analysed, highlighting the main insightful points that represent the bridge to the subsequent section of this research thesis. It is, indeed, the definition of the theoretical research framework that lays the basis for the proceedings where each pillar content will be questioned by running a set of interviews and performing related case studies.

5.1 Research Framework

As said in previous paragraphs, the framework is nothing but the structural representation of the three research questions outputs and of how they relate to each other. Being a graphical transposition of the thesis main objectives, the framework aims at showing the potential connections between SCF and Sustainability worlds. Indeed, after uncovering the two theoretical gaps in the sustainability literature, the research thesis goal is to investigate whether SCF solutions can act as effective sustainability levers, thus providing a concrete answer to hurdles encountered when applying sustainability concepts to the whole supply chain dominium.

Such an investigation is conducted by the means of the three research questions, widely discussed in previous paragraphs, whose outputs represent the basis of the three pillars composing the research framework. Such outputs, in the first phase of the research, are theory-based as they completely ground on literature insights, except for the RQ1 content which draws also from secondary data investigation.

Accordingly, the first pillar (on the left-side) deal with both suppliers' and buyer's drivers triggering the adoption of sustainability-oriented SCF programs while the third pillar (on the right side) reports both players' benefits coming from the implementation of this specific kind of financial programs. The central pillar, instead, puts forward possible architectural dimensions deemed relevant for a sustainability-oriented SCF solution. To this regard, a two-step approach has been adopted: firstly, through the literature review some architectural

variables are suggested as key for a SCF program; secondly, by collecting secondary data, the formerly selected variables have been confirmed or disproved.

These three blocks, as observable in the figure in the next page, are mutually linked in a consequential fashion, thus making the three RQs an unicum: companies' needs (i.e. drivers) should lead to select a certain type of SCF program (i.e. diverse SCF solutions architectures) which, in turn, are supposed to bring a set of advantages for the participating parties (i.e. benefits). In this sense, the framework aims at visually connecting SCF and Sustainability topics, intending SCF as a sustainability lever. This connection is made explicit by proposing some potential architectures of SCF programs, where each of them fits a set of sustainability-oriented needs and brings to a set of sustainability-oriented benefits.

In the following thesis section, such a theoretical research framework will be applied by running repetitive case study analyses, going to integrate and adjust the content basing on real evidences. Such case studies originate from interviews to multinational companies taking on a sustainability-oriented SCF program with the aim of figuring out the drivers triggering the program activation, the architectural structuring of the program and the drawn benefits. The interview protocol is, thus, completely aligned to the three research questions purposes and automatically to the research framework content.

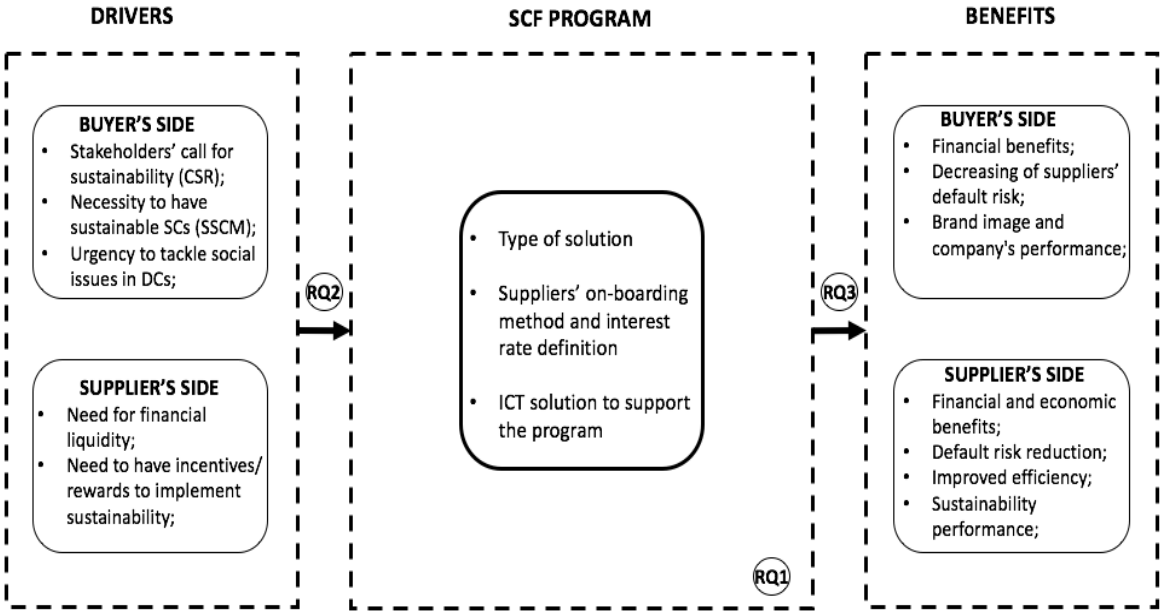


Figure 15: Preliminary Research Framework

The next subparagraphs precisely present each pillar content, reporting the respective literature sources and, in the case of the central pillar, the integration between theoretical foundations and evidences from the three major real-life cases so as to state the relevant architectural dimensions for a sustainability-oriented SCF program.

1st Pillar – Drivers of SCF programs with a sustainability orientation:

Drivers of SCF programs with a sustainability orientation are split in two main areas: drivers for suppliers and drivers for buyers, to take into account the perspective of both the main actors involved in a SCF program.

The main drivers for suppliers are two and are identified on the basis of the literature about SCF:

- Need for financial liquidity: suppliers, especially the small and medium-size ones, are constantly in urgent need for financial liquidity at accessible costs to run the operative business. The recent financial crisis and these players' lack of proper guarantees and collaterals made, indeed, the access to credit via traditional channels ever-more expensive. Such a financially-constrained position, if extended over time, might disastrously impact the competitiveness of these small players, with a high likelihood of default (Delavallade, 2006). As a consequence, such small players have been constantly asking for cheaper sources of financing to their major business partners in a win-win game logic, thus leveraging their acknowledged strategic role into the supply chain.
- Need for incentives attached to sustainability plans: small and medium-size suppliers tend, in most of the cases, to not give priority nor importance to sustainability issues as the latter ones are not perceived as directly related to their core business. In light of that, suppliers would need to be incentivised in pursuing sustainability goals, whether they are part of a wider sustainable supply chain plan or not (Andersen, 2005). In absence of some sort of direct rewards, indeed, a typical SME is unwilling to take on sustainability-oriented actions requiring a considerable deployment of resources without a clear and direct economic return for their bottom-line (Holt et al., 2001). As an example, many multinational corporations severely struggled with the issue of how to implement their codes of conduct in their global supply chains (Leigh and Waddock, 2006) as well as in transferring CSR

practices and socially responsible behaviours to suppliers located in developing countries (Al Zaabi et al., 2013).

On the other hand, the main drivers for buyers are three and are identified on the basis of the sustainability literature:

- Stakeholders' call for sustainability: Stakeholders' (e.g. NGOs, customers, local institutions, governments) increasingly put pressure on companies to deploy sustainable-sound actions and initiatives (Kerkhoff et al., 2010).

This is strictly in line with the concept of Corporate Social Responsibility for which the big brand firms, when doing business, should consider as a final objective of any strategic action plan not only a direct economic return but also an improvement in the living conditions of the social community they base their success on. As a consequence, companies are called to concretely commit to social-oriented actions with a twofold purpose: on one hand, safeguarding the brand image and reputation in the eye of customers, more and more attentive to social themes, and, on the other hand, sustaining the society, and in particular all the small players they interact with, so as to indirectly preserve the continuity of their own business and related competitiveness in the market (Markley and Davis, 2007);

- Call for sustainable supply chains: in order to deliver fully sustainable products or services to the customers, it is necessary for big brands to extend and guarantee sustainability, not only within organizational boundaries, but all along the company supply chain: having all the suppliers adopting and implementing sustainability practices (Holt and Ghobadian, 2009). At the same time companies are held responsible for sustainability performances of their suppliers. Such performances belong to three dimensions characterizing the Triple Bottom Line (3BL) principle, namely economic, environmental and social. All of that has a profound impact on company's brand image and reputation as the public opinion carefully scrutinizes the entire product life cycle, from the raw materials treatment up to the last-mile delivery. A negligence in the compliance to the global environmental and social standards by a supply chain actor could entail countless economic damages for all the linked players (Goebel et al., 2012);
- Urgency to tackle social issues in developing countries: the abovementioned company's enforcement is crucial when it comes to do business with players located in developing

countries where the total absence of laws, regulations and the low level of authority of local institutions leads to rampant corruption, dangerous working conditions, low educational level and child labour. Living standards and environmental conditions are, as well, extremely poor and prohibitive. It is, therefore, big brands' role to make sure their business partners work in accordance to sustainability standards by identifying and setting up tools, systems and programs to assess and monitor how suppliers manage social issues (Walker and Jones, 2012).

Below is a table resuming both suppliers' side and buyer's side relevant drivers triggering the adoption of sustainability-oriented SCF programs. In the table the key indicators, the definition and the literature sources are provided for each driver.

MACRO-VARIABLE	VARIABLE	INDICATORS	DEFINITION	SCF REFERENCES	SSCM REFERENCES
BUYER'S DRIVERS	Stakeholders' call for sustainability (CSR)	Call for social-oriented actions in favour of smaller business partners	Big firms are called by stakeholders to deploy socially sensitive actions		Kerckhoff et al., 2010; Carter and Easton, 2011; Seuring and Muller 2007; Markley and Davis, 2007; Holt and Ghobadian, 2009; Seuring and Sarkis, 2008; Carter and Jennings, 2001
	Call for Sustainable Supply Chains (SSCM)	Suppliers' in compliance to social and environmental global standards	Focal firms are considered responsible for all their supplier's sustainability performances.		Windsor, 2007; Vachon and Klassen, 2006; Koplinet al., 2006; Klassen et al.; Walker and Jones, 2012
	Urgency to tackle social issues in developing countries	Alarming living conditions Rampant corruption Child Labour	Focal firms are called to identify tools and systems to cope with social issues.		Alwaysheh and Klassen, 2009; Carter, 2000; Andersen, 2005; Delavallade, 2006; Durth et al., 2002; Mani et al., 2014
SUPPLIERS' DRIVERS	Need for financial liquidity	High costs of traditional financings Shortage of liquidity to run the business	Small suppliers are evermore cash-constrained, with direct repercussions on the business	Wuttke et al., 2013; Hoffmann, 2005; Pfohl and Gomm, 2009	
	Need for incentives attached to sustainability plans	Absence of monetary rewards for sustainability commitment	Small suppliers are not keen on investing resources for sustainability without rewards		Hillary, 1999; Crals and Vereeck, 2005; Catusus et al., 1997; Barchard, 1998; Holt et al. 2001

Table 13: Suppliers' and Buyer's drivers

2nd Pillar – Relevant architectural variables of a sustainability-oriented SCF program

The research framework second pillar aims at figuring out the architectural variables which are considered as relevant when setting up a SCF program with a sustainability orientation. Once such structural dimensions are identified along with the entire theoretical research framework, the research work objective, through the multiple case study approach, is to test the key relevance of the identified architectural variables to direct SCF programs towards sustainability goals. To do so, such architectural dimensions will have to act as building levers so that the outcoming SCF program responds to the initial sustainability-oriented needs (i.e. drivers of the program) and leads to a set of desired sustainability-oriented benefits.

As previously said, the methodology followed to build up such a pillar consists in two progressive steps: firstly, architectural variables that are relevant for a generic SCF program according to the most notable authors of the field have been sought and analysed; secondly, through secondary data investigation, three major real-life applications of sustainability-oriented SCF solutions have been identified and detailed with the main aim of sealing the relevant architectural variables for a SCF program with a sustainability orientation. Put differently, through the literature, some strategic variables for building up a SCF program have been put forward and the related key relevance and importance in structuring a sustainability-oriented SCF program have been subsequently confirmed or disproved by reviewing the three real-life cases.

In so doing, this central pillar, starting from a theoretical base, finally grounds on real evidence. In line with this two-step approach, the following subparagraph is to report what are the relevant and distinctive architectural dimensions for a sustainability-oriented SCF program, mainly basing on the evidences stemming from the three real-life applications of sustainability-oriented SCF programs.

More precisely, such dimensions have been stated by providing, on one side, the theoretical foundation testifying their primary importance for the structuring of a general SCF program and, on the other side, reporting why they played a fundamental role for a program implemented and oriented to sustainability.

As regards for the cases identified to test theory-based architectural dimensions of a SCF programs, three cases of sustainability-oriented SCF solutions emerged, from the secondary data investigation, as particularly meaningful and relevant for this research thesis scope: two of them (Puma and Levi's) are framed in the SSCM direction while the third one (Staff International) is in line with the concept of CSR (a comprehensive report is in the appendix).

Relevant architectural dimensions for a SCF program with a sustainability orientation:

SCF literature, despite being quite recent, embodies several diverse kinds of approaches to the topic, each one intending and perceiving SCF from a slightly different angle. One of the various discriminating factor is what make a financial product a SCF solution: the boundaries of this new breakthrough research area are not completely defined yet. As a matter of fact, many notable authors and academics disagree on what are the distinctive features of a SCF solution and the related key architectural choices when setting up a program.

To this research thesis purposes, the drawn literature sources (Hofmann and Belin, 2011, Gelsomino et al., 2015) have been combined and taken as a reference to state the diverse architectural variables that are deemed crucial to determine and structure a SCF program. Then, after carefully analysing the three real case studies, some of the previously identified architectural dimensions have been confirmed as playing a key role for a sustainability-oriented SCF program while others have been judged as not crucial to embed sustainability goals within the program.

- Geographical coverage: according to this dimension solutions are classified in domestic and cross-border ones. The formers, entirely executed in the same country, are said to be easier to manage with respect to the latters that, by contrast, require the intermediation of different financial and technology actors to make the operative procedures smooth and effective across more countries. The diversity of cultures, languages and jurisdictions further complicates the proper functioning of the program. In light of that, international programs, most of the times, require a much more complicated structure and a difficult related management.

Such a dimension, however, turned out not to be a key variable for the effective settings of a sustainability-oriented SCF program. In fact, two big brands (Puma and Levis) implemented the program with both national and international suppliers without registering any substantial complications nor sustainability-related advantages when dealing with cross-countries transactions. To this regard, the decision to opt for an international bank (BNP Paribas) with years of experience in managing world-wide trade was fundamental to make all the operative burden smooth and efficient;

- Type of solution: as observed in the section dealing with SCF literature review, plenty of different financial solutions are classified as belonging to SCF dominium. Each one has its own way of operative functioning, its scope of application, specific players involved and set of triggering needs and related brought benefits. There are, indeed, different categories of SCF programs that are structured to respond to specific types of needs and to particularly benefit a supply chain actor while not bringing clear advantages to the other involved players.

Advance Reverse Factoring solution, with its specific functioning, resulted to be key, for all the three examined real cases, in allowing all the involved players to satisfy their own needs. More precisely, the Reverse Factoring crucial feature of letting suppliers access to cash with the same financial conditions as their buyer's ones (i.e. focal firm of the supply chain) revealed to be crucial both in a Corporate Social Responsibility view and in representing concrete incentives for suppliers to move towards required directions (i.e. committing to buyer-driven sustainability plans).

As a matter of fact, the type of solution is absolutely a primary architectural dimension to build up a SCF program oriented to sustainability;

- Players involved in the program functioning: a general SCF solution usually comprises a set of suppliers, the focal firm and the financial player providing the financing as the basic actors. In addition, however, other ancillary players can intervene in the process, such as technology providers for ICT platforms and logistics providers who may take temporary ownership of the exchanged goods in some kinds of SCF programs (e.g. inventory finance).

For what concerns the three real cases, only the traditional actors, namely the big focal firm of the supply chain, its supply base and a financial institution, are involved in the SCF program. No other peculiar actors take part to the program functioning as the adopted solution is a classic Reverse Factoring, except for some intrinsic architectural choices, below reported. In light of that, the type of players involved in the program turned out not to be a relevant and distinctive architectural dimension for a sustainability-oriented SCF program;

- ICT solution to support the program: (e.g. type of platform adopted): SCF solutions mainly aim at facilitating and accelerating the informational and financial flows within a supply chain, trying to couple them with the physical movement of material. To this

end are different ICT platforms enabling fast and seamless types of financing and payment arrangements between the supply chain partners. While there are multiple technological providers in the market offering the most advanced ICT platforms to support these innovative financing systems, the usual owner of the platform, within a SCF context, is the bank that offer its virtually-based space to their clients so as to speed up and optimize all the operative procedures, also making the program extremely flexible.

In the analysed cases, the ICT platform plays a key role in that it allows the buyer (and the bank) to constantly assess and monitor all the suppliers' performances upon whose accomplishment the program is activated. The platform is also crucial in guaranteeing a proper and efficient interest rate attribution to every supplier as the latter is composed of a fixed part plus a variable one that may vary over time based on suppliers' performances.

In this respect, the selection of a suitable ICT platform is doubtless a relevant architectural dimension for a sustainability-oriented SCF program.

- Suppliers' on-boarding system and interest rate definition: in the big majority of cases SCF programs are triggered by buyers, jointly with banks or factors representing the financing providers, with the aim of satisfying a certain set of needs, whether they are buyer or suppliers-oriented. This is because the focal firm (i.e. the buyer) has enough bargaining power towards the financing actor to set up a tailored and innovative financial solution with specific benefits. Single suppliers, indeed, are either too small or in an unfavourable position towards the banks to drive these kinds of financial programs. Hence, it is the buyer, alongside the bank, that orchestrates the SCF program structuring and the subsequent operative functioning. To this regard, the selection of the supply base subset participating to the program is a strategic decision as the buyer, by the means of this discriminating choice, can give the desired imprint to the financial solution. In this sense, it is possible for the buyer to distribute the program-attached financial and non-financial benefits to a certain set of suppliers. Such a lever in the hand of the buyer may thus represent a powerful weapon to push suppliers in a certain direction by, as an example, restricting the access to the program to those suppliers meeting some performances thresholds. This is exactly what has been done in the three registered real-life applications of sustainability-oriented SCF programs: the big brand buyers restricted the program access to suppliers that reach some pre-defined values of

operative or sustainability-related performances. It is, therefore, very clear how this architectural lever is of paramount importance and relevance in order to orient SCF programs towards a desired direction, in this case sustainability goals.

Another equally relevant and determinant architectural variable for a sustainability-oriented SCF program, somehow related to the suppliers' on-boarding system decision, is the way interest rates, at which suppliers will earlier discount their invoices, is defined. Such a decision, indeed, played a key role in the three identified real-life applications in that the interest rate strictly depends on suppliers' achievement in monitored performances: the better suppliers score in assessed performances, the lower is the obtainable interest rate to discount invoices. Suppliers are, therefore, strongly incentivised to pursue buyer's sustainability-oriented objectives.

To sum up, the combined effect of managing the suppliers' access to the program system plus the dynamic definition of the interest rate for discounting invoices is a key and strategic architectural choice for a sustainability-oriented SCF program.

In accordance to the three architectural dimensions found to be relevant and determinant for a sustainability-oriented SCF program (i.e. 1-type of solution, 2-ICT solution to support the program, 3-suppliers' on-boarding system and interest rate definition) interviews will be structured so as to interrogate multinational companies, first of all, about the choices made for such architectural variables and, then, about other registered relevant architectural decisions. As already said, the desired output is the formation of different archetypes representing possible architectural configurations for a sustainability-oriented SCF program.

Below is a table resuming the three relevant architectural dimensions for a sustainability-oriented SCF program, pointing out the literature sources proving their relevance for a SCF program along with the reason why they played a key role in modelling a SCF program oriented to sustainability.

ARCHITECTURAL DIMENSION	PROVED RELEVANCE	LITERATURE REFERENCES
Type of solution	Financial benefits for suppliers	Hofmann and Belin 2011
Suppliers' on-boarding system and interest rate definition	Incentives for suppliers	Seuring and Muller, 2007
ICT solution to support the program	Merit-based system for interest rate definition	Hofmann and Belin 2011

Table 14: relevant variables for sustainability-oriented SCF programs

3rd Pillar – Benefits of SCF programs with a sustainability orientation:

Principal benefits drawn by SCF programs with a sustainability orientation can be divided in two main categories: drivers for suppliers and drivers for buyers so as to take into consideration the perspective of both the main actors involved in a SCF program.

The main benefits for suppliers are four, identified in accordance to the literature about SCF:

- Financial benefits: by benefitting a SCF program, it is possible for suppliers to get financings at a much lower cost with respect to traditional financing channels (Gelsomino et al., 2015). Furthermore, alongside economic savings, suppliers can, by far, improve their Working Capital position as these innovative financial programs allow to faster access liquidity, thus automatically reducing the amount of cash to finance for the operative business (Phofl and Gomm, 2009). By leveraging the business relationship and the joint financial program with the big brand firm, the orchestrator of the entire supply chain, suppliers get also higher bargaining power vis-à-vis banks, resulting in further and collateral financial advantages (e.g. openings of new credit lines) (Wuttke et al., 2016);
- Decreasing of default risk: the optimization and improvement of company's financial conditions have strongly positive implications on day-to-day activities, giving continuity to operations and allowing to dedicate the managerial efforts to further develop the strategic part of the business. The firm's long-term survival and competitiveness in the market, most likely, will be no longer at risk, given the tight correlation between a company's financial condition and the related stability and competitiveness within the market place. One of the most common reasons why firms go bankrupt is, indeed, a lengthened cash-constrained situation which triggers a vicious cycle as banks further limit the access to credit, thus ending up stifling the firm's business (Dyckman, 2009);
- Improved efficiency: implementing environmental and socially responsible practices might lead to improved operational performances as working to enhance sustainability parameters automatically implies to cut excessive production costs, reduce waste and increasing productivity from better working conditions. A virtuous cycle can be, then, triggered as the latter operation-related improvements in turn get the firm closer and closer to sustainability-sound practices, thus further increasing efficiency indicators. Often, then,

committing to work for environmental (e.g. reducing CO2 emissions) and social (e.g. preventing child labour) issues is awarded by national and international institutions with fiscal benefits and financial reliefs (Fabien, 2000, Golicic and Smith, 2013);

- Sustainability performance: restructuring practices, routines and facilities towards a sustainable-sound direction can be seen also as a concrete challenge and opportunity to differentiate from the competitors thanks to good sustainability scoring, thus adding to costs-cutting attribute abovementioned (Polonsky and Jevons, 2006). Such an aspect is becoming, nowadays, more and more relevant given the social-oriented wave investing the world-wide marketplace, especially the final consumers that consider firms' attention to sustainability issues as a fundamental prerogative.

As regards for the second categories, the main benefits for buyers are three and are grounded on Sustainability literature:

- Financial benefits: by implementing a SCF program (e.g. a Reverse Factoring solution), there is the possibility for big brands to get an extension of payment terms from the bank: while suppliers immediately receive cash from the bank, the buyer often lengthens the pay-back period, thus decreasing its working capital amount. In so doing, the big brand, while setting up a financial program framed to satisfy sustainability-oriented purposes, also gets to an optimisation of its own financial flows, freeing up cash to re-invest in other profitable investments (Seifertand Seifert, 2011);
- Decreasing of suppliers' default risk: in parallel, by setting up these innovative financial solutions, the risk of strategic suppliers' default strongly decreases as they are allowed to get access to cash in a faster and cheaper way, always linking a firm's survival to its financial position. The big brand, thus, makes sure of the supply continuity of all their upstream partners, which is a fundamental prerequisite for maintaining its own desired long-term competitiveness in the market place. Given, indeed, the current structural configuration of the business world in long, complex and cross-countries supply chain, widely presented in the related literature review part, the competition is no longer between single firms but between entire supply chains (Garcia-Teruel and Martinez-Solano, 2007)
- Brand image and company's performance: regarding the sustainability aspect, having the supply base incentivised to become more and more sustainable allows the company to

extend sustainability practices along the Supply Chain, making the latter fully compliance to sustainability standards and requirements. This commitment to sustainability has a double positive effect: on one side, the company's brand image and reputation is strengthened with positive repercussions on the business and, on the other side, having sustainable-sound operations directly leads to an improved overall efficiency of the supply chain, reflecting in higher organizational performances and competitiveness in the market. [37(3rd social enablers and in discussion) (Clarkson 1991, Carter et al., 2000).

