SUSTAINABLE SUPPLY CHAIN FINANCING: HOW FINANCIAL INSTITUTIONS COULD ENHANCE SUPPLY CHAIN SUSTAINABILITY

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By

Gema Perez, B.A.

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Gema Perez, B.A.
Mentor: Ricardo Ernst, Phd.

ABSTRACT

In the context of the financial crisis, society has increasingly questioned whether the financial industry plays by the code of ethics that can guarantee a sustainable future for generations to come. This thesis explores the role that financial institutions (FIs) could play as responsible global corporate citizens by enhancing sustainability along the corporate supply chain.

The research method relies on an interdisciplinary approach that integrates three distinct but complementary theories: supply chain management, sustainable supply chains and supply chain financing. These three building blocks are derived from different disciplines: supply chain management mainly from management and engineering; sustainable supply chain, from sociology, environmental and political sciences; and supply chain financing, from economics and finance. Each of these three disciplines offers a unique perspective, and complements each other in offering explanations.

The resulting Sustainable Supply Chain Financing (SSCF) framework relies on the hypothesis that: i) FIs have a pivotal position in the supply chain that allows them to have access to relationships, information and financial resources in each link in the chain; ii) large corporates can exert their purchasing power on their suppliers to promote the adoption of more sustainable business practices; iii) suppliers, especially small and
medium enterprises (SMEs), have the capacity to adapt quickly to more sustainable business models when the right incentives are provided.

The research concludes that FIs have the potential to become the engine to foster sustainability along the supply chain. The SSCF framework propositions suggest that there is an opportunity for FIs vis-à-vis resource rationalization, information transparency and alignment of incentives to enhance supply chain sustainability, based on the characteristics we have identified as the triple-T of SSCF: Teamwork, Transparency and Traceability. The research portrays an illustrative case of how the resulting SSCF framework could be implemented in an applied context, using Brazil as an example. Finally, this thesis also leads to further areas of research in the new field of sustainable supply chain financing, which might begin to guide future inquiry on this topic.
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ABBREVIATIONS

C2C       Cash to Cash
CCC       Cash Conversion Cycle
CEO       Chief Executive Officer
CSR       Corporate Social Responsibility
ESG       Environmental, Social and Governance
ESMS      Environmental and Social Management System
FI        Financial Institution
GABV      Global Alliance of Banking on Values
GRI       Global Reporting Initiative
ISO       International Organization for Standardization
LIBOR     London Interbank Interest Rate
MIT       Massachusetts Institute of Technology
OECD      Organization for Economic Cooperation and Development
SA        Social Accountability
SCF       Supply Chain Financing
SCM       Supply Chain Management
SME       Small and Medium Enterprises
SSC       Sustainable Supply Chain
SSCF      Sustainable Supply Chain Financing
WCED      World Commission of Economic Development
CHAPTER 1

WHY A SUSTAINABLE SUPPLY CHAIN FINANCING FRAMEWORK?

Worldwide demonstrations, such as the Occupy Wall Street movement, suggest that the social contract between banks and society has fallen apart. The last financial scandal of international banks manipulating the London Interbank Interest Rate (LIBOR) was the last straw in the financial crisis saga of greed and mistrust. At no time in the recent history had the reputation of financial institutions (FIs)\(^1\) been so damaged. This research intends to add some fresh thinking to the role of FIs as responsible global corporate citizens, which could lead to more convivial relationships with the rest of their stakeholders (customers, shareholders, governments and society as a whole). In a moment when citizens are questioning whether the financial industry plays by the code of ethics that can guarantee a sustainable future for future generations and that human values seem to be suddenly absent from the way business operate, the topic is even more relevant.

The methodology follows Carter and Roger’s (2008) approach to develop a theoretical framework in their cornerstone publication “A framework of sustainable supply chain management: Moving toward new theory.” They follow Meredith’s definition of conceptual framework (“a collection of two or more interrelated propositions which explain an event, provide understanding, or suggest testable hypotheses”) and Meredith’s methodology to carry out the exercise of theory building (“a number of different works . . . summarizing the common elements, contrasting the differences, and extending the work in some fashion,”) (Meredith 1993). Carter and

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\(^1\) The terms Financial Institution (FI) and bank will be used indistinguishably in this thesis.
Rogers complement their methodology with “the definition of variables and the development of ‘specific predictions’ based on this integration of existing theory along with ‘logical deduction’ which bring about the conceptual framework’s propositions.” In addition, the research methodology used in this thesis comprises investigation of primary sources, including interviews with experts in the field, as well as the study of supply chains in Brazil and their integration with Brazilian FIs.

Chapter 1 lays the ground to introduce the need of a Sustainable Supply Chain Financing (SSCF) framework by exploring the trends, definitions and rational behind the adoption of sustainable practices by supply chain and FI managers.

Chapter 2 aims to identify the elements found in each of the three building theories, which constitute the foundations of the SSCF framework. Each section of Chapter 2 will attempt to address the following methodological questions: *What are the key elements of each discipline? Why could they be important in the context of a SSCF strategy? How could they be measured?* The amount of existing publications in each of the studied theories is immense, while the reviewed literature for the purpose of this research, narrower. The selection of the reviewed literature follows an inductive approach based on general observations and personal experience about which subcategory in each theory could be most relevant to the SSCF framework definition, while aiming to maintain at all times objectivity and variety of sources.

Chapter 3 compiles the underlying theory explored in Chapter 2 to propose a series of propositions that constitute the basis of the SSCF framework, while offering guidelines for future research and testing. The SSCF framework delineated in Chapter 3 centers on
the role of FIs vis-à-vis resource rationalization, information transparency and alignment of incentives.

Finally, Chapter 4 portrays a study case of how the SSCF framework could be potentially implemented in a currently well-developed environment for efficient supply chain management such as the Brazilian one. This chapter combines primary and secondary sources research to draw conclusions on the necessary steps and challenges to fully implement the SSCF framework.
SECTION 1

The Unrelenting Movement towards Sustainability in Business

This section provides some background on the evolution of the *sustainability* concept in business. It also discerns among the several existing definitions of the term *sustainability* and addresses some nomenclature issues in order to apply conceptual rigor along the thesis. This section also explores why sustainability in business is increasingly becoming a “must have” rather than a “nice to have,” and how the adoption of sustainable business practices can help reduce cost and enhance revenues, in addition to simply improving public relations.

Sustainable, responsible, ethical, economic, environmental, social corporate responsibility, triple bottom line, and shared value. These are only some of the terms that have populated research, publications, media, debates and public opinion. The nomenclature is as varied as the concept is important. Happily, the notion of sustainable business, however broad, is not just a trendy transient topic. The term *sustainability* is more and more frequently invoked in the news, business schools and boards of directors. Global risks such as climate change, economic inequality and systemic crisis seem to be more present every day. In response to rising pressure from different stakeholder groups, corporations are beginning to find in their supply chains hints to improve their overall sustainability profile. Business as usual, irrespective of its impacts on society and the environment, is no longer conceivable.
Defining Sustainability

The World Commission on Economic Development (WCED) first coined the term “sustainable development” in its 1987 report, “Our common future.” The WCED definition assumes that for development to be sustainable “the needs of the present must be met without compromising the ability of future generations to meet their own needs” (WCED 1987). Although sustainability was not a common topic in business journals until the 90s, many researchers reference the WCED definition to frame their research. Since then, both academics and practitioners have argued that for development to remain sustainable, it must simultaneously satisfy environmental, social and economic standards. Nonetheless, literature review shows that the term sustainability has been broadly defined and applied in the existing research.

As Carter and Rogers (2008) point out, “unfortunately, the macro-economic, societal definition of sustainability is difficult for organizations to apply and provides little guidance regarding how to identify future versus present needs, determine the technologies and resources required to meet those needs, and understand how to effectively balance organizational responsibilities to multiple stakeholders.” On the other hand, “the micro-economic applications of sustainability in the fields of management, operations, and engineering have focused on specific and partial conceptualizations of the topic such as environmental sustainability, obviating social and economic responsibilities” (Carter and Rogers 2008).

In this research we will follow the long-term perspective in the definition of sustainability and sustainable business practices to address the integration of social,
environmental and economic responsibilities in the core business of a company. This definition follows the triple bottom line approach, first coined by John Elkington, which suggests that at the intersection of social, environmental, and economic performance, organizations can engage in activities which positively affect the natural environment and society, but also result in long-term economic benefits and competitive advantage for the company (Elkington 2004). This definition is also aligned with the now widely accepted notion that sustainability strategies need to be embedded in the core business of the company, in order to be maintained over time.

**Sustainable Business Practices over the Century**

Much has been achieved since Upton Sinclair published *The jungle* in 1906, his compendium of bad corporate practices, which triggered stricter food safety regulations. In his article “How great companies think different” published in *Harvard Business Review* in November 2011, Rosabeth Moss Kanter revises the evolution of the good company concept over the last century.

In the 1910s, Henry Ford’s "Five Dollar Day" increased paychecks, promising to turn workers into consumers. The Great Depression triggered the debate over how profits should be shared among investors, business leaders, and employees. During war times, supporting the war effort was seen as a duty; innovation and creativity also became important criteria to be called a “good company.” In the 1950s, economic prosperity made bigger and more synonym of better. In the 1960s, the Civil Rights movement set a new ethical bar against discrimination and product safety. In the 1970s, as companies struggled to survive stagflation, efficiency became a mark of goodness. In the 1980s, under pressure from global competition, business leaders focused on a single measure of goodness: shareholder value. For the first time in the 1990s, the idea of corporate social responsibility, which had only been studied in academia until then, went mainstream and ‘good companies’ created corporate social responsibility (CSR) departments. (Kanter 2011)
Kanter explains how in 1997, Nike suffered its first media reverse when public's rising awareness of sweatshop labor and environmental damage made them become more aware of the risks embedded in their global supply chain. Since then, the first decade of the new century was full of burst bubbles and hammered corporate reputation. The concept of CSR began to evolve towards a comprehensive strategy embedded in business models. Social entrepreneurs and multinationals started to see opportunities to make money by finding innovative ways to solve problems in the developing world (Kanter 2011).

Now it is not only about being a good company, but also about how make (more) money while being a good company. This change of approach was a real breakthrough. The possibility of increasing economic profit while creating social and environmental good is what will eventually activate private efforts to address the world sustainability challenges. This approach differs from previous versions of the concept, whereby CSR was understood as simply charity, donations or sponsorships. These types of activities, although valuable in their context, are typically seen by companies as cost centers. They might eventually yield the intangible value of an improved corporate image, but they also entrench the risk of being perceived as “green washing” activities especially if the company does not behave responsibly in other core areas of its business. Furthermore, as these activities are unlinked to the core business of the company, they tend to be downscaled in times of financial distress.

In a recent report by the Boston Consulting Group and MIT (MIT 2009), a survey of more than 1,500 business leaders, and more than 400 academics, government officials,
and executives, was conducted to learn more about how sustainability changes competition for businesses. The research found that there is a strong consensus that “sustainability is having—and will continue to have—a material impact on how companies think and act.” In fact, more than 92% of survey respondents said that their company was addressing sustainability in some way. In the last McKinsey annual survey on business sustainability, more companies reported that they are actively integrating sustainability principles into their businesses, and they are doing so by pursuing goals that go far beyond earlier concern for reputation management. The last survey’s results in November 2011 showed that in comparison to previous years, more executives say sustainability programs make a positive contribution to their companies’ short- and long-term value (McKinsey 2011).

Creating Shared Value

Despite piles of related publications, the practicality of the sustainability concept is not evident and many companies still wonder how to embed sustainable business practices in the core business. As the Boston Consulting Group and MIT 2009 survey data shows, despite the recognition of its importance, applying the sustainability word down to a concrete strategy is where most companies struggle (MIT 2009).

Some argue that planning a sustainability strategy does not differ from strategic management. In his latest seminal work “Creating shared value: Redefining capitalism and the role of the corporation in society,” the influential Michael Porter along with Mark R. Kramer, describe the opportunities to build a social value proposition into the corporate strategy and obtain a competitive advantage.
Their work relies upon the idea that the competitiveness of a company and the well-being of its stakeholders are interdependent. The authors elaborate the concept “by capitalizing on the connections between societal and economic progress as the engine power to unleash growth.” Their work identifies three ways in which companies can create shared value opportunities: i) reconceiving products and markets (companies can meet social needs while better serving existing markets, accessing new ones, or lowering costs through innovation); ii) redefining productivity in the supply chain (companies can improve the quality, quantity, cost, and reliability of inputs and distribution while simultaneously acting as a steward for natural resources and driving economic and social development); iii) enabling local cluster development (companies need reliable local suppliers, a functioning infrastructure of roads and telecommunications, access to talent, and an effective and predictable legal system in order to compete and thrive) (Porter and Kramer 2011).

Among the three areas identified by Porter to create shared value, the second opportunity area related to supply chain productivity is where most companies find their comfort zone to approach sustainability strategies. The next section shall explore why.
SECTION 2

The Leverage Power of Supply Chains

This section explores why Sustainable Supply Chain (SSC) management is a powerful tool to achieve large scale positive changes by leveraging corporations’ different influence levels along supply chains.

In 2007, Mattel suffered a backlash when lead paint was discovered in its toys. The paint’s source was traced to a third tier supplier\(^2\) in China that Mattel was not aware of. Mattel had no means to reach out and mitigate the risks along its extended supply chain. This is a typical problem in supply chain management. SSC management—extending a company’s commitment to sustainable business practices to its value chain—has become increasingly popular not only to enhance a company’s positioning as a good corporate citizen, but also as a strategy to mitigate reputational risks, reduce costs and enhance branding.

Mitigation of financial risks is an additional compelling argument for companies to engage in SSC strategies. As Denise Bedell explains in her article “Green profits,” the need to build sustainability into supply chains also came into clear focus during the last financial crisis. “Companies found that their critical suppliers were not always in the best of financial health, and when key suppliers folded unexpectedly, buyers were left dealing with the outcome.” This findings confirm that sustainability is not just about social or

\(^2\) The terms link and tier will be used indistinctively in this thesis to refer to the position a supplier occupies in the extended supply chain.
environmental programs but also about creating an end-to-end product chain that is efficient, secure, well-capitalized, and around for the long haul (Bedell 2011).

Other studies have also confirmed the link between SSC management and good general business practices. The consultancy Accenture (Wright, Jones, and Hoyle 2009), conducted a sustainable supply chain survey among 245 supply chain executives from diverse industries and regions during 2008. Companies were ranked into three categories with regards to sustainable supply chain initiatives: masters (those in the top quartile of performance of cost effectiveness and customer service), average performers (those in the second and third quartiles), and laggards (those in the bottom quartile). The study found that the best performing organizations on cost and service were also the frontrunners implementing sustainability across all links of their end-to-end supply chain.

**Defining Sustainable Supply Chains**

In one of the most widely accepted definitions, MIT professor Charles Fine (1998) describes a supply chain as the material, information and cash flows, typically crossing several different organizations, involved in producing and delivering a product or service to an end user (Fine 1998). A sustainable supply chain is one that includes measures of profit and loss as well as social and environmental dimensions (Carter and Rogers 2008; Linton, Klassen, and Jayaraman 2007). Such conceptualization is in line with the triple bottom line — economic, social, and environmental — performance approach described in the previous section and the definition of *sustainability* that will be used in this research.
Supply chain management deals with both, internal and external practices integrating a firm with its customers and suppliers. Yet, as Carter and Rogers identify, SSC management literature has focused mainly on internal supply practices that affect the company’s own internal processes such as reducing packaging, using more fuel efficient transportation, improving working conditions in warehouses, employee satisfaction, etc. (Carter and Rogers 2008).

