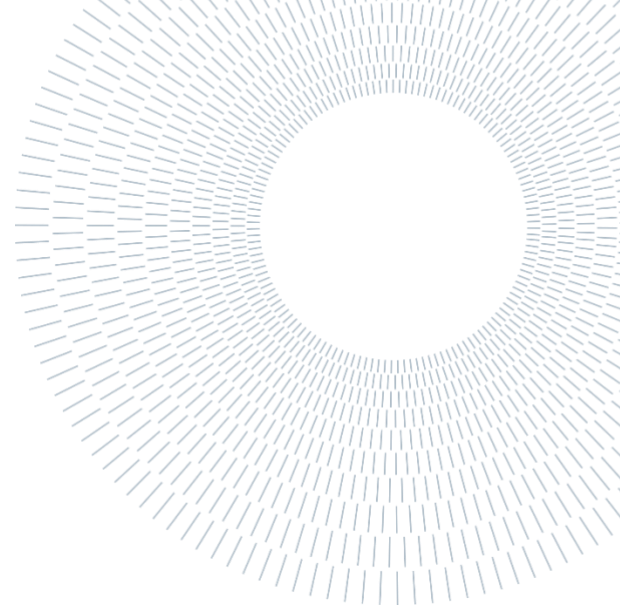




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EXECUTIVE SUMMARY OF THE THESIS

Framing Deep Tier Financing: an exploratory analysis on drivers, barriers and potentials for sustainability

TESI MAGISTRALE IN MANAGEMENT ENGINEERING

AUTHORS: CARLO ALBERTO CIRLA, VLAD ADRIAN CRUTAN

ADVISOR: FEDERICO FRANCESCO ANGELO CANIATO

CO-ADVISOR: ELISA MEDINA

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1. Introduction

In the last fifty years, a progressive globalization [1] has toughened business competition, causing an acceleration of the de-verticalization trend [2] which grants enterprises higher efficiency by allowing them to focus on their core activities, while outsourcing others. Huge supply chains have been developed [3], composed by multiple tiers of nodes, whose size decreases the deeper the tier [4], deeper layers being constituted by SMEs. Despite hiding in the rear guard, SMEs' relevance becomes evident, these being the majority of the supply chain nodes [5]. Still, SMEs remain fragile, unable to access financial resources [6] because of their intrinsic characteristics. This situation makes supply chain prone to disruptions [7], and focal companies strive to improve their resilience [8] through various strategies, among which Supply Chain Finance (SCF) [9]. SCF consists in financing schemes capable of providing cheap financial resources to the suppliers