Below is a table resuming both suppliers' side and buyer's side main benefits drawn from the adoption of sustainability-oriented SCF programs. In the table the key indicators, the definition and the literature sources are provided for each benefit.

MACRO-VARIABLE	VARIABLE	INDICATORS	DEFINITION	SCF REFERENCES	SSCM REFERENCES
BUYER'S BENEFITS	Financial benefits	Working capital optimisation More efficient use of liquidity	Possibility for the focal firm to optimise its working capital through SCF programs implementation	Wuttke et al., 2013; Randall and Farris 2009	
	Decreasing of suppliers' default risk	Financially-secured suppliers Guarantee of supply continuity	Concret risk for the focal firm of strategic suppliers' default with direct repercussion on its own business	Garcia-Teruel and Martinez-Solano; Seifert and Seifert, 2011	
	Brand image and company's performance	Enhanced firm's reputation Increased sales	Having the own supply chain fully sustainability compliance benefits the focal firm's image		Christmann, 2004; Drumwright, 1994; Carter and Dresner, 2001; Klassen and Vachon, 2003; Sarkis, 2003; Clarkson 1991; Cruz, 2015; Carter et al., 2000
SUPPLIERS' BENEFITS	Financial and economic benefits	Working capital optimisation Cheaper financing costs	Through SCF solutions suppliers get access to cash in a faster and cheaper way	Dyckman, 2009; Hofmann and Kotzab 2010; Klapper, 2006	
	Decreasing of default risk	Long-term business continuity	Due to the untrapped liquidity the risk of failure is by far mitigated	John Liebl, Evi Hartmann, Edda Feisel, 2016	
	Improved efficiency	Waste reduction Higher productivity Costs cutting	Adopting social and environmental-sound practices have positive reflections on operations		Clarkson, 1991; Fabien 2000; Golcic and Smith, 2013; Carter et al., 2007
	Sustainability performance	Sustainability as competitive advantage	Excellent sustainability scoring can represent a competitiveness and differentiation lever		Carter and Rogers, 2008; Green et al., 2011; Polonsky and Jevons, 2006

Table 15: Suppliers' and Buyer's benefits

6 RESULTS&DISCUSSION

In this section a thorough case study analysis is illustrated with the aiming of inferring the main results for this research thesis. As previously mentioned, the multiple case study approach has been selected to test and integrate the theoretical research framework whose structure and content have been carefully presented in the former section. For running repetitive case studies, first of all, interviews to ten multinational companies have been carried out, following a pre-defined interview protocol aimed at interrogating firms in line with the three research questions purposes. Interviews protocol, indeed, derives from a detailed decomposition of the three high-level research questions guiding the development of this thesis.

By building up case studies and structuring follow-up analyses, the preliminary research framework representing the theoretical answer to the three research questions is put to the test of empirical evidences. That is, the depicted function of SCF to represent an effective lever to make the implementation of sustainability plans smoother and successful, whether sustainability is framed in a SSCM context or in a CSR perspective, is assessed with multiple case study analyses. In this respect, the research questions output will be totally based on evidence-based results and the eventually proved connection between SCF and Sustainability will be transposed in the final research framework.

Case studies, as reported in the methodology section, have been studied and investigated by the means of ten within-case analyses, one for each interviewed firm, and three cross-case analyses aiming at structurally comparing the ten multinational companies along the three research questions. Within-case analyses allow to detail each case study according to a set of pre-defined key variables stemming from a faithful decomposition of the three research questions content. The three cross-case analyses, instead, are built up by putting together the previously-formed within-case analyses and grouping the key variables in three macro-areas, each one corresponding to one research question content.

In line with the structuring of case studies follow-up analyses, the next subparagraphs precisely present the inferred results for each research question by reporting and discussing the respective cross-case analysis. The latter is, indeed, the key element allowing to take out commonalities and discrepancies between the case studies along a set of variables.

6.1 RQ1: How can a SCF programme be implemented with a sustainability orientation?

This first research question aims at identifying the different possible architectures of SCF programs that allow to embody and reach sustainability objectives through the implementation of the selected solution. The desired output is the identification of groups of SCF programs differentiating from each other for the diverse architectures of sustainability-oriented SCF programs. Programs architectures may, indeed, vary based on a set of relevant architectural dimensions that, combined in diverse ways lead to different configurations of SCF programs.

For the case studies to act as effective tools to test the research framework central pillar, dealing with potential architectures of sustainability-oriented SCF programs, the ten firms have been asked questions based on the previously identified relevant architectural dimensions. The latter ones represent the starting point to figure out SCF programs architectures of the interviewed firms, extending the analysis to other dimensions relevant for the single cases.

In this respect, the three formerly stated architectural dimensions (e.g. 1 - the type of solution, 2 - the suppliers' on-boarding system and interest rate definition, 3 - ICT solution to support) have been furtherly either decomposed in sub-dimensions or integrated with other variables, so as to best grasp commonalities and differences between interviewed firms.

In this regard, the type of solution is coupled with the numbers of financial institutions (i.e. banks and factors) the big brand buyer (i.e. the interviewed firm) set up the program with to better depict the SCF program features. The ICT solution in support of the program is furtherly characterized in the type of selected solution and the owner of the latter. Whereas, the second dimension has been first split in, on one side, suppliers' on-boarding system and, on the other side, financial aspects.

Suppliers' on-boarding system dimension, then, has been in turn divided in diverse sub-variables, below reported, that further characterize the management of suppliers:

- Number of program classes: SCF program can be structured in different classes therein different suppliers are placed. Classes usually differ for the program financial conditions. In this regard, CNMI reported how “the SCF program is a class-based solution with each participating supplier belonging to one class, from which he or she may pass to a more advantageous one or be degraded to a less advantageous one”;
- Variables of classes: in SCF programs characterized by the presence of suppliers' classes, some pre-defined variables determine the assignment of suppliers to a certain class based, such as the registered suppliers' results in operative or sustainability

performances. Turning to the interviewed firms, Puma mentioned that “each class is characterised by certain threshold values related to sustainability performances, only those suppliers achieving pre-defined targets can access that class;

- Re-auditing period: SCF programs conditions and suppliers’ performances assessment go through periodic audits. Related to that, Staff International and Wind-Tre stated a periodic review time, twice per year and once a year, respectively. Group Engineering, instead, said how “there is no a a-priori rule, the revising period is case-specific”;
- Access criteria: criteria regulating the suppliers’ access to the program play a key role for the effectiveness of the SCF solution to push the same suppliers towards a desired direction. This architectural dimension played a crucial role in Puma, Staff International and CNMI SCF programs as only virtuous suppliers, according to assessed performances, can enter the program. To this purpose, key is the quote by Staff International: “we constantly monitor and rate our suppliers in some key operative performances and only those achieving threshold values in all the evaluated performances are allowed to access the program”. Whereas, Azimut-Benet said that “all our suppliers can think of participating to the program”.
- Responsible for suppliers’ entrance: the entity (e.g. either the buyer or the bank) deciding which supplier is allowed to enter the program is indicative of the SCF program purposes, as it can be explained in the following. Such an architectural variable, indeed, plays a key role in directing the program towards the desired direction. Stick to that, Staff International reported: “we decide which supplier can take part to the program, based on the achieved operative performances” while Fincantieri stated how “it is the bank to decide whether one supplier of our supply base can enter the program, based on supplier’s financially-related indicators. We do not put any entrance barrier”.
- In-out system: the permanence of suppliers in the SCF programs may be either contract-based or related to the scoring in pre-defined performances or automatic when entering the supply base of the big brand buyer. To this regard, Puma stated that “suppliers can enjoy the program advantageous financial conditions as long as required sustainability performances are met”. Sonepar, instead, explained how “the permanence of suppliers in this financial program is tied to length of the contract: once a contract expires, new financing conditions have to be negotiated”.

Financial aspects, instead, comprises different financial-related issues, among which the interest rate definition, that are of crucial importance in assigning financial benefits to the involved parties:

- Re-negotiation of payment terms: SCF programs, whether it is oriented to sustainability or not, can be used by the buyer also to extend the payment terms towards the bank, thus improving its own working capital position. Related to this architectural dimension, interviewed companies made different choices. CNMI stated that “the program was not used to get financial own benefits, being entirely tailored to sustain suppliers. Therefore, no extension of payment terms has been negotiated with the bank”. A different decision characterised Wind-Tre stating how “the program main objective is to sustain and support suppliers but it also acts as a tool to improve our own financial position;
- Who defines the interest rate: in these sustainability-oriented SCF programs, the definition of the interest rate, at which suppliers will discount their invoices, can be made by either the buyer along with the bank or the supplier and the bank without involving the buyer. Both alternatives have strong impacts in the benefits stemming from the SCF program implementation. In this regard, Staff International said that “the interest rate is defined by us and the bank for all the participating suppliers so as to guarantee consistent financial and economic savings for them. Other companies, such as Nice and Fastweb, instead, do not intervene in the interest rate negotiation process;
- Discrimination factor for interest rate definition: such a variable is strictly related with the previous one: interest rates strongly depend on which actor negotiates financing conditions with the bank. Stick to such a consideration, CNMI reported how “the supplier’s performances define the belonging class and consequently the enjoyed discounting interest rate”. Azimut, instead, said how “it is the supplier that, by leveraging its financial recordings, can negotiate better interest rates”;
- Interest rate revision period: interest rates can be revised periodically or on a performance-based system. Such a variable strictly depends on whether the program is a In-Out-based solution. In this sense, Fastweb stated how “the revision period of the interest rate, whenever it occurs, is totally case-specific.

Accordingly, interviews to ten multinational companies have been carried out basing on these dimensions, thus obtaining ten consistent and comparable sets of data (e.g. within-case analyses). Then, a cross-case analysis has been built up by putting together the ten cases, aiming

at grouping interviewed firms and related sustainability-oriented SCF programs in clusters according to commonalities registered in the variables composing the previously performed within-case analyses. By definition, indeed, groups are internally homogeneous and externally heterogeneous: based on stated architectural dimensions, similar SCF programs are put together in the same groups.

In so doing, such clusters represent different possible archetypes of sustainability-oriented SCF programs, formed by similar configurations of architectural variables.

The next figure is the graphical representation of the RQ1 cross-case analysis where all the ten case studies are detailed along the key architectural variables.

To follow, every single sustainability-oriented SCF program archetype, inferred from the table, is presented and analysed.

RQ1: How can a SCF be implemented with a sustainability orientation?											
Architectural dimension		Staff Internationa	Puma	Group Engineering	Fincantieri	CNMI	Azimut	Sonepar	Wind-Tre	Fastweb	Nice
Program features	SCF solution	Reverse factoring	Reverse factoring	Reverse factoring	Reverse factoring	Reverse factoring	Reverse factoring	Saving Factoring	Reverse factoring	Reverse factoring	Reverse factoring
	#factors involved	1	1	3	8	1	3	1	10	>1	>1
Supplier's onboarding method	#classes of the program	None	3	None	None	>1	None	None	None	None	\
	Variables of classes	None	Sustainability performances	None	None	Sustainability performances	None	None	None	None	None
	Re-auditing period	Twice per year	From 8 to 18 months	Varying case by case	Varying case by case	/	Varying case by case	Varying case by case	Once a year	Contract-based	Contract-based
	Access criteria	Eligible suppliers	Eligible suppliers	All suppliers	All suppliers	Eligible suppliers	All suppliers	All suppliers	All suppliers	All suppliers	All suppliers
	Responsible for supplier's entrance	Firm	Firm	Bank	Bank	Firm	Bank	Firm	Bank	Bank	Bank
	In-Out system	Yes	Yes	No	No	Yes	No	Yes	No	Contract-based	Contract-based
ICT solution	Owner of the platform	Bank	Technological provider	Bank	Bank	/	Bank	Bank	No platform	No platform	Bank
	Type of solution	Web-based	Web-based	Web-based	Web-based	Web-based	Web-based	Web-based	No platform	No platform	Web-based
Financial aspects	Re-negotiation of payment terms	No	No	Yes	Yes	No	Yes	No	Yes	Yes	Yes
	Who defines interest rate	The firm with the bank	The firm with the bank	The bank with the supplier	The bank with the supplier	The firm with the bank	The bank with the supplier	The bank with the supplier	The bank with the supplier	The bank with the supplier	/
	Discrimination factor	Operative performances	Sustainability performances	Financial records	Financial records	Sustainability performances	Financial records	Financial records	Financial records	Financial records	Financial records
	Interest rate revision	Not fixed a priori	From 8 to 18 months	Varying case by case	Varying case by case	/	Varying case by case	Varying case by case	Varying case by case	Varying case by case	Varying case by case

Table 16: RQ1 cross-case analysis

6.1.1 Archetypes definition

By referring on what emerges from the cross-case analysis, three macro archetypes of sustainability-oriented SCF program are identifiable and needed to cover and embrace all the ten interviewed firms and related SCF solutions. To form the archetypes, as observable from the table, not all the architectural variables have been discriminant for the cases. Some of them (re-auditing period, owner of the platform and interest rate revision period), in fact, have been found either not to play a key role for orienting the program towards sustainability while others to be equally set up for almost all the cases (interest rate discrimination factor, type of solution). In this respect, the architectural dimensions particularly determinant to group the analysed cases and, thus, figure out the three archetypes have been: the type of solution adopted, the number of financial players involved, the program access criteria, who is responsible for suppliers’ entrance into the program, the In-Out feature, the re-negotiation by the buyer of payment terms and the interest rate definition process.

In line with that, below is a summery table presenting the three identified macro-archetypes, discriminating from each other according to the abovementioned relevant architectural dimensions:

Architectural dimension	SCF solution	#financial players	Access criteria	Responsible for supplier's entrance	In-Out system	Payment term renegotiation	Interest rate defintion
Archetype 1	Reverse Factoring	1	Eligible suppliers	Firm	Yes	No	Firm+Bank
Archetype 2	Reverse Factoring	>1	All suppliers	Bank	No	Yes	Variable
Archetype 3	Saving Factoring	1	Potentially all suppliers	Firm	Yes	No	\

Table 17: SCF macro-archetypes

The next subparagraphs present every macro archetype in detail with related internal variants, highlighting distinctive traits and peculiarities.

Archetype 1:

Architectural dimension	SCF solution	#financial players	Access criteria	Responsible for supplier's entrance	In-Out system	Payment term renegotiation	Interest rate definition
Archetype 1	Reverse Factoring	1	Eligible suppliers	Firm	Yes	No	Firm+Bank

Table 18: Macro-archetype 1 variables

This archetype, embodying Staff International, Puma and CNMI cases and based on a Reverse Factoring without recourse solution, is mainly characterized by a carefully structured suppliers’ on-boarding system with strict and fixed criteria regulating the access to the program. The buyer (i.e. the interviewed firm) develops, along with a unique financial player (e.g. a bank or a factor), a tailored SCF program aiming to bring concrete financial-related benefits to a subset of its supply base. In fact, only those suppliers meeting stated performances targets can access the program and enjoy related financial conditions (e.g. interest rate and DSO), initially and jointly defined by the buyer and the financial actor. The buyer, therefore, acts as the owner of the program, taking the responsibility of whom enters and exits the program. Suppliers, indeed, keep on benefitting the program advantageous conditions as long as required prerequisites are met and maintained above threshold values. In this regard, Staff International reported: “we decide which supplier can take part to the program, based on the achieved operative performances” In this sense, this type of sustainability-oriented SCF program is destined to reward virtuous suppliers without bringing any direct return for the buyer. More precisely, in this regard, there is no a further extension of buyer payment terms (i.e. DPO) towards the bank, one of the most typical buyer-oriented advantages from a Reverse Factoring solution. Related to that, CNMI stated that “the program was not used to get financial own benefits, being entirely tailored to sustain suppliers. Therefore, no extension of payment terms has been negotiated with the bank”.

For what concerns the operative functioning of the program, a cloud-based ICT platform is the virtual space where all the transactions and information flows occur. The platform, here, assumes also a strategic role in that it allows to constantly assess and monitor suppliers’ performances on which their permanence in the program depends.

This first archetype in turn is divided in two variants (1A and 1B). The first one, wherein Staff International case is placed, restricts the access to the program to those suppliers achieving pre-defined targets in some operative performances (e.g. quality, reliability, service level). Here, the buyer sets up with the bank determined financing conditions holding for all the suppliers participating to the program. The second variant, instead, including Puma and CNMI SCF programs, beyond basing the program access to the achievement of sustainability performances targets, includes merit-based classes with diverse financing conditions: the better suppliers score in sustainability-related performances, the more advantageous are the obtainable financing conditions.

Archetype	Firm	Meritocratic classes	Discriminating factor
1A	Staff International	No	Operative performances
1B	Puma	Yes	Sustainability performances
	CNMI		

Table 19: Archetype 1 variants variables

Archetype 2:

Architectural dimension	SCF solution	#financial players	Access criteria	Responsible for supplier's entrance	In-Out system	Payment term renegotiation	Interest rate definition
Archetype 2	Reverse Factoring	>1	All suppliers	Bank	No	Yes	Variable

Table 20: Macro-archetype 2 variables

This second archetype, still based on a Reverse Factoring without recourse solution, differs from the previous as all the belonging SCF programs have been set up with more financial players (in some cases many factors) letting suppliers decide the most preferable one. Another key difference is the opening of the program to the entire firm's (i.e. the buyer) supply base, completely in contrast to the precisely structured access systems of the first archetype: as long as a supplier provide goods or services to the focal firm, he or she has been given the possibility to enter the program. In this sense, it is the bank to finally decide whether a supplier gets access to the SCF program, basing on suppliers' compliance to general financial and banking indicators. Furthermore, the permanence of the suppliers in the program is not linked to the maintenance of performances targets or whatsoever: suppliers may enter, exit the program and

switch from a factor to another one, among the ones the buyer activated the program with, at their will.

To this regard, Fincantieri stated how “it is the bank to decide whether one supplier of our supply base can enter the program, based on supplier’s financially-related indicators. We do not put any entrance barrier”.

Finally, a key feature of the archetype is the extension of payment terms by the buyer towards the bank, thus exploiting one of the most recurrent buyer-oriented benefits of the Reverse Factoring solution. Wind-Tre stated how “the program main objective is to sustain and support suppliers but it also acts as a tool to improve our own financial position”.

As in the case of the first archetype, the second archetype can be, in turn, subdivided in three variants too (2A, 2B and 2C), basing on whom defines the interest rate at which suppliers discount invoices in advance, the possibility for the buyer to get economic discounts on the nominal value of suppliers’ invoice and the presence of a ICT platform.

More precisely, 2A (Fincantieri and Azimut programs) and 2B (Group Engineering and Nice cases), while both having the ICT platform and the buyer getting economic discounts on invoices values, differ for the actors negotiating the interest rate: in 2B the buyer closely monitors the output of the supplier-bank negotiation, thus making sure the bank does not exercise its higher bargaining power vis-à-vis suppliers, while in 2C the buyer never intervenes in the process. The same negotiation dynamics characterizes 2B archetype therein, in contrast with the others, the buyer does not ask for a discount on the invoice and all the operative procedures are run manually, without the presence of a ICT platform.

Archetype	Firm	Interest rate definition	Costs Savings	ICT platform
2A	Fincantieri	Bank+Supplier	Yes	Yes
	Azimut			
2B	Group Engineering	Firm monitoring	Yes	Yes
	Nice			
2C	Wind-Tre	Bank+Supplier	No	No
	Fastweb			

Table 21: Archetype 2 variants variables

Archetype 3:

Architectural dimension	SCF solution	#financial players	Access criteria	Responsible for supplier's entrance	In-Out system	Payment term renegotiation	Interest rate definition
Archetype 3	Saving Factoring	1	Potentially all suppliers	Firm	Yes	No	\

Table 22: Macro-archetype 3 variables

Regardless of the name, the third archetype, embedding only Sonepar program, is a completely *sui-generis* architecture of sustainability-oriented SCF program as it grounds on a different type of solution, a sort of mix between a Reverse Factoring solution and a Dynamic Discount while combining some features of the first and the second archetype.

First of all, the financial program is contract-based and so are related financial conditions, which are established by the buyer with its suppliers with no intervention of the financial player. Every time the buyer engages a supplier for a provision of goods or services, he or she decides whether to offer this program to the supplier or not, passing, then, to negotiate all the financial aspects. The company clearly reported how “the permanence of suppliers in this financial program is tied to length of the contract: once a contract expires, new financing conditions have to be negotiated”

Turning, instead, to the solution functioning, the buyer gets a fixed economic discount on the nominal value of the invoice issued by the supplier who, in return, receive cash, earlier in time with respect to the standard DSO, from the bank.

In this sense, the financial player plays a far minor role with respect to the other archetypes as it limits to give cash in advance to suppliers once related invoices are certified by the buyer. The latter enjoys a consistent economic savings on invoices while not getting any extension of payment terms towards the bank whereas suppliers benefit a working capital optimisation.

The program is, therefore, framed as a pure commercial transaction as no financings, with related interest rate negotiations, occur: suppliers optimise their financial flows thanks to an anticipated cash collection while the buyer gets a fixed economic discount on invoices.

6.2 RQ2: Why would buyers and suppliers introduce a SCF programme with a sustainability orientation?

The second research question main goal is to clearly find out all the key and primary drivers and motivations pushing both suppliers and buyer (i.e. the focal firm) to ideate and, then, activate a SCF program with a sustainability orientation.

Said differently, the reasons why supply chain actors decide to embark on such kinds of financial programs, oriented to sustainability, are investigated. This research questions aims, therefore, at uncovering and precisely stating primary and also secondary and minor drivers, directly or indirectly linked to sustainability goals, that turned out to be determinant in guiding the buyer and its suppliers in selecting these kinds of SCF solutions.

To this purpose is a macro section of the interview protocol aiming at interrogating the ten firms, responsible for the triggering of their sustainability-oriented SCF programs, on what have been their main drivers, sustainability and non-sustainability-related, pushing them to take on this specific kind of SCF programs. Interviewed firms have been asked also about probable drivers and motivations that led suppliers to adhere and participate to the program. In this regard, as interviews have been conducted solely with buyers, suppliers' side motivations for embarking on the program cannot have the same valence as the buyer's ones. However, a good proxy is obtainable as the buyer is strictly in contact with them, knowing their strengths, weaknesses and impeding obstacles.

In line with the theoretical research framework, the interviews aimed at testing the validity of the framework first pillar, dealing with suppliers' and buyer's drivers, by asking the selected firms, first, whether the theory-based drivers actually played a key role and, then, to report other eventual drivers, determinant for the program activation.

In so doing, the first pillar content is tested and, subsequently, integrated and adjusted.

While running interviews, the main objective was to constantly search for similar patterns in firms' responses for key and relevant drivers pushing them to activate a sustainability-oriented SCF program.

Having defined diverse possible archetypes of sustainability-oriented SCF programs with the first research questions, the final desired output of this second research questions is to make solid connections between sets of reported drivers, both on suppliers' side and buyer's side, and the different archetypes.

In theoretical terms, for a correspondence to be robust, analysed cases of programs belonging to the same archetype, that is to say firms adopting a similar configuration of SCF program, have to be triggered by the same set of needs (i.e. suppliers' and buyer's drivers).

In this sense, a clear and direct correspondence is established between firms' needs and the most suitable and fitting SCF program.

As easily understandable, a perfectly centred correlation between SCF programs belonging to the same archetype and a well-defined set of triggering drivers cannot be reached as each single real-life case present some peculiarities affecting its genesis. SCF programs within the same archetype are slightly different too.

However, quite a satisfying result has been obtained: each archetype, characterized by similarly structured programs, has been finally linked to one set of triggering drivers, both suppliers' and buyer's side, based on interviews results. In such sets, in most of the cases, the majority of drivers played a key pushing role for all the SCF programs within the archetype while the remaining ones turned out to be relevant only for programs. This is the reason why the obtained result is deemed as quite meaningful and respondent to the initial intent.

To infer results and link each archetype to a set of triggering drivers, a cross-case analysis has been performed to structurally and contemporary compare all the ten studied cases. The structuring of this RQ2 cross-case slightly varied from the one destined to RQ1 as, on the rows, all the mentioned drivers across the ten interviews have been reported and a "X" has been signed at the crossing with the column if the related program has been triggered by that drive. This building strategy was to facilitate the identification of similarities and differences regarding the key playing drivers across the ten interviewed firms. As it can be noted by looking at the table (RQ2 cross-case) in the next page, it turned out that archetypes registered quite a respected internal homogeneity and external heterogeneity as regards for triggering drivers. Some drivers, especially the ones reported for suppliers' side, are transversal to almost all the archetypes, thus not representing discriminating elements. This might be partly due to the absence of a direct suppliers' view.