However, there is an increasing consensus that the real impact of SSC practices relies in the extended supply chain. As Denise Bedell remarks, “when the sustainability management process stops at the boundaries of the company proper—and does not extend upstream or downstream from the firm—it can reduce the value gleaned from those efforts. Which customer is going to applaud a firm that reduces its carbon footprint at home, only to sell goods supplied by manufacturers that use highly energy-consumptive production processes abroad?” Bedell continues, “perhaps more importantly from a corporate perspective, by helping suppliers increase efficiency and reduce their cost of production, the company should see some of the upside by negotiating better prices and thus reducing their own costs” (Bedell 2011).

In this research, we will focus on the external activities of SSC management, that is, the integration and coordination of economic, environmental and social practices throughout the supply chain, through supplier selection and supplier development.

**SMEs and Sustainable Supply Chains**

Small and medium enterprises (SMEs) play a crucial role in supply chains as they constitute the bulk of large corporates’ suppliers. The use of SMEs for outsourcing
purchased materials has grown to represent more than 50% of total sales for an average manufacturing firm (Subramaniam 1998). In OECD countries, SMEs account for 60% to 70% of employment and this percentage is generally much higher in less developed countries (GPT 2005). The opportunities for SMEs to capitalize on sustainable supply chain initiatives are boundless. SMEs are the economic engine of developing countries, especially those with employment and income distribution challenges.

In a study about the value of investing in sustainability for SMEs, Schaper (2002) affirms that SMEs are “a means of innovation and change within the business sector, and form an important support to the large businesses which they co-exist alongside with. Although usually not given a great deal of attention, the role of small businesses and the entrepreneurs who operate them are a key part of the sustainability debate.” However, his research found that “compared to larger businesses, most SMEs tend to be somewhat reactive to environmental issues, and limited to small-scale, ad-hoc changes in business activities” (Schaper 2002).

Similar conclusions are reached by Revell, Stokes, and Chen (2010), who identify that SMEs face more difficulties than large corporates incorporating environmental management into corporate strategies. These authors identify some potential reasons including lack of knowledge, tools and resources, skepticism due to perceived time, cost and resources required, and uncertainty about the business benefits. On the other hand, as Bos-Brouwers (2010) points out, SMEs have the competitive advantage of greater flexibility in the way they manage their business due to less burdensome procedures and greater responsiveness, and an intrinsic more dynamic and entrepreneurial leadership
Building on the intrinsic characteristics of today’s global supply chains, the use of external pressure from SMEs’ main procurers coupled with financial incentives could help overcome the difficulties faced by SMEs to adopt more sustainable practices.

In fact, the negotiating influence that large corporations such as Walmart have on their suppliers is a powerful tool to enhance the sustainability agenda. In July 2009, Walmart announced the creation of a sustainability index to be applied to its over 100,000 suppliers. The index is being rolled out in three phases including a suppliers sustainability assessment, a life cycle analysis database, and a labeling system to provide the consumer with the environmental measurement of the product they are purchasing (Bustillo 2009). According to Walmart’s 2012 Global Responsibility Report, “the ultimate objective of the index is the development of merchant tools that will help their suppliers understand and improve the sustainability of our products” (Walmart 2012a). Ultimately, Walmart will provide customers with information about the sustainability of their products. This exercise could prove to be a real breakthrough if Walmart and the decision power of its end customers, could exercise a voting right with their dollars, and revolutionize the way thousands of smaller suppliers do sustainable business.

**Sustainable Supply Chains, the Next Level**

The literature review shows that i) working with sustainable suppliers not only mitigates reputational risks, but also enhances the financial profile of companies’ supply chains; ii) although more managers in large corporations identify the adoption of sustainability as an important tool to increase brand value, mitigate risks and enhance revenues, questions remain about the implementation of such strategies, especially with
regards to how to obtain information from second tier suppliers and beyond; iii) engaging with SME suppliers and providing the right incentives is a necessary element to help them comply with higher sustainable practices.

FIs are in a strategic position to fill the above mentioned gaps with regards to information flows, process standardization and incentives provisions. Next section shall explore the business opportunity for FIs to engage in sustainable supply chain financing.
SECTION 3

Financial Institutions as Agents of Positive Change

This section studies the current financial context to shed some light on the business opportunities and growing pressure that FIs face to address sustainability matters.

In our nowadays, globalized society, FIs play a critical role in allocating financial resources. While unfortunately their activities are sometimes damaging to the environment and social equity, research has shown that banks can also be powerful agents of change. As a large majority of companies in the world is dependent on their services, FIs play a pivotal role in every link of the supply chain. They have the potential to take advantage of their hub position as a product, information and financial flows distribution center to enhance sustainable business practices.

“The financial sector is a critical channel through which price signals, regulation, and civil society pressure can direct financial capital to more or less sustainable economic activity.” With this sentence, Tony Blair summarized the essence of The London principles of sustainable finance at the United Nations World Summit on Sustainable Development in Johannesburg in 2002. Ten years after the 1992 Earth Summit in Rio, Johannesburg aimed to adopt concrete steps and identify quantifiable targets for better implementing the agenda defined in Rio. By that time, sustainability started to resonate more and more and FIs were pointed for the first time as essential pieces to address increasingly present global risks associated to climate change and endemic poverty.

The London Principles (2002) identified the characteristics of a sustainable financial market. More specifically, they aimed to identify financial products, process and market
innovations that addressed sustainable development risks and opportunities, to draw from this experience lessons for future innovation. The London Principles 2002 report was followed by a second report in 2005, *The London principles - Three years on from Johannesburg*, which reviewed the progress made on the project. The second report concluded that despite significant progress in the field of sustainable finance, much more needed to be done. In particular, the report determined that the financial sector needed to play a stronger role in addressing the global challenges of economic prosperity, environmental protection and social development. The 2005 report outlined seven principles, which are worth stressing, as they are aligned with the triple bottom approach followed in this research:

**Economic prosperity**

- **Principle one:** Provide access to finance and risk management products for investment, innovation and the most efficient use of existing assets. *The Principles* argued that allocating finance from savers to companies and individuals investing and innovating was the primary wealth creation role of the financial services sector.

- **Principle two:** Promote transparency and high standards of corporate governance in themselves and in the activities being financed. *The Principles* referred to the numerous corporate scandals which had shocked the markets over the previous years (Enron, Worldcom, Parmalat, etc.) to argue for the need for financial market mechanisms to promote high standards of corporate governance.

**Environmental Protection**

- **Principle three:** Reflect the cost of environmental and social risks in the pricing of financial and risk management products. *The Principles* pointed the signal provided by prices as the primary market mechanism. Therefore, they argued that in order for financial markets to promote environmental protection it was necessary for debt and equity prices to reflect social and environmental risks. They called for regulation or reputation effects to have a higher impact on the negative effect that environmental and social risk have on long-term corporate financial performance.
• Principle four: Exercise equity ownership to promote efficient and sustainable asset use and risk management. *The Principles* argued that equity investors not only had ownership rights over the companies in which they invested, but also a responsibility to exercise those rights in the long-term interests of the shareholders.

• Principle five: Provide access to finance for the development of environmentally beneficial technologies. *The Principles* urged FIs to provide access to commercial finance for the developers of the key new technologies in energy, water, waste and other areas. They identified innovation and the financing of clean technologies as the key elements to transition to a sustainable economy.

**Social Development**

• Principle six: Exercise equity ownership to promote high standards of corporate social responsibility by the activities being financed. *The principles* identified business risks from supply chain employment conditions, local community impacts and other social development issues and stressed the roles of equity investors, as owners, to protect investment returns by ensuring these risks are managed through high standards of corporate responsibility.

• Principle seven: Provide access to market finance and risk management products to businesses in disadvantaged communities and developing economies. *The Principles* called for market mechanisms to provide access to commercial finance for both, developing economies and business in disadvantaged communities, to manage the risks arising from inequitable development, and also as a source of commercial benefit from untapped entrepreneurship in these areas. *(The London Principles 2005)*

  Albeit one of the most ground-breaking pieces of work that have been written in the field of sustainable finance, the *London principles of sustainable finance* went unheard during the financial crisis in the years that followed. The financial crisis did indeed confirm the pivotal role that financial intermediaries play in a globalized society. Unfortunately, it did so demonstrating the downside of financial interconnectivity. Arguably, the same multiplier effect could have an upside for societies by using FIs to address global sustainability challenges.
In fact, a large body of evidence shows that financial sector development can contribute to economic growth and poverty reduction (Berthelemy & Varoudakis 1996; Levine, Loayza & Beck 2000; Calderon & Liu 2003). All these authors argue that financial sector development exerts a large positive impact on economic growth, and that financial sector underdevelopment can therefore be a serious obstacle to growth, even when a country has established other conditions necessary for sustained economic development. They argue that FIs are essential to mobilize savings (secure place for savings to be reinvested into the economy), manage risk (diversify risks to increase returns and encourage more savings), acquire information about investment opportunities (reduce information costs to ensure an effective capital allocation), monitor borrowers and exert corporate control (perform monitoring on behalf on many investors, incentivize borrowing companies to perform well), and facilitate the exchange of goods and services (reduce transaction costs allowing greater specialization and productivity).

The Unique Current Opportunity

Ancient forms of banking exist from around 2000 BC. During the Dutch Republic in the 16th century important innovations took place. The developments in telecommunications and computing during the 20th century finally shaped the banking system causing major changes to banks operations and causing a dramatic increase in size and geographic spread, leading to the inter-mingled global financial system as we know it today (Davies and Bank 2002).

During the first decade of the 21st century, in an environment of economic growth and inexpensive lending, banks entered in a spiral of greed and profits. Housing bubble, weak
underwriting practices, predatory lending, deregulation, increased debt burden, shadow banking system, incorrect pricing of risk, and financial complexity, were among the hidden risks that would lead to one of the most harmful financial crisis in history, only equated to the Great Depression in the 30s. The responsibility of banks during the crisis, along with daily bad news about LIBOR, money laundering, and financial holes scandals, have eroded the little goodwill standing for global banks.

Although few major banks have taken the opportunity to attempt to reverse their past practices, in recent years, some small FIs have taken an evident shift towards addressing the environmental, social and economic impacts of their financial services. This is an important first step in this direction, which hopefully will trigger the demonstration effects needed.

Some remarkable examples are worth noting. One is The Global Alliance on Banking on Values (GABV), a network of banks committed to sustainable banking to promote responsible finance that benefits traditionally underserved communities, beyond financial security. “Unlike their enormous mainstream contemporaries, these banks are profitable, growing and crisis resistant. When it was unfashionable to do so, they stuck to simple, core banking services that balance, people and profit,” said Peter Blom, the alliance co-founder and Triodos Bank CEO in an interview to *Sojourners Magazine* in June 2009 (Ager 2009).

The GABV refers to sustainable banks as those which consistently deliver products, services and social, environmental and financial returns to support the real economy. These banks have increased their activity during the present recession, expanding their
lending to small and growing businesses in particular. Committed to providing a broad range of banking services to the real economy over the long-term, they highlight the powerful role of sustainable banks as stewards of successful, equitable capitalism.

The GABV defines the principles of sustainable banking as i) triple bottom line approach at the heart of the business model; ii) grounded in communities, serving the real economy and enabling new business models to meet the needs of both; iii) long-term relationships with clients and a direct understanding of their economic activities and the risks involved; iv) long-term, self-sustaining, and resilient to outside disruptions; v) transparent and inclusive governance; vi) with all of these principles embedded in the culture of the bank (GAVB 2012).

In 2011, the GABV commissioned a research report to compare the financial profiles of those banks identified as sustainable to those banks identified by the Financial Stability Board (FDB) as Global Systemically Important Financial Institutions (GSIFIs). The research examined the financial capital dynamics and impact metrics systems. The key conclusions from the analysis illustrated that: i) sustainable banks have a significantly higher proportion of their assets invested in lending than GSIFIs do; ii) sustainable banks fund a much larger portion of their total balance sheet with customer deposits than GSIFIs do; iii) sustainable banks are better capitalized than GSIFIs; iv) sustainable banks have generally better or comparable return on assets and returns on

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3 The FSB has been established by the leaders of the G20 countries to coordinate at the international level the work of national financial authorities and international standard setting bodies and to develop and promote the implementation of effective regulatory, supervisory and other financial sector policies in the interest of financial stability.
equity and their returns are also less volatile than those of GSIFIs; and v) sustainable banks have significantly higher growth in loans and deposits leading to higher growth in assets and income than GSIFIs do (GAVB 2012).

These results hint that sustainable banks not only have a competitive edge in terms of sustainability leadership, but that they can also demonstrate enhanced financial returns. Although more research needs to be done, this is a first step towards elucidating the business case for sustainability among FIs. In a moment when society is expecting banks to accept their part of responsibility in the financial crisis and take action towards improving their relationships with society, developing new sustainable products and services could not be more opportune. The benefits could be multiple: not only to help mitigate their exposure to credit, compliance and reputational risks, but also to improve relationships with their stakeholders (not simply shareholders), and obtain new sources of revenues and future growth.

FIs have a privileged position in the supply chain: i) they have access to relationships with all the links in the chain (end consumers, micro, small, medium enterprises and corporates); ii) they manage large amounts of valuable information (products such as factoring require sophisticated databases that track the performance of accounts payable along the entire supply chain through discounted receivables to influx liquidity in the chain); and iii) they have the ability to offer interesting financial incentives by adapting their financial products. In sum, while most FIs are currently dealing with increased regulation costs, capital requirements and historic low reputational levels, it is a unique opportunity for leading FIs to take an active role promoting sustainable business
practices. The following chapters shall explore how these strategies could be materialized through Sustainable Supply Chain Financing.
CHAPTER 2
THEORY BUILDING BLOCKS

The objective of Chapter 2 is to review the existing literature in each of the three building blocks of the SSCF framework (Supply Chain Management, Sustainable Supply Chain, and Supply Chain Financing) to later find the common ground that will serve to build the pillars of the framework.

Section 1 studies the field of Supply Chain Management (SCM). SCM has been extensively researched as its popularity has increased in the past years. As Burguess, Singh, and Koruglu (2006) point out in their literature review paper, “this is evidenced by marked increases in practitioner and academic publications, conferences, professional development programs and university courses in the area.” Despite the widespread interest in SCM, the authors argue that “much of the knowledge about SCM still resides in narrow functional silos such as purchasing, logistics, IT and marketing.” As a consequence, the authors suggest that there is a lack of coherent definition of SCM, unclear links between SCM research methods and concepts, and lack of a coherent knowledge framework due to the difficulties of consolidating knowledge (Burguess, Singh, and Koruglu 2006). Section 1 does not do an exhaustive examination of each of these functional disciplines of SCM, but rather, it reviews relevant publications in those areas of study pertinent for the proposed framework; more concretely, drivers of supply chain performance, SCM and SME suppliers, and supplier and buyer relationships. The literature review is done by keeping in focus how the findings could be important to the definition of the SSCF framework, and potential ways of measuring.
Section 2 explores the drivers of success of SSC strategies, components, implementation and monitoring in supply chains. It does so by reviewing the main theoretical frameworks developed in SSC management as well as practitioners’ publications related to SSC implementation strategies and examples. This section also attempts to identify the aspects that could be important in the context of a SSCF strategy such as the involvement of suppliers, environmental and social management systems and the particularities of implementing SSC strategies for SMEs. Finally, this section explores how SSC performance could be measured.