Drivers description:

Before turning to analyse the cross-case results, a further introduction has to be performed aiming at presenting the drivers, both on suppliers' and buyer's side, adding up to the ones already presented in the preliminary research framework. As previously explained, indeed, interviews have been run so as to test and integrate the theory-based answers to the three research questions, graphically and holistically depicted in the preliminary research framework. To do that interview protocol has been developed and structure with the aim of, firstly, testing the validity of theory-based drivers (composing the framework first pillar) and, then, figuring out other relevant drivers for the adoption of the diverse SCF programs of the selected companies.

Hence, a brief description of all the drivers cited by interviewed firms as key in activating the SCF programs and not present in the preliminary research framework is reported, thus facilitating the RQ2 cross-case analysis:

Buyer's side:

- Need to assess and monitor suppliers' performances: companies belonging to archetype 1 intended the implemented SCF program also a tool to indirectly measure suppliers' performances. By restricting the access to those suppliers meeting some pre-defined targets of performances, companies aimed also at assessing how their supply base is performing;
- Will to financially help the supply base: such a driver has been found to be transversal to all the analysed cases. It represents, indeed, one of the main sustainability-oriented drivers pushing the adoption of these kinds of SCF programs;
- Safeguard the national know-how and competences: Staff International and CNMI felt the necessity for the big brand to preserve the specificity and tacit know-how characterising the own supply chain, mainly artisan-based;
- Make sure of supply continuity: all the interviewed firms but Sonepar mentioned how the necessity to make sure of the long-term supply continuity is a key driver for such programs that represent a fuel for suppliers;
- Need to standardise and optimise the invoice payment process: Fincantieri, Azimut, Group Eng. and Nice reported how their SCF programs have been pushed also by an

internal need to standardise and optimise the invoices management, currently manually-based;

- WC regularisation and optimisation: all the firms, except for Staff International, Puma and CNMI, stated how the need to improve their own financial flows and working capital positions was a relevant driver for the programs activation;
- Costs control: Fincantieri, Azimut, Group Eng, Nice and Sonepar used the program as a way also to get economic discounts on the nominal value of suppliers' invoices, in a sort of entrance-fee logic.

Suppliers' side:

- Financial costs: all the interviewed firms reported how their suppliers were constantly in search for cheaper financings, and not only for financial relief;
- Possibility to focus on operative business: Staff International and CNMI have been said to have adhered to related SCF programs as the achievable financial conditions could have allowed to solely focus on the operative business.

Below is the RQ2 cross-case analysis where all the ten studied cases are compared along key variables representing the different drivers said to be relevant, by interviewed firms, in triggering SCF programs oriented to sustainability.

Why would buyers and suppliers introduce a SCF programme with a sustainability orientation?											
Player	Drivers	Staff Int.	Puma	CNMI	Fincantieri	Azimut	Group Eng.	Nice	Wind-Tre	Fastweb	Sonepar
Buyer	Stakeholders' call for sustainability (CSR)	x	x	x							
	Necessity to have sustainable SCs		x	x							
	Urgency to tackle social issues in DCs		x								
	Need to assess and monitor suppliers' performances	x	x	x							
	Will to financially help the supply base	x	x	x	x	x	x	x	x	x	x
	Safeguard the national know-how and specific competences	x		x							
	Make sure of the supply (pdt/service) continuity	x	x	x	x	x	x	x	x	x	
	Need to standardise and optimise invoices payment process					x	x	x	x		
	Working capital regularization and optimisation					x	x	x	x	x	
Costs control					x	x	x	x			x
Suppliers	Need for financial liquidity (WC improvement)	x	x	x	x	x	x	x	x	x	x
	Need to reduce financial costs	x	x	x	x	x	x	x	x	x	
	Possibility to focus on operative business	x		x							
	Need for incentives attached to sustainability plans		x	x							
Archetypes		1A	1B		2A		2B		2C		3

Table 23: RQ2 cross-case analysis

Taking a look at the diverse reported drivers and the related crossings with the ten analysed case studies, some interesting results emerge. On buyer's side, the stakeholders' call for sustainability and the need to assess and monitor suppliers' performances are exclusive of archetype 1 programs and transversal to them. Exclusive to archetype 1 cases is also the safeguard of national know-how and specific competences which, nevertheless, does not hold for Puma program. The latter is, indeed, more devoted to cope with social and environmental issues related to suppliers based in poor countries. Whereas, the necessity to successfully implement SSCM plans is what drove Puma and CNMI to activate the respective SCF programs. Stick to buyer's side drivers, the will to financially help the supply base and the need to guarantee the long-term supply continuity are completely transversal to all the ten analysed cases. The need to standardise and optimise invoices payment process and the necessity to control costs are, instead, relevant drivers for Fincantieri, Azimut, Group Eng. and Nice. The latter companies along with Wind-Tre and Fastweb have been pushed to implement the respective financial programs by the need to regulate and optimise their own WC position.

As regards for suppliers, the need for financial and economic improvements, namely a faster access to liquidity and lower costs of financing, represent the main drivers, transversal to all the ten studied cases.

Then, before tackling all the archetypes and related internal variants, identified in the RQ1 discussion, some high-level considerations regarding the imprinting of the diverse archetypes can be reported, in line with what just reported.

SCF programs belonging to the archetype 1 are strongly oriented to sustainability objectives, thus being focused on bringing concrete benefits to all the supply chain with no direct economic return for the big brand buyer. More precisely, archetype 1B programs act in a SSCM perspective as their primary goal is to make sure the entire supply chain is compliance to global sustainability standards; archetype 1A program, instead, responds to a CSR call as it aims to financially sustain small suppliers composing the backbone of the supply chain without bringing any financial nor economic advantageous for the buyer.

For what concerns, instead, the archetype 2, SCF programs, still framed in a CSR perspective, are also intended by the initiating focal firms (i.e. buyers) as powerful risk management strategies. Indeed, by contributing to the survival of their entire supply base, the firms automatically secure their own competitiveness in the market. In line to that, the archetype 2 programs bring also some financial and economic benefits to the buyers. In archetype 2A the risk management function prevails over the CSR one while the archetypes 2B and 2C are

globally more directed towards the CSR wave. However, both these variants present architectural elements pushing the program in a risk management orientation. Indeed, 2B and 2C have some totally buyer-oriented functioning dynamics leading to both financial and economic benefits.

Archetype 3 program, instead, is the configuration farthest to sustainability-related objectives, neither SSCM nor CSR ones. The program is, indeed, strongly buyer-oriented.

In the following subparagraphs, a sort of reversed perspective is taken to best characterize each archetype in terms of the drivers, both on suppliers' and buyer's side, triggering the activation of the related sustainability-oriented SCF program.

Archetype 1A

1A	Actor	Drivers
	Buyer	Stakeholders' call for sustainability (CSR)
Need to assess and monitor suppliers' performances		
Will to financially help the supply base		
Safeguard the national know-how and specific competences		
Make sure of the supply (pdt/service) continuity		
Suppliers	Need for financial liquidity (WC improvement)	
	Need to reduce financial costs	
	Possibility to focus on operative business	

Table 24: Archetype 1A drivers

The above table present the buyer's side and suppliers' side drivers triggering the activation and implementation of the SCF program. This archetype is populated only by the Staff International program, characterized by the focal firm's will to act in a social responsible direction towards their supply base. The virtuous (according to some monitored operative performances) suppliers, indeed, are offered a financially and economically advantageous program guaranteeing their business long-term continuity. In this regard, one of the major motivations pushing the buyer to set up such a kind of financial program is to preserve the extraordinary national know-how and specific competences, typical of these small family-run suppliers. As the company's supply base is mainly regional-based (Veneto region) this financial program is framed as a concrete example of social-oriented initiative benefitting a society.

Assuming the suppliers' perspective, such a program represents a huge opportunity to get financial and economic improvements and, consequently, to completely focus on the operative part of the business. Players, as said above, are very small in size and this program represent

pure oxygen for their operation while augmenting the fidelisation with Staff Int in a long-term win-win strategy.

Reporting Diesel CEO Renzo Rosso’s words: “Such a cutting-edge financial should act as an example for the whole industry as it uniquely aims at bringing a concrete help to small suppliers heavily struggling in a such financially difficult scenario”

Archetype 1B

1B	Actor	Drivers
	Buyer	Stakeholders' call for sustainability (CSR)
Necessity to have sustainable SCs		
Urgency to tackle social issues in DCs		
Need to assess and monitor suppliers' performances		
Will to financially help the supply base		
Make sure of the supply (pdt/service) continuity		
Safeguard the national know-how and specific competences		
Suppliers	Need for financial liquidity (WC improvement)	
	Need to reduce financial costs	
	Need for incentives attached to sustainability plans	

Table 25: Archetype 1B drivers

This archetype, embodying Puma and CNMI financial programs, is triggered and pushed by drivers linked to both CSR wave and SSCM perspective. Such a program configuration, indeed, consistently pushes suppliers in actively committing to sustainability supply chain plans projected by the focal firm of the supply chain (i.e. the interviewed firm), by involving only those suppliers who meet some sustainability-related performances targets. The latter ones comprise social and environmental aspects that, nowadays, are on the spotlight to preserve the environmental integrity and guarantee social and human rights. In this respect, the CSR imprint of the program comes from the clear financial and economic rewards, typical of a Reverse Factoring solution, enjoyed by participating suppliers while the SSCM driver entailed to restrict the access to the program to suppliers deploying sustainable-sound initiatives. In this regard, the big brand devotes particular attention to alarming social issues present in countries where some suppliers, especially the manufacturing ones, are located. To this purpose, Puma, jointly with BNP Paribas, set up a tailored suppliers’ rating revolving around social and environmental performances. If a supplier achieves, at least, the threshold values of all the performances composing the framework is allowed to enter the program.

As it was in the previous archetype variant, the buyer, through the program, wants to make sure of the supply continuity, vital for the own business, while safeguarding tacit skill and competences of suppliers.

Referring to suppliers’ side drivers, what pushed them to enter the program in the archetype 1A still holds for the 1B. Nevertheless, here, suppliers, already asked to commit to sustainability plans, see at the program as a big incentive to proactively work alongside the buyer in sustainability direction. CNMI reported how suppliers, once being aware of the possibility to enjoy such an innovative financial program, started to considerably commit to sustainability initiatives, also beyond big company’s requirements.

Archetype 2A

2A	Actor	Drivers
	Buyer	Will to financially help the supply base
Make sure of the supply (pdt/service) continuity		
Need to standardise and optimise invoices payment process		
Working capital regularization and optimisation		
Costs control		
Suppliers	Need for financial liquidity (WC improvement)	
	Need to reduce financial costs	

Table 26: Archetype 2A drivers

The archetype 2A, comprising Fincantieri and Azimut-Benetti SCF programs, is the variant of archetype 2 which is mostly oriented toward a risk management strategy perspective and distant from a pure CSR logic. Indeed, on the buyer’s side, the key drivers for the triggering of the program have been the will to financially help the whole supply base so that the supply continuity is kept effective and responsive over time. This is the reason why the program is open to all the firm’s suppliers, regardless of any kind of related performances. Due to the operative settings of the program, explained in the RQ1 discussion, suppliers enjoy only financial-related benefits without receiving any substantial economic relief (the interest rate negotiation is mostly up to bank and suppliers). Contrary to what happens in archetype 1, the buyer, here, through the SCF program, aims at obtaining financial and economic benefits by extending payment terms towards the bank and claiming an economic discount on suppliers’ invoices, as a sort of price to participate to the program. Azimut, in this regard, states that “the program was conceived also as a fast way, on one side, to improve our own financial flows and thus decrease the WC amount and, on the other hand, to get economic discounts on invoices

nominal value“. Moreover, a secondary but, still relevant, buyer’s driver is the need to standardize and optimize the invoices payment process aiming at reaching efficiency savings. For what concerns suppliers’ side motivations for entering the program is seen as a big opportunity to give oxygen to their financially weak situation while getting economic savings, even though limited, on cost of financings.

Archetype 2B

2B	Actor	Drivers
	Buyer	Will to financially help the supply base
		Make sure of the supply (pdt/service) continuity
		Need to standardise and optimise invoices payment process
		Working capital regularization and optimisation
	Suppliers	Costs control
		Need for financial liquidity (WC improvement)
Need to reduce financial costs		

Table 27: Archetype 2B drivers

The archetype 2B, including Group Engineering and Nice SCF programs, present the same set of triggering drivers as the archetype 2A, both on suppliers’ side and buyer’s side, as observable by comparing the two respective summary tables.

A subtle difference is registered in suppliers’ side drivers in that, given the 2B diverse architecture with respect to 2A, the possibility for suppliers to get economic savings in costs of financings is a far stronger driver as, for this archetype programs, the firm strictly monitors the interest rate negotiation process between the bank and the supplier. The out-coming interest rate is, therefore, lower than the one obtainable in archetype 2A programs. Related to the latter aspect, Group Engineering reported that “the company set up a monitoring system to effectively make sure that suppliers would not be exploited by the banks in the interest rate negotiation process”.

Archetype 2C

2C	Actor	Drivers
	Buyer	Will to financially help the supply base
		Make sure of the supply (pdt/service) continuity
		Working capital regularization and optimisation
	Suppliers	Need for financial liquidity (WC improvement)
		Need to reduce financial costs

Table 28: Archetype 2C drivers

The archetype 2C, including Wind-Tre and Fastweb SCF programs, present, on buyer’s side, the key drivers characterizing the other variants of archetype 2, namely the will to financially sustain the entire supply base thus assuring the supply continuity along with a financial optimisation need coming from the extension of payment terms towards the bank. This archetype programs, however, are not pushed by the buyer’s need to make economic savings nor get higher efficiency from a possible standardisation or optimisation of invoices payment process, as it was the case for 2A and 2B. In this regard, Fastweb mentioned how “the program was thought mainly to financially sustain our supply base while, in case, representing a tool to optimise WC position by re-negotiating payment terms with the bank” For what concerns suppliers’ drivers, the needs to improve their working capital position and get economic benefits in the costs of financing, here limited to the same architectural configuration as 2A, are still registered.

Archetype 3

3	Actor	Drivers
	Buyer	Will to financially help the supply base Costs control
	Suppliers	Need for financial liquidity (WC improvement)

Table 29: Archetype 3 drivers

The archetype, including only the Sonepar SCF program, presents on buyer’s side two drivers, recurrent in other archetypes but, here, with different relative weights. That is, the buyer still wants to financially help its supply base, by letting suppliers access to cash in advance, but the focal attention is put on getting own economic benefits. This is why such an archetype is almost completely oriented to the buyer who enjoys consistent economic savings on nominal value of suppliers’ invoice, in return for anticipating the payment. To this purpose, Sonepar stated how “the program has to be intended as a pure commercial lever to get relevant economic discounts on invoices nominal values, in return of early paying suppliers”.

As regards for suppliers’ driver, only the need to improve their working capital position is registered as relevant driver.

6.3 RQ3: What are the benefits for buyers and suppliers from a SCF programme with a sustainability orientation?

Once identified the diverse architectures of sustainability-oriented SCF solutions (i.e. archetypes) and related sets of drivers triggering the programs, by the means of this third research question, the research thesis aims at definitely reporting and commenting all the different registered benefits across the ten real cases. As in the case of the former research question, all the benefits, whether they are directly or indirectly related to sustainability, brought by these kinds of SCF programs are considered and subsequently analysed. As notable in the following proceedings of this RQ3 paragraph, among the firms-reported benefits, there are some of them which are strictly related to the program triggering drivers and others unexpected in the program building phase.

To gather actually relevant benefits, for both suppliers' and buyer's side, the third section of the interview protocol consists in questions aiming at clearly figuring out all the registered benefits and advantages stemming from the program implementation. The above reported consideration about a weaker valence of suppliers-related benefits still holds here as the buyer has been asked to indicate, in his or her opinion, the main benefits for suppliers in participating to the program.

Specular to the analysis of triggering drivers, the interviews, with their third macro-section, mainly aimed at testing and eventually integrating the theoretical research framework third pillar, destined to list suppliers' and buyer's benefits from SCF programs. To do so, interviews questions objective was, firstly, to verify whether the theory-based benefits have been actually registered in the ten analysed cases and, secondly, to eventually report and classify all the other relevant benefits, reported by firms. The theory-based third pillar is, thus, tested and, then, adjusted and integrated with real evidences.

As in the case of RQ2, the principal goal of the interviews and follow-up analysis was to figure out whether a correspondence between sets of registered benefits, both for suppliers' buyer's side, and the firms' residing in the same archetype exists. Said on other words, the desired output is to have SCF programs of the same archetype all leading to the same defined set of benefits. Archetypes, then, as shown with the former research question, are in turn linked to sets of drivers. A final evidence-based framework is, thus, built up, representing a powerful tool for companies to select the most suitable type of sustainability-oriented SCF program given their own specific and suppliers' needs (i.e. program drivers) and a certain set of desired benefits for both parties.

Again, as the data stem from real-life cases, a perfect correlation between SCF programs belonging to the same archetype and a well-defined set of derived benefits is obviously unreachable. Nevertheless, as in the case of RQ2, quite a consistent result has been obtained: by analysing interview results, each archetype, characterized by similarly structured SCF programs, has been definitely linked to one set of brought benefits, both suppliers' and buyer's side. Referring to the single sets of benefits linked to the archetypes, the majority of benefits have been registered by all the same archetype firms (/programs) while other benefits by only some of them. This is the reason why the obtained result is deemed as quite meaningful and respondent to the initial intent.

To take out possible recurrent patterns in registered benefits attached to SCF programs belonging to the same archetype, a cross-case analysis has been performed to structurally and contemporary compare all the ten studied cases. The structuring of this RQ3 cross-case is the same as the RQ2 one with all the mentioned benefits, both suppliers' and buyer's side, on the rows and the columns representing the ten cases. A "X" has been put at the crossings whenever that firm registered that kind of benefit, thus immediately noting common patterns among firms on registered benefits. As it can be noted by looking at the table (RQ3 cross-case) in the next page, it turns out that archetypes present quite a respected internal homogeneity and external heterogeneity with respect to benefits drawn from the programs. As in the case of RQ2 cross-case, some listed benefits, especially the ones reported for suppliers' side, are transversal to almost all the archetypes, thus not representing discriminating elements. This might be partly due to the absence of a direct suppliers' view.

Benefits description:

As it was in the case of RQ2, before turning to analyse the cross-case results, a further introduction has to be performed aiming at presenting the benefits, both on suppliers' and buyer's side, adding up to the ones already presented in the preliminary research framework. As previously explained, indeed, interviews have been run so as to test and integrate the theory-based answers to the three research questions, graphically and holistically depicted in the preliminary research framework. To do that interview protocol has been developed and structure with the aim of, firstly, testing the validity of theory-based benefits (composing the framework third pillar) and, then, figuring out other relevant benefits brought the implementation of the diverse SCF programs of the selected companies.

Hence, a brief description of all the SCF programs relevant benefits registered by interviewed firms and not present in the preliminary research framework is reported, thus facilitating the RQ3 cross-case reading:

Buyer's side:

- Sustainability performances: Puma and CNMI registered a substantial improvement in their suppliers' sustainability performances thanks to the tailored SCF programs implementations;
- Improvement of supply base performances: Staff Int., Puma and CNMI enjoyed improvements in suppliers' performances regulating the access to the program;
- Effective monitoring of suppliers' performances: through the peculiar suppliers' onboarding system, Staff Int., Puma and CNMI are able to effectively and constantly monitor suppliers' performances;
- Valorisation of national know-how: by financially sustaining suppliers, Staff International and CNMI indirectly safeguarded the inherent know-how;
- Efficient credit management process: Fincantieri, Azimut, Group Eng and Nice gained efficiency in invoices management due to technology-based solutions;
- Economic savings: firms (Fincantieri, Azimut, Group Eng and Nice) using the programs as discounting levers got economic savings.

Suppliers' side

- Continuity of operations: Staff Int., Fincantieri, Group Eng and Nice suppliers are said to have benefitted a guaranteed continuity of operations;
- Sustainability performances: in line with the measured performances, suppliers of Puma and CNMI registered improvements in sustainability performances.

Below is the RQ3 cross-case analysis where all the ten studied cases are compared along key variables representing the diverse benefits registered by interviewed companies.

What are the benefits for buyers and suppliers from a SCF programme with a sustainability orientation?											
Player	Benefits	Staff Int.	Puma	CNMI	Fincantieri	Azimut	Group Eng.	Nice	Wind-Tre	Fastweb	Sonepar
Buyer	Financial benefits (WC optimisation)				X	X	X	X	X	X	
	Decreasing of suppliers' default risk	X	X	X	X	X	X	X	X	X	X
	Brand image and company's reputation	X	X	X							
	Sustainability performances		X	X							
	Improvement of supply base performances	X	X	X							
	Effective monitoring of suppliers' performances	X	X	X							
	Valorization of national know-how	X		X							
	Efficient credit management and paym process					X	X	X	X		
Economic savings					X	X	X	X			X
Supplier	Financial benefits (WC optimisation)	X	X	X	X	X	X	X	X	X	X
	Decreasing of default risk	X	X	X	X	X	X	X	X	X	
	Improved efficiency				X	X					
	Financial costs savings	X	X	X			X	X			
	Continuity of operations	X					X	X			X
	Additional financing alternatives	X				X					
Sustainability performance		X	X								
Archetypes		1A	1B		2A		2B		2C		3

Table 30: RQ3 cross-case analysis

Having a look at the diverse registered benefits and the related crossings with the ten analysed case studies, some interesting results emerge. On buyer's side, the improvement of supply base performances and the effective monitoring of suppliers' performances are exclusive of archetype 1 programs and transversal to them. Exclusive to archetype 1 cases is also the valorisation of national know-how which, nevertheless, does not hold for Puma program (in line with drivers' distribution). This is, indeed, in line with drivers' distribution, depicted in RQ2 cross-case. Whereas, the enhancement of sustainability performances is a direct benefit for Puma and CNMI, thus effectively responding to their initial need and attention for better sustainability-related indicators. Stick to buyer's side benefits, the decrease of suppliers' default risk is completely transversal to all the ten analysed cases.

The efficient credit management and payment process along with registered economic savings represent relevant drawn benefits for Fincantieri, Azimut, Group Eng. and Nice. The latter companies along with Wind-Tre and Fastweb have also reported to have witnessed a consistent financial optimisation, going to lower their WC amounts.

As regards for suppliers, financial benefits and the drastic reduction of default risk represent completely transversal benefits. Financial costs benefits have been then registered by Staff Int.,

Puma, CNMI, Group Eng. And Nice suppliers as their respective buyers intervene, with different degrees, in the interest rate definition process.

Before precisely reporting all the benefits attached to each single archetype, some principal high-level considerations about the main directions of the diverse archetypes in terms of brought benefits, in particular for the buyer, can be drawn and reported.

SCF programs belonging to the archetype 1 have been found to bring, for buyer's side, non-economic benefits, completely in line to the sustainability-oriented drivers triggering the program activation. More precisely, archetype 1B programs led to SSCM-related benefits, such as a proved improvement in supply chain sustainability performances, while financially securing the long-term survival of the firm's supply chain. The latter kind of benefits is registered in archetype 1A program too.

Stick to the buyer's side, SCF programs composing the archetype 2, instead, have been all found to bring relevant financial benefits while economic and efficiency savings have been registered for those programs whose activation has been due also to economic efficiency reasons (2A and 2B). another key benefit for the buyer was the consistent reduction of the suppliers' default risk, responding to the CSR-related drivers.

In this sense, still for the archetype 2, the initial needs have been completely satisfied by the implemented programs.

Archetype 3 program, due to its atypical architectural configuration, brought as main and consistent buyer-related benefit, consistent economic savings.

The following subparagraphs are to characterize each archetype according to the brought benefits, both on suppliers’ and buyer’s side.