Lastly, Section 3 reviews the existing literature related to Supply Chain Financing (SCF). SCF is more of a practitioners’ topic than and academic’s (a revision of sources reveals that most research in this field is sponsored by companies working in the SCF business, such as banks or other financial intermediaries). Among the existing academic SCF related literature, most publications deal with internal supply chain cash flow management, and not necessarily with the role of third party financial intermediaries; while practitioner focused publications provide a more financial product-centric approach with emphasis in financial software. This thesis adopts both approaches as complementary. For the purpose of the SSCF framework, the understanding of the internal financial supply management is a premise to the study of the extended version of the financial supply chain that includes the role of third party FIs.
SECTION 1

Supply Chain Management Theory

Drivers of Supply Chain Performance

In 2004, *Harvard Business Review* published a supply chain influential series “The 21st Century Supply Chain.” In this six-article series, eleven authors presented new theory based on in-depth case studies on some of the world’s leaders in supply chain management.

In his October 2004 article “The triple-A supply chain,” Stanford University’s Hau L. Lee described the attributes a top-performing supply chain must have—agility, adaptability, and alignment—and how to recognize and develop them. Lee challenged the up to then common understanding that the drivers of supply chains should be high speed and low cost. He maintained that although these are necessary conditions, they aren’t sufficient to give companies a sustainable competitive advantage over competitors. Based on observations of supply chain leading companies such as Walmart, Amazon and Dell Computer, he concluded that the supply chains of top performers are simultaneously agile, adaptable and agile. The methods described by Lee to accomplish each of these traits constitute useful guidelines to be extrapolated to the SSCP framework:

- **Agile supply chains** are those that respond to short-term changes in demand or supply quickly. Two of the methods identified by Lee are particularly relevant for the SSCP framework: i) continuously provide supply chain partners with data on changes in supply and demand so that they can respond promptly; and ii) collaborate with suppliers and customers to redesign processes, components and products in ways that provide a head start over competitors.
Adaptable supply chains are those that adjust design to accommodate market changes. Two of the methods are pertinent for this framework: i) track economic changes, especially in developing countries; and ii) use intermediaries to find reliable vendors in unfamiliar parts of the world.

Aligned supply chains are those that align incentives for partners to improve performance of the entire chain. Lee mentions four significant methods to achieve the alignment goal: i) provide all partners with equal access to forecast, sales data and plans; ii) clarify partners’ roles and responsibilities to avoid conflict; iii) redefine partnership terms to share risks, costs and rewards for improving supply chain performance; and iv) align incentives so that players maximize overall chain performance while also maximizing their returns from the partnership. With regards to alignment, Lee particularly mentions the role that FIs can play in vendor (supplier) managed inventory, for example by buying components from suppliers at hubs and selling them to manufacturers. He explains how every party benefits given that the intermediaries’ financing costs are lower than the vendors’. Lee points out that this technique requires trust and commitment from all parties involved. (Lee 2004)

In 2008, McKinsey & Company developed new research about the supply chain practices of more than 60 companies, which provided supportive evidence of SCM best practices. The in-depth structured interviews covered more than 50 aspects of SCM. The authors identified six practices that drove the success of top performers: i) align supply chain strategy with corporate strategy; ii) design multiple supply chains to deal with complex products and services; iii) create a top-down and forward-looking vision of the overall supply network; iv) optimize end-to-end supply chains, and drive true collaboration across functions; v) use disciplined integrated planning processes; and vi) make supply chain talent development and acquisition an organizational priority (McKinsey & Company 2008).

The work of Narayanan and Raman in their 2004 Harvard Business Review article “Aligning incentives in supply chains” provided support to a relevant hypothesis already
identified in Lee’s work (2004): “to induce supply chain partners to behave in ways that are best for everybody, companies have to create or modify monetary incentives.” For these authors, aligning incentives means that “the risks, costs and rewards of doing business are distributed fairly across the network.” The authors identified three reasons why incentive-related issues arise in supply chains: i) when companies cannot observe other firms’ actions, they find it hard to persuade those firms to do their best for the supply network; ii) it’s difficult to align interests when one company has information or knowledge that others in the supply chain do not; iii) incentive schemes are often badly designed. The authors also proposed three techniques to redesign incentives: i) changing contracts to reward partners for acting; ii) gathering or sharing information what was previously hidden; and iii) using intermediaries or personal relationships to develop trust with supply chain partners (Narayanan and Raman 2004).

The need to develop trust along the supply chain is a constant in examined research about top performing supply chains. Most authors hint at the use of third party intermediaries to develop that trust. Narayanan and Raman (2004) show the case of the Hong Kong-based supply chain intermediary Li& Fung as an example of third party institution that helps align the right incentives. Li & Fung enforces a code of ethics on its network of factories in Asia and it monitors suppliers to ensure that they adhere to quality and ethical standards. The authors argue that Li & Fung reputation reduces the need for formal contracts.
The Fung Brothers, owners of the Li & Fung Group, along with Yoram Wind wrote in 2008 *Competing in a flat world*, a forward-looking influential book about how to compete in an increasingly interconnected environment. The authors coined a new paradigm in supply chain management: in a globalized world, it is not about competing companies, not even about competing supply chains, but about competing networks. The authors discuss about the importance of “orchestrating networks” and the benefits derived from it. This particular point is of special importance for the proposed framework. The authors recognize that international compliance systems are increasingly calling for the need of more rigorous monitoring of networks preventing potential environmental and social breaches and ensuring accountability in each step of the way. They recommend companies to take responsibility for the whole chain by building flexible and while strong supply chain networks (Fung, Fung and Wind 2008).

In sum, embedding sustainability along the entire supply chain requires the cooperation from suppliers in all links of the chain. The reviewed literature suggests that this is better achieved through collaboration, information sharing and incentives alignment. The use of intermediaries to build trust and clear definition of roles and incentives along the supply chain are mentioned as potential elements to fulfill that goal. FIs in particular are cited tangentially as potential incentive aligners in the context of supplier managed inventories.

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4 Dr. Victor K. Fung is Group Chairman of Li & Fung and Vice Chairman of the International Chamber of Commerce. Dr. William K. Fung is Group Managing Director of Li & Fung.
SCM and SME Suppliers

Any strategy involving the coordination of sustainability practices along the supply chain requires the understanding and collaboration of SMEs, especially for those large corporates outsourcing products and services from emerging countries. For the purpose of the proposed framework, it is important to study the challenges that SMEs face to manage supply chains in an efficient manner.

Research linking SCM to SMEs is not as abundant as research linking SCM to larger firms. Most of the literature in the field agrees that despite the economic importance of SMEs, they face difficulties to efficiently manage supply chains and to become fully internationalized as part of global supply chains. Arend and Wisner (2005) researched whether supply chain performance was relevant to SME corporate performance. They run a survey among over 420 SME managers in the US, Mexico and Europe. They concluded that SMEs do not implement efficient SCM as deeply as large enterprises, SMEs received fewer advantages from their partnerships, SMEs did not emphasize strategic focus areas to engage in SCM, and SMEs tended to be more shortsighted in partner selection rather than more comprehensive (Arend and Wisner 2005).

Kim, OW and Junc (2005), in their article “SME strategies: an Assessment of high vs. low performers,” used a modified balanced scorecard to link financial performance and supply chain management practices. They concluded that even if top performers consider streamlining information flows a top priority, they still find difficulties in gathering and analyzing information, and invest relatively low efforts in collaborative planning and data sharing across the firm. Likewise, these authors pointed out that even the best SME
performers pay limited attention to the use of e-technologies and implementation of collaborative best practices in supply chain planning and execution (Kim, OW and Junc 2005).

SMEs’ lack of capabilities in utilizing electronic communication and information technologies real-time is highlighted by the literature as one of the main barriers for SMEs to fully integrate in supply chains. The recommendations to overcome these challenges include the creation of networks of SMEs, experience and best practice sharing, using technology to improve SME performance in SCM, etc. (Hennet 2008). There is consensus in the SME development literature that SME support programs should adopt a sub-sectorial focus, i.e. preferably work with clusters of SMEs in the same industry, to increase effectiveness (Mead and Liedholm 1998; and Altenburg 1997).

Overcoming the challenges faced by SMEs in managing supply chains is relevant for the proposed framework especially because SMEs with unsophisticated compliance systems are more vulnerable to social and environmental risks, which could affect the integrity of the entire supply chain. The literature review suggests that appropriate training, experience sharing, cluster specialization and use of technology could help surmount those difficulties.

**Buyer Supplier Relationships**

Overall, the supplier buyer literature largely agrees on the fact that “traits such as coordination, collaboration, commitment, communication, trust, flexibility, and dependence, are widely considered to be central to meaningful relationships” (Kannan and Tan 2006).
In one of the most cited attempts to examine strategic purchasing and its influence on supplier evaluation systems, buyer supplier relationships, and firm’s financial performance, Carr and Pearson (2002) used correlation analysis and exploratory factor analysis to conclude that firms that have a strategic purchasing function are more likely to implement supplier evaluation systems, which provide a better understanding of supplier performance, a critical factor for companies seeking to establish long-term relationships with their suppliers (Carr and Pearson 2002).

These conclusions have been corroborated by later studies, building on the advancements of fifteen more years of research in the field of supplier-buyer relationships, and linking attempts to manage suppliers to business success. Kannan and Tan (2006) suggested that selecting the right suppliers and developing the infrastructure for successful relationships constitute the basis of this linkage. “Given competitive pressures for improved responsiveness yet reduced cost, alignment of buyer needs with supplier capabilities becomes increasingly important. It behooves buyers to carefully articulate their needs and to be discriminating in identifying suppliers. However, equally important is the need to create an environment in which the relationship with a supplier can be a source of value added” (Kannan and Tan 2006). These conclusions underpin the importance of explicitly considering a potential supplier’s strategic orientation and commitment in order to meet shared goals and objectives.

Cousin et al. (2008) also arrived to relevant conclusions for the purpose of this framework. They showed that superior performance outcomes are not only influenced by supplier performance measures, but also by the extent of a firm’s buyer-supplier
socialization mechanisms. These findings led them to conclude that “monitoring supplier performance is not of itself sufficient, rather, it is the process of socializing the buyer and supplier that is critical to the success of the relationship” (Cousin et al. 2008).

Research in the field of buyer supplier relationship management provides strong fundamentals for the definition of the SSCF framework, which heavily relies on collaboration among all actors in the chain to meet the common objective of enhancing sustainability performance. The findings hint at the strategic selection of suppliers, joining forces in the definition of common sustainability goals, and maintaining an open dialogue on best practices, rather than simply imposing and evaluating.

**Measuring SCM**

Measuring is what eventually allows hypothesis to be proven true. A framework that entails collaborations among the different actors in the supply chain requires measuring performance across organizations. This is methodological challenging. Reasons include non-standardized data, poor technological integration, geographical and cultural differences, differences in organizational policy, lack of agreed upon objectives, and poor understanding of the need for inter-organizational performance measurement, among others (Hervani et al. 2005).

This research relies on the premise that the complexity of performance measurement depends largely on the goals of the company or those of the particular strategy. Since the SSCF framework consists on improving the sustainability performance across the different organizations in the supply chain, we will focus on the SCM area of study related to buyer-supplier relationships - “the cooperative and more exclusive relationships
between organizations and their upstream suppliers and downstream customers” as defined by Gunasekaran et al. (2004).

The attempt to model a SCM buyer-supplier measurement framework of Gunasekaran et al. (2004) is among the most comprehensive ones. Their framework was based largely on metrics discussed in the literature related to planning, production, delivery and supplier metrics. The suggested metrics were tested by a survey among a total of 150 large companies from a wide range of industries. Following a thorough literature review, the authors identified six key performance indicators related to supply link evaluation and ranked them according to the importance attributed by the survey participants. The most important indicator was supplier delivery performance, followed by those ranked as moderately important (supplier lead time against industry norm, supplier pricing against market, and efficiency of purchase order cycle time), and finally, those identified as less important (efficiency of cash-flow method, and supplier booking in procedures).

Most of the reviewed literature in the field of supplier buyer relationships uses qualitative indicators. For instance, in their research “Performance measurement in strategic buyer-supplier relationships,” Cousin et al. (2008) use four sets of variables: i) socialization mechanism measures (number of joint workshops, supplier conferences, cross-functional teams, matrix style reporting structure); ii) communication performance measures (communication effectiveness, information exchange quality and timeliness, feedback from supplier); iii) operational performance measures (delivery to schedule, conformance to specifications, lead times); and iv) business performance measures
(increased market share, improved time to market and lead time reduction). Other commonly used relevant indicators are loyalty, face-to-face meetings, high corporate level communications, computer-to-computer links, responsiveness, special agreements with suppliers who have improved performance, exchange of performance feedback, sharing sensitive information, sharing strategic goals, signing formally written long-term plans, involvement of key suppliers in product design, etc. (Chen et al. 2004; Kannan and Tan 2006; and Chen and Paulraj 2004).
SECTION 2

Sustainable Supply Chain Theory

The field of SSC management is maturing as reflected in the number of literature review publications appeared in recent years (Srivastava 2007, and Seuring and Müller 2008a, among others). Likewise, the number of deliberate developments of theoretical frameworks in SSC has increased. A clear trend in the observed literature is the movement towards a holistic comprehension of SSCs integrating not only environmental aspects, but also economic and social ones. Indeed, during the late 90s and early 00s, most authors focused on the green component of SSC. For instance Bowen et al. (2001), in one of the first attempts to develop a theoretical framework in the field, focused mainly in “greening the supply processes;” while the later frameworks developed, such as Carter and Rogers’ (2008), Seuring and Müller’s (2008a) and Pagell and Wu’s (2009) included all aspects of the triple bottom line (environmental, social and economic). We will focus on the findings of these three seminal works.

In their publication “A framework of sustainable supply chain management: moving towards new theory,” Carter and Rogers (2008) defined SSC management “as the strategic, transparent integration and achievement of an organization’s social, environmental, and economic goals in the systemic coordination of key inter-organizational business processes for improving the long-term economic performance of the individual company and its supply chains.” The authors delineated a total of five propositions addressing the links between the three components of SCM. They authors predicted that “firms that strategically undertake SSC management strategies will achieve
higher economic performance than firms that pursue only one or two of the three components of the triple bottom line.” They supported this hypothesis on the fact that supply chains which integrate social and environmental resources and knowledge may be more difficult to imitate and therefore, they have a competitive advantage. Although their framework remained quite theoretical, it broke new ground with regards to the conceptualization of the three components of SSCs. Their illustration of the SSC concept (see figure 1) remains a reference in sustainability related literature.

![Figure 1. The integration of sustainable supply chain management practices. Source: Carter and Rogers 2008, 369.](image)

One of the most comprehensive literature reviews in SSC management probably is the one performed by Seuring and Müller (2008a), who revised 191 papers published from 1994 to 2007 and summarized the research in the field to build a conceptual
framework. Their framework identified first the external triggers that urge companies to implement SSC strategies. These triggers typically derive from governing agencies, customers and other stakeholders. Based on these triggers, the authors identified two SSC strategies: “supplier management for risks and performance” and “supply chain management for sustainable products.” Figures 1 and 2 summarize the two strategies:

Figure 2. Supplier management for risks and performance. Source: Seuring and Müller 2008a, 1706.