Archetype 1A

1A	Actor	Benefits
	Buyer	Decreasing of suppliers' default risk
		Brand image and company's reputation
		Improvement of supply base performances
		Effective monitoring of suppliers' performances
		Valorization of national know-how
	Suppliers	Financial benefits (WC optimisation)
		Decreasing of default risk
		Financial costs savings
		Continuity of operations
Additional financing alternatives		

Table 31: Archetype 1A benefits

This archetype, including Staff International SCF program, brought, on buyer’s side, strategic benefits, indirectly turning in economic advantages: a decrease of suppliers’ default risk, an enhanced brand image and a substantial improvement of suppliers’ operative performances. All of that has been allowed by the specific settings of the programs and tailored suppliers’ on-boarding system. A further extremely relevant benefit for the buyer is the preservation of specific competences and tacit know-how characterizing its supply chain. To this regard Staff International reported how “the program allowed, on one side, to save and effectively maintain the supply base integrity, with direct positive repercussions on Veneto region and, on the other side, to consistently improve suppliers’ operative performances, thanks to the incentivising factor”.

For what concerns the benefits for participating suppliers, consistent financial and economic benefits, due to an earlier cash collection and an invoice discounting at a very low interest rate, are registered and translated, then, in strategic advantages in that they can afford to completely dedicate their time and financial resources to operations.

Archetype 1B

1B	Actor	Benefits
	Buyer	Decreasing of suppliers' default risk
		Brand image and company's reputation
		Sustainability performances
		Improvement of supply base performances
		Effective monitoring of suppliers' performances
		Valorization of national know-how
	Suppliers	Financial benefits (WC optimisation)
		Decreasing of default risk
		Financial costs savings
Sustainability performance		

Table 32: Archetype 1B benefits

The archetype 1B, including Puma and CNMI SCF programs, brought, on buyer's side, strategic benefits, indirectly turning in economic advantages: a decrease of suppliers' default risk, an enhanced brand image and a substantial improvement of suppliers' operative performances. In addition, this archetype programs led to considerable improvements in the sustainability performances of the entire firm's supply chain, thanks to the peculiar on-boarding systems pushing suppliers to be compliant to global social and environmental standards. In this sense, explanatory is what reported by Puma: "thanks to this program, we registered a consistent improvement in social and environmental indicators, transversal to majority of our supply base, with immense positive effects on the same suppliers and indirectly on ourselves". Similar to the archetype 1A, the buyer managed to preserve and give continuity to its highly artisan-based supply chain, a key strategic asset for its own long-term competitiveness in the market.

As regards for the benefits for involved suppliers, the registered ones in the archetype 1A are still valid for these programs. As suppliers are pushed to work for improving their sustainability (environmental and social) performances, such an enhancement in sustainability scoring can act for them as a differentiating lever vis-à-vis competitors.

Archetype 2A

2A	Actor	Benefits
	Buyer	Financial benefits (WC optimisation)
		Decreasing of suppliers' default risk
		Efficient credit management and paym process
		Economic savings
	Suppliers	Financial benefits (WC optimisation)
		Decreasing of default risk
		Improved efficiency
		Continuity of operations
Additional financing alternatives		

Table 33: Archetype 2A benefits

The archetype 2A, including Fincantieri and Azimut-Benetti SCF programs, brought, on buyer's side, financial benefits, thanks to the extension of payment terms, economic benefits, due to discounts on invoices, and efficiency savings, enabled by the web-based platform standardising all the monetary and information flows while consistently reducing the default risk of the entire supply base in that the program is potentially open to all the firm's suppliers. To this purpose Azimut said to have benefitted consistent improvements in the management of financial flows and economic savings by flexibly re-negotiating payment terms with the banks while asking suppliers for invoice discounts on a recurrent basis.

For what concerns the benefits for participating suppliers, a consistent financial improvement in the financial situation is registered with a consequent reduction of default risk thanks to the anticipated access to cash. Managerial efforts can be, therefore, completely turned on the operative part of the business as the long-term survival is no longer at risk. Marked efficiency savings are registered thanks to the program automatizing the invoice payment process.

Archetype 2B

2B	Actor	Benefits
	Buyer	Financial benefits (WC optimisation)
		Decreasing of suppliers' default risk
		Efficient credit management and paym process
		Economic savings
	Suppliers	Financial benefits (WC optimisation)
		Decreasing of default risk
		Financial costs savings
Continuity of operations		

Table 34: Archetype 2B benefits

The archetype 2B, including Group Engineering and Nice SCF programs, brought, on buyer's side, financial benefits, thanks to the extension of payment terms, economic benefits, due to discounts on invoices, and efficiency savings, enabled by the web-based platform standardising all the monetary and information flows while consistently reducing the default risk of the entire supply base in that the program is potentially open to all the firm's suppliers.

Related to the efficiency savings, eloquent is what mentioned by Group Eng.: "through this program and especially the web-based platform, we enjoyed a huge administrative and operative relief".

Regarding the benefits for participating suppliers, a consistent financial improvement in the financial situation is registered with a consequent reduction of default risk thanks to the anticipated access to cash. Here, a further relevant benefit for suppliers is reported: thanks to the close monitoring, by the buyer, of the interest rate negotiation process (between bank and supplier), suppliers can enjoy also consistent economic savings when discounting invoices

Archetype 2C

2C	Actor	Benefits
	Buyer	Financial benefits (WC optimisation)
		Decreasing of suppliers' default risk
	Suppliers	Financial benefits (WC optimisation)
		Decreasing of default risk
		Continuity of operations

Table 35: Archetype 2C benefits

The archetype 2C, including Wind-Tre and Fastweb SCF programs, led, on buyer's side, to financial savings and to a reduction of the entire supply base's default risk. The latter is said to have represented the major and most desired benefits for Wind-Tre: "having secured our supply base by providing financial facilitations makes us very proud and, at the same time, represent a competitive advantage as risk of supply chain disruptions is by far reduced".

For what concerns the benefits for participating suppliers, a consistent financial improvement in the financial situation is registered with a consequent reduction of default risk and the possibility to give continuity to their operations.

Archetype 3

3	Actor	Benefits
	Buyer	Decreasing of suppliers' default risk
		Economic savings
	Suppliers	Financial benefits (WC optimisation)
		Continuity of operations

Table 36: Archetype 3 benefits

The archetype 3, including Sonepar SCF programs, led, on buyer's side, to economic savings, due to discounts on invoices and a reduction of the potentially entire supply base's default risk. For what concerns the benefits for participating suppliers, a financial improvement in the financial situation is registered with a consequent reduction of default risk and the possibility to give continuity to their operations.

To better comment the program benefits are Sonepar statement: "this innovative financial program contemporary benefits us and the suppliers. For what concerns Sonepar, consistent discounts on nominal value of invoices are got while, regarding suppliers, they collect cash much earlier with respect to standard times, despite conceding fixed discounts.

6.4 Discussion

As it can be inferred from the previous section reporting the analysis of the case studies outputs, quite interesting and delineate results came out to provide answers to the research questions. More precisely, the initial goal to apply the theoretical research framework and, whenever necessary, to adjust and integrate it can be considered as sufficiently accomplished. Indeed, through the building of such a theory-based framework, representing the theoretical holistic answer to the three research questions, and its successive completion by the means of the multiple case study methodology, the dissertation claimed purpose was to identify diverse possible architectures of sustainability-oriented SCF programs, each one fitting quite a precise set of triggering drivers, mainly sustainability-oriented, and bringing along a defined set of benefits. Drivers and benefits are intended and studied for both suppliers' and buyer's side. In this regard, this explorative work can act as a powerful practical tool for companies struggling to implement sustainability in that, given a set of starting needs, the most suitable SCF program is suggested to best cope with encountered issues and get desired benefits.

Turning to the main evidences stemming out of results, three clearly distinct archetypes of sustainability-oriented SCF programs emerged from the ten case-studies analysis as macro-categories of financial programs adoptable by companies to deal with sustainability-related issues. Nevertheless, the main and key intent of this research work was not so much to find out possible architectures of SCF programs but as much to link each architecture to sets of pushing drivers and brought benefits, thus best depicting the SCF role of sustainability lever. In line with that, to best characterize each SCF archetype function and effect, a bi-dimensional graph indicating, on y-axis, the degree of sustainability orientation and, on x-axis, the supply chain actor most benefitted by the program has been drawn. In so doing, besides the final research framework (shown in the following), an alternative representation of dissertation results is put forward. The graph, indeed, graphically resumes the aggregated outputs of the three research questions by tying the diverse SCF programs archetypes to both their triggering drivers and related brought benefits. This is, indeed, the initial goal of the research work: identifying and hinting possible architectures of SCF programs responding to sets of defined sustainability-oriented needs and bringing to desired benefits. While the abscissas axis clearly deals with the benefits brought by the diverse identified SCF archetypes, the ordinates axis is not that intuitive: by reporting how much archetypes are oriented to sustainability goals, it indirectly indicates the drivers responsible for SCF programs initial triggering. In this respect, the horizontal axis ranges from low sustainability imprinting (low risk but savings sector) up to SSCM level which

represents the highest degree of sustainability orientation for the identified SCF archetypes, thus covering all the archetypes variants spectrum. In the middle, two intermediate levels of sustainability orientation (CSR and Risk Management Strategy sectors) are reported to precisely depict all the registered combinations of triggering drivers.

This y-axis, however, does not have to be conceived as a discrete set of values where above a certain threshold value a diverse orientation is registered but, instead, as a continuum with fuzzy boundaries between one orientation and the other. Being, indeed, a qualitative nature research, the different archetypes cannot be assigned precise values when it comes to assess their contribution to the sustainability cause.

The same holds for x-axis: the interviewed firms, and automatically their sustainability-oriented SCF programs, are distributed along the axis based on qualitative evaluations of registered benefits. By basing on the provided answers, analysed cases have been placed from left (programs benefitting mostly the buyer) to right (programs bringing benefits to suppliers and supply chain overall) with progressive distribution of benefits in-between. As it will be shown below, some programs, the ones belonging to archetype 2, are very similar regarding the way benefits are distributed.

Accordingly, the placement of each case studies along these two axis assumes relevance in relation to the other case studies placements and not in a stand-alone fashion. In the light of that, the sectors division adopted in the graph is just to facilitate such a comparison and not to stately mark clear divisions along the two axes.

Bearing in mind such key considerations, the ten case studies have been positioned in the graph and interesting and coherent results emerged.

In line with what inferred from the cross-case analyses and related discussions, SCF programs are collocated along a sort of diagonal: each archetype effectively responds to the initial triggering needs as it leads to related desired benefits, thus confirming also the goodness of archetypes creation phase.

In the next page the bi-dimensional graph, hereabove introduced, is shown.

SSCM			1B
CSR			1A
Risk mgmt strategy		2B	2C
Low risk but savings	3	2A	
	Buyer's benefits	Both players' benefits	Suppliers' benefits and SC effects

Table 37: Program orientation – benefits graph

Legenda:

1A: Staff International case

2B: Group Eng. and Nice cases

1B: Puma and CNMI cases

2C: Wind-Tre and Fastweb cases

2A: Fincantieri and Azimut cases

3: Sonepar case

Turning, thus, to comment the graph content, only blocks composing a sort of graph diagonal are filled: the up-right part of the graph is populated by archetype 1, the archetype 2 is entirely placed in the centre while archetype 3 falls in the bottom-left area.

Archetype 1, as notable, can be furtherly divided in smaller subsets corresponding to archetype 1 variants. The first one (1B), comprising Puma and CNMI programs, has the strongest orientation to sustainability in that belonging programs act as SSCM levers by pushing suppliers to adopt sustainable-sound practices while financially helping them; brought benefits are, automatically, direct advantages for suppliers that enjoy improved financial positions and enhanced sustainability performances with strongly positive repercussions on the whole supply chain. In this sense, the focal firm indirectly benefits from the suppliers' financial securitisation and enhancement in sustainability performances, as deeply discussed in results section. Both Puma and CNMI, indeed, set up an Advance Reverse Factoring solution that can be accessed by only those suppliers meeting some pre-defined target of sustainability-related performances. In so doing, focal firms strongly incentivise their supply base to commit to sustainable-sound initiatives by rewarding them with a highly financially advantageous program. No extension of

payment terms towards the bank nor economic discounts for the big brands characterise the program functioning as such solutions are only to benefit suppliers. Indirectly, focal firms benefit from the suppliers' higher solidity and enhanced sustainability performances along the chain. Such 1B programs, thereby, are framed as both SSCM and CSR levers in that they contribute to extend sustainability upstream the supply base while allowing initiator focal firms to deploy socially responsible actions. The second subset of the up-right section (1A), instead, presents a bit lighter orientation to sustainability as the Staff International program acts in the CSR wave by financially sustaining the suppliers while pushing them to operationally improve; as regards for the drawn benefits, it is still suppliers who directly benefit the most out of the program with consistently positive effects on the entire supply chain as the continuity of supply is secured. The Staff International program, as in the case of 1B archetype, grounds on an Advance Reverse Factoring solution whose access is, yet, restricted upon accomplishment of operative performances. In this respect, the program can be said to operate only in the CSR wave as it provides suppliers with a concrete financial help whereas SSCM sphere is not approached. Staff International, the supply chain focal firm, does not get any direct benefits from the program but a consistent improvement of suppliers' operative performances along with a strong reduction of supply chain disruptions indirectly reflect in higher overall competitiveness.

Archetype 2 section of the graph can be subdivided too, always according to previously identified variants. For what concerns the degree of sustainability orientation, archetype 2A cases are placed in the risk management strategy band as related programs, by offering the tailored SCF program, mainly aim at securing the continuity of supply and bringing direct advantages also for the focal firm. Fincantieri and Azimut programs, indeed, offer to their entire supply base a Reverse Factoring program allowing suppliers to early discount invoices. The big firms, contrary to archetype 1 cases, use the program also to negotiate a payment terms extension with the bank while asking suppliers an economic discount on invoices nominal value in return. Such financial solutions, thereby, act, on one side, as powerful risk management strategies by fuelling liquidity to suppliers and, on the other side, as effective tools for buyers to get financial and economic benefits. A further aspect regards the considerable efficiency savings for the buyers thanks to the complete digitalisation of programs-related administrative procedures. A bit higher orientation to sustainability characterises the 2B variant cases since related programs aims at more concretely helping suppliers, both financially and economically. In fact, Group Engineering and Nice SCF programs resemble archetype 2B programs in the program functioning: all suppliers are allowed to enter the program and the initiator buyers get

payment terms extension from the bank and economic discounts on invoices alongside relevant efficiency savings thanks to programs complete digitalisation. What differs, here, is the strict focal firms' monitoring of interest rate negotiation between suppliers and the bank. In this way, suppliers are also guaranteed notable economic savings thanks to lower costs of financing. 2C variant, therein Wind-Tre and Fastweb fall, instead, is furtherly closer to CSR logic as, on buyer's side, only the will to financially sustain the suppliers is key in triggering the program: neither financial nor economic nor efficiency drivers are present for the buyer. Again all the suppliers can enter the program and earlier collect cash but without conceding any discount on invoices.

The placement along the horizontal axis mainly reflects the initial purposes of the three variants programs, that is to say that the programs registered benefits aligned to the triggering needs. Accordingly, in terms of brought benefits, 2A cases are more buyer-oriented, 2C programs are more suppliers and supply chain-oriented while 2B ones reside in the middle, balancing benefits among the two parties.

Archetype 3 block is, instead, characterised by the lowest registered level of sustainability orientation in that, as precisely reported in the results section, is a strongly buyer-oriented program aiming contemporary to minimise suppliers' default risk and reach consistent economic savings for the buyer. In light of that, benefits are totally polarized towards the buyer who enjoys big economic discounts, in return of anticipating cash to suppliers.

As it can be noted by looking at the graph, only some blocks are populated by the identified SCF archetypes with all the remaining ones empty, representing other crossings between sustainability orientations and kinds of drawn benefits. More precisely, archetypes are positioned along a sort of diagonal of the graph, certifying the SCF programs effectiveness in directly responding to the triggering initial needs. However, in spite of not registering cases in diverse blocks, a further extension and development of the research, by augmenting the empirical database, might uncover cases of SCF programs positioning in such empty spaces. In this sense, the research findings, reported on the graph, are not intended as entirely exhaustive of the potential relation between sustainability and SCF and, more in particular, of how and in which measure SCF can act as effective sustainability lever. By keeping on running interviews, it would be possible, indeed, to verify whether the currently-filled blocks are completely representative of the relation between these two topics or other feasible crossings exist.

Referring to the actual positioning of the diverse analysed cases along the graph diagonal, as already said, SCF, meant as its set of financial programs, results to be an applicable and modular

tool to respond to different sustainability-related issues and criticalities, bringing defined sets of benefits.

In the light of that, such findings can be generalized, thus assuming a key practical relevance for companies meeting obstacles on their own way to sustainability: as an example, firms struggling to implement SSCM plans are suggested archetype 1 SCF programs (especially 1B variant ones), whereas companies willing to provide a concrete help to their supply chains while minimising risk of supply disruptions can take archetype 2 programs as a reference. As already mentioned, however, it is a utopia to suppose that companies looking at these findings will perfectly replace the adoption of one the proposed SCF archetypes. Every supply chain is different to each other, both in the composing business actors and in the related supplier-buyer dyads dynamics, thus requiring specific operative declinations of the diverse identified programs. In this sense, such archetypes are considered as relevant in their basic reported structure with some architectural dimensions varying from case to case so as to fit peculiar needs of companies willing to embark on these programs.

Apart from these applicability considerations, the main purpose of this dissertation work, namely providing companies with a practical tool suggesting them the most-suitable kind of SCF program configuration to cope with defined sets of sustainability-related issues, can be considered as mostly achieved.

What makes results and findings even more significant is the identification, within the described dynamics of the diverse SCF archetypes in responding to the triggering needs, of some theoretical reminding and connections. Said differently, inferred results of this research thesis can be provided a theoretical base so as to furtherly augment and reinforce their proved validity. In this respect, the diverse programs and related practical adopted measures put in place by the interviewed firms to respond to some defined sets of sustainability-related issues have been studied and analysed also in the light of literature insights in this regard.

Such a dissertation work has been triggered by the willing to investigate whether SCF could be leveraged to fill two theoretical gaps detected in sustainability literature, respectively in SSCM and CSR related theoretical streams.

The first gap, identified in SSCM field, regards the recurrent anticipated failure of SSCM plans mainly due to scarce suppliers' collaboration in deploying required actions and initiatives. To this regard, the literature clearly underlines how such a contingency occurs as suppliers are not given any kind of incentives nor direct economic rewards for proactively participating to these sustainability-oriented plans. Suppliers are, therefore, called to dedicate a considerable amount of time and financial resources to such projects that are perceived as collateral to their core

business (manufacturing a product or providing a service), thus end up being totally disregarded.

Suppliers, being often small-size companies, are inevitably forced to provide their entire efforts to remunerative activities, directly impacting the bottom-line. Hence, extra-costs and resources for sustainability projects mainly represent a further counterproductive burden for these suppliers' income statements.

To this purpose, however, the literature has not provided yet any relevant contribution nor practical application as it has mostly limited to underline how the absence of incentives for suppliers to follow up on these projects is one of the main causes stopping the sustainability implementation process on supply chains.

What analysed interviewed firms, in particular the ones belonging to archetype 1B, did to cope with such a situation was to implement a bespoke SCF program offered to a restrict set of suppliers. The program is a Reverse Factoring-based solution offering to suppliers highly advantageous financial conditions but presenting an innovative factor: the suppliers' access to the program is upon accomplishment of some pre-defined targets in sustainability performances, both in social and environmental area. In so doing, the buyer (i.e. the supply chain focal firm) strongly incentives its supply base to commit in a sustainable-sound direction by offering such an innovative financial program.

To this regard, Raymond P. Cotec et al. (SSCM 12) stressed out how setting up economic instruments, by the buyer, to push suppliers towards sustainability initiatives may play a key incentivizing role, thus possibly overcoming the suppliers' inactivity in such buyer-driven strategic plans. To this regard, the authors remark how time and financial resources are the greatest limiting factors for suppliers' poor commitment in sustainability initiatives and, therefore, financially-based rewards could represent an effective way out. Not only do the authors suggest buyer-developed incentive systems, but they also assign to governments and public institutions the role to attach economic benefits and reliefs to sustainability-related plans and initiatives.

In the light of that, archetype 1B SCF programs assume a higher relevance as they can be said to adhere to what literature suggests as possible remedy in such contingencies.

For what concerns, instead, the second theoretical gap, it regards the absence of examples of concrete ways and methods for a company to support its supply chain while acting in CSR logic. Big brands are, indeed, called to put in place social-oriented actions aiming to support their own supply chains, usually composed of several SMEs, deemed fundamental to guarantee the success of the final product or service and too often in financially weak positions. As a

consequence, operative business is put at serious risk with direct repercussions on all the downstream chain. Here, the literature stresses how big firms should provide a concrete help in these contingencies as it is of paramount importance to guarantee the continuity of supply while preserving the integrity of its own supply chain in ethic and social-oriented way. However, in the literature, no practical suggestion nor successful cases have been reported yet for big companies to apply so as to contemporary guaranteeing supply continuity and deploy socially responsible actions. To cope with that situation of suppliers' instability, interviewed firms belonging to archetype 1A and 2 (all variants) developed a tailored SCF program, still based on a Reverse Factoring solution, acting as a concrete and effective tool to financially sustain their entire supply base. In this respect, these kinds of financial programs are framed as powerful risk management levers while allowing to deploy social responsible actions in that small suppliers are guaranteed a long-term survival with positive repercussions on overall society, as previously seen.

In line with such an approach, Hutchins et al. (Hutchins et al., 2008) and Cruz et al. (Cruz, 2001) highlight how, in a context characterized by complex and long business networks (i.e. global supply chains), deploying financially supportive actions in favour of its smallest partners can be a strongly social responsible way to help society. Indeed, by providing financial fuel, such small players can give continuity to their business, thus indirectly sustaining the society they operate in.

In such a perspective, as in the case of archetype 1B, programs belonging to archetype 1A and 2 acquire theoretical significance as they put in place what some authors suggests as effective and practical way for big companies to socially act.

6.4.1 Revised final research framework

The main acknowledged objective of this explorative work was to figure out whether SCF can represent an effective and practical lever to concretely help companies in implementing sustainability, intended in terms of both SSCM plans and CSR actions. Indeed, the literature review on sustainability theory stream uncovered two main gaps, detected in SSCM and CSR research areas, respectively. Subsequently, three research questions have been identified so as to guide the proceedings of the work in the desired direction. In this sense, the research questions aim at testing the potentiality of SCF programs to act as effective enablers and facilitators in the deploying of sustainability plans by focal firms of supply chains.

Then, preliminary theory-based answers to three research questions have been provided by grounding on both sustainability and SCF literatures, backing also on secondary data collection which went to integrate and enrich literature insights. Such temporary results have been, subsequently, graphically transposed in the so-called preliminary research framework, thus visually reporting the holistic theoretical answer to the thesis research questions. In this respect, the framework puts forward a supposed connection between SCF and Sustainability topics, intending SCF as a sustainability lever in support of focal firms of the supply chain.

Such a research framework, already deeply presented and detailed in the dedicated section, has been, then, thoroughly tested by running interviews to ten multinational companies and building up follow-up analyses, precisely reported and described in the results and discussions sections. Said differently, through the ten case studies analyses, the previously theory-based answers to the three research questions have been tested, integrated and adjusted based on the findings and the evidences stemming out of interviews. That is, the preliminary research framework and the related depicted connection between SCF and Sustainability has been put to the test of ten real applications of sustainability-oriented SCF programs, resulting in a revised and final research framework. The latter graphically resumes the main findings and contributions of this explorative work.

In fact, as widely explained both above and in the former sections, the research framework represents the graphical transposition of the three research questions outputs. In line with that, the revised final research framework is based on the final answers to the three research questions, derived from the ten interviews and related analyses and discussions. More precisely, as deeply presented in former sections, the three research questions final outputs have been initially based on literature review and, subsequently, integrated and adjusted with evidences and findings from the ten analysed case studies. Accordingly, the final research framework

grounds on its theory-based preliminary version with adjustments and integrations as regards for the first and third pillar. For what concerns, instead, the central pillar, the three identified macro archetypes constitute the backbone of such a pillar which, in the initial version, presented architectural dimensions deemed as potentially relevant for a SCF program oriented to sustainability. All the three archetypes composing the final central pillar are characterized and discriminated along a set of key architectural variables, some of them already present in the theory-based version and others new, based on case studies findings. A solid consistency is, therefore, guaranteed between the “old” and the “new” version of the research framework as the “old” pillars represent the foundations for the development and the building of the final framework. Such a strict observance, respected by running interviews and performing follow-up analyses in accordance to preliminary research framework structure, allowed to better test the theoretical findings and subsequently integrate them with evidences from real cases. In the next page, the revised final research framework is shown, highlighting the main evidences of the analysed ten case studies and allowing to graphically infer the principal findings of this explorative work.