Figure 3. Supply chain management for sustainable products. Source: Seuring and Müller 2008a, 1706.
With regards to the relationship with suppliers, Seuring and Müller found several incentives and barriers related to SSC management (in order of importance): i) higher costs; ii) coordination effort and complexity; and iii) insufficient or missing communication in the supply chain. Among the supporting factors, they identified: i) communication; ii) environmental and social management systems (ISO 14000 or SA 8000); iii) monitoring, evaluation, reporting, sanctions; iv) training education of purchasing employees and suppliers; and v) integration into the corporate policy. Interestingly, communication was identified as both, a barrier and an enhancer. The authors concluded that although communication causes higher costs, joint efforts of all supply chain partners can help control those costs. Another relevant finding of their research was the importance of “environmental and social management systems” as an element to monitor and control the implementation of the minimum performance required. We will explore the role of these systems more in-depth later on.

Pagell and Wu (2009) used case studies of ten exemplar firms to build a model of management practices that can guide supply chain managers to develop a SSC model. They did so by studying what SSC leaders are doing differently than traditional SCM and comparing the behaviors among those leaders. The authors concluded that “the practices that lead to a more sustainable supply chain are equal parts best practices in traditional supply chain management and new behaviors.” They identified five sets of best practices among SSC leaders:

1. **Commonalities, cognitions and orientations.** Responsibility for sustainability is shared across the supply chain, top management is proactive and committed, and there is an alignment between the three elements of sustainability. “Sustainability for the
organization is tightly tied to the business model, protected the brand and used to guide decision making” (Pagell and Wu 2009).

2. **Ensuring supplier continuity.** SSC leaders make efforts to ensure that all members of their chain stay in business, in a manner that allows them to thrive, reinvest, innovate and grow. Some of the incentives used to help suppliers excel in sustainability matters are to provide long-term contracts and access to supplier development resources, or to pay above market prices. In return, buyers typically ask for more transparency in the chain such as more detailed information on the flows of money. SSC leader buyers see transparency “as a strong element of social responsibility because it helps to ensure that no one in the chain is being abused” (Pagell and Wu 2009).

3. **Re-conceptualize the chain and its players.** SSC leaders typically collaborate with external entities that managers would typically ignore or treat as adversaries, such as NGOs, local governments, or even competitors.

4. **Supply chain management practices.** SSC leaders typically tie supplier selection decisions to sustainability goals, collaborate with their suppliers to help achieve sustainability goals, or certify their suppliers on social and/or environmental actions and outcomes. Large buyers typically demand information directly from suppliers. Another common characteristic of SSC leaders is their investment in human capital through human resource practices that increase employee well-being and commitment to the organization.

5. **Measurement.** One of the striking findings of Pagell and Wu’s research was that even leaders in supply chain sustainability struggle with the measurement of impacts of their environmental and social activities. The measurement complexity increases when it is extended to suppliers. Some of the analyzed companies used life-cycle analysis on a rudimentary basis. Typically these activities capture only the environmental impacts of the chain and not the social component. Of the SSC leaders studied, only 33% had created a coherent measurement and reward system that clearly guided behavior toward sustainability goals. “When it comes to measuring the noneconomic components of sustainability the respondent organizations are just beginning to truly understand their entire impact” (Pagell and Wu 2009).
Environmental and Social Management Systems

Environmental and social management systems are a common tool among SSC leaders to manage the implementation of their SSC strategies (Pagell and Wu 2009). We will review the most commonly used systems.

The most popular standardized environmental (although not social) management system identified in literature is the ISO 14001. According to the International Organization for Standardization (ISO), ISO 14001:2004 specifies requirements for “an environmental management system to enable an organization to develop and implement a policy and objectives, which take into account legal requirements and other requirements to which the organization subscribes, and information about significant environmental aspects” (ISO 2004). ISO 14001 relates to the process of production, rather than to the
product itself. It also relates exclusively to processes that can be audited or certified. The implementation of the standard follows a five step approach: plan, do, check, act and continuously improve.

Standardized social management systems are much less developed and widely used (Pagell and Wu 2009). Some of the SSC leading companies studied by Pagell and Wu use either the SA 8000 (Social Accountability 8000) or internally developed codes of conduct. SA 8000 was developed in 1997 by Social Accountability International (SAI), “a non-governmental, international, multi-stakeholder organization dedicated to improving workplaces and communities by developing and implementing socially responsible standards” (SAI 2012). The SA 8000 is an “auditable social certification standard based on conventions of the ILO, UN and national laws. The management system supports sustainable implementation of the principles of SA8000 in the following areas: child labor, forced and compulsory labor, health and safety, freedom of association and right to collective bargaining, discrimination, disciplinary practices, working hours, remuneration” (SAI 2012).

In 2010, following pressure from external stakeholders, ISO developed ISO26000 – Social Responsibility standard, the first international standard that combines environmental, social and governance matters. Given that the ISO has not developed yet a certification procedure for this standard, ISO26000 provides guidance rather than requirements. “Instead, it helps clarify what social responsibility is, helps businesses and organizations translate principles into effective actions and shares best practices relating to social responsibility, globally” (ISO 2010). A schematic overview of ISO26000 is
depicted in figure 5. In comparison to the general ISO9000 (typically required by major purchasers), which focuses on quality management systems, ISO 26000 provides a more holistic supply chain approach, “including extended upstream and downstream involvement and integration as well as environmental approaches such as recycling or life-cycle assessment” (Castka and Balzarova 2007). Given the relatively novelty of the standard, its validity as an effective corporate responsibility management system is still to be confirmed.

Figure 5. A schematic overview of ISO26000. Source: ISO 2010.

**SSC and SMEs**

While both, large and small companies face similar issues when pursuing voluntary standards of business responsibility, smaller companies find particular barriers. Small companies have fewer financial, technical and human resources. SMEs’ tighter budgets
do not always give them much margin to explore new initiatives. “Owners and managers of SMEs are more acutely sensitive than their counterparts at large multinational corporations to issues such as market access, access to credit and financing and the immediate costs of improved social and environmental performance” (Global Compact 2005).

Literature suggests that SSC initiatives should include support in quality management for SMEs and focus on the business case as well as on compliance mechanisms. As the Resource Centre for the Social Dimensions for Business Practice recently found in relation to their research in Tanzania, “socially responsible business in the North should consider prioritizing their support to developing country supplier businesses in the form of management support and mentoring, which are of greater help than codes of practice” (Shankleman and Selby 2001).

Despite the importance for large corporations to engage with their smaller suppliers farther away in the supply chain in developing countries, literature agrees that the linkage is often quite difficult to make. “Large corporations (while to some extent operating limited supplier development programs for their first-tier suppliers) usually cannot justify bearing alone the expense of upgrading entire local productive systems, which however is often required to reduce capability gaps” (Global Compact 2005). Some authors argue that dysfunctional market mechanisms in relation to information, skills and infrastructure, explain the difficulties in developing effective business linkages between large corporations and SMEs. “This is largely due to the fact that quite abruptly, producers in
developing countries are faced with quality and productivity requirements that do not yet apply to their domestic markets” (UNTAC 2001).

In the light of these difficulties, the role of an intermediary that intervenes and facilitates the creation of sustainable business linkages might be justified. “Any such linkage support programs initiated by a neutral broker will need to adopt a sector-wide approach, strengthen existing service institutions, work with local partners and arrange for world-class expertise to be delivered to supplying SMEs” (Global Compact 2005).

In sum, the findings in SSC SMEs related literature are aligned with those in general SSC literature about the importance for large buyer corporations to build commercial links and develop partnerships, which help SMEs gain access to markets, funding, training, physical infrastructure and business support services.

**Measuring SSC**

As made evident by the literature examined, measurement related to sustainability is an area in which even SSC leaders struggle. This challenge is not new. Since the interest in socially responsible investments (SRI) thrived at the beginning of the 90s, assets managers started to inquire about how to measure the social and environmental impact of their investments. The maturing SRI industry, estimated at approximately $3 trillion in the US (SIFF 2010), revealed the need to have a common reporting framework for sustainability reporting analogous to the International Financial Reporting Standards (IFRS) for accounting.

In 1997, the Boston-based nonprofit CERES (Coalition for Environmentally Responsible Economies) started the Global Reporting Initiative (GRI). The United
Nations Environment Program (UNEP) joined as a partner in 1999. Other strategic partners such as OECD and ISO have joined and supported the effort, consolidating GRI at the commonly accepted sustainability reporting framework. In 2002, CERES set up the GRI as an independent body with a mission to “integrate and unify the many standards in the marketplace into a single, generally accepted sustainability reporting framework, encompassing environmental, social, and economic performance” (GRI 2002).

The G3 guidelines set out core content for sustainability reports. The first part of the guidelines covers reporting principles, including materiality, stakeholder inclusiveness, sustainability context, and completeness. The second part covers standard disclosures in three areas that should be included in a sustainability report: strategy and profile, management approach, and performance indicators.

No regulation requires companies to generate sustainability reports, but the trend to provide these disclosures is definitely growing. According to GRI, the last version of the guidelines has been voluntarily adopted by more than 1,500 companies worldwide. According to the November 2011, KPMG International Corporate Responsibility Reporting Survey, 95% of the 250 largest companies in the world now report on their corporate responsibility activities; while 69% of the 100 largest companies, do so by adhering to GRI Sustainability Reporting Guidelines. The survey also reveals that companies in Europe continue to maintain the highest reporting rates, the Americas and the Middle East and Africa region are quickly increasing their reporting rates, while only around half of largest Asia Pacific companies report on their sustainability activities. “It
seems clear, therefore, that companies not yet reporting on their sustainability activities are under significant pressure to start” (KPMG 2011).

Despite the tremendous progress made by the GRI in promoting a common sustainability reporting framework, a grey area persists with regards to how to report on the supply chain sustainability performance. Conscious about this gap, the GRI has convened a working group to develop recommendations on how to improve supply chain disclosure in the Reporting Guidelines. The working group consists of 17 individuals with expertise in the supply chain field representing a varied sample of constituencies and geographies. The recommendations of this Working Group will be incorporated into the next version of the GRI Guidelines - G4, expected to be published in May 2013.
SECTION 3

Supply Chain Financing Theory

The differences mentioned above between academics’ and practitioners’ points of view in the field of SCF, are reflected in the definition of supply chain financing. In one of the first academic papers published in relation to SCF, Hofmann defines it as follows: “located at the intersection of logistics, supply chain management, collaboration, and finance, SCF 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. While preserving their legal and economic independence, the collaboration partners are committed to share the relational resources, capabilities, information, and risk on a medium to long-term contractual basis” (Hofmann 2005). In contrast, the Aberdeen Group, a business intelligence research firm generating research catered to the private sector, defines SCF as “a combination of trade financing provided by a financial institution, a third-party vendor, or a corporation itself, and a technology platform that unites trading partners and financial institutions electronically and provides the financing triggers based on the occurrence of one or several supply chain events” (Aberdeen 2006).

While academic publications have concentrated around the internal treasury-related financial supply chain, practitioner focused publications adopt a more external financial product-centric supply chain with emphasis in financial software. This research adopts both approaches as complementary and will study both.
The Internal Financial Supply Chain

The literature review on the internal financial supply chain leads to accept as valid the general academic consensus that an efficient management of the financial supply chain enhances corporate performance. The objective of efficiently managing the financial supply chain is to improve the working capital position of both, buyers and suppliers. Working capital is defined as accounts receivable plus inventories minus accounts payables, that is, for how long a company has to finance its own inventory. This concept has been coined as “cash-to-cash cycle” (C2C) or “cash conversion cycle” (CCC). C2C measures the number of days between the initial cash outflow (when the company pays its suppliers) to the time it receives cash from its buyers. It is calculated as: days of sales outstanding (number of days to receive accounts payable), plus days in inventory (number of days that goods remain in stock), minus days payable outstanding (number of days to pay the accounts payable) (Camerinelli 2009). For buyers, the objective is to have access to extended payment terms without loading suppliers with increasing financing costs, reduce working capital requirements and improve the relationships with suppliers. For suppliers, the objective is to receive early payment of invoices, while having more predictable payment flows.

There is academic consensus on the overall benefits of an efficient management of the financial flows in the supply chain. Most of the academic literature related to SCF deals with the relationship between an efficient C2C cycle with the value of the firm, that is, how the reduction of working capital needs, enhances the value of the company (Hutchinson et al. 2009; Presutti and Mawhinney 2007). Other authors have focused on
the impact of the financial supply chain on corporate performance, providing some interesting data. For instance, the *Supply Chain Management Review* special supplement on SCF estimated that “4% percent of the cost of finished goods relates to financing — more than is spent on logistics and transportation” (Hartley-Urquhart 2006).

Until the last decade, to meet their working capital financing needs, suppliers either seek financing on their own, or approached their larger buyer trading partners for better trading conditions such as earlier payment of invoices. In fact, the influx of liquidity in the supply chain has typically been done by large corporates by paying earlier their suppliers’ invoices while receiving later their own payables from buyers. Although this practice might sound counterproductive for companies, research demonstrates that by adopting a collaborative approach and sharing information among sellers and buyers on their working capital structure, all actors in the chain can benefit. This comes at the expense of some trade-offs that must sum positive for all parties involved, such as for example, accepting some deterioration in a company’s C2C numbers in order to improve the financial position of its trading partners and therefore, mitigating its counterparty credit risk. The limitation of this approach is the potential reluctance of actors in the supply chain to share proprietary data (Hutchison et al. 2009). According to these authors, this could be overcome by building trust in the chain.

**The External Financial Supply Chain**

Authors such as Dyckmann (2009) see an inherent difficulty in the previous approach. “Because buyers and sellers have conflicting goals — the buyer wishing to delay payment for as long as possible and the seller wanting to accelerate collections — a
mutually beneficial process does not seem feasible.” Dyckman explores instead the alternative of introducing external FIs in the chain. He describes this process as follows: “the large corporate buyer or seller brings credit arbitrage into play, giving suppliers and/or buyers of its products access to capital at reduced rates” (see figure 6). The way a credit arbitrage is commonly achieved when a large, investment-grade buyer provides both, its banks and its suppliers, with information about invoices and approved payments. The bank sees these invoices as credit risk from the larger corporate buyer, and therefore is able to “discount” them (that is, to advance cash the seller supplier) and collect a later payment from the large buyer (Dyckman 2009). Although this financial product has received different names depending on its nuances (whether the invoice discount occurs pre-shipment or post-shipment of goods, or whether is done on a ‘recourse’ or ‘non-recourse’ basis against the buyer), we will generically refer to it as factoring.5

5 Other commonly used and related terms include supplier financing, reverse factoring, forfaiting, etc.
Regarding measurement, the two most common used indicators related to SCF are working capital and CCC.

**SCF and SMEs**

Dyckman points out that in recent years, FIs began to realize that strong buyers could support the funding needs of its supply chain partners while still meeting its own working capital goals. The way that large buyer companies benefit is by negotiating extended payment terms or lower costs of goods sold from their suppliers in return of providing increased liquidity and access to reduced financing costs. The author highlights that in the advent of the financial crisis, more and larger buyers are approaching banks to implement SCF programs as a way of stabilizing the financial health of their supply chains, instead of improving their own working capital positions (Dyckman 2009). A study carried out
by Abbey UK Corporate Banking concluded that factoring solutions were becoming progressively more relevant as buyers were increasing the number of days to pay their invoices. Among European corporates, invoices are paid in 59.2 days on average with payment delays rising, equating to €250 billion in delayed accounts receivables, or funding needs (Hawsen 2008). The burden of this trend is bore by SMEs, which typically pay a much higher cost of funding, demonstrating the need for SCF solutions to target SMEs. As Sarah Jones describes it, “if an SME supplier is having to finance a higher accounts receivable balance at a cost of finance that is significantly higher than the platform company that it supplies, it is going to result in, at best, a higher cost of goods. At worst, the SME supplier cannot access sufficient financing to support a higher working capital need and goes out of business” (Jones 2008).