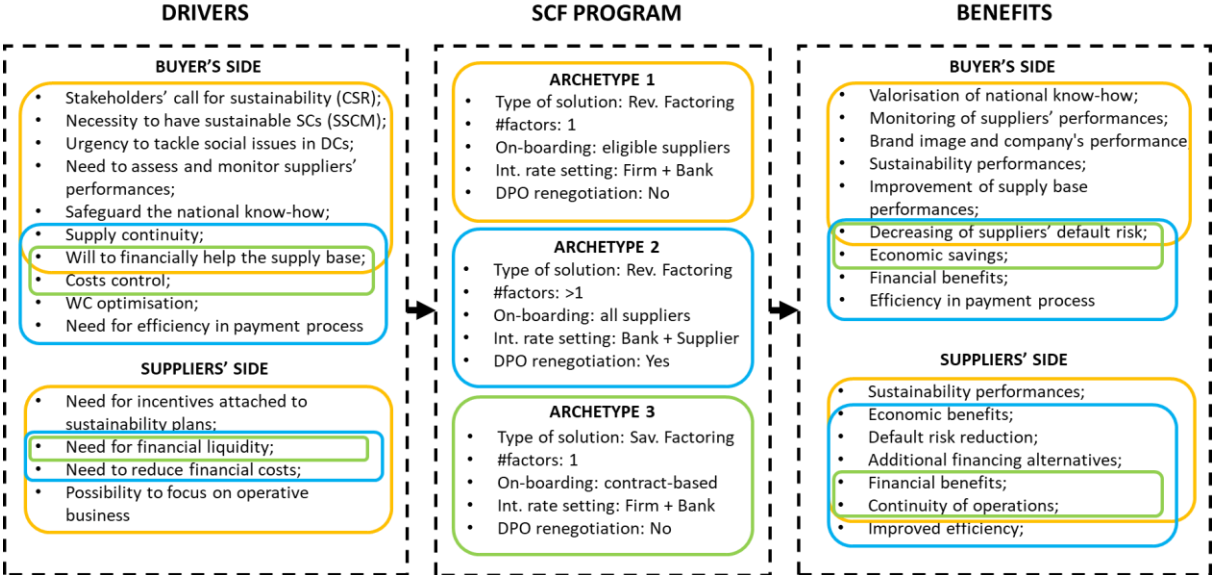


Figure 16: Revised Final Research Framework

By looking at the framework, the central pillar, as above explained, embodies the three macro-archetypes of SCF programs oriented to sustainability. Whereas, the first and the third pillar include the former theory-based drivers and benefits, respectively, plus consistent integrations,

both on buyer's side and suppliers' side, so as to embrace all the relevant drivers and benefits reported through interviews.

What particularly characterizes and make this final framework insightful is the underlining of the registered and evidence-based types of connections between SCF programs and Sustainability. More precisely, as formerly explained and discussed, SCF, in the form of identified archetypes, acts as a sustainability enabler as programs are mainly pushed and triggered by sustainability-oriented drivers and bring to certain sets of desired benefits, mostly sustainability-related as well. The key intent of this research thesis was, indeed, to provide possible diverse configurations of SCF programs (i.e. SCF archetypes), each of them responding to a set of sustainability-related needs and leading to a set of related hoped benefits. Such cause-effect relations are depicted in the research framework which, therefore, can be conceived as a tool for companies struggling with sustainability-related issues to pick up the most fitting SCF program. As an example, a focal firm experiencing difficulties in implementing SSCM plans can refer to the archetype 1 as a possible way out, so can a company adopt archetype 2 to deploy effective social-sensitive actions.

To this purpose, the framework presents the use of three different colours to emphasize how each archetype is triggered by a pretty defined set of drivers and leads to an equally pretty defined set of benefits. To explain, the yellow box drivers push the adoption of the archetype 1, yellow-circled, which in turn brings along benefits in the yellow box. The same holds for the other colours, representing the other two macro-archetypes.

In this sense, this framework, resuming the main findings of this dissertation work, acts as a powerful tool for companies to facilitate and smooth the implementation of sustainability-related plans. Firms experiencing difficulties in deploying desired sustainability actions strategy are, indeed, suggested the most suitable archetype of SCF program to cope with encountered hurdles. Such a proposed archetype, then, is believed to bring a set of related benefits. The framework, representing thesis results, has to be intended, therefore, as a sort of problem-solver that, fed by inputs (i.e. drivers), puts forward a solution (i.e. the different archetype), thus bringing desired benefits.

7 CONCLUSIONS AND FURTHER DEVELOPMENTS

The main acknowledged objective of this dissertation work was to find out possible connections between two apparently distant research areas, namely SCF and Sustainability topics. More precisely, the aim was to figure out whether SCF can represent an effective and practical lever to concretely help companies, usually focal firms of supply chains, in implementing sustainability, intended in terms of both SSCM initiatives and CSR commitment. Indeed, the literature review on sustainability theory stream uncovered two main gaps, detected in SSCM and CSR research areas, respectively. To follow, three research questions have been built up so as to guide the proceedings of the work in the desired direction. In this sense, the research questions aim at testing the potentiality of SCF programs to act as effective enablers and facilitators in the deploying of sustainability plans by focal firms of supply chains. To this regard, the first research question (RQ1) investigates all the possible architectural configurations for a SCF programs oriented to sustainability; the second research question (RQ2) aims at finding out the drivers, both on buyer's side and suppliers' side, that are responsible for the triggering of the related SCF program; finally the third research question (RQ3) objective is to report and qualitatively assess all the main benefits, both on buyer's and suppliers' side, brought by the diverse configurations of SCF programs with a sustainability-orientation. Then, preliminary theory-based answers to three research questions have been provided by grounding on both sustainability and SCF literatures, backing also on secondary data collection which went to integrate and enrich literature insights for the RQ1. Such temporary results have been, subsequently, graphically transposed in the so-called preliminary research framework, thus visually reporting the holistic theoretical answer to the thesis research questions. In this respect, the framework puts forward a supposed connection between SCF and Sustainability topics, intending SCF as a sustainability lever in support of focal firms of the supply chain. Such a research framework has been, subsequently, entirely tested and integrated by running interviews to ten multinational companies and building up follow-up analyses, resulting in a revised and final research framework.

Through such a final research framework, the main findings of this dissertation work are presented. Three macro-archetypes, composing the framework central pillar, are identified as diverse financial programs adoptable by companies to deal with sustainability-related issues. Each archetype is triggered by a set of pushing drivers (first pillar) and leads to a certain set of benefits (third pillar). In this sense, the diverse registered and evidence-based types of connections between SCF programs and Sustainability are depicted in the framework.

Finally, such findings can be generalized, assuming a key practical relevance for companies meeting obstacles on their own way to sustainability

7.1 Theoretical contributions

Such a research work started by carefully analysing both SCF and Sustainability literature streams with the aim of figuring out whether they could complement each other. Said differently, SCF, given its recent birth, was believed to bring interesting contributions to Sustainability research area, an already widely discussed topic but still in continuous development with fuzzy theoretical boundaries. To this purpose, the two literatures have been contemporary tackled so as to continuously search for potential connections and points of conjunctions. As a result, two main theoretical gaps have been detected in the sustainability literature, respectively in SSCM and CSR streams, and clearly detailed with SCF thought to potentially represent a cure in filling them up. More precisely, the gap found in SSCM theory is centred on the difficulty by focal companies to successfully implement SSCM plans which often failed due to suppliers' scarce commitment. What keep suppliers from actively participating to such sustainability-sound plan is the complete absence of incentives and direct economic returns attached to such sustainability initiatives which, thus, end up being disregarded. To this purpose, however, the literature has not provided yet any relevant contribution nor practical application as it has mostly limited to underline how the absence of incentives for suppliers to follow up on these projects is one of the main causes stopping the sustainability implementation process on supply chains. The second theoretical gap is identified in Corporate Social Responsibility (CSR) area. Put differently, companies are called to concretely support their own supply-chain, usually composed of plenty of small and medium-size firms. Such suppliers, deemed fundamental to guarantee the success of the final product or service, often severely struggle with liquidity shortage due to the recent financial crisis which particularly hit small-size companies with low assets value. The literature stresses how big firms should provide a concrete help in these contingencies in a win-win logic but, again, no practical suggestion nor successful cases have been reported yet.

Having underlined such theoretical gaps, this research work aimed at filling them by drawing on SCF topic, intended as its spectrum of innovative financial solutions whose supportive function can represent a practical way out to successfully implement sustainability to the whole supply chain. Accordingly, through the building of multiple case studies, this thesis thoroughly investigated whether SCF programs can represent enablers for sustainability along the supply

chain, smoothing out issues and obstacles encountered by focal firms. In this regard, different SCF archetypes, representing groups of architectural configurations, have been linked to sets of triggering drivers and sets of brought benefits. All the drivers and benefits included in the analysis are strictly related to sustainability dominium, thus proving how SCF can act as sustainability enabler and facilitator when it comes to deploy sustainable-sound actions along supply chains. In line with that, this dissertation work novelty resides in providing a practical and concrete remedy detected gaps in the sustainability literature. Stick to that, this thesis clearly shows how SCF can, thus, be framed and leverage in a sustainability direction, freeing it up from the mere financial concept. To do that, a first relevant theoretical contribution was to precisely list and analyse issues registered by companies when trying to deploy sustainability-related action plans, both in SSCM and CSR areas. In the same way, all the benefits potentially stemming from enhancements in sustainability performances have been still reported, highlighting how in such a complex current business scenario it is crucial to carefully mind to sustainability indicators, whether they deal with SSCM or CSR areas. Then, by building up the research framework, SCF has been assigned a new powerful function as, thanks to its peculiar features, it is framed as a bridge allowing to cope with some criticalities (i.e. drivers), finally leading to defined benefits.

To conclude, the main research findings, resumed in the final framework, assume quite a high level of generalization, as better reported and explained in the following section, thus giving to the work a higher validity.

7.2 Managerial contributions

In this subsection, what this explorative work brings as a contribution for companies and, more generally, to the whole business management field is reported and described.

As already stated in previous sections, the main aim of this thesis was to figure out whether SCF can represent an effective and practical lever for sustainability plans, whether they regard the implementation of SSCM initiatives or the deploying of social-oriented actions, falling under the wider area of CSR. In order to effectively verify whether such connections between these two research areas hold, three research questions have been developed. Theoretical-based answers have been provided so as to lay the basis for the proceedings of the work. To follow, certain patterns of sustainability-oriented SCF programs adoption have been identified: diverse SCF archetypes have been linked to precise sets of triggering drivers and to the related set of brought benefits, based on case studies findings, thus putting forward some proved connections

between SCF and Sustainability areas. In this respect, each archetype, comprising programs of interviewed firms with similar architectural configurations, has been assigned a practical function in solving some specific implementation issues in the sustainability dominium. As precisely reported in the results and discussions sections, each SCF archetype, indeed, is pushed and, subsequently, responds to a pretty defined set of needs, both on suppliers' and buyer's side, finally leading to the related desired benefits. Hence, a clear connection between the kinds of companies' needs (i.e. drivers) and the way a SCF program is structured and built up (i.e. its architecture) is noticed and proved. Such different architectural configurations are, in turn, found to be leading to diverse sets of registered benefits.

In the light of that, such evidence-based findings can be easily generalised, thus inferring some precious insights for whichever focal firm of a supply chain. By the means of the identified SCF archetypes and their suitability to respond to some defined needs, the program fitting the specific sustainability-related obstacles is suggested to the focal firm that will, then, likely enjoy equally-defined benefits. More precisely, the generalised validity of these findings particularly applies for eventual companies struggling to implement actions and plans related to the considered sustainability streams (SSCM and CSR).

Accordingly, a firm dealing with one of these categories of sustainability-related impediments can leverage and exploit the findings and evidences of this dissertation work to overcome experienced obstacles and, thus, reaching initial sustainability goals. To this purpose, indeed, a specific SCF architecture is suggested to best accomplish the required tasks.

To conclude, it is clear how each real-life case presents peculiar characteristics making it different from whichever other case. In this sense, it is very unlikely that a specific SCF program architecture can be applied in the exactly same way for more companies and related supply chains. Amendments and additions will be always necessary to make the program perfectly address case-specific characteristics and criticalities. Nevertheless, the thesis findings, namely the correspondences between SCF archetype with triggering drivers and brought benefits, assume key and strategic relevance in representing practical guidelines to follow when clashing with sustainability-related issues.

7.3 Limitations and future research

A first limitation, already cited when presenting results of cross-case analyses and related evidences, is concerned with the lack of direct suppliers' perspective regarding the analysed SCF programs, representing the key component leading to this research thesis findings. Indeed,

by solely running interviews with buyers, there is a plausible risk to get a bit distorted vision of what actually pushed suppliers in adhering to such financial programs and of what have concretely been the registered benefits for them. Buyers, despite closely working with their supply base, might wrongly interpret suppliers' primary needs and main benefits drawn from such a kind of SCF program. To confirm this possible research limitation, the results drawn from RQ2 and RQ3 for suppliers' side triggering drivers and obtained benefits show how very small variations are observed along the ten analysed cases. Suppliers, indeed, are supposed to be always pushed by almost the same sets of needs and to enjoy almost the same set of benefits. This is likely due to the absence of a direct suppliers' point of view. In accordance to that, a promising future development of the research is to enlarge the data collection by running interviews also with suppliers, trying to better figure out what drive them in participating to such kinds of sustainability-oriented financial programs.

A second limitation concerns the small sample of cases gathered through secondary data investigation which went to integrate literature insights so as to provide the basis for the framework central pillar, finally resulting in the three archetypes. Indeed, three real-life cases have been taken to seal the possible relevant architectural dimensions for a SCF program. This is due mostly by the highly innovative component of such programs. Then, the sample of interviewed companies still represents a limit as the risk of not having covered the complete spectrum for all the possible architectures of SCF programs with a sustainability orientation exist. In this respect, also reported drivers and benefits could represent a partial picture of a wider set of pushing needs and drawn advantages, respectively. To this regard, therefore, a possible way to enrich and furtherly develop such a dissertation work could be to consistently increase the sample of companies to interviews, whether they are buyers or suppliers.

Finally, a last identified limitation regards the absence of benefits quantification: registered benefits, both on suppliers' and buyer's side, miss a quantitative assessment, being solely based on qualitative answers by interviewed companies. In this sense, it has been impossible to measure and quantify how much SCF improve sustainability-related performances, only limiting to state whether it does it or not. Hence, a particularly interesting research development would be to try to measure sustainability performances, before and after the program implementation, thus assessing more precisely the SCF lever effect.

APPENDIX A

Questionnaire:

- 1) Is a SCF program present in the company?
 - If so:
 - How long has it been in the company?
 - Which are the functions involved in the choice of such a program?
 - If not so: Are you thinking to introduce a SCF program in the future?
- 2) Which solution did you implement?
- 3) Why did you opt for this SCF program? What are the reasons why you set up the program? What, instead, are the reasons why suppliers decided to join the program?
- 4) Among these reasons, is there the will to support and help financially the whole supply chain? In particular, the small and medium-size suppliers
- 5) If not so, could this program intended also as a lever to support the survival of all the players in the supply chain?
- 6) How many banks did you work with for this program? What kinds of data are exchanged with banks for the suppliers' selection?
- 7) The program is addressed to which suppliers of your supply base? What characteristics do the selected suppliers have? How has the on-boarding been carried out?
- 8) How many suppliers are involved in the program? Which is the spending quota that is covered with this program?
- 9) What are the conditions to access the program? Is there a rating system regulating the suppliers' access to the program?
- 10) Is the program scalable? That is, the better the suppliers perform, the more advantageous is the access to cash?
- 11) If not so, do you think it is feasible to make the program scalable?
- 12) Does the suppliers' rating include sustainability performances?
- 13) If not so, do you think it is feasible/convenient to include such kinds of performances?
- 14) What are the information to be exchanged between the buyer and the suppliers? What information between buyer and bank? And between bank and suppliers?
- 15) How are the data between actors exchanged? (periodic meetings, inter-functional teams, asynchrony data exchanges, shared platforms, etc.)?

- 16) What are the advantages you achieved/think to achieve through the adoption of this program? What, instead, are the advantages/benefits for the suppliers?
- 17) Within the benefits of both actors, are there some direct/indirect advantages related to sustainability?
- 18) If not so, do you think that some improvements in sustainability area can be achieved in the future thanks to this program?

APPENDIX B

Engagement e-mail:

Dear Ms/Mr

I am Mattia a student of Master of Science in Management Engineering at Politecnico di Milano. Currently, I am collaborating with Supply Chain Finance Observatory of Politecnico di Milano to develop my Master Thesis which revolves on Supply Chain Finance and Sustainability topics and how they relate to each other. Cosa intende per scf

More precisely, the thesis aims at understanding whether Supply Chain Finance solutions can act as sustainability levers for the company and their efficacy in doing that, with all the operative implications.

I am contacting you to ask for your availability to an interview aiming to discuss your Supplier Financing Program, jointly developed with BNP Paribas and IFC. In particular, the following points are of interest:

- Brief company and related supply chain description
- The main reasons why such program has been set up
- Benefits brought by this program
- Understanding of how this program is managed operatively among the involved parties
- Impacts of this program on company's sustainability performances

The interview will last around half an hour and can be done by phone call or Skype. Would you be available for such interview in next weeks?

All data gathered through the interview will be managed confidentially. In case you were interested, the thesis results can be shared with your company.

I thank you in advance for the courtesy and I remain available for any request/info from your side.

Yours sincerely,

Mattia Invernizzi

APPENDIX C

Puma Case Study

Company Introduction

Puma is a German multinational company, being part of French group Kering since 2007, that designs and manufactures athletic and casual footwear, apparel and accessories, headquartered in Herzogenaurach, Bavaria. As regards for the foundation, in 1924, Rudolf and his brother Adolf Dassler jointly formed the company Gebrüder Dassler Schuhfabrik (Dassler Brothers Shoe Factory). The relationship between the two brothers deteriorated until the two agreed to split in 1948, forming two separate entities, Adidas and PUMA. Following the split from his brother, Rudolf Dassler originally registered the new-established company as Ruda, but later changed the name to PUMA while Adolf founded Adidas. Puma was definitely established in 1948, and the first shoe to release was the Atom a soccer shoe. Not long after, athletes started wearing Puma's in key events. In 1952 runner Josef Barthel wore Puma while he won an Olympic Gold Medal in the 1500 m. In 1956, the form stripe was introduced and since then, has been a Puma trademark. It wasn't till 1968 when Puma brought the now famous "Puma" aka Cat logo to the sneakers and that same year a controversial event took place. Tommie Smith, who won the Olympic Gold 200 m in Mexico was wearing a pair of Puma running shoes. He then took stand barefoot with the Puma's by his side. At this time, team mate John Carlos and Tommie Smith made the Black Power salute, because of the mistreatment of African Americans at the moment. Mr. Smith then left his pair of Puma's for the world to see. Later, both

Olympians were banned from the Olympics. In 1972, PUMA-partnered athletes Mary Peters, Great Britain (pentathlon), John Akii-Bua, Uganda (400m hurdles), Randy Williams, USA (long jump) and Klaus Wolfermann, West-Germany (javelin) all win gold medals at the Olympic Games in Munich. In 1974, At the World Cup in Germany, “Player of the Tournament” Johan Cruyff wears PUMA football boots and wins the prestigious “European Footballer of the Year” award for the second time in a row. The Dutch national team wears orange jerseys featuring the three stripes of a different supplier. Team captain Johan Cruyff is a Puma athlete and feels closely connected to the brand; he refuses to play in a different outfit. So a custom-made design is made for him, featuring only two stripes. A legend is born. Other professional athletes to wear Puma are Diego Maradona, a professional soccer player and tennis superstar Boris Becker, which he had his own signature sneaker the “Puma Becker” and “Puma Becker Ace”, releasing in the 1980s. In 1968 the Puma Clyde released, which is a basketball shoe designed by Walter “Clyde” Frazier, which today is one of the more popular Puma’s. Over the years, Puma has taken their models to the next level. Puma King player Lothar Matthäus leads Germany to the country’s World Cup title in Italy. The captain of the national team is also voted “European Footballer of the Year”, “World Footballer of the Year” and “World Athlete”. In 1991 Puma designed what is called a disc system. The Puma did not have any laces, but an adjustable fit. In 1996 Puma released the “Cell” which it is said to be the first foam free midsole. From then on, Puma has incorporated them into new models. In 2004, The PUMA partnered Cameroon National Team arrives at the Africa Cup of Nations without sleeves – and takes the 2002 Africa Cup home to Yaoundé. In 2004, the “Indomitable Lions” follow up with their equally controversial one-piece PUMA UniQT, which removed unnecessary bulk and limited shirt-grabs by opponents. FIFA punishes the team by revoking six points in the qualification for the 2006 World Cup and imposes a fine. PUMA launches a public campaign in support of Cameroon and sues FIFA against the prohibition of the jersey. The legal dispute ends with a compromise and a shared donation to a football development project in Cameroon. Always in 2004, Puma and Ferrari announce that they have signed a multi-year contract making PUMA the official supplier of Scuderia Ferrari, the most successful Formula One team of all times. The partnership with Ferrari also allows PUMA to develop licensed Ferrari footwear, apparel and accessories for global distribution.

The company has been listed at the Frankfurt Stock Exchange in 1986. Currently, Puma employs more than 10,000 people worldwide and distributes its products in more than 120

countries, with a turnover of around 3,6 bln €. The aim of this brief report is to present the Puma Vendor Financing Programme (PVFP), a sustainability-oriented SCF solution.

Drivers and features of the program

Mainly, two factors have driven the introduction of a sustainability-driven SCF program which has been, then, converted in a scalable solution. On one hand, despite having outsourced most of the production in foreign countries, Puma has always considered under its responsibility the safeguard of environmental and social standards throughout the entire supply chain, taking care of suppliers' compliance. To this end, Puma has been carrying out sustainability ratings of suppliers for more than 15 years, in order to push them in sustainability direction. On the other hand, most of the suppliers often went to Puma asking for some financing aids to increase their financing possibilities as the financial crisis and current economic context make it more difficult to raise liquidity through traditional channels. More precisely, suppliers desired to get access to cash at a cheaper cost with a subsequent positive impact on Working Capital. As a consequence, in order to address these two issues, Puma decided to set up a Reverse Factoring program which is accessible upon accomplishment of some sustainability parameters. That is, if a supplier achieves all the threshold values in the Puma sustainability rating, he/she is eligible to sign up to the program and benefit from Puma competitive rating. In a first stage, the program was a classic Reverse Factoring solution providing a very competitive financing interest rate, based on Puma banking rating. The program is supported by a web seamless platform, GT Nexus, through which every Puma sourcing activity takes place. In particular, after outsourcing the production, a new trading entity has been set up and based on such a platform where all suppliers are registered. Up to that such SCF program is a digitally-based in-out solution as suppliers may enter or exit the program depending on their sustainability performances: if minimum targets are met, the supplier can enjoy the program. In this respect, whether a supplier performs very good in sustainability or at the minimum required he/she gets the same financing conditions that, as said, depend just on Puma rating. To fill such a gap, the company decided to introduce a bonus-malus scheme to apply on the fixed part of the interest rate. In this way, suppliers are incentivised to improve their performances as they get better financing conditions. Such upgrade of the program did not require any additional effort by both parties as everything is still supported by the same GT Nexus platform. This kind of system has not been invented from scratch by Puma but it had been already pushed by IFC, a subsidiary of World Bank, which has been striving to seek out

innovative financing tools for businesses for quite a long time. In particular, similar programs had already been introduced for US buyers whereas, in Europe, Puma can be considered the first mover in this regard.

Sustainability focus

The rating regulating the access to the program, the so-called Puma SAFE rating, is totally based on sustainability parameters and so is the bonus-malus scheme, without any reference to operative performances. The reason why Puma decided to focus solely on sustainability gets back to three main points:

- 1) As already mentioned, Puma has been strongly committing to sustainability topic as a key part of its DNA, even more after outsourcing the production;
- 2) With the previous program no extra-rewards were given to suppliers particularly virtuous in sustainability topic;
- 3) As the current business context is more and more sensible to sustainability issues such as wasting rate, recycling, safe working conditions, etc. and, as the market is extremely competitive, it is crucial to guarantee fully sustainable practices all along the supply chain. Indeed, environmental and/or social scandals might strongly damage company reputation.

Program functioning and involved actors

The program is a Reverse Factoring solution, based on GT Nexus platform, jointly developed with International Finance Corporation, a World Bank subsidiary. The financial intermediary, along with IFC, is BNP Paribas which, with its international presence, allowed to expand the program on a world-wide basis. The solution is very flexible and easy to manage as each any approved supplier can decide to discount whichever invoice directly from the platform, without open up any new banking account, receiving the money after 10-15 days. At due date, then, Puma pays back the bank. The interest rate enjoyed by suppliers is structured as follows:

SAFE Rating	Reference Interest Rate	Bank Fee	GTN Fee [per invoice]	SAFE Bonus/ Malus
A	3-months USD LIBOR adjusted quarterly	Bank-individual margins depending on Puma's solvency	Additional fee for GTN processing funding request & related payments	-0,50%
B+				0,00%
B-				0,50%

These 3 suppliers' classes can access the program while C-class and D-class suppliers are excluded as their sustainability performances do not meet Puma requirements. Nevertheless, the system is dynamic in that there are periodic re-audits after which a supplier can scale classes or be downgraded to lower ones.



In particular, Puma still does business with C-class but not with D-class. Regarding the categories of suppliers allowed to participate, the program is targeted only to direct suppliers, accounting for 10% of the overall supply base (around 300 suppliers worldwide with an increasing acceptance rate). This is the only restriction: there are no constraints about size, spending volume, geographic location, etc.

Main benefits for the involved actors

This sustainability-driven Reverse Factoring brings along several benefits for all the participating parties. In the following the main upsides for each party are reported:

Puma suppliers:

- Maximum flexibility: suppliers can choose to discount whichever invoice they want at any time, no need to open up a new banking account
- No committed bank credit lines required: everything is done on GT Nexus platform and the money is automatically sent to own banking account;
- Positive impact on Account Receivables levels and Working Capital: money is transferred to suppliers around 10-15 days after the issue of invoice;
- Fully integrated in GT Nexus: no need to install a new piece of software nor a new IT infrastructure;
- Competitive rates as Puma solvency and ratings apply for pricing: one of the main advantages from a Reverse Factoring solution is the discount rate calculated on buyer's competitive rating;
- Suppliers benefit from their work and investment in SAFE environmental and social compliance: not only do suppliers benefit financially by improving their sustainability performances, but they may enjoy better efficiency and enhanced brand image;

Puma:

- Suppliers' compliance to social and environmental standards: this SCF program push suppliers to comply and meet the performances of the SAFE rating;
- Reputational effect: such innovative program puts Puma in the spotlight as one of the most sustainability-committed player in the business, with consistent returns in terms of image;
- Low implementation effort: as already said, everything occurs very smoothly on the platform, without Puma direct intervention;

Financing Partner:

- Reputational effect: the bank or the financial intermediary is seen as a relevant contributor to an innovative and sustainability-sound project;

- Low implementation effort: the easiness of the implementation and operative management of the program still holds also for the financing partner.

Staff International Case Study

Company introduction

Staff International, being part of Only The Brave (OTB) group, is a state-of-the-art company specialized in the product research and development, ready-to-wear production and exclusive worldwide distribution of some of the most iconic prêt-à-porter and advanced contemporary collections of international fashion. OTB is the parent company of some of the most iconic fashion brands like Diesel, Maison Margiela, Marni, Viktor&Rolf, and state-of-the-art companies like Staff International, and Brave Kid. Our brands are globally recognized as the brands of unconventional, individual consumers. OTB reveals its brands' true essence and character: innovative and iconic, unique and daring. Carrying this ambitious vision into the future, our brands not only change the way consumers see themselves but also the world around them. Chaired by Renzo Rosso, the Italian entrepreneur who founded Diesel, the group embodies his spirit and vision today. OTB believes in pushing the boundaries of fashion and lifestyle, offering a portfolio of global brands to a new breed of consumer – those who challenge traditional perceptions, preferring to embrace fashion on their own. Standing for “Only the Brave”, even the name OTB reflects the group’s vision and values. Passion and creativity. And a pragmatic approach to building global brands. As regards the group holding company, Diesel is an innovative international lifestyle company, producing a wide-ranging collection of jeans, clothing and accessories. Since its creation in 1978, Diesel has experienced extraordinary growth and has evolved from being a leading pioneer in denim into the world of premium casual wear, becoming a true alternative to the established luxury market. Diesel’s philosophy has remained the same as the day of its creation: Renzo Rosso had envisaged a brand that would stand for passion, individuality and self-expression. Diesel thrives on change: it produces no less than 3,000 new products every season and each one derives from a process of enormous creative freedom, ensuring constant innovation. The collections include: Diesel (recently “rebooted” by the arrival of Nicola Formichetti as its Artistic Director), Diesel Black Gold (the contemporary line designed by Andreas Melbostad) and Diesel Kid. Diesel is not just apparel and denim: it’s a lifestyle, which has been interpreted through licenses (under the creative

leadership of Andrea Rosso) with leading companies to develop watches and jewellery (with Fossil), eyewear (with Marcolin), fragrances (with L'Oréal), helmets (with AGV), headphones (with Monster), bikes (with Pinarello), strollers (with Bugaboo) and a complete home collection (with Foscari, Moroso, Zucchi, Seletti and Scavolini). Everything, from production to distribution, is performed under the "Made in Italy" hallmark, a guarantee of quality and excellence. The aim of this brief report is to present the C.A.S.H. (Credito Agevolato - Suppliers Help) project, a SCF program jointly developed by OTB Group and Ifitalia, of BNP Paribas, and targeted to Staff International suppliers.

Drivers and features of the program

Starting from half 2012, two factors have come out and driven the setting up of such a SCF program by Staff International. Firstly, there was the need to clearly assess and monitor the operative performances of the suppliers in terms of quality, reliability and degree of partnership. Given the business context where the company operates, suppliers play a crucial role in guaranteeing continuity of supply while providing goods (e.g. raw materials, components, accessories, services) with the highest quality and excellence. Therefore, a suppliers' rating has been developed with Key Performance Indicators (KPIs) subdivided in raw materials, finished products/components and services (laboratories) categories. As previously reported, the KPIs covers performances of quality (e.g. defects, return rate), reliability (e.g. timeliness, quantities respect) and partnership (collaboration, service, documentation), with weights of 50%, 35% and 15%, respectively. Secondly, especially after the financial crisis, more and more suppliers really struggled to obtain financing from their own banks with consequent risks of failure and performances degradation. Indeed, the Staff International supply base is composed of very small companies, most of them with hand-made production, for which traditional financing alternatives are extremely costly (up to 18% as interest rate). Trying to simultaneously cope with both aspects, the group, along with Ifitalia acting as financial partner, decided to set up a Reverse Factoring program whose access is based upon achievement of threshold values of the different KPIs. Put simply, suppliers who meet targets of operative performances are eligible to enter the program and enjoy financing conditions, negotiated by OTB group as a whole with Ifitalia. All the monetary transactions and information exchanges occur on a web-based platform, Mediana, the home factoring system by Ifitalia, making the solution very flexible and easy to manage.

Sustainability focus

As already highlighted, with this program, virtuous suppliers get real oxygen for their financial stability and, thus, they can afford to dedicate all the managerial efforts on the operative part of the business with positive effects on Staff International performances. In this respect, this program can be considered as an effective and long-term oriented lever to financially sustain all the supply chain, minimizing the default risk of these small suppliers and preserving the “Made in Italy” know-how and competences. Being the suppliers mostly small regional (Veneto) and family-run companies, such system effectively helps and sustains the regional economy and society, representing a brilliant example for all the other similarly-structured Italian Fashion supply chains. Moreover, Staff International does not want to draw any direct economic benefit from this program, such as extension of payment terms or renegotiation of purchasing prices.

Program functioning and involved actors

The program is a typical Reverse Factoring solution, without recourse, which backs on OTB excellent banking rating, allowing suppliers to get access to cash with a very low interest rate, sometimes even 10 percentage points less than what they would otherwise get. More precisely the interest rate is around 2% plus a fixed commission fee. Operatively speaking, there has been a consistent procedures simplification with Staff International that, once received and approved the invoice issued by the supplier, entitles Ifitalia to anticipate, at the agreed interest rate, the 95% of the invoice amount (the remaining 5% at the invoice due date) to suppliers who receive the corresponding cash after one week. Then, Staff International pays back Ifitalia once payment terms are expired. All these transactions and data exchanges are performed through Mediana web-based platform, leading to full visibility and no extra administrative effort by involved parties. Finally, a very positive feature of the solution is the complete flexibility for suppliers as, once on-boarded in the program, they can discount whichever invoice at any time. If, instead, a supplier, despite being eligible, may decide not to access the program for internal own considerations, no penalties nor financial costs are charged. Regarding the relationship between Staff International and suppliers, regular audits are performed every 6 months after which a supplier may be confirmed, enter or exit the program, depending on last 6-months operative performances.

Main benefits for the involved actors

Suppliers:

- Additional Financing alternatives: suppliers are given a new and advantageous financing possibility which, even in the case of decision to not sign up to the program, may represent a further lever when re-negotiating contractual conditions with own financial institutions;
- Working capital and cash flow optimization: being a Reverse Factoring, this program enables suppliers to optimize Net Working Capital since Days Sales Outstanding (DSO) are by far reduced along with strong economic benefits as the cost of capital is very low;
- Outsourcing of receivables management: the operative and administrative procedures to manage receivables are externalized to a factoring company;
- Program flexibility and easiness: suppliers can discount whichever invoice they want at any time and all the operative part is smoothly run on Mediana platform, without the need to open up a new banking account;

OTB/Staff International:

- Suppliers' fidelization: through this program the degree of collaboration and partnership between the company and its suppliers is enhanced with increased operative synergies;
- Virtuous circle: suppliers are incentivised to improve operative performances in order to get advantageous financing conditions which, in turn, allow to better concentrate and channel efforts to further increase the quality of operations. All of that has huge positive impacts on Staff International business;
- Definition of key operative performances: by developing and monitoring suppliers' operative rating Staff International has clearly stated and identified which are the crucial business areas to monitor and improve;
- Procedures simplification: rationalization of payment procedures of suppliers' invoices: bundling of all the invoices coming from one supplier;
- Program easiness: such a program does not require any additional administrative effort by Staff International;

Financing partner (Ifitalia):

- Reputational effect: the bank or the financial intermediary is seen as a relevant contributor to an innovative and sustainability-sound project
- Low implementation effort: the easiness of the implementation and operative management of the program still holds also for the financing partner;
- Revenue growth: by setting up such a solid and innovative program, the factor set up a long-term agreement with one of the biggest fashion company in Italy, with relevant business benefits in the future;

Group Engineering Case Study

Company introduction

Group Engineering, offering a complete offer of business integration, application and infrastructure outsourcing, innovative solutions and strategic consultancy employs more than 10,000 employees, 50 sites distributed in Italy, Germany, Spain, Belgium, Republic of Serbia, South America (Brazil and Argentina) and United States, a consolidated revenue portfolio in 2017 of more than 1 billion Euro. 35 years are not much for the history of a business enterprise, but they represent an entire era for an IT company. In 1980, when the current President, Michele Cinaglia founded Engineering Ingegneria Informatica, computerization was still in its infant stage in Italy. The company was created through a management buyout operation by Cerved, the Italian Chamber of Commerce network's IT company, which is now called Infocamere. Industrial and financial shareholders such as IBM, IMI, Benetton and the Italcementi Group also took their place alongside the shareholding company managers over the years, with minority holdings. It was IMI that accompanied the parent company's entry in the stock market in 2000 in the FTSE Italia STAR segment, which includes shares with the highest equity requisites. From software house to global player, Engineering entered the Italian Stock Market in 2000. Thanks to the arrival of fresh capital from the market, the company and the Group then funded the growth of activities, via internal lines and through acquisitions, in an increasingly global and competitive market. In recent years, Engineering has invested about 300 million Euro in new acquisitions, that have enriched the group in terms of competence and resources that now total about 10,000 IT professionals. In 2013, One Equity Partners, an American fund that manages more than 10 billion dollars in investments on behalf of JP Morgan worldwide,

became a shareholder of Engineering, with a share of 29.9%. On January 21, 2015 JP Morgan sold its stake of Engineering to OEP Secondary Fund. In the initial months of 2016, the funds NB Renaissance (a partnership between Neuberger and Intesa Sanpaolo) and Apax III acquired 44.3% of the share capital of Engineering. This transaction resulted in the launch of a mandatory tender offer, which was fully completed with the subsequent delisting from the Stock Exchange on July 8, 2016. Engineering has a consolidated presence on all vertical markets and operates through its 4 business units - Public Administration & Healthcare, Telco & Utilities, Industry & Services, Finance - supported by cross-business unit centres of competence and by the Research and Innovation Department which, with its 250 resources, has the dual role of promoting research on software at an international level and transferring innovation to the production cycle of the business structures. The Group operates in the outsourcing and cloud computing market via an integrated network of 4 data centres located in Pont-Saint-Martin (AO), Turin, Vicenza and Milan, equipped with infrastructure aligned to the best technological, quality and security standards. An exclusive asset in Italy is the company's IT & Management School "Enrico Della Valle", that with 200 certified lecturers and 363 courses available provided 18,700 technical, method and process training days in 2017. The aim of this brief report is to present the Supplier Support Factoring project, a SCF program jointly developed by Group Engineering and Ifitalia, of BNP Paribas, and targeted to Group Engineering suppliers.

Drivers and features of the program

Starting from 2010, two long-standing and severe issues have led the company to look for innovative financial programs and to finally set up this Supplier Support Factoring program. Firstly, as previously reported, in order to have a flexible costs structure allowing to dynamically adapt to the recurrent ups and downs of the business context, the company strongly relies on external resources (e.g. consulting firms) to provide its services to the market. Such external resources are very numerous and, to finance their own working capital, were used to turn to different factoring players and discount their invoices. From Group Engineering side, this led to a huge organisational complexity as the company was constantly approached by plenty of big and small-size financial institutions and factors claiming lots of different payments at the due date. In this respect, there was the internal need to regulate and standardise the payments towards all these service suppliers. The company, indeed, was used to receive thousands of payment requests per month from lots of different factors as every supplier issued a single invoice for each project.

Secondly, in the Italian current context, the Days of Sales Outstanding (DSO) figure is incredibly high, especially in the upstream part of the supply chain where small and medium-size companies seriously struggle with liquidity shortage. This is exactly the case of most of Group Engineering suppliers who suffered very high DSO and did not manage to get acceptable financing conditions, given their small size, capitalization and lack of collaterals and guarantees. To simultaneously address these two criticalities, Group Engineering opted for a Reverse Factoring solution offered to all company suppliers and jointly developed with the financing partner (Ifitalia, Unicredit and others). The program leverages the excellent Group Engineering banking rating to offer suppliers a very cheap financing possibility with immediate cash release and without an extra administrative effort by both parties.

Sustainability focus

In the previous paragraphs, it comes out how the survival of all the small and medium-size firms doing business with Group Engineering is absolutely crucial for the efficient delivery of the company services. Indeed, the continuous market demand fluctuation forces the company to partially rely on external players when proposing its offer to the market and, thus, such service suppliers are required to be always ready and operative. In this respect, such Supplier Support Factoring project intervenes to prevent all these suppliers from going bankrupt due to financial gaps. Without this financial aid, in fact, these small companies should face a further increase of DSO by downstream players and, given the highly expensive costs of traditional financing, would be forced to stop the operative business, with negative consequences on Group Engineering activities. Not only does Group Engineering benefit from the financial stability of its supply base but it can enjoy lower service fees as these suppliers incur in lower financing costs and such savings can be returned in the offer price. To sum up, this Reverse Factoring program makes Group Engineering very appealing to work with for suppliers.

Program functioning and involved actors

The program is a typical Reverse Factoring solution, without recourse, which backs on Group Engineering excellent banking rating, allowing suppliers to get access to cash with a very low interest rate, around 1,2%.

Regarding the suppliers' on-boarding, Group Engineering has a section of its web portal where any supplier willing to work for the company can apply by posting a series of self-certifications (e.g. fiscal compliance) along with private and public documents (e.g. financial statements). After a brief check, the supplier is approved to work with the company and he/she is given the possibility to enjoy the Supplier Support Factoring program. At this point, the financing partner has to carry out other stricter verifications and evaluations generating a rating after which the supplier may access the program or not. A supplier in the program, then, issues an invoice which is simultaneously transferred to both Group Engineering and Ifitalia. The former verifies whether the invoice matches what has been actually delivered; the latter, once the company has approved the invoice, starts the negotiation for the interest rate with the supplier. In this sense, efficient and virtuous suppliers might get better conditions with respect to other worse-performing ones. To this regard, Group Engineering has set up an observatory aimed at verifying the outcome of this negotiation, assuring that the factor does not abuse of its bargaining power against the small and weak supplier. Once the interest rate has been defined, Nice and suppliers negotiate the invoice price with focal firm usually getting economic discounts in return of letting suppliers enjoying the program. For what concerns the pay back of Group Engineering to the financing partner, for some contracts the company regularly pays at the due date while, for others, the payment occurs only when the company gets paid in turn by its clients (back to back option). In the case the supplier is not approved by the factor he/she can still work with Group Engineering despite not taking part of the program.

Main benefits for the involved actors

Suppliers:

- Working capital and cash flow optimization: being a Reverse Factoring, this program enables suppliers to optimize Net Working Capital since Days Sales Outstanding (DSO) are by far reduced along with strong economic benefits as the cost of capital is very low;
- Long-term stability: with this favourable financing option, the company suppliers can afford to dedicate all the efforts to the operational part of the business;

Group Engineering:

- Suppliers' fidelization: through this program the degree of collaboration and partnership between the company and its suppliers is enhanced with increased operative synergies. Furthermore, a supplier often prefers to work for Group Engineering, with respect to another company, due to immediate cash availability after the invoice issuing;
- Administrative and organizational smoothing: by channelling the majority of the supply base (80%) into this program, Group Engineering managed to regulate and standardise all the payments and related procedures, with a consequent drastic reduction of all the old administrative inefficiencies;
- Economic benefits: as suppliers incur in much lower financing costs they may propose lower service prices to Group Engineering compared to what they would in absence of this program;
- Financial benefits: WC optimisation thanks to the extension of payment terms negotiated with the bank.

Fincantieri Case Study

Company introduction

Fincantieri designs and builds merchant vessels, passenger ships, offshore, and naval vessels, and is also active in the conversion and ship repair sectors. The company also owned Grandi Motori Trieste, which constructed marine diesel engines, but this was sold to Wärtsilä in 1999. Founded in 1959 as Società Finanziaria Cantieri Navali – Fincantieri S.p.A. as a State financial holding company, part of IRI, the company became a separate entity in 1984. Today Fincantieri is one of Europe's largest shipbuilding groups and the largest in the Mediterranean. Fincantieri employs a staff of about 10,000 (rising to approximately 20,000 if the supply chain is included) working at eight shipyards, two design centres, one research centre and two production sites for mechanical components. The shipyards of Monfalcone (Gorizia), Marghera (Venice), Sestri Ponente (Genoa), Ancona, Castellammare di Stabia (Naples) and Palermo report to the Merchant Ships Business Unit while the shipyards of Riva Trigoso (Genoa) and Muggiano (La Spezia) report to the Naval Vessel Business Unit. Fincantieri successfully completed the acquisition of Manitowoc Marine Group from its parent company The Manitowoc Company, Inc. on January 1, 2009, which consisted of two shipyards in Wisconsin, including Marinette

Marine, which built the first Freedom-class littoral combat ship. Fincantieri also purchased from Manitowoc Marine Group a topside repair yard in Ohio and one production plant in Wisconsin, making it one of the leading mid-sized shipbuilders in the United States for commercial and government customers, including the U.S. Navy and U.S. Coast Guard. Already the largest shipbuilder in Europe, after the acquisition of Vard the Fincantieri group doubled in size to become the fourth largest in the world. In March 2015, Fincantieri won its biggest ever independent order from Carnival Corporation & plc in a 4 billion euro deal commissioning the company to build five new cruise ships. Fincantieri is currently in talks with the French government to purchase part of the majority of STX ship building although negotiations are ongoing and controversial. On February 2, 2018, Fincantieri announced an agreement for 50 percent of STX France valued at 59.7 million euro. In March 2018, Fincantieri established Fincantieri Services USA - a subsidiary based in Miami, Florida. With more than 7,000 ships built over its 230-year history, Fincantieri has built epoch-making ships in every era. The vessels built by the Group include undisputed global icons of the sea, such as the Amerigo Vespucci, the Italian Naval Academy training ship, and the transatlantic liner Rex, which held the “Blue Riband” record for the fastest transatlantic crossing of a passenger ship. Listed on the Milan Stock Exchange, today the Group is one of the largest shipbuilders in the world and the only one able to build all kinds of high-tech ships: from naval vessels to offshore units, from special ships and highly complex ferries to mega yachts, as well as carrying out ship repairs and conversions, manufacturing systems and components, and providing after-sales services.

Drivers and features of the program

Starting from 2009, three main and registered issues have led the company to look for innovative financial programs and to definitely launch a Supplier Support Factoring program. Firstly, Fincantieri has a huge supply base composing of around 4000 suppliers with many of them small and medium-size players. Being, indeed, a construction multinational company, it has to interact with plenty of different business partners whose readiness and flexibility strongly contribute to the company’s success and competitiveness in the market. Such external resources are, therefore, very numerous and, to finance their own working capital, were used to turn to different factoring players and discount their invoices.

From Fincantieri side, this led to a huge organisational complexity as the company was constantly approached by plenty of big and small-size financial institutions and factors claiming lots of different payments at the due date. In this respect, there was the internal need to regulate and standardise the payments towards all these service suppliers. The company, indeed, was used to receive thousands of payment requests per month from lots of different factors as every supplier issued a single invoice for each project. Secondly, in the Italian current context, the Days of Sales Outstanding (DSO) figure is incredibly high, especially in the upstream part of the supply chain where small and medium-size companies seriously struggle with liquidity shortage. In this sense, the diverse Fincantieri suppliers were constantly at serious risk of failure, given their small size and subsequent low bargaining power vis-à-vis bank to access cash at acceptable costs. Third, through the implementation of this program, the company wanted to get extra-economic discounts on invoices nominal value. Suppliers, indeed, have to owe their big client a discount for letting them benefit from the program advantageous conditions. To satisfy these three internal requests, Fincantieri opted for a Reverse Factoring solution offered to all company suppliers and jointly developed with the financing partner (Ifitalia, Unicredit and others). The program leverages the high Fincantieri bargaining power to offer suppliers a further financing possibility with immediate cash release and without an extra administrative effort by both parties. In return of this advantageous financially opportunity, Fincantieri ask suppliers for an economic discount on invoices.

Sustainability focus

Describing the program and related triggering drivers, it comes out how the survival of all the small and medium-size firms that supply Fincantieri's main constructions is absolutely crucial for the company's business continuity. In the diverse construction sites, the big firm gets, indeed, in contact with plenty of business partners making it possible the proper delivery of the "product". Fincantieri relies also on several external resources as way to gain flexibility and adapt to fast-changing needs of the potential customers. In this respect, such Supplier Support Factoring project intervenes to prevent all these suppliers from going bankrupt due to financial gaps. Without this financial aid, in fact, these small companies should face a further increase of DSO by downstream players and, given the highly expensive costs of traditional financing, would be forced to stop the operative business, with negative consequences on Fincantieri activities.