The benefits of factoring and SCF as a financial tool for SMEs are particularly important in emerging countries. The context of emerging market countries might be propitious for SME factoring products given that SMEs typically face more difficulties to access sufficient financing in the local banking systems, while large firms (domestic, foreign, or multinational) usually have more inexpensive access to domestic and foreign bank and public-debt financing. Factoring may also be a well suited product in weak business environments with uncertain commercial enforcement laws and inefficient insolvency resolution systems. “The virtue of factoring in a weak business environment is that the factored receivables are removed from the bankruptcy estate of the borrower and become the property of the factor” (Kappler 2006).
What Makes Successful SCF Programs Work

Dyckman (2009) identifies five key areas within a company that need to adapt to make external SCF programs work: treasury (to understand the financial impact), credit risk (to provide insight with regards to which suppliers to include in the program), accounts payable (to manage the introduction of another payment type directly to banks), procurement (as they maintain the direct relationship with suppliers) and especially, information technology (to develop some form of electronic interface with the Partner FI to support payables or e-invoicing). The author comments that the adoption of a SCF program should follow a top-down strategy with impulse from the executive management down to the rest of the involved areas.

The table below found in Dyckman’s research (2009) provides a summary of the benefits of implementing SCF programs for buyers and suppliers. In addition, FIs also benefit by accessing new customer bases, cross-selling opportunities, and enhancing the risk-return of their portfolios given the high return, low risk profile of working capital financing products vis-à-vis other riskier products.
Table 1. Benefits of supply chain financing

<table>
<thead>
<tr>
<th>Benefits for buyers</th>
<th>Benefits for suppliers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Achieves working capital or other commercial terms benefit</td>
<td>Attractive liquidity management tool through the early payment option</td>
</tr>
<tr>
<td>Improves cash flow by reducing working capital and related funding costs</td>
<td>Converts accounts receivable to cash through a more attractively priced, non-recourse sale</td>
</tr>
<tr>
<td>Improves commercial terms without increasing cost to the supply chain</td>
<td>Frees up borrowing capacity with lenders</td>
</tr>
<tr>
<td>Transitions suppliers to electronic payments</td>
<td>Positive working capital benefits</td>
</tr>
<tr>
<td>Uses a powerful electronic payment tool</td>
<td>Increases cash flow, reduces accounts receivable and days sales outstanding</td>
</tr>
<tr>
<td>Provides suppliers with remittance visibility over the Web</td>
<td>Reduces capital costs (e.g., accounts receivable carrying costs)</td>
</tr>
<tr>
<td>Reduces transaction costs</td>
<td>Full payment transparency</td>
</tr>
<tr>
<td>Reduces payment issuance fees</td>
<td>Provides details on approved payments and their timing</td>
</tr>
<tr>
<td>Reduces administrative costs in accounts payable and results in fewer supplier inquiries</td>
<td>Provides full detail remittance information for each payment</td>
</tr>
<tr>
<td>Resolves errors early and eliminates error replication proactively</td>
<td>Provides early resolution of errors and proactive elimination of error replication</td>
</tr>
<tr>
<td>Improves relationships with suppliers</td>
<td>Enhances certainty of payment</td>
</tr>
<tr>
<td>Introduces visibility into the payment process</td>
<td>Ability to receive information and payment in a format that best suits their needs</td>
</tr>
<tr>
<td>Increases suppliers’ cash flow</td>
<td>Over the Internet — in either a statement or report format</td>
</tr>
<tr>
<td>Reduces suppliers’ borrowing costs</td>
<td>Through their local relationship bank via electronic payment</td>
</tr>
</tbody>
</table>

Source: Dyckman 2009.

The Challenges

Despite the general intuition about the benefits of adopting a SCF program, there is still a research gap with regards to the role that third party FIs could play enhancing a more efficient management of the financial supply chain. Although it has been present in research targeting practitioners since approximately a decade ago, and most global banks have implemented some sort of SCF line of business, more empirical research needs to be done with regards to the challenges and benefits of implementing SCF programs with external funding providers (Hawser 2010).
SCF first emerged as a field with a large potential for FIs due to the low credit risk associated to working capital financing and the possibility to tap networks of new customers by leveraging the distribution platforms of large clients. However, the literature review suggests that FIs have not managed to fully reap the benefits of SCF yet. For instance, the Journal of Supply Chain Management Review has published several articles from 2006 to 2008 related to the potential of SCF and the progress that the finance industry is making (Kerr 2007; Atkisnon, 2008), although not yet a fully developed SCF framework.

Among all the publications depicting the large although not yet fully achieved potential of SCF, the most pragmatic one is a McKinsey study in October 2010, “Supply Chain Finance: From Myth to Reality,” which reviews the evolution of SCF from simple domestic working capital instruments such as reverse factoring, to products offering cross-border solutions such as international reverse factoring and other trade finance instruments. It highlights that the next necessary step for SCF is to evolve towards an integrated electronic working capital platform that could offer supply chain end-to-end financing solutions. Yet, McKinsey points out that although integrated SCF programs could provide significant benefits to all parties involved, as of today, no bank has achieved such a fully integrated SCF solution. The study identifies the lack of common standard as the main constraint for SCF to fully attain its global potential as a data exchange among different technology platforms. The study identifies some milestones that FIs need to achieve in order to reach integrated end-to-end SCF solutions: cover the main trade corridors, target industries in which payment terms vary widely across the
supply chain, secure participation of buyers first, or become 100% paperless (Hurtrez and Salvadori 2010).

Further challenges to implement SCF programs identified in the reviewed literature are described below:

- **Internal difficulties due to large size.** Global banks are, in general, siloed. Typically, product lines dealing with different stages of the supply chain financing, lay in different departments. In addition, cash management services are only offered to large blue chip companies, while trade services target distributors and manufacturers who have a requirement for financing. Jones (2008) concedes that although progress is being made, it is taking them time due to discussions around cannibalization of existing business lines.

- **Industry knowledge.** "While there are commonalities, every industry sector is different, and every supply chain is different in terms of the participants, products, jurisdictions and business models used," asserts Jones (2008). Having a good industry sector and corporate business knowledge is crucial to successful SCF programs. “The challenge for any firm hoping to become a serious provider in the SCF space is that there is no all-encompassing solution that suits every industry or corporate supply chain” (Hawsen 2010).

- **Supplier knowledge and willingness to absorb suppliers’ risk.** Not all banks have the risk appetite neither the internal credit analysis abilities for this type of financing, especially with regards to financing smaller suppliers in more distant links (Hawsen 2010).

- **Local presence.** Having a good knowledge of local markets is important not only to enhance the credit knowledge of your customers, but also, to have a deep understanding of their customers’ supply chains and the relationship between buyers and suppliers in those chains (Hawsen 2010).

- **Large volumes.** In order for supplier financing solutions to work effectively and gain economies of scale, banks need to work closely with large volume buyers in order to gain access to their network of suppliers (Hawsen 2010).

- **Efficient pricing.** Depending on their size, industry and location, companies typically have multiple financing options, which makes the pricing exercise more complex. “Optimal pricing is achieved when supply chain financing is managed on a dynamic, distribution basis rather than on the traditional bilateral approach,” affirms Jones (2008).
• **Technological investment**: Successful SCF programs require a significant ongoing investment in technology and web-based platforms that enable suppliers to join SCF programs more quickly, and facilitate the automatic upload of approved invoices by buyers (Hawser 2010).

**How SCF is Important for the SSCF Framework**

The SCF literature review exercise confirms that SCF is an evolving research discipline. As it becomes more understood, so will the relationships along supply chains. “The challenges arising with these developments bring along a new understanding and role of the supply chain actors and their relationships. New inter-functional and inter-organizational tasks at the intersection of finance and logistics open new supply chain opportunities” (Hofmann 2005).

All the same, the current state of the art with regards to SCF suggests that: i) an efficient management of the financial supply chain enhances corporate performance; ii) the use of external funding providers SCF programs can result in win-win-win situations for all parties involved with regards to efficiently managing financial flows and building trust for information sharing; iii) the use of SCF products such as factoring can be particularly advantageous in emerging countries and SME financing; and iv) important challenges remain for external SCF programs to achieve its potential (namely those related to risk appetite, technological support and industry specialization).

These findings lead to the following preliminary assumptions about relevant elements that should be present in SSCF programs: i) seek specialization by industry; ii) rely heavily on strong technological platforms; iii) count of a buyer’s driven strategy, whereby the buyer, who best knows its own supplier network and who should be most
interested in implementing a SSCF program, encourages its network of supplier to participate in the SSCF program. The next chapter shall explore these findings in more depth in order to outline the SSCF framework propositions.
CHAPTER 3
SUSTAINABLE SUPPLY CHAIN FINANCING: A FRAMEWORK

The objective of this chapter is to delineate the SSCF framework by presenting propositions about why and how FIs could be enhancers of sustainability along the supply chain. These propositions will be based on the integration of the existing theory reviewed in the three building blocks presented in Chapter 2, by identifying the common elements and contrasting the differences. The common elements serve as pillars to build the framework, which is complemented with logical deductions leading to the framework definition.

The potential practical implementation of the framework is illustrated in a hypothetical SSCF example based however on a real world supply chain case: Apple’s and the sustainability challenges it faces with its suppliers in China. Finally, based on the challenges identified in each of the theory building blocks, this chapter delineates potential difficulties to implement the SSCF framework, along with possible mitigants and further areas of research that could help elucidate some of the challenges presented.
SECTION 1

The Triple-T of Sustainable Supply chain financing

No matter whether the objective is to meet just in time standards, reduce carbon emissions or improve cash flow management, there is consensus that collaborative, transparent and aligned supply chains are more successful. Concepts such as teamwork, transparency, and traceability of incentives, increasingly resonate in supply chain related literature. They have become passwords to increased efficiency, better service, and enhanced revenues. What is more interesting is that the literature review exercise reveals that these are common themes in the three building blocks of this framework (SCM, SSC, and SCF). Let’s now summarize how these concepts interrelate and how they could be part of an integrated framework.

Teamwork

SCM theory perceives collaboration as a way to enhance revenues and provide better service by having different actors in the chain work together in the definition of processes and products. This is achieved mainly by including suppliers in the design process and by feeding data into the chain so that suppliers readjust rapidly to changes in the environment. SCM theory has progressively looked at collaboration with better eyes. In fact, in recent years SCM theory has veered from an approach of confront and competition, to a more inclusive approach that relies on the support of suppliers to build more responsive chains.

For SSC theory, collaboration resides at the heart of the greening process. In order to build more sustainable supply chains, corporations need to rely on the responsibility of
their suppliers to meet the necessary standards. Although some authors argue that audits and imposition add value to the process, most literature suggests that a collaborative approach is more effective. Teamwork in the field of SSC includes training, information, and communication.

Finally, SCF looks at collaboration as a way to enhance cash flow management efficiency in the supply chain. Teamwork is also naturally embedded in SCF processes. In fact, traditional SCF products such as factoring, rely on the premise that a buyer company is willing to give up part of its financial profit by shortening its accounts payables at the expense of providing some financial relieve to smaller suppliers to become financially healthier and stay in business.

Overall, all three theories coincide on the fact that supplier continuity is preferred over supplier competition. It is more valuable to help a good supplier meet the common goals than to hamper the process. Teamwork is also viewed as a way to attain enhanced adaptation, agility and resilience. Yet the approaches to teamwork differ in relation to the advancement of the concept. While in the field of SCM the idea of “orchestrated networks” started to gain momentum more recently, following the publications of the Fung brothers *Competing in a Flat World*, the SSC discipline developed with the collaboration concept embedded as a means to the greening process.

**Challenges to Teamwork**

Unequivocally, all three theories agree on the fact that building trust along the chain is a key ingredient to improved teamwork. And yet, it remains the biggest challenge. How to convince a corporate to make a supplier participant of a product redesign process
that could be potentially shared with other competitors? How to train suppliers’ managers in emerging countries on controversial issues such as gender salary fairness, or social discrimination? How to persuade a supplier to share their database of accounts receivables so that a joint system of electronic invoice payments can be implemented? Suggested solutions from the three fields of expertise hint at third party intermediaries as a way to build trust along the chain. Some SCM authors have pointed to third party distributors as controllers in the chain, especially in emerging countries, such as the case of Li&Fung company discussed in Chapter 2. Distributors would act as regulators in the chain, without being direct competitors to either supplier or buyers. The independence of distributors is therefore an important quality in trust building for collaboration. SSC approaches the questions on how to build trust by increasing communication and training, while SCF appeals to mutual efficiencies gains over time.

Integrating SMEs in the equation is also seen as a challenge related to increased collaboration. Less sophisticated inventory management systems in SCM, laxer environmental and social standards in SSC or lack of electronic invoice systems in SCF, increase the difficulties of working with SME suppliers. This is especially true in the case of SMEs operating in emerging countries environments.

Finally, and to a lesser extent, dealing with multilayer links in the chain is also identified as an additional difficulty to collaborate. This is particularly the case in the field of SSC where engaging with second and third tier suppliers to preserve the integrity of the entire supply chain becomes more relevant. In the fields of SCM and SCF, relationships are primarily held with first tier suppliers, which typically deal and are
responsible for issues related to the subsequent tiers in the chain such as in time delivery of goods or financial health of smaller suppliers.

Among the creative solutions to foster teamwork in supply chains, some authors have argued in favor of redefinition of partnerships such as the inclusion of third party players (alliances with governments, NGOs and other nontraditional actors), as well as rethinking the common terms of risks, costs and rewards, beyond the obvious patterns.

The preceding discussion on the benefits and challenges of collaboration, and the use of third party intermediaries to help build trust in the chain leads to the first proposition in the SSCF framework delineated by the authors of this research:

\[ P1. \text{Financial intermediaries, given their independence, access to products and services (the first type of flow in supply chains) along the different layers in the extended supply chain, could play the role of third party intermediaries to help rationalize resources when implementing a sustainable supply chain model.} \]

**Transparency**

Intimately related to collaboration, transparency is the second common element identified in all three theories. Either the purpose is to redesign a new product with stronger components, reduce water consumption among suppliers or have access to more favorable financing terms, relying on information about the type of materials used by suppliers, the kind of water supply facilities in sourcing countries, or the financing mechanism used by suppliers, becomes decisive.

Transparency is closely related to measurement. Increasing transparency in the chain is not only a matter of sharing raw data, but doing it in a meaningful way. This is where standardized quantitative and qualitative indicators come into play.
SCM has long dealt with process measurement. The sub-discipline of buyer-supplier relationships has recurred to qualitative indicators to measure the effectiveness of contacts with suppliers. Indicators related to socialization, communication, loyalty, etc. such as the ones exposed in Section 1 of Chapter 2, are common in SCM practices.

SSC theory still struggles with measuring the economic, social and environmental impacts of suppliers. However, progress has been made with regards to standardized sustainability reporting under the Global Reporting Initiative (GRI) framework. Although the specific guidelines for reporting on supply chain processes will not be published until 2013, the proven track record of GRI as an integrated reporting framework supports the possibility of becoming the reference framework for sustainable supply chain reporting.

Finally, SCF theory has consistently referred to two main indicators as drivers of effective supply chain cash flow management: Cash-Conversion-Cycle and working capital.

Overall, all three theories agree on the benefits of enhanced transparency as a means to more efficient processes in each of the disciplines. Among the mechanisms delineated in literature to facilitate more fluid data sharing, we find more socialization mechanisms, user-friendly questionnaires to report systematic data, or integration of IT systems when possible. There is consensus however that no matter how the data sharing processes are organized, the willingness to report reverts to the level of existing trust in the chain.