Not only does Fincantieri benefit from the financial stability of its supply base but it can enjoy lower service fees as these suppliers incur in lower financing costs and such savings can be returned in the offer price. Considering, then, the nature of Fincantieri's suppliers, the program assumes also a strong socially responsible connotation as suppliers are mostly national and regional-based, key for the maintenance of society integrity.

Program functioning and involved actors

The program is a typical Reverse Factoring solution, without recourse, which backs on Fincantieri excellent banking rating, allowing suppliers to earlier get access to cash. Regarding the suppliers' on-boarding, Fincantieri has a section of its web portal where any supplier willing to work for the company can apply by posting a series of self-certifications (e.g. fiscal compliance) along with private and public documents (e.g. financial statements). After a brief check, the supplier is approved to work with the company and he/she is given the possibility to enjoy the Supplier Support Factoring program. At this point, the financing partner has to carry out other stricter verifications and evaluations generating a rating after which the supplier may access the program or not. A supplier in the program, then, issues an invoice which is simultaneously transferred to both Fincantieri and Ifitalia. The former verifies whether the invoice matches what has been actually delivered; the latter, once the company has approved the invoice, starts the negotiation for the interest rate with the supplier. In this sense, efficient and virtuous suppliers might get better conditions with respect to other worse-performing ones. To this regard, Fincantieri does not intervene in the interest rate definition process. This often entails suppliers to not get particularly advantageous as regards for the costs of financings in that the higher bargaining power of the banks prevails in the negotiation. Once the interest rate has been defined, Fincantieri and suppliers negotiate the invoice price with focal firm usually getting economic discounts in return of letting suppliers enjoying the program. In the case the supplier is not approved by the factor he/she can still work with Fincantieri despite not taking part of the program.

Main benefits for the involved actors

Suppliers:

- Working capital and cash flow optimization: being a Reverse Factoring, this program enables suppliers to optimize Net Working Capital since Days Sales Outstanding (DSO) are by far reduced. Much higher liquidity is now at suppliers' disposal;
- Long-term stability: with this favourable financing option, the company suppliers can afford to dedicate all the efforts to the operational part of the business as the long-term survival is no longer at risk due to the improved financial situation;

Fincantieri:

- Suppliers' fidelization: through this program the degree of collaboration and partnership between the company and its suppliers is enhanced with increased operative synergies. Furthermore, a supplier often prefers to work for Fincantieri, with respect to another company, due to immediate cash availability after the invoice issuing;
- Administrative and organizational smoothing: by channelling the majority of the supply base (80%) into this program, Fincantieri managed to regulate and standardise all the payments and related procedures, with a consequent drastic reduction of all the old administrative inefficiencies;
- Economic benefits: as suppliers incur in much lower financing costs they may propose lower service prices to Fincantieri compared to what they would in absence of this program;
- Financial benefits: WC optimisation thanks to the extension of payment terms negotiated with the bank.

Azimut-Benetti Case Study

Company introduction

Azimut Benetti Group, which owns the prestigious brands Azimut Yachts, Benetti Yachts, Yachtique, Fraser Yachts, Lusben, Marina di Varazze and Royal Yacht Club Moscow, offers the most extensive range of motor boats from the 34 feet to the 100 metre plus yachts built by Benetti. A leader in production, Azimut Benetti has the most extensive sales network in the boating industry worldwide, with 138 sites in 68 countries. Being close to boat owners in all four corners of the globe is an ideal basis for delivering an outstanding level of service to customers. The Group has a division dedicated to financial services, yacht management and the development of marinas. Azimut Yachts came about in 1969, when the young university student Paolo Vitelli founded Azimut Srl, and began chartering sailing boats. In 1970 some prestigious yachting brands appointed the company to distribute their boats in Italy. Azimut quickly expanded its operations: Apart from distribution, it began to design new yachts. In a joint venture with Amerglass, it designed the AZ 43' Bali, a mass-produced fibreglass boat, which was an immediate success. The company gradually expanded its range, focussing on the lower end of the market - with the launch of the AZ 32' Targa in 1977, the "Ford T" of the boat world - and upper end too - (with the memorable début of the Azimut 105' Failaka in 1982, the biggest mass-produced yacht in fibreglass at the time). In 1985 Azimut acquired Benetti. This historical brand, based in Viareggio, had been building boats since 1873, and designed the concept of the megayacht. Azimut was now able construct its own yachts, defining new style and industry standards that would go on to revolutionise the boat building industry, such as: large frameless windows, electric seats, and walnut interiors. From the late nineties onwards, with the acquisition of new boatyards at Fano, the restructuring of the Benetti boatyards at Viareggio and the construction of a new site at Avigliana, in the province of Turin, Azimut went on to become the foremost builder of yachts and megayachts. This leadership position was confirmed in subsequent seasons, thanks to numerous business successes and an investment policy which has consolidated Azimut's technological and production capacities over the years, with sites now established in Brazil. Design, technology, materials, components and human expertise are all Azimut hallmarks that meet a higher standard: quality. This philosophy is possible because Azimut has put its income back into the company, over more than forty years, investing in personnel training, technological research, product development and the upgrading of plants

and structures. Only in this way has it been possible to be the number one boatyard of choice worldwide for the construction of mega-yachts for 15 years.

Drivers and features of the program

Starting from 2009, two main and acknowledged issues have led the company to look for innovative financial programs and to definitely launch a Supplier Support Factoring program. Firstly, Azimut has a huge supply base composing of plenty of different suppliers with many of them small and medium-size players. Being, indeed, a big building-ship company, it has to interact with plenty of different business partners whose readiness and flexibility strongly contribute to the company's success and competitiveness in the market. Such external resources are, therefore, very numerous and, to finance their own working capital, were used to turn to different factoring players and discount their invoices. From Azimut side, this led to a huge organisational complexity as the company was constantly approached by plenty of big and small-size financial institutions and factors claiming lots of different payments at the due date. In this respect, there was the internal need to regulate and standardise the payments towards all these service suppliers. The company, indeed, was used to receive thousands of payment requests per month from lots of different factors as every supplier issued a single invoice for each project. Secondly, given the peculiarity of the industry, both Azimut and their suppliers have to face specific dynamics in terms of financials. Indeed, as the ship production process mainly occurs during the fall and winter seasons to be able to sell, then, the boats for spring and summer, Azimut has to deal with almost null cash-in flow for several months. Hence, on one hand, the company needed an innovative financial system allowing to cope with such a situation. On the other hand, Azimut's suppliers had the urgent need to lower their WC amounts and, thus, receiving the payment earlier in time so as to continue operating, given their small size and consequent difficulty to negotiate with banks acceptable financings conditions. Third, through the implementation of this program, the company wanted to get extra-economic discounts on invoices nominal value. Suppliers, indeed, have to owe their big client a discount for letting them benefit from the program advantageous conditions. To satisfy these three needs, Azimut opted for a Reverse Factoring solution offered to all company suppliers and jointly developed with the financing partner (Ifitalia, Unicredit and others). The program leverages the high Azimut bargaining power to offer suppliers a further financing possibility with immediate cash release and without an extra administrative effort by both parties. This program is key also in allowing Azimut to extend payment terms towards the banks so as to cope with no-revenues-

period. In return of this advantageous financially opportunity, Azimut asks suppliers for an economic discount on invoices.

Sustainability focus

Describing the program and related triggering drivers, it comes out how the survival of all the small and medium-size firms that supply Azimut's main projects is absolutely crucial for the company's business continuity. For the numerous boats component, the big firm gets, indeed, in contact with plenty of business partners making it possible the proper delivery of the final ship to the customers. Azimut relies also on several external resources as way to gain flexibility and adapt to fast-changing needs of the potential customers. It would be worthless, indeed, to keep totally inside the production as the different activities might vary over time. In this respect, such Supplier Support Factoring project intervenes to prevent all these suppliers from going bankrupt due to financial gaps. Without this financial aid, in fact, these small companies should face a further increase of DSO by downstream players and, given the highly expensive costs of traditional financing, would be forced to stop the operative business, with negative consequences on Azimut activities. Not only does Azimut benefit from the financial stability of its supply base but it can enjoy lower service fees as these suppliers incur in lower financing costs and such savings can be returned in the offer price. Considering, then, the nature of Azimut's suppliers, the program assumes also a strong socially responsible connotation as suppliers are mostly national and regional-based, key for the maintenance of society integrity.

Program functioning and involved actors

The program is a typical Reverse Factoring solution, without recourse, which backs on Azimut excellent banking rating, allowing suppliers to earlier get access to cash. Regarding the suppliers' on-boarding, Azimut has a section of its web portal where any supplier willing to work for the company can apply by posting a series of self-certifications (e.g. fiscal compliance) along with private and public documents (e.g. financial statements). After a brief check, the supplier is approved to work with the company and he/she is given the possibility to enjoy the Supplier Support Factoring program. At this point, the financing partner has to carry out other stricter verifications and evaluations generating a rating after which the supplier may access the program or not.

A supplier in the program, then, issues an invoice which is simultaneously transferred to both Azimut and Ifitalia. The former verifies whether the invoice matches what has been actually delivered; the latter, once the company has approved the invoice, starts the negotiation for the interest rate with the supplier. In this sense, efficient and virtuous suppliers might get better conditions with respect to other worse-performing ones. To this regard, Azimut does not intervene in the interest rate definition process. This often entails suppliers to not get particularly advantageous as regards for the costs of financings in that the higher bargaining power of the banks prevails in the negotiation. Once the interest rate has been defined, Azimut and suppliers negotiate the invoice price with focal firm usually getting economic discounts in return of letting suppliers enjoying the program. In the case the supplier is not approved by the factor he/she can still work with Azimut despite not taking part of the program.

Main benefits for the involved actors

Suppliers:

- Working capital and cash flow optimization: being a Reverse Factoring, this program enables suppliers to optimize Net Working Capital since Days Sales Outstanding (DSO) are by far reduced. Much higher liquidity is now at suppliers' disposal;
- Long-term stability: with this favourable financing option, the company suppliers can afford to dedicate all the efforts to the operational part of the business as the long-term survival is no longer at risk due to the improved financial situation;

Azimut:

- Suppliers' fidelization: through this program the degree of collaboration and partnership between the company and its suppliers is enhanced with increased operative synergies. Furthermore, a supplier often prefers to work for Azimut, with respect to another company, due to immediate cash availability after the invoice issuing;
- Administrative and organizational smoothing: by channelling the majority of the supply base (80%) into this program, Azimut managed to regulate and standardise all the payments and related procedures, with a consequent drastic reduction of all the old administrative inefficiencies;
- Economic benefits: as suppliers incur in much lower financing costs they may propose lower service prices to Azimut compared to what they would in absence of this program;

- Financial benefits: crucial WC optimisation thanks to the extension of payment terms negotiated with the bank and consequent financial relief in fall and winter season.

WIND-TRE

Company introduction

On one side, Wind was established in 1997 by the Italian Electrical Company Enel, which sold Wind in 2005 to Wind Telecom S.p.A. (former Weather Investments). The company, officially Wind Telecomunicazioni S.p.A. (also known as Wind Italy) was an Italian telecom operator which offers integrated mobile, fixed telephony and Internet services (under Wind brand for mobile and business services and under Infostrada brand for home). Wind Italy had 21.6 million mobile customers with a market share of 22.9% (placing itself behind TIM and Vodafone Italy) and 2.8 million customers on fixed lines with a market share of 13.2% (that makes it the second largest fixed line operator, behind TIM). The company served through a network of 159 owned stores and around 498 exclusive franchised outlets under the WIND brand, as well as 396 electronic chain stores. Wind was the third mobile operator to join the Italian market (after TIM and Vodafone Italy, formerly known as Omnitel Pronto Italia). Wind had run a GSM (900/1800/E900), GPRS, EDGE, UMTS (videocall and mobile broadband), HSPA and LTE network. While the GSM/GPRS/EDGE network is available almost everywhere, UMTS, HSPA and LTE are still expanding in the country. Wind has been also the exclusive provider for Italy of i-mode. In April 2013, Wind announced it would be investing \$1.3 billion on building a fourth-generation (4G) mobile broadband network to catch-up with its rivals Telecom Italia and Vodafone. On the other side, 3 (or Three) is a global brand name under which several UMTS-based mobile phone networks and Broadband Internet Providers operate across Hong Kong, Macau, Austria, Denmark, Indonesia, Ireland, Italy, Sweden and United Kingdom. The brand was founded in 2002 in Hong Kong. Three-branded networks in different locations has different ownerships. CK Hutchison Holdings (formerly Hutchison Whampoa) owns direct majority interests of six networks through 3 Group Europe, including Austria, Denmark, Italy, Ireland, Sweden and the United Kingdom. Hutchison Telecommunications Hong Kong Holdings operates the networks in Hong Kong and Macau, while Hutchison Asia Telecom Group operates the network in Indonesia. All companies are wholly owned subsidiary of CK Hutchison.

3 Italia (officially H3G S.p.A; formerly known as Andala 3G)[35] founded in November 1999 and controlled by Sardinian internet company Tiscali and Franco Bernabè. It was the first mobile operator to offer 3G services (UMTS), launched in March 2003. As of March 2010, 3 Italia had 9 million registered customers. 3 Italy is the largest company in the 3-group measured in number of subscribers. On August 6, 2015 Wind and CK Hutchison Holdings (the owner of Hutchison 3G) have agreed to combine their Italian telecommunications units in a deal valued at 21.8 billion euros (\$24 billion), creating a carrier that would unseat Telecom Italia SpA (Telecom Italia Mobile) as the country's largest wireless provider by customers.

Drivers and features of the program

Starting from 2013, some defined issues have led the company to look for innovative financial programs and to definitely launch a Supplier Support Factoring program. Firstly, Wind-Tre has a huge supply base composing of several service providing suppliers with many of them small and medium-size players. Being, indeed, a big telecommunication company, it has to interact with plenty of different business partners supplying networks and related services. The guarantee of this supply is for the company of paramount importance in order to remain competitively in the market, given the peculiarity of the industry where the infrastructure has to be shared among different players. Such external resources are, therefore, very numerous and, to finance their own working capital, were used to turn to different factoring players and discount their invoices. In addition, in the Italian current context, the Days of Sales Outstanding (DSO) figure is incredibly high, especially in the upstream part of the supply chain where small and medium-size companies seriously struggle with liquidity shortage. In this sense, the diverse Wind-Tre suppliers were constantly at serious risk of failure, given their small size and subsequent low bargaining power vis-à-vis bank to access cash at acceptable costs. A specific category of Wind-Tre suppliers was the one comprising all those small entities providing call-centre services, representing a very important component of company's value proposition. Third, through the implementation of this program, the company negotiated with the bank a further extension of payment term regarding suppliers' invoices so as to optimise WC management and improve overall financial situation. No economic discounts on invoices nominal value are required by Wind-Tre to suppliers, thus strongly framing the program in a CSR wave.

To satisfy these criticalities, Wind-Tre opted for a Reverse Factoring solution offered to all company suppliers and jointly developed with the financing partner (different factors have been involved). The program leverages the high Wind-Tre bargaining power to offer suppliers a further financing possibility with immediate cash release and without an extra administrative effort by both parties.

Sustainability focus

Describing the program and related triggering drivers, it comes out how the survival of all the small and medium-size entities that supply network and call-centre services to Wind-Tre is absolutely crucial for the company's business continuity. It is in full company's interest to make sure the national network infrastructure and related players' stability are safeguarded. In this respect, such Supplier Support Factoring project intervenes to prevent all these suppliers from going bankrupt due to financial gaps. Without this financial aid, in fact, these small companies should face a further increase of DSO by downstream players and, given the highly expensive costs of traditional financing, would be forced to stop the operative business, with negative consequences on entire Italian telecommunication industry. Considering, then, the nature of Wind-Tre's suppliers, the program assumes also a strong socially responsible connotation as suppliers are mostly very small entities that would suffer a lot without remunerative collaborations with such huge telecommunication firms.

Program functioning and involved actors

The program is a typical Reverse Factoring solution, without recourse, which backs on Wind-Tre excellent banking rating, allowing suppliers to earlier get access to cash. For what concerns the operative functioning of the program, there are no cloud web-based platform as every information and transaction exchange occur manually via e-mail. In this regard, the company is thinking of soon digitalising the program so as to grasp the attached efficiency savings opportunities. The company offers the program to all its supply base, leaving up to the bank the possibility to exclude some suppliers not in compliance with some financial criteria. To this purpose, the financing partner has to carry out other stricter verifications and evaluations generating a rating after which the supplier may access the program or not.

Turning to a classic program flow, a supplier involved in the program issues an invoice which is contemporary transferred to both Wind-Tre and the bank. The former verifies whether the invoice matches what has been actually delivered; the latter, once the company has approved the invoice, starts the negotiation for the interest rate with the supplier. In this sense, efficient and virtuous suppliers might get better conditions with respect to other worse-performing ones. To this regard, Wind-Tre does not intervene in the interest rate definition process. This often entails suppliers to not get particularly advantageous as regards for the costs of financings in that the higher bargaining power of the banks prevails in the negotiation. Once the interest rate has been defined suppliers will start freely discount their invoices in advance at the negotiated interest rate. In the case the supplier is not approved by the factor he/she can still work with Wind-Tre despite not taking part of the program.

Main benefits for the involved actors

Suppliers:

- Working capital and cash flow optimization: being a Reverse Factoring, this program enables suppliers to optimize Net Working Capital since Days Sales Outstanding (DSO) are by far reduced. Much higher liquidity is now at suppliers' disposal;
- Long-term stability: with this favourable financing option, the company suppliers can afford to dedicate all the efforts to the operational part of the business as the long-term survival is no longer at risk due to the improved financial situation;

Wind-Tre:

- Suppliers' fidelization: through this program the degree of collaboration and partnership between the company and its suppliers is enhanced with increased operative synergies. Furthermore, a supplier often prefers to work for Wind-Tre, with respect to another company, due to immediate cash availability after the invoice issuing;
- Financial benefits: WC optimisation thanks to the extension of payment terms negotiated with the bank.
- Decreasing of suppliers' default risk: the continuity of supply is guaranteed with positive impacts on all the downstream chain.

Fastweb Case Study

Company introduction

In September 1999, in Milan, e.Biscom is founded with a business project to develop and promote a new generation of transmission networks as an alternative to the traditional telephone networks. The company focuses on the creation of a widespread fibre optic network in the metropolitan area of Milan. e.Biscom is the parent company to which other companies report, including Fastweb, wholly owned by e.Biscom, which provides telecommunications services. In March 2000 e.Biscom is listed on the Italian New Market Stock Exchange in order to expand and finance the growth of the fibre optic network in the main Italian cities. e.Biscom is the first operator in the world to use full IP technology and to take optical fibre to the cities. The first home services are launched. The innovative Video-on-Demand service is introduced to the market. From July 2001, e.Biscom voice, data and Internet also begins to be supplied through xDSL technology. Cabling in fiber optic is completed in Milan and Fastweb consolidates its presence in Rome, Genoa, Turin, Naples and Bologna. Over the course of the year, the range of television services is extended, combining Video-on-Demand with widespread programming and video communication services. In December 2004, the merger of Fastweb into e.Biscom is completed, decided on in the preceding April by the respective BoDs. With the merger, the group focuses on its core business: broadband telecommunications on the Italian landline network. The company takes on the name of Fastweb. For the first time in Italy, Fastweb launches connections of up to 100 Mega per for small and medium enterprises in areas served by its fibre optic network. Furthermore, the company launches mobile telephony and data services for homes, the self-employed and small and medium enterprises. Fastweb, which has always been a leader in convergence thanks to Triple Play, becomes to all effects a 4P operator. In 2012, Fastweb launches a major network expansion plan to take optical fibre with a connection speed of up to 100 megabits per second to twenty cities by 2014 with Fibre to the Street Cabinet (FttCab) technology to more than 5.5 million homes and businesses, achieving domestic coverage of more than 20%. In 2015, Fastweb's investments in landline and mobile infrastructure continue. An agreement is signed with Telecom Italia to become a Full Mobile Virtual Network Operator (Full MVNO) in order to ensure greater quality, greater network coverage and access to 4G and 4G-plus mobile services for its customers.

Drivers and features of the program

Starting from 2015, some defined issues have led the company to look for innovative financial programs and to definitely launch a Supplier Support Factoring program. Firstly, Fastweb has a huge supply base composing of several service providing suppliers with many of them small and medium-size players. Being, indeed, a big telecommunication company, it has to interact with plenty of different business partners supplying networks and related services. The guarantee of this supply is for the company of paramount importance in order to remain competitively in the market, given the peculiarity of the industry where the infrastructure has to be shared among different players. Such external resources are, therefore, very numerous and, to finance their own working capital, were used to turn to different factoring players and discount their invoices. In addition, in the Italian current context, the Days of Sales Outstanding (DSO) figure is incredibly high, especially in the upstream part of the supply chain where small and medium-size companies seriously struggle with liquidity shortage. In this sense, the diverse Fastweb suppliers were constantly at serious risk of failure, given their small size and subsequent low bargaining power vis-à-vis bank to access cash at acceptable costs. A specific category of Fastweb suppliers was the one comprising all those small entities providing call-centre services, representing a very important component of company's value proposition. Third, through the implementation of this program, the company negotiated with the bank a further extension of payment term regarding suppliers' invoices so as to optimise WC management and improve overall financial situation. No economic discounts on invoices nominal value are required by Fastweb to suppliers, thus strongly framing the program in a CSR wave. To satisfy these criticalities, Fastweb opted for a Reverse Factoring solution offered to all company suppliers and jointly developed with the financing partner (different factors have been involved). The program leverages the high Fastweb bargaining power to offer suppliers a further financing possibility with immediate cash release and without an extra administrative effort by both parties.

Sustainability focus

Describing the program and related triggering drivers, it comes out how the survival of all the small and medium-size entities that supply network and call-centre services to Fastweb is absolutely crucial for the company's business continuity. It is in full company's interest to make sure the national network infrastructure and related players' stability are safeguarded.

In this respect, such Supplier Support Factoring project intervenes to prevent all these suppliers from going bankrupt due to financial gaps. Without this financial aid, in fact, these small companies should face a further increase of DSO by downstream players and, given the highly expensive costs of traditional financing, would be forced to stop the operative business, with negative consequences on entire Italian telecommunication industry. Considering, then, the nature of Fastweb's suppliers, the program assumes also a strong socially responsible connotation as suppliers are mostly very small entities that would suffer a lot without remunerative collaborations with such huge telecommunication firms.

Program functioning and involved actors

The program is a typical Reverse Factoring solution, without recourse, which backs on Fastweb excellent banking rating, allowing suppliers to earlier get access to cash. For what concerns the operative functioning of the program, there are no cloud web-based platform as every information and transaction exchange occur manually via e-mail. In this regard, the company is thinking of soon digitalising the program so as to grasp the attached efficiency savings opportunities. The company offers the program to all its supply base, leaving up to the bank the possibility to exclude some suppliers not in compliance with some financial criteria. To this purpose, the financing partner has to carry out other stricter verifications and evaluations generating a rating after which the supplier may access the program or not. Turning to a classic program flow, a supplier involved in the program issues an invoice which is contemporary transferred to both Fastweb and the bank. The former verifies whether the invoice matches what has been actually delivered; the latter, once the company has approved the invoice, starts the negotiation for the interest rate with the supplier. In this sense, efficient and virtuous suppliers might get better conditions with respect to other worse-performing ones. To this regard, Fastweb does not intervene in the interest rate definition process. This often entails suppliers to not get particularly advantageous as regards for the costs of financings in that the higher bargaining power of the banks prevails in the negotiation. Once the interest rate has been defined suppliers will start freely discount their invoices in advance at the negotiated interest rate. In the case the supplier is not approved by the factor he/she can still work with Fastweb despite not taking part of the program.

Main benefits for the involved actors

Suppliers:

- Working capital and cash flow optimization: being a Reverse Factoring, this program enables suppliers to optimize Net Working Capital since Days Sales Outstanding (DSO) are by far reduced. Much higher liquidity is now at suppliers' disposal;
- Long-term stability: with this favourable financing option, the company suppliers can afford to dedicate all the efforts to the operational part of the business as the long-term survival is no longer at risk due to the improved financial situation;

Fastweb:

- Suppliers' fidelization: through this program the degree of collaboration and partnership between the company and its suppliers is enhanced with increased operative synergies. Furthermore, a supplier often prefers to work for Fastweb, with respect to another company, due to immediate cash availability after the invoice issuing;
- Financial benefits: WC optimisation thanks to the extension of payment terms negotiated with the bank.
- Decreasing of suppliers' default risk: the continuity of supply is guaranteed with positive impacts on all the downstream chain.

Nice Case Study

Company introduction

In 1993, Lauro Buoro founded Nice, creating remote controls and accessories for the automation of gates and garage doors, proposing to the Home Automation sector a new way to produce and communicate. In the early 90's the market for industrial goods was characterised by a rather elementary offer, presenting products through anonymous communication, concentrating exclusively on functional characteristics (still very basic). The Nice business idea proposed integrated automated systems, created not to be cumbersome, but easy to use and quick to install, functional, friendly for both the implant project designer, the installer and the final user. In 1995, Nice increased its offer, putting the electronic and electromechanical products side by side to offer the market complete automated solutions for gates and garage doors. Later, in 2000, Nice expanded its range by the takeover of a company producing automation systems for awnings, rolling shutters and solar screens, becoming in this way one of the few companies in the world able to offer a complete range of integrated automation systems for any kind of residential and industrial building, controlled by only one transmitter. In 2006, Listing on Borsa Italiana S.p.A. Ready to accept new challenges Nice became listed on the STAR segment of the Italian Stock Exchange. Two years later, Nice entered new market segments: alarm systems and industrial doors. Nice entered the USA market. The company extended also its offer of Home Automation and wireless alarm systems through a new NiceHome business line. In 2010, Nice acquired the majority share capital of FontanaArte, the Milan-based company recognized in Italy and abroad for having marked the "history of lighting and furnishings". One year later, the firm acquired the elero Group, leader in the manufacture of automation systems for sun protections and venetian blinds. Nice entered the South American market with Peccinin and acquired a specialist in gate automation, KingGates. In this regard, in 2015, the company acquired the South-African company specialized in gate automation E.T. Systems while creating the ThePlace, an area of 3,000 sq. m. next to the Headquarters in Italy: an inspiring location, open to new experiences and participation, where everyone can be active protagonist, contributing to the development of innovative ideas and growth opportunities. In last years, the company confirmed its focus on the Home and Building Automation reference sector and achieved a new important goal in the framework of its growth on a global scale with the acquisition of HySecurity, a leading player in North America

specialized in the design and manufacture of automation systems for industrial and commercial gates, characterized by the highest security standards.

Drivers and features of the program

In 2012, two alarming issues have brought the company to search for innovative financial programs and to finally set up this Supplier Support Factoring program. Firstly, in the Italian current context, the Days of Sales Outstanding (DSO) figure is incredibly high, especially in the upstream part of the supply chain where small and medium-size companies seriously struggle with liquidity shortage. This is exactly the case of most of Nice suppliers who suffered very high DSO and did not manage to get acceptable financing conditions, given their small size, capitalization and lack of collaterals and guarantees. Secondly, in order to gain flexibility and responsiveness to any market change and mutation, especially for the numerous technological innovation characterizing this particular industry, the company strongly relies on external resources and partners to provide its services to the market. Such external resources are very numerous and, to finance their own working capital, were used to turn to different factoring players and discount their invoices. From Nice side, this led to a huge organisational complexity as the company was constantly approached by plenty of big and small-size financial institutions and factors claiming lots of different payments at the due date. In this respect, there was the internal need to regulate and standardise the payments towards all these service suppliers. The company, indeed, was used to receive thousands of payment requests per month from lots of different factors as every supplier issued a single invoice for each project. Third, the company had quite an urgent need to relax its own financial condition and especially the Working Capital Management which ended up being a bit too high. To simultaneously address these criticalities, Nice opted for a Reverse Factoring solution offered to all company suppliers and jointly developed with the financing partner (Ifitalia, Unicredit and others). The program leverages the excellent Nice banking rating to offer suppliers a very cheap financing possibility with immediate cash release and without an extra administrative effort by both parties.

Sustainability focus

From the previous paragraph, it comes out how the survival of all the small and medium-size firms doing business with Nice is absolutely crucial for the efficient delivery of the company services. Indeed, the continuous disruptive changes in technological innovations forced the company to back on external players when proposing its offer to the market and, thus, such technology-based suppliers are required to be always ready and operative. In this respect, such Supplier Support Factoring project intervenes to prevent all these suppliers from going bankrupt due to financial gaps. Without this financial aid, in fact, these small companies should face a further increase of DSO by downstream players and, given the highly expensive costs of traditional financing, would be forced to stop the operative business, with negative consequences on Nice activities. Not only does Nice benefit from the financial stability of its supply base but it can enjoy lower service fees as these suppliers incur in lower financing costs and such savings can be returned in the offer price. To sum up, this Reverse Factoring program is strongly framed in a Corporate Social Responsibility wave as it consistently contributes to help small players and, consequently, the whole society wherein they operate.

Program functioning and involved actors

The program is a typical Reverse Factoring solution, without recourse, which backs on Nice excellent banking rating, allowing suppliers to get access to cash with a very low interest rate. Regarding the suppliers' on-boarding, Nice has a section of its web portal where any supplier willing to work for the company can apply by posting a series of self-certifications (e.g. fiscal compliance) along with private and public documents (e.g. financial statements). After a brief check, the supplier is approved to work with the company and he/she is given the possibility to enjoy the Supplier Support Factoring program. At this point, the financing partner has to carry out other stricter verifications and evaluations generating a rating after which the supplier may access the program or not. A supplier in the program, then, issues an invoice which is simultaneously transferred to both Nice and Ifitalia. The former verifies whether the invoice matches what has been actually delivered; the latter, once the company has approved the invoice, starts the negotiation for the interest rate with the supplier. In this sense, efficient and virtuous suppliers might get better conditions with respect to other worse-performing ones. To this regard, Nice has set up an observatory aimed at verifying the outcome of this negotiation, assuring that the factor does not abuse of its bargaining power against the small and weak

supplier. Once the interest rate has been defined, Nice and suppliers negotiate the invoice price with focal firm usually getting economic discounts in return of letting suppliers enjoying the program. In the case the supplier is not approved by the factor he/she can still work with Group Engineering despite not taking part of the program.

Main benefits for the involved actors

Suppliers:

- Working capital and cash flow optimization: being a Reverse Factoring, this program enables suppliers to optimize Net Working Capital since Days Sales Outstanding (DSO) are by far reduced along with strong economic benefits as the cost of capital is very low;
- Long-term stability: with this favourable financing option, the company suppliers can afford to dedicate all the efforts to the operational part of the business;

Nice:

- Suppliers' fidelization: through this program the degree of collaboration and partnership between the company and its suppliers is enhanced with increased operative synergies. Furthermore, a supplier often prefers to work for Nice, with respect to another company, due to immediate cash availability after the invoice issuing;
- Administrative and organizational smoothing: by channelling the majority of the supply base (80%) into this program, Nice managed to regulate and standardise all the payments and related procedures, with a consequent drastic reduction of all the old administrative inefficiencies;
- Economic benefits: as suppliers incur in much lower financing costs they may propose lower service prices to Nice compared to what they would in absence of this program;
- Financial benefits: WC optimisation thanks to the extension of payment terms negotiated with the bank.

Camera Nazionale della Moda Italiana Case Study

Company introduction

The "Camera Sindacale della Moda Italiana", was set up on 11th June, 1958, in the Grand Hotel, Via Vittorio Emanuele Orlando 3, Rome. This was the forerunner of the body which subsequently became the "Camera Nazionale della Moda Italiana". The Association's Head Office was established in Rome. The main function of the Camera Nazionale delle Moda Italiana was to be the self-regulatory body to which all the Fashion Houses adhered spontaneously. The fragmentary nature of the different organisations that existed in those days, would find a measure of co-ordination in this way. From 29th September 1962, due to resolutions passed in an extraordinary Meeting, the aims, purposes and structure of the Association were changed, so that as a private, apolitical organisation giving no support to any political party, it began to operate actively in the Fashion sector. Its aim, as it still is today, was to "represent the highest values of Italian fashion, and to protect, co-ordinate and strengthen the image of Italian fashion in Italy and abroad, as well as the technical, artistic and economic interests of its Associates". The Camera Nazionale della Moda Italiana (The National Chamber for Italian Fashion) is the non-profit-making Association which disciplines, co-ordinates and promotes the development of Italian Fashion. The Association represents all the highest cultural values of Italian Fashion. It aims to protect, co-ordinate and strengthen its image, both in Italy and abroad. In accordance with the statutory provisions, the Association is the point of reference, as well as the preferential mouthpiece, for all the national and international initiatives aimed at valuing and promoting Italian style, customs and Fashion. Right from the year of its foundation, in 1958, the Association has pursued a policy of organisational support aimed at the knowledge, promotion and development of Fashion through events with a highly intellectual image in Italy and abroad. Recent agreements over international calendars, which have led to the signing of the Italian-French agreement, have given Milan and the Camera Nazionale della Moda Italiana the role of undisputed protagonist on the international fashion scene, thus also contributing to the consolidation of alliances with London and New York. The Franco-Italian Protocol signed in Paris on 26th June 2000 is founded on the strong will by Camera Nazionale della Moda Italiana and Fédération Française du prêt-à-porter Féminin to implement a common policy aimed at developing and circulating luxury products in non-European areas. On January 17th 2005, this agreement has been reconfirmed in Milan with the signature of a new protocol, in presence of the French Minister of foreign trade, On. François

Loos and of the Vice-Minister, On.Adolfo Urso, countersigned by the President of Lombardy Region, On.Roberto Formigoni, with the integration of new initiatives particularly relevant, in order to manage the new scenery of the international trade, characterized by the increasing competition that will get worse and worse at the end of the Multifibre Worldwide Agreement.

Drivers and features of the program

Mainly, two factors have driven the introduction of a sustainability-driven SCF program which has been, then, converted in a scalable solution. On one hand, fashion companies belonging to CNMI have always considered under their responsibility the safeguard of environmental and social standards throughout the entire supply chain, taking care of suppliers' compliance. To this end, companies have started for some years to carry out sustainability ratings of suppliers, in order to push them in sustainability direction. On the other hand, most of the suppliers often went to these fashion companies asking for some financing aids to increase their financing possibilities as the financial crisis and current economic context make it more difficult to raise liquidity through traditional channels. More precisely, suppliers desired to get access to cash at a cheaper cost with a subsequent positive impact on Working Capital. Most of the times, suppliers of these Italian fashion big brands are very small players, regional-based and family-run. It is therefore in companies' interest to protect and sustain them, given the key and tacit know-how, making the final product so special and unique. As a consequence, in order to address these two issues, CNMI developed alongside belonging fashion brands a Reverse Factoring program which is accessible upon accomplishment of some sustainability parameters. That is, if a supplier achieves all the threshold values in the diverse fashion brands sustainability rating, he/she is eligible to sign up to the program and benefit from Puma competitive rating. The program, then, may be composed of different classes based on the different levels of performances achievement by suppliers. The classes, accordingly, differentiate from each other based on obtainable financial conditions, namely a better interest rate at which discounting invoices. The program is supported by a web seamless platform through which every fashion brands sourcing activity takes place. In particular, after outsourcing the production, a new trading entity has been set up and based on such a platform where all suppliers are registered. The SCF program is, thereby, a digitally-based in-out solution as suppliers may enter or exit the program depending on their sustainability performances: if minimum targets are met, the supplier can enjoy the program.

Furthermore, CNMI is working alongside brands to further develop the program in order to reward virtuous suppliers committing to sustainability beyond respecting firm-imposed standards. In fact, suppliers of these Italian fashion brands launched structural projects aiming at renewing their facilities to incredibly reducing CO2 emissions at totally inventing from scratch new ways of sustainable working.

Sustainability focus

The rating regulating the access to the program, is totally based on sustainability parameters and so is the bonus-malus scheme, without any reference to operative performances. The reason why Puma decided to focus solely on sustainability gets back to three main points:

- 1) As already mentioned, fashion brands have been strongly committing to sustainability topic as a key part of their DNA, both in a SSCM and CSR direction;
- 2) Small family-run suppliers are given a concrete support to continue operating and, therefore, contributing to stability and wealth of the whole society they operate in;
- 3) As the current business context is more and more sensible to sustainability issues such as wasting rate, recycling, safe working conditions, etc. and, as the market is extremely competitive, it is crucial to guarantee fully sustainable practices all along the supply chain. Indeed, environmental and/or social scandals might strongly damage company reputation.

Program functioning and involved actors

The program is a Reverse Factoring solution, leveraging a cloud-based platform, jointly developed with Unicredit bank. The solution is very flexible and easy to manage as each any approved supplier can decide to discount whichever invoice directly from the platform, without open up any new banking account, receiving the money after 10-15 days. At due date, then, the fashion brand pays back the bank without asking for any extension of payment terms. The interest rate enjoyed by suppliers is based on the fashion brand excellent rating on which possible further lowering is obtainable based on suppliers' improving sustainability performances. The interest base is negotiated only by the fashion brand and the bank with no intervention of the different suppliers.

Once a supplier is on-boarded in the program, she/he issues an invoice which is simultaneously transferred to both the fashion brand and the bank. The former verifies whether the invoice matches what has been actually delivered; the latter, once the company has approved the invoice, anticipate cash to suppliers.

Main benefits for the involved actors

Fashion brands' suppliers:

- Maximum flexibility: suppliers can choose to discount whichever invoice they want at any time, no need to open up a new banking account
- No committed bank credit lines required: everything is done on web-based platform and the money is automatically sent to own banking account;
- Positive impact on Account Receivables levels and Working Capital: money is transferred to suppliers around 10-15 days after the issue of invoice;
- Fully integrated in cloud-based platform: no need to install a new piece of software nor a new IT infrastructure;
- Competitive rates as fashion brands solvency and ratings apply for pricing: one of the main advantages from a Reverse Factoring solution is the discount rate calculated on buyer's competitive rating;
- Suppliers benefit from their work and investment in environmental and social compliance: not only do suppliers benefit financially by improving their sustainability performances, but they may enjoy better efficiency and enhanced brand image;

Fashion brands:

- Suppliers' compliance to social and environmental standards: this SCF program push suppliers to comply and meet the required sustainability-related performances;
- Reputational effect: such innovative program puts adhering fashion brands in the spotlight as strongly sustainability-committed players in the business, with consistent returns in terms of image;
- Low implementation effort: as already said, everything occurs very smoothly on the platform, without fashion brands' direct intervention;

- Enhanced financial stability of small and medium-size suppliers with positive repercussions on the overall supply chain and to the Italian fashion industry as a whole.

Sonepar Case Study

Company introduction

Sonepar is an independent family-owned company with global market leadership in B-to-B distribution of electrical products and related services. Founded in 1969 by Henri Coisne, Sonepar, electrical equipment distributor, grew rapidly thanks to the ongoing support of its family shareholders, organizing and structuring its business of electrical equipment distribution. A group of European stature as of 1982, Sonepar is now enlarging its international footprint through targeted acquisitions around the world. The integration of substantial Hagemeyer assets in 2008 marks a major step forward in that direction. Today, with 20.6 billion euros of revenue (31 December 2016), Sonepar is represented by 239 entities operating in 44 countries on five continents. It is at the heart of a €251 billion global market which, due to the growing number of applications for electrical equipment, fast-changing product technologies, and the need for new services, has considerable further potential. Sonepar's business involves seeking out manufacturers and identifying and selecting the electrical equipment and technical solutions best suited to market requirements and then making them available to its own customers - generally electricity professionals - in the right place, at the right time and at the right price. Its logistics expertise, which serves a dense distribution network, ensures efficient, reliable and rapid distribution of high-quality products.

Drivers and features of the program

With respect to the other above-reported SCF programs, the one implemented by Sopenar, jointly with Ifitalia, is quite different. The adopted financial solution, indeed, is not a tailored Advance Reverse Factoring but the so-defined, by the company, "Saving Reverse Factoring" having the characteristics to configure the related transactions as commercial activities, and not financial ones.

Through this program, Sonepar pursued, in fact, an economic goal to reduce operative costs stemming from suppliers' invoices. In this sense, the program strongly resembles a Dynamic

Discount solution but it differentiates in that no dynamic discounting conditions are set up. The company and its suppliers negotiate, on a contract basis, an economic discount (a certain percentage of invoice nominal value) in relation to an anticipated payment by Sonepar. The financial player, here, solely acts as intermediary making it possible to earlier transfer money from Sonepar to their suppliers, once the invoice has been received and verified. Once the supply contract is expired, new economic conditions have to be negotiated between Sonepar and suppliers. As regards for the program accessibility, no restrictions are set: ideally all the players doing business with Sonepar can implement this program, thus benefitting from an earlier cash collection in return of a certain economic discount.

Sustainability focus

The program main sustainability component resides in the financial help given to suppliers as they collect cash in advance with respect to the standard collection times. In this respect, they can improve their usually weak financial conditions by lowering the WC amount to finance. In this sense, such Saving Reverse Factoring project intervenes to prevent all these suppliers from going bankrupt due to financial gaps. Without this financial aid, in fact, these small companies should face a further increase of DSO by downstream players and, given the highly expensive costs of traditional financing, would be forced to stop the operative business, with negative consequences on Sonepar activities.

Program functioning and involved actors

As previously said, the program is framed as a pure commercial transaction with no financing activities. Once a new supplier is engaged by Sonepar for a service or product supply, the supplier is given the possibility to adhere to this financial program. If so, Sonepar and the supplier start negotiating the program conditions, namely the economic discount and the related anticipation time for the invoice payment. Accordingly, once the supplier issues invoices and the latter ones are verified and approved, Sonepar will anticipate the invoice amount discounted by the agreed percentage. Within this flow, the bank is only an intermediary making the money flow from Sonepar to the supplier. Then, at the contract expiration date, also the negotiated program conditions expire. With a new contract, Sonepar and other eventual suppliers will negotiate other conditions.

Main benefits for the involved actors

Suppliers:

- Working capital and cash flow optimization: this program enables suppliers to optimize Net Working Capital since Days Sales Outstanding (DSO) are by far reduced. Much higher liquidity is now at suppliers' disposal;
- Long-term stability: with this favourable financing option, the company suppliers can afford to dedicate all the efforts to the operational part of the business as the long-term survival is no longer at risk due to the improved financial situation;

Sonepar:

- Suppliers' fidelization: through this program the degree of collaboration and partnership between the company and its suppliers is enhanced with increased operative synergies. Furthermore, a supplier often prefers to work for Sonepar, with respect to another company, due to immediate cash availability after the invoice issuing;
- Economic benefits: Sonepar gets considerable economic discounts in favour of paying suppliers earlier;
- Decreasing of suppliers' default risk: thanks to a higher liquidity availability, the stability of suppliers and related supply continuity is by far augmented.

APPENDIX D

RQ2 Cross-Case analysis – extended version

Why would buyers and suppliers introduce a SCF programme with a sustainability orientation?											
Player	Drivers	Staff Int.	Puma	CNMI	Fincantieri	Azmut	Group Eng.	Nice	Wind-Tre	Fastweb	Sonepar
Buyer	Stakeholders' call for sustainability (CSR)	Public attention on fashion supply chain	Public attention on apparel supply chain	Public attention on fashion supply chain							
	Necessity to have sustainable SC		Need for full product sustainability	Need for full product sustainability							
	Urgency to tackle social issues in DCS		Poor living conditions in suppliers' countries								
	Need to assess and monitor suppliers' performances	Ineffective monitoring of performances	Ineffective monitoring of performances	Ineffective monitoring of performances							
	Will to financially help the supply base	Strategic suppliers struggling with financials	Strategic suppliers struggling with financials	Strategic suppliers struggling with financials	Strategic suppliers struggling with financials	Strategic suppliers struggling with financials	Strategic suppliers struggling with financials	Strategic suppliers struggling with financials	Strategic suppliers struggling with financials	Strategic suppliers struggling with financials	Strategic suppliers struggling with financials
	Safeguard the national know-how and specific competences	Tact know-how within the supply base		Tact know-how within the supply base							
	Make sure of the supply (pdt/service) continuity	High supply chain disruption damages	High supply chain disruption damages	High supply chain disruption damages	High supply chain disruption damages	High supply chain disruption damages	High supply chain disruption damages	High supply chain disruption damages	High supply chain disruption damages	High supply chain disruption damages	High supply chain disruption damages
	Need to standardise and optimise invoices payment process				Expensive payment process management	Expensive payment process management	Expensive payment process management	Expensive payment process management			
	Working capital regularization and optimization				High levels of WC	High levels of WC	High levels of WC	High levels of WC	High levels of WC	High levels of WC	High levels of WC
Costs control				Possibility to get discounts on invoices	Possibility to get discounts on invoices	Possibility to get discounts on invoices	Possibility to get discounts on invoices			Possibility to get discounts on invoices	
Suppliers	Need for financial liquidity (WC improvement)	Alarming liquidity shortage	Alarming liquidity shortage	Alarming liquidity shortage	Alarming liquidity shortage	Alarming liquidity shortage	Alarming liquidity shortage	Alarming liquidity shortage	Alarming liquidity shortage	Alarming liquidity shortage	Alarming liquidity shortage
	Need to reduce financial costs	Very high costs of financing	Very high costs of financing	Very high costs of financing	Very high costs of financing	Very high costs of financing	Very high costs of financing	Very high costs of financing	Very high costs of financing	Very high costs of financing	Very high costs of financing
	Possibility to focus on operative business	Managerial effort to financial issues		Managerial effort to financial issues							
	Need for incentives attached to sustainability plans		Unconvenience of sustainability plans	Unconvenience of sustainability plans							
Archetypes	1A	1B	2A	2B	2C	3					

RQ3 Cross-Case analysis – extended version

What are the benefits for buyers and suppliers from a SCF programme with a sustainability orientation?											
Player	Benefits	Staff Int.	Puma	CNMI	Fincantieri	Azmut	Group Eng.	Nice	Wind-Tre	Fastweb	Sonepar
Buyer	Financial benefits (WC optimisation)				WC levels reduction	WC levels reduction	WC levels reduction	WC levels reduction	WC levels reduction	WC levels reduction	WC levels reduction
	Decreasing of suppliers' default risk	Higher solidity of suppliers	Higher solidity of suppliers	Higher solidity of suppliers	Higher solidity of suppliers	Higher solidity of suppliers	Higher solidity of suppliers	Higher solidity of suppliers	Higher solidity of suppliers	Higher solidity of suppliers	Higher solidity of suppliers
	Brand image and company's reputation	Project benefitting the society	Project benefitting the society	Project benefitting the society							
	Sustainability performances		Sustainability along the supply chain	Sustainability along the supply chain							
	Improvement of supply base performances	Suppliers' better operative performances	Suppliers' better sustainability performances	Suppliers' better sustainability performances							
	Effective monitoring of suppliers' performances	Suppliers' performances constantly monitored	Suppliers' performances constantly monitored	Suppliers' performances constantly monitored							
	Valorisation of national know-how	Maintenance of unique know-how		Maintenance of unique know-how							
	Efficient credit management and paym process				Efficiency savings in invoices management	Efficiency savings in invoices management	Efficiency savings in invoices management	Efficiency savings in invoices management			
Economic savings				Economic discounts on invoices	Economic discounts on invoices	Economic discounts on invoices	Economic discounts on invoices			Economic discounts on invoices	
Supplier	Financial benefits (WC optimisation)	Faster access to liquidity	Faster access to liquidity	Faster access to liquidity	Faster access to liquidity	Faster access to liquidity	Faster access to liquidity	Faster access to liquidity	Faster access to liquidity	Faster access to liquidity	Faster access to liquidity
	Decreasing of default risk	Higher financial stability	Higher financial stability	Higher financial stability	Higher financial stability	Higher financial stability	Higher financial stability	Higher financial stability	Higher financial stability	Higher financial stability	Higher financial stability
	Improved efficiency				Savings in invoices management	Savings in invoices management					
	Financial costs savings	Lower costs of financing	Lower costs of financing	Lower costs of financing			Lower costs of financing	Lower costs of financing			
	Continuity of operations	Financial base to run operations				Financial base to run operations	Financial base to run operations	Financial base to run operations			Financial base to run operations
	Additional financing alternatives	Higher bargaining vis-à-vis banks			Higher bargaining vis-à-vis banks						
	Sustainability performance		Higher sustainability scoring	Higher sustainability scoring							
Archetypes	1A	1B	2A	2B	2C	3					

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