**Challenges to Transparency**

Harmonization of data is a common challenge identified in studied literature. Buyers can define indicators to report on, but indicators do not necessarily guarantee the quality
of the data or the precision of the calculation. The data quality control becomes a critical task that demands a significant amount of resources.

The two other challenges associated to transparency are common to those related to increased collaboration: SMEs’ poor information management systems and dealing with the extended supply chain.

SMEs typically have less sophisticated management information systems. SME related information is not as much an issue of accessibility as it is to quality control.

Finally, buyers face up the added difficulty that most existing Enterprise Resource Planning systems are not usually prepared to manage information on suppliers beyond the first tier, which hinders the transparency of the extended supply chain. Overcoming these difficulties requires thought and investment.

The preceding discussion on the benefits and challenges of transparency, including the need to harmonize and trace data, and deal with less sophisticated providers leads to the second proposition in the SSCF framework delineated by the authors of this research:

**P2. Financial intermediaries, given their access to information (the second type of flow in supply chains) along the different layers in the extended supply chain, could provide information management services for corporations to monitor the sustainability performance of all the actors in their extended supply chains, by ensuring the standardization and quality reporting of relevant measurement indicators.**

**Traceability**

Supply chains that have well-structured and traceable incentives are more effective in achieving their strategy goals. This is common understanding in the three theories
analyzed. Right incentives often translate into having a winning situation for all parties involved.

In SCM theory, well-designed monetary incentives might be the driver for loyal suppliers to provide in time quality products, usually in competition with other buyers. Incentives in SCM are especially relevant when information does not flow smoothly in the chain or competition is fierce.

SSC theory adopts a less contentious approach and argues for the use of incentives to motivate suppliers to become compliant with sustainability matters, irrespective of competition. Typically, a sustainability support program for suppliers is an incentive in and of itself as it helps suppliers become more competitive and reliable companies for other buyers as well. Although this indirectly helps competitors, SCM literature argues that benefits overcome the costs.

Finally, SCF theory sees incentives as an integral piece of the business model. Fund providers generally offer more favorable conditions to clients who generate more business opportunities and who have lower credit risk. The prospect of accessing reduced financing costs triggers in borrowers a more responsible approach in their credit and financial management.

Challenges to aligning and tracing incentives

Challenges identified to implement effective incentive programs are similar to difficulties common to previous areas; concretely, reduced transparency in the chain, lack of trust and dealing with SME higher credit risk.
When buyers do not have access to information beyond their first tier suppliers, understanding the business drivers that would affect suppliers’ performance becomes harder. So it does incentivizing suppliers to perform.

Likewise, when information is misaligned and some companies have knowledge that others in the chain don’t, a lack of trust develops. In these cases, the use of intermediaries to infuse confidence among supply chain partners could be a solution.

Finally, offering better financing terms through monetary incentives sometimes conflicts with a higher interest rate to compensate for taking SMEs’ arguably higher credit risk. This is why as we move forward on more distant links in the chain, access to finance for smaller suppliers becomes more difficult. Smaller buyers cannot rely easily on extended payment terms, neither are they able to offer delayed payments when they are sellers. Furthermore, analyzing the credit worthiness of more informal companies, whose financial data is not readily available and whose financial statements are not always audited, becomes more art than science. In these cases, the role of a specialized third party fund provider with the internal expertise to analyze credit risks might be a suitable solution to influx liquidity in the chain.

The preceding discussion about the benefits and challenges of structuring a traceable incentive program, including the need to rely on reliable information, and have independent and specialized incentives providers leads to the third proposition in the SSCF framework delineated by the authors of this research:

*P3. Financial intermediaries, given their access to financial resources (the third type of flow in supply chains) and their role as third party fund providers in different tiers*
in supply chain, could offer incentive-based financing to promote the adoption of sustainable business practices along the chain.

**The Logical Deduction of the Framework**

The SSCF framework propositions are deducted from the combination of two foundational premises outlined by the authors of this research:

- The three common areas identified in the three theory building blocks (*the triple-T characteristics of the SSCF framework*): teamwork, transparency and traceability.

- The access that FIs have to the three types of flows present in every supply chain: products and services, information and financial resources.

**Table 2. The logical deduction of the SSCF framework**

<table>
<thead>
<tr>
<th>Theory Foundation</th>
<th>Supply Chain Flows</th>
<th>SSCF Model Proposition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teamwork</td>
<td>Products and Services</td>
<td>Resource Rationalization</td>
</tr>
<tr>
<td>Transparency</td>
<td>Information</td>
<td>Information Transparency</td>
</tr>
<tr>
<td>Traceability</td>
<td>Financial</td>
<td>Alignment of Incentives</td>
</tr>
</tbody>
</table>

*Source: Authors.*

Moreover, these two premises are also related to each other: more collaboration and teamwork are related to the effective use of products and services; transparency in the chain is related to the type of information that flows through that chain; while traceability of incentives is directly related to the cash flows and financial resources managed by the actors in the chain. This relationship derives into the SSCF framework as showed in figure 7.
Figure 7. The SSCF framework pillars. Source: Authors.
SECTION 2

The Sustainable Supply Chain Financing Framework in Practice

“Two years ago, 137 workers at an Apple supplier in eastern China were injured after they were ordered to use a poisonous chemical to clean iPhone screens. Within seven months last year, two explosions at iPad factories, including in Chengdu, killed four people and injured 77” (Duhigg and Barboza 2012). With these words, the New York Times alerted in its January 2012 article “In China, Human Costs Are Built Into an iPad” about human rights incompliances in Apple’s supply chain. In public declarations after these events, Apple’s insiders tried to justify the efforts that the most celebrated company in the world is making to address suppliers’ incompliances, such as Apple’s code of conduct and regular audits. Yet, the New York Times article pinned on one of the unresolved issues in supply chain sustainability: potential conflicts between business targets and business responsibility. “Some former Apple executives say there is an unresolved tension within the company: executives want to improve conditions within factories, but that dedication falters when it conflicts with crucial supplier relationships or the fast delivery of new products,” the New York Times reports.

This conflict of interest could be mitigated by the use of incentives. Apple suppliers will only make real efforts to address human rights issues when they get compensated for it. Fines and banning would not make it alone. Furthermore, Apple’s executives were only referring to solving the issues related to first tiers suppliers. Apple published for the first time a list of its main suppliers in 2012 and reported several cases of incompliances with the supplier’s code of conduct, which Apple claimed were being resolved.
Arguably, smaller, less sophisticated and more remote suppliers could hide higher environmental and social risks. And yet, what happens behind Apple’s first tier suppliers remains a mystery that could soon explode on Apple’s hands. So what are Apple’s alternatives to deal with this situation?

What follows is an illustration of how FIs could be an alternative to help Apple implement a robust sustainable supply chain program that deals with the extended supply chain, harmonizes information from all suppliers, and offers the right incentives while maintaining the chain financially healthy. Let’s explore how the SSCF framework could be put into practice in the case of Apple's supply chain.

**The Apple Inc. Business Case**

Effective sustainable supply chain programs are buyer driven. Thus, the primary impulse and driver to implement a SSCF model should come from Apple.

On the first stage of the SSCF model, Apple contacts a FI with local presence in the markets where Apple’s suppliers operate, for instance Citibank. Most global FIs already have in place SCF programs whereby they discount invoices from buyer large corporations to advance liquidity to seller suppliers. Apple makes an agreement with its supplier base to use the financial services of Citibank. It is in the interest of Citibank to have exclusivity with a buyer to operate as the fund provider of choice for its suppliers. Up to this point, nothing new from regular supply chain financing programs, besides the exclusivity to work with a specific FI. Citibank uses a traditional factoring product, taking credit risk of Apple, and advancing liquidity to its suppliers.
The novelty resides in that under the SSCF model, Citibank not only gathers customary data from Apple’s suppliers such as inventory turnover, cash conversion cycle, and other financial variables, but also, data on the suppliers’ sustainability compliance.

For the purpose of easiness, information is gathered following the standardized sustainability indicators defined by the GRI. Apple has agreed with its suppliers that Citibank will share the data related to sustainability performance. This is the first and critical new aspect of the SSCF model: transparency enhancement by providing access to sustainability information.

Citibank implements a monetary incentive program embedded in the factoring product offered to suppliers. The structure is simple: the more sustainable, the better interest rates. In factoring programs, FIs usually advance cash at around 70% of the value of the invoice, and only once the corporate buyer pays the invoice on time, the seller receives the remaining 30% from the FI, less interest and service fees. Under the SSCF model, upon verification of progress in meeting sustainability standards, Citibank could reduce the fees charged to the supplier. The levels of interest rate and fee discounts associated to sustainability standards based on ratings should be transparent and comprehensible to all. This is the second critical new aspect of the SSCF model: provision and traceability of incentives to enhance the sustainability adoption process.

On a second stage, and once Citibank becomes familiarized with Apple’s first tier suppliers, the model is extended to second tier suppliers. The mechanics are similar. Each supplier makes an agreement with its first tier suppliers to use the financial services of Citibank. In this case, Citibank would be taking credit risk of Apple’s first tier supplier,
with whom it would have become acquainted during the first stage of the model. Citibank gathers data on sustainability performance about Apple’s second tier suppliers that sends it to both, Apple and its first tier suppliers. Likewise, it offers incentives to second tier suppliers linked to improvement in their sustainability management practices.

On a third stage, by having access to a more extended base of clients, Citibank can develop a wide database of best practices, sectorial and regional knowledge to develop training materials, technical assistance and other kind of auxiliary business that could facilitate the sustainability enhancement process. Likewise, by overseeing the process along the entire chain, Citibank can play an important standardization role. Furthermore, since Citibank already performs due diligence visits and has the direct on-site relationship with the borrowers, the cost of adding the sustainability supervision is reduced with regards to an external audit performed on a standalone basis. In sum, the synergies and efficiencies attained with the presence of an FI such as Citibank that oversees the entire process, standardizes policies and harmonizes data, represent the third critical new aspect of the SSCF model: the rationalization of resources through teamwork.

**The SSCF Framework, an Illustration**

Figure 8 represents the SSCF model process. Each symbol is tinted in the color of the tier of suppliers it refers to. Let’s take the example of the manufactured iPad coming from China (first tier supplier tinted in orange). Apple orders the iPads (the goods) and makes an agreement with the Chinese supplier to exclusively use Citibank as their fund provider. They also agree that Citibank will not only provide them with the traditional factoring services (invoice discounting), but it will also be their contact point with
regards to sustainability matters. This includes guiding them on how to meet sustainability standards, gathering sustainability performance information from them in a standardized manner, sharing it with Apple, and finally, providing them with better financing conditions when progress is made.

Once the program starts, the Chinese supplier provides Citibank with the invoice issued to Apple to purchase iPads (invoice symbol tinted in green in reference to Apple), and delivers the iPads to Apple (goods symbol tinted in orange in reference to the first tier Chinese supplier which produced the goods). In the SSCF model, Citibank would use its factoring product to discount (advance cash) to the supplier upon the presentation of invoices. This advancement of cash would be linked to incentives to improve the sustainability compliance process (cash incentive symbol colored in green to reference that the cash advancement is in relation to Apple’s purchases).

Before Citibank discounts Apple’s invoices, the Chinese supplier has to provide Citibank with information related to its sustainability activities (information symbol colored in orange in reference to the Chinese supplier). Citibank Chinese branch, as part of its due diligence process and analysis, performs on-site visits to the Chinese supplier to validate the information provided and offer guidance in the process. On the invoice due date, Apple makes the payment of the invoice directly to Citibank (money symbol colored in orange).

Finally, upon the reception of the invoice payment from Apple, Citibank provides Apple with the information related to the sustainability performance of the Chinese supplier (information symbol colored in orange).
The same process is extended to second tier suppliers once Citibank becomes acquainted with the credit risk of the first tier Chinese supplier, and so forth with subsequent links in the chain (the same color codes apply).

Products and services

Information on sustainability performance

Payment of invoices on due date

Invoices

Discounted invoices payment advanced with monetary incentives for improving sustainability practices

Goods ordered and request to use Citibank’s services

Citibank’s global electronic database on credit risk and sustainability items

Figure 8. The SSCF framework in practice. Source: Authors.
SECTION 3
Benefits and Further Research

Synergies Creation and Benefits of the SSCF Framework

The creation of synergies in the model resides on the leverage exercised upon the already existing FI’s branch and technological network. FI’s local network of branches serves as a platform to oversee the supply chain greening process relying on the already existing local expertise and staffing. When analyzing the credit worthiness of a subject, FIs engage in a wide array of activities that might include on-site visits, information quality verification or even indirect coaching about how to manage the business. Increasingly more FIs are implementing environmental and social management systems consisting on specific questionnaires and sustainability related items to be checked as part of regular credit due diligence.

As analyzed in previous chapters, sustainability risks are increasingly perceived by FIs as factors that deteriorate credit quality. Therefore, the added sustainability analysis would be complementary to the work already done by FIs. Moreover, the cost of adding more targeted sustainability compliance verification to the traditional FI credit analysis would be arguably lower than organizing specific sole-purpose social and environmental audits. The synergies are therefore many.

Overall, all three main actors benefit from the model. The following chart summarizes the potential benefits to buyers, suppliers and FIs.
Table 3. The SSCF framework benefits

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<th>Benefits for buyers</th>
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<td>Control the</td>
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<td>crisis.</td>
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Source: Authors.

Additional Considerations for Further Research

The challenges observed in the each of the three theory building blocks provide guidance with regards to further considerations for the SSCF framework. These challenges can also guide future research in relation to the functionality of the model. The following paragraphs identify potential challenges for the implementation of the SSCF framework, alternative mitigants and further areas of research related to each item.
Driver from buyers

SSC research has concluded that successful SSC programs are driven by large buyers, which are typically under more public scrutiny with regards to the sustainability of their practices. This leads to deduct that a potential factor for the success of SSCF models should be the clear commitment and impulse from the corporation at the end of the chain. This means that corporate buyers should not only agree with their suppliers to use the services of the specific FI, but they should also keep all suppliers in check with regards to their commitment to the program by using their purchasing power in the chain to exercise pressure. This is what we referred to as “the leverage effect of supply chains” in Section 2 of Chapter 1. A topic for further research is the motivation mechanisms that smaller buyers at the end of supply chains have to implement similar programs even when they are not exposed to the same level of public eye inquiry and more importantly, they do not have the purchasing power to influence relations with suppliers.

Robust technology platforms

SCF theory sheds light on the fact that many traditional SCF programs fail or are unable to reach scale due to the lack of robust technology. One of the acuter challenges resides in the difficulties to integrate systems from different companies, especially those related to electronic invoice management and payments. Moreover, the less sophisticated the company is, the more difficult the integration. As identified in Section 2 of Chapter 2, many FIs still struggle with the implementation of global supply chain financing programs. Robust technology platforms should be a requisite for the subsequent implementation of SSCF models. Once the technological platform is in place, adding the
sustainability component to the information management system should imply an upgrade.

A potential alternative to the global SSCF model until FIs resolve the challenge of technology integration would be to apply the model on a country level first before expanding to truly global supply chains with worldwide dispersed suppliers. Further research on SCF technology challenges would certainly help to shed light on this topic.

Industry and regional expertise

SSC theory suggests that supply chain sustainability programs might require of sectorial expertise; especially with regards to environmental management (i.e. plastic manufacturers’ environmental risks might differ from those in the apparel industry). Likewise, regional specific expertise might be required with regards to social risks such as labor related regulations, which are different from country to country. FIs, especially those with local presence, should know well the regulatory context of their countries of operation, which gives them an advantage over other third parties unfamiliar with those markets. Moreover, those FIs already using environmental and social management systems as part of the credit analysis are certainly in an advantageous position with regards to sectorial sustainability management expertise. Nonetheless, a clear challenge to the success of the model resides in the commitment from FIs. Despite of the progress made they have done in recent years, dealing with sustainability is not their natural comfort zone.

The SSCF model would entail FI’s research and development resources for the new product design, with implications in talent recruitment as well as knowledge
management. A potential area of research would be an analysis of the level of development in the financial industry with regards to sustainability related expertise and the specific challenges that FIs could face to upgrade their current environmental and social management systems to more sophisticated SSCF products.

Credit risk

As the SSCF model is expanded towards farer away links in the chain, FIs need to fund smaller suppliers. This might be a challenge for more conservative FIs whose main area of expertise are large corporates and not necessarily SMEs. SCF products such as factoring have the built-in advantage of relying on the repayment capacity of the larger buyer first (in the example above, Citibank takes Apple’s credit risk in the first stage of the project, and it only starts taking first tier supplier’s risk, once the program moves to discount invoices to second tier suppliers after Citibank becomes familiar and comfortable with the modus operandi of the first tier Chinese supplier). However, chances are that smaller suppliers are never ready to meet the credit standards required by FIs. In those cases, other credit enhancement mechanisms should be put into place such as for instance, having credit recourse to the larger buyer at the end of the chain, or demanding additional credit guarantees such as real assets collateral. A potential area of research to gauge the implications of this challenge could be an analysis of smaller producers’ access to credit in emerging countries and the identification of further mechanisms to facilitate the influx of liquidity in more distant layers of supply chains.
SMEs’ lack of sophistication

A common challenge to all three building theories, SMEs’ lesser sophistication might also imply delays and difficulties in the SSCF processes, from technology integration, to harmonization of policies. Related to the previous item, those FIs with experience working with smaller companies would also have an advantage in integrating SMEs in the process. As suggested in some SSC SME related literature, cluster working groups, training events and best practices knowledge sharing might also be helpful. FIs that have access to all the contacts in the chain, might be in a good position to facilitate business relations and opportunities among different client companies by organizing sustainability conferences, training events, or web based community marketplaces or workshops to share experiences and best practices. These could be additional value added services that could also work in the benefit of the FI as brand value enhancement and cross-selling opportunities. Research on previous experiences of value added services in the financial industry could also provide guidance on the usefulness and functionality of these kinds of networking activities.
CHAPTER 4

SSCF IN CONTEXT: THE BRAZILIAN CASE

In Chapter 4 we will study a hypothetical example of how the SSCF framework could be potentially implemented. We have chosen Brazil due to: i) its relatively well-developed infrastructure and legal framework for an efficient management of supply chains; ii) the importance that sustainability aspects are acquiring in the context of Brazil’s economic development; and iii) the active role that FIs have in financing local and international supply chains in Brazil. These characteristics make Brazil a good candidate to gather primary source information about opportunities and challenges to implement a SSCF strategy in an applied context.

Banks in Brazil have been historically specialized in domestic SCF, providing short term financing mainly in the form of factoring (“desconto de duplicatas”) or trade finance products that provide liquidity to import and export companies operating in global supply chains. The adoption of sustainable business practices is relatively advanced in Brazil in comparison to other emerging economies. Some of these banks such as Banco Industrial e Comercial (BicBanco) or Banco Itau have consistently ranked high in sustainability surveys due to their implementation of environmental and social management systems as part of their core business credit analysis.6 Furthermore, one of the national credit bureaus (Serasa-Experian) recently started a project to collect data on the sustainability performance of banks’ clients. In June 2011, Petrobras, the large national oil company,

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6 The 2010 6th edition of the annual ranking in sustainability, social responsibility and corporate governance by Management & Excellence published in LatinFinance magazine ranked BicBanco as the most sustainable mid-cap FI in Brazil and the third in Latin America.
launched the supply chain financing program Progedir in partnership with six Brazilian banks to foster a favorable environment for the provision of credit backed by future receivables under contracts with supply chain participants. This chapter will examine these initiatives to gather insights about the potential implementation of the SSCF framework.

Section 1 studies the elements present in the Brazilian context that could favor or hamper the implementation of the SSCF framework. It analyzes how Brazilian companies have increasingly paid more attention to sustainability aspects but how addressing sustainability in the extended supply chain still remains a challenge. It also reviews some concrete initiatives that could set up the infrastructure to implement the framework.

Section 2 describes the outcomes from in-depth interviews carried out with two mid-size local Brazilian FIs with regards to their practices integrating sustainability aspects in their credit risks analysis and financing their extended supply chains.

Finally, Section 3 summarizes the findings, identifies the elements necessary to fully implement the SSCF framework in the Brazilian context and highlights the challenges for further steps.
SECTION 1

The Brazilian Context

Uniquely amongst emerging economies, Brazil has been in the avant-garde of sustainability matters for nearly a decade. In 2001, Bovespa, the Sao Paolo stock exchange, created the corporate governance focused listing segment called Novo Mercado, which raised the corporate governance standards bar higher than in most peer economies. That same year, former Banco Real, nowadays Banco Santander launched Brazil’s first socially responsible investment (SRI) mutual fund, Fundo Ethical, at a time when most developed economies were only starting to discover the term (IFC 2009). But the real breakthrough arrived in 2005 when Bovespa launched the Corporate Sustainability Index (ISE), along the lines of the Dow Jones Sustainability Index in the US or the UK FTSE4Good Index Series in the UK. The ISE was the first of its kind in Latin America, and was designed to create an investment environment with high standards of sustainability in Brazilian companies, encourage them to be good corporate citizens and trigger demonstration effects.

The ISE is a tool for comparative analysis of the performance of the companies listed on M&FBovespa from the standpoint of corporate sustainability, based on economic efficiency, environmental equilibrium, social justice and corporate governance. It also enhances public understanding of companies and groups committed to sustainability, differentiating them in terms of quality, level of commitment to sustainable development, equity, transparency and accountability, and the nature of their products, as well as business performance in the economic, financial, social, environmental and climate change dimensions. (ISE 2012a)

Voluntary non-financial reporting by Brazilian companies is also quite strong when compared to that in large emerging economies such as India or China. About 60% of
companies in the IBovepa, the main Sao Paolo Stock Exchange index equivalent to the Dow Jones or S&P500 in the US, publish sustainability reports, based on international good practice guidelines such as those issued by the Global Reporting Initiative (IFC 2009).

This trend is also driven by an additional external force: end consumers. According to a survey by the Brazilian Ministry of Environment and IBGE – Instituto Brasileiro de Geografia e Estatística (Brazilian Institute of Geography and Statistics) – the role of conscious consumers is significant. In 2001, 44% of consumers bought products in recyclable packages, 36% preferred environmentally friendly products, 81% indicated motivation to buy ecologically responsible products and 73% claimed motivation to buy an organic product. These numbers show that increasingly more Brazilian consumers use their purchasing power as a way to engage with economic, social, environmental responsibility (UNIDO 2005).

**Sustainable Supply Chains in Brazil: still Way to Go**

In the light of these numbers, one can conclude that Brazilian large companies are indeed making efforts to address sustainability conscious consumers´ concerns. However, when it comes to smaller companies unexposed to public scrutiny, the story changes. All of the 160 GRI based sustainability reports published yearly in Brazil belong to mid-size or large companies and none of them deals with sustainability in the extended supply chain.

For instance, Petrobras-Petróleo-Brasil S.A. (Petrobras), the government-owned oil company and tenth largest company in the world per market value (US$180 billion
worth) according to Forbes (2012), has consistently published an annual sustainability report over a hundred pages long. There is only a two hundred word section entitled “Supplier Management,” which deals mostly with Petrobras’ efforts to engage with local suppliers for employment generation. “We seek to generate income and jobs for people living near our operations, and endeavor to strengthen relationships with local suppliers, promoting professional qualification initiatives and efforts to insert small and medium enterprises into the industry’s production network” (Petrobras 2010). The only concrete mention to addressing sustainability issues in the supply chain is a general commentary on Petrobras’ efforts to train supplier on social responsibility. “Petrobras’ internal actions to implement the ISO 26000 guidelines include qualifying workforce through specific training courses on the issues covered by the standard to be held at Petrobras University, and providing training in social responsibility to suppliers” (Petrobras 2010). However, no specific action is cited on how the trainings are performed or the number of supplier benefited from this training.

The literature in the field of supply chain sustainability in Brazil is not optimistic either. In 2009, Jabbour and Jabbour studied whether Brazilian companies were adopting environmental requirements in the supplier selection process. They performed five in-depth case studies with large Brazilian industrial companies. Based on the cases, they concluded that “companies still use traditional criteria to select suppliers, such as quality and cost, and do not adopt environmental requirements in the supplier selection process in a uniform manner.” They also found that the experience on environmental management and the depth with which companies adopt environmental criteria were
positively correlated. Based on these results, the authors outlined three hypotheses relevant for this research:

H1. The stage of business environmental management relates positively to the level of insertion of environmental criteria in the supplier selection process.
H2. The greater environmental performance of products relates positively with the greater environmental performance of suppliers.
H3. The availability of environmental information on suppliers relates positively with the possibility to select suppliers with high environmental performance.
(Jabbour and Jabbour, 2009)

These findings related to the Brazilian context are aligned with the general consensus highlighted in previous chapters about the importance of having a strong commitment from large corporates with purchasing power at the end of the supply chain to leverage their influence in order to promote higher sustainability standards among their suppliers.

**How Are Brazilian Companies Engaging with Suppliers? The Case of Petrobras**

So what are Brazilian companies doing to engage with their suppliers, besides the statements in their sustainability reports? In one of the “HARDTalk” series from the British BBC News, Petrobras CEO, Gabrielli de Azevedo, argued that Petrobras takes sustainability seriously, and that fuel produced from substandard labor practices does not make it into their supply chain. The way Petrobras commits to this statement is by relying on the government published “black list” of companies denounced to have violated the labor regulations. If Petrobras’ suppliers become part of the list, they are banned from working with Petrobras. However, Gabrielli de Azevedo did not address how Petrobras deals with potential flaws in the methodology such as delays in government audits or lack of first hand verification and understanding of suppliers’ modus operandi (BBC News 2009).
In July 2005, Petrobras implemented a supplier’s online portal in which first tier suppliers need to register to become part of Petrobras’ supply chain. The online registration includes a “security, environmental and health system” (SMS, as the Portuguese acronym), which requires supplies to provide information about their sustainability risk management and performance. Petrobras’ website states that the SMS implementation strategy is based on a two-step approach. “Due to the volume and complexity to implement all requirements, decided to implement the SMS program in an increasing and secure manner, establishing priorities and minimum requirements, which shall increase over time along with experience, targeting outstanding levels in the future ” (Petrobras 2012).

During the first stage, Petrobras will only gather and analyze sustainability related information from its suppliers. During a future second stage, Petrobras shall establish minimum requirements for suppliers and possibly, other incentives, which are yet to be defined. Petrobras has developed a simple sustainability classification for suppliers based on the degree of implementation of environmental policies (not social policies yet). The system has the following scale: zero (the supplier does not have an environmental policy), three (the supplier has an environmental policy), five (the supplier has and promotes an environmental policy thorough all levels in the organization), seven (the supplier has, promotes and implements an environmental policy thorough all levels in the organization), nine (the supplier has, promotes, implements and systematically evaluates an environmental policy thorough all levels in the organization), and ten (the supplier has an external environmental certification).
A comparative analysis of Petrobras’ SMS system with those of other peer corporates in terms of size, such as Walmart’s Sustainability Scorecard analyzed in Chapter 1, leads to conclude that Petrobras’ SMS system: i) is still on a very incipient stage of development; ii) lacks comprehensiveness with regards to other aspects of sustainability such as social and governance issues, beyond simply environmental aspects; iii) contemplates exclusively qualitative aspects, which might be subject to subjective interpretation; and iv) relies on self-reported information with no additional verification, even on a sample basis, such as that performed by Walmart. Additionally, Petrobras does not provide any guidance vis-à-vis the timing to move towards the second stage of the SMS implementation plan, despite the fact that the tool was first launched over seven years ago. A hypothesis that could explain the delays the implementation might be the difficulties associated to the onsite verification of the self-reported information. In contrast, Walmart claims in its corporate website that it has set the target of having “complete audits for 100% of factories supplying direct-import, private-label and non-branded merchandise for all retail markets by January, 2012” (Walmart 2012b). As of January 2012, Walmart had reached 96% completion, while Petrobras did not have targets set up yet.

Despite the lack of an active sustainability program to deal with its more than 5,700 suppliers, Petrobras is taking however leap steps towards managing its financial extended supply chain. In 2010, Petrobras launched Progredir, an online platform to provide funding to Petrobras’ suppliers through a network of local banks, using Petrobras’ guaranteed invoices. The operative is based on a simple online factoring system: each
supplier registers in the online platform and presents to the network of Petrobras’ preapproved banks, the invoices issued to Petrobras in exchange of good and services. Banks then present their respective offers to advance funds to the supplier, under the same mechanism of traditional factoring. The settlement of the transaction is done online.

Two concrete features make the Progredir program particularly interesting for future upgrades in the context of implementation of the SSCF framework. One is that, unlike traditional factoring programs whereby the FI usually has 100% recourse to the large corporate seller, in Progredir, Petrobras only guarantees up to 50% of the supplier-issued invoices. This means that the FI takes direct credit risk of the smaller supplier from the first iteration of the factoring process. The second feature is that Petrobras also guarantees up to 50% of the invoices issued by suppliers placed in up to the fourth tier of the supply chain. This feature is of particular importance to promote access to credit to smaller suppliers. As explained in Section 2 of Chapter 2, FIs tend to hesitate when moving towards farer away links in the chain as they are increasingly exposed to credit risks from smaller and therefore, arguably weaker companies. Having a large strong corporate such as Petrobras guaranteeing half of the credit risk of suppliers in the fourth link of the chain, offers additional comfort to FIs to finance smaller companies that would not have had access to credit otherwise. This also allows Petrobras to have enhanced control and information about the financial health of its extended supply chain.

What Progredir lacks however is information related to suppliers ‘sustainability performance in order to have a comprehensive picture of the risks hidden in its supply chain. In fact, FIs gather exclusively financial information, which is then passed to
Petrobras. FIs play the role of information transparency enhancers only with regards to the financial health of the supply chain. The program has already established the technological infrastructure to gather information from suppliers and the FIs are already playing the intermediation role to facilitate information. Arguably, this infrastructure could be leveraged to gather information on sustainability aspects, beyond simply financial ones.

But are Brazilian FIs ready to gather sustainability-related information? In the next section, we will explore what Brazilian FIs are doing to address this aspect based on the interviews carried out with two mid-size Brazilian banks.
SECTION 2
Field Interviews with Brazilian Financial Institutions

Brazilian FIs typically rank high in the regional sustainability rankings. Five of the fourteen Latin American FIs that invest more in sustainability are Brazilian, according to the second edition of the Sustainability ranking for Latin American FIs arranged by the consultancy Management & Excellence (M&E) and the American magazine *Latin Finance* (Latin Finance 2011). Five Brazilian banks (Banco Bradesco, Bicbanco, Itau, Itau Unibanco, and Banco Santander Brazil) are present in the above mentioned ISE index, which has actually outperformed its traditional benchmark, the IBOvespa (ISE 2012b).

So what are Brazilian FIs doing concretely to address sustainability? To find it out, we carried out in-depth interviews with two Brazilian mid-size banks, whose traditional niches are Brazilian SMEs. The larger one, with US$10 billion in assets, is part the ISE Bovespa, while the smaller one, with US$2.5 billion in assets, is not.

Both banks are receiving funding from multilateral development banks, which require as part of their policies, the implementation of an Environmental and Social Management System (ESMS). The ESMS establishes the policies, procedures and workflows that will be followed for investments made by the two banks. The ESMS is composed of several questionnaires that are applied by loan officers to borrower clients when performing the borrowers’ credit risk assessment. Therefore, these questionnaires are applied in a systematic manner along with other financial analysis traditional assessment tools. Both banks confirmed that the information gathered as part of the ESMS is uploaded into a
management information system, which is perfectly integrated through an interface with
the general bank-wide loan tracking system. As a result, the credit risk of potential
borrowers is analyzed in a comprehensive manner, including both financial information
and sustainability risks and performance information.

The length of the ESMS questionnaires depends on the borrower size. Larger
companies are required to provide more detailed and comprehensive information; for
instance, suppliers with up to US$15 million in annual revenues are required to provide
information mainly related to environmental and social local regulation compliance.
Companies with annual revenues above the US$15 million threshold are required to
provide additional information including environmental aspects such as whether the
companies complies with international certification like ISO 14001, social aspects such
as whether the company has an internal accident prevention committee, or whether the
work areas have proper bathrooms and drinkable water supply.

With regards to the number of links financed in the chain, both banks confirmed that
they are currently financing only up to the second link. Coincidentally, one of the two
banks recently joined Petrobras’ Progredir platform. This bank confirmed that Progredir
would allow them to finance up to the fourth link in the chain; they had not done so
before due to credit risk concerns. This confirms the effectiveness of the Progredir
program incentivizing FIs to provide access to funding farer away links in the chain,
thanks to the additional credit comfort offered by the large buyer by covering up to 50%
of credit risk of indirect suppliers. By becoming part of the Progredir program, this bank
also benefited from improved relations with the largest Brazilian company and from accessing a new market segment that it would not have accessed otherwise.

Both banks considered negative sustainability performance as a detriment to credit quality. Borrowers with very poor sustainability performance or major environmental or social policy incompliances are denied credit. According to the ESMS policy, if sustainability incompliances are found in an already existing portfolio, both banks would attempt to put into practice on a best effort basis, a corrective action plan, consisting on predefined remedies to be implemented by the borrower with the supervision of the bank. If after a certain time, the corrective targets are not met, those borrowers are denied credit and excluded from the portfolio. This confirms that both banks, even if not staffed with personnel that would proactively seek to improve the sustainability performance of their loan portfolio, they do count however on expert teams to guide borrowers on remedying sustainability incompliances in order to mitigate the potential negative transfer to credit risks and eventual defaults.

Both banks also confirmed that larger buyer companies at the end of the supply chain are increasingly requiring higher sustainability standards from their suppliers. However, companies, including the large ones such as Petrobras, are not demanding specific information on their suppliers yet. As a matter of fact, interviews confirmed that despite the fact that banks are gathering important amounts of financial and sustainability related information about suppliers, this information remains as proprietary to the banks and does not flow from company to company. There is however, an external system that is currently gathering public information on sustainability performance of Brazilian
companies: the credit bureau Serasa-Experian, the new product line of one of the largest private credit bureaus operating in the country.

Serasa-Experian developed in 2010 a pilot project to gather information from Brazilian companies on their sustainability performance. As a credit bureau, Serasa-Experian is consulted by all kinds of lenders as a complementary credit assessment tool to analyze the credit worthiness of a borrower. During the first phase of the sustainability pilot project, Serasa-Experian relied on the information provided by the FIs which were already gathering this kind of information as part of their respective ESMS, such as the FIs interviewed for this research. During the second stage of the pilot, Brazilian companies started to report directly to the credit bureau on their sustainability performance. Both interviewed banks confirmed that they are using this service as a complementary tool to further assess the sustainability performance of their potential and current borrowers.

Finally, both banks confirmed that they are not currently providing financial incentives to companies to improve their sustainability performance. They are nonetheless offering better financial conditions to those borrowers with a good track-record and better credit ratings. That means that if sustainability-related risks are arguably a comprehensive part of the total credit risk of a borrower, banks are indirectly factoring in sustainability performance as part of their financial conditions. In sum, although not done explicitly yet, both banks agreed that developing an incentive-based program to improve sustainability performance among borrowers, should not be difficult.
SECTION 3

Findings

The analysis of the Brazilian context in the previous two sections leads to conclude that Brazil already has the technological and methodological infrastructure in place that could be leveraged to put in practice the SSCF model. The field research led to conclude that three concrete key elements are present: i) the increasing public and corporate consensus about the importance of managing sustainability risks in supply chains; ii) the driver from larger corporate buyers such as Petrobras, which has already developed an online platform to finance the extended supply chain (Progredir); and iii) the advancement of Brazilian FIs in identifying and factoring in sustainability risks as an integral part of their credit analysis.

The SSCF Framework Pillars

Following the three main pillars of the SSCF framework portrayed in Chapter 3, let’s now analyze how the already existing infrastructure in Brazil could be enhanced and what elements are still missing for full SSCF framework implementation.

Teamwork and Resource Rationalization

Brazilian FIs are already performing the on-site supplier verification process that it is costly and cumbersome to be performed by large corporate buyers such as Petrobras due to the large number of suppliers. FIs are already working with their borrowers to implement corrective action plans when sustainability incompliances are present. FIs are also gathering and tracking sustainability related information integrated with other credit risk factors, which could be useful for large buyers.
**Potential SSCF upgrades.** In order to fully benefit from resource rationalization by FIs, some enhancements would need to be done with regards to the training of FIs’ internal staff; for instance, FIs’ personnel could not only coach incompliant borrowers on remediation plans, but also, actively engage with suppliers to promote better social, environmental and economic policies in their practices. This way, the efforts related to supplier sustainability trainings that Petrobras is already implementing among a selected group of suppliers (as per Petrobras’ Sustainability Report), could be enhanced and scaled up.

**Transparency of Information**

FIs are already playing the role of information transparency enhancers with regards to financial information by having contact with up to the fourth link in the chain. Furthermore, the Progredir online platform provides the technological infrastructure to facilitate the information exchange and monitoring of the extended supply chain. Likewise, tools like the Serasa-Experian database add supplemental transparency to the process.

**Potential SSCF upgrades.** In order to fully benefit from information transparency by FIs in the context of the SSCF framework, Petrobras should also demand the FIs participating in the Progredir program, information related to the sustainability performance of its suppliers. Since FIs are already gathering this kind of information, making it available to Petrobras with the consent of the suppliers, in exchange of a fee, should be beneficial to all parties involved.
Traceability and Alignment of Incentives

In an informal and indirect way, FIs are already penalizing sustainability incompetent suppliers by denying access to credit. Likewise, FIs are also offering better financial conditions to those suppliers with less credit risk. These incentives are not however structured in a formal program whereby suppliers would know upfront which levels of sustainability standards they should meet in order to benefit from better financial conditions in their access to FIs’ funding.

Potential SSCF upgrades: In order to fully make the most of alignment of incentives by FIs in the context of the SSCF framework, Brazilian FIs could formalize incentive programs by setting up standards to be met by suppliers in order to access better financial conditions. The in-depth interviews carried out for this research confirmed that Brazilian FIs could be willing to formalize financial incentive programs with low implementation costs given the already existing integration between sustainability monitoring information and the general loan tracking management information systems. This way, FIs could benefit from client loyalty and a healthier loan portfolio.

The Challenges in Context

In Chapter 3, we identified five types of potential challenges to implement the SSCF framework: driver from buyers, robust technology platforms, industry and regional expertise, credit risk, and lack of sophistication of SMEs. After analyzing the Brazilian case, we can conclude that the more prominent challenge is the lack of industry expertise. Let’s analyze each of them in context:
Driver from buyers

Petrobras has definitively been exercising its corporate leadership to engage with its suppliers. By using its purchasing power, it has influenced suppliers to participate in the online financing platform Progredir. This means that by the same token, Petrobras could exercise its influence to engage suppliers to adopt more sustainable practices. As a matter of fact, Petrobras is already collecting suppliers’ self-reported information on sustainability aspects through its SMS system, although as explained above, this system has not achieved its full potential yet. Integrating both systems by letting FIs be the information collectors could generate efficiencies.

Robust technology platforms

The in-depth interviews confirmed that Brazilian FIs are already operating with management information systems that can integrate sustainability and financial related information. These FIs operate however mainly in a local context. Further research with regards to the difficulties to deal with multi-country supply chain financing particularities is needed. Different regulatory aspects related to electronic invoices or electronic settlement of accounts might come into play. In that case, technology should be adapted and additional technological enhancements should be introduced.

Industry and regional expertise

Research of primary sources confirmed that FIs’ ESMS are indeed an important leap forward in assessing and managing sustainability risks of suppliers; however, there is still room for progress. Even if these questionnaires gather first hand loan officer on-site verified information, they still rely on qualitative information not necessarily related to
international sustainability reporting frameworks such as that of the Global Reporting Initiative described in previous chapters. Furthermore, they are not industry focused yet. They require general information regardless of the specificities of each industry. For instance, particularly polluting industries such as leather treatment or chemical production might require additional specific information and expertise to implement remediation plans. For a full implementation of the SSCF framework, FIs could consider hiring and training a sustainability-expert workforce, who could provide technical support to reinforce the coaching and supervision already performed by loan officers.

**Credit risk.**

The particularities of the Progredir program whereby Petrobras guarantees up to 50% of the credit risk of up to fourth tier suppliers, mitigate the FIs’ reluctance to finance smaller suppliers. Although this is typically not the case in traditional supply chain financing programs, such a peculiarity could possibly be extrapolated to the implementation of the SSCF framework. Large buyer corporates interested in improving the sustainability of their supply chains and willing to lead the SSCF program in partnership with a FI, could offer risk coverage for smaller suppliers in farer away links in their chains, possibly in exchange of a better service fee from the FI. This credit risk mitigant offered until the FI becomes more familiarized with the smaller suppliers, could be beneficial to all parties involved: the corporate buyer benefits from a financially healthier supply chain, smaller suppliers have access to credit, while the FI is willing to establish direct yet mitigated credit relationships with a new base of smaller companies.
SME’s lack of sophistication

The field research did not confirm that the lack of sophistication of smaller suppliers could be a detriment to the implementation of the framework. The two interviewed banks already deal in their portfolios with non-sophisticated companies. Furthermore, in order to be a supplier of Petrobras, suppliers need to at least register in the Progredir platform, which requires a fiscal identification number. This implies that even if smaller, suppliers in the program need to have a certain degree of formalization. However, this uniqueness might probably change in other contexts. Smaller emerging economies with less sophisticated regulatory and supervision environments might face this pressing challenge. On the other hand, as smaller informal companies start receiving financing from the formal financial sector, their incentives to join the formal economy and adapt to a more demanding business setting, are more persuasive.

In sum, the analysis of the Brazilian case and the potential implementation of the SSCF framework leads to conclude that the existing current infrastructure could be easily leveraged to implement upgrades and make the framework work. These upgrades could include for instance, the addition of the already FI gathered sustainability related information as part of the information passed to large corporate buyers at the end of the chain, training of FIs’ staff to play a more proactive role in fostering sustainable business practices among their borrowers, and the design of sustainability incentive based products to be offered by FIs in connection to the SSCF program. The development of sustainability related expertise by both FIs and leader corporates was discovered to be
among the most important challenges. In any case, the field of sustainability is constantly evolving. As the public becomes more aware and involved with the cause of sustainability and Brazilian companies become more persuaded about the benefits of becoming responsible corporate citizens, this challenge shall be naturally resolved.
CHAPTER 5

CONCLUSIONS

The economic crisis has shed light on the shortfalls of the way corporations have been doing business. Short-term strategies aimed to attain immediate profit are no longer sustainable. Customers and end users – the real drivers of the production chain - are increasingly demanding more sustainable business practices; those that meet the needs of the present without compromising the ability of future generations to meet theirs. According to a 2010 Mintel’s study on green living, 35% of survey respondents would pay more for environmentally friendly products (Mintel 2010), suggesting that those corporations that adopt sustainable practices will have a competitive advantage and that business sustainability represents a business opportunity in itself.

Managing sustainable supply chains has become increasingly popular not only to enhance a company’s positioning as a good corporate citizen, but also as a strategy to mitigate risks, reduce costs and enhance branding. And yet, it is not simple. Despite dozens of yearly publications and growing acknowledgement about the importance of the topic, many companies still do not know how to manage their supply chains in a sustainable manner. A Harvard Business Review survey reported in 2010 that cost, complexity, and lack of know-how were delaying the deployment of sustainable supply chain strategies. The same study showed that only 50% of respondents were very confident in understanding the sustainability performance of their internal suppliers; the percentage decreased to 33% when inquired about first-tier suppliers, 16% about second-tier suppliers and 10% about third-tier suppliers (Prokesch 2010). These figures are proof
that accessing the extended supply chain to expand sustainable business practices to suppliers remains a challenge for companies.

This thesis concludes that this is not the case for FIs. FIs could actually become crucial enhancers of supply chain sustainability. FIs have a privileged position in the supply chain: they have access to relationships with all the links in the chain, they manage large amounts of valuable information, and they have the ability to offer interesting financial incentives by adapting their financial products. In sum, FIs have the potential to solve the current difficulties identified by large corporations in implementing sustainable supply chain strategies.

The originality of this research relies on the exploration of a new tool in the field of business sustainability: although supply chain management, sustainable supply chains and supply chain financing have been extensively studied on their own, the combined potential of all three approaches has not yet been explored.

This combination leads to the definition of a Sustainable Supply Chain Financing (SSCF) framework. The framework is built upon the common elements identified across the three foundational disciplines: what we have called “the triple-T of sustainable supply chains” (Teamwork, Transparency and Traceability). The framework propositions suggest that by leveraging their privileged position in the supply chain, FIs could help corporations rationalize resources, enhance information transparency, and align incentives, in order to implement sustainable business practices along the extended supply chain.
Despite its potential, the SSCF framework implementation is not challenge-free. Literature suggests the need to have a real commitment from buyers, robust technology platforms, industry and regional expertise, appetite for credit risk beyond first tier suppliers, and flexibility to adapt to the idiosyncrasy of smaller suppliers, as the main challenges. As part of this research, we analyzed the Brazilian context and carried out field interviews with local FIs to identify the implementation viability of the SSCF framework. Interestingly, the study case showed that most of the infrastructure to implement such a framework is already present in Brazil. Large corporates such as Petrobras already have in place online supply chain financing programs to engage with their suppliers in partnership with FIs, while FIs are already gathering information on sustainability performance of their borrowers.

The challenges related to commitment from buyers, technology platforms, and adaptation to working with smaller suppliers, proved to be less problematic than originally assumed; while FI´s reluctance to assume credit risks of smaller companies and the lack of sustainability-related expertise were in turn identified as the most prominent challenges.

Buyer-driven initiatives could help provide comfort to FIs to lend to smaller suppliers. For instance, Petrobras´ initiative to cover part of the credit risk of up to fourth tier suppliers has yielded positive results to promote lending to smaller companies. Generating sustainability related expertise on the other hand, might require more time. This challenge will be overcome as business sustainability awareness gradually gains
force. As the field of sustainability builds momentum and attracts more brainpower, gathering sustainability related expertise will become second nature.

With historically low reputation levels, corporations and FIs face growing public pressure to embed sustainability practices in their core strategies, which makes the combination of supply chain management, sustainable supply chains and supply chain financing more opportune than ever.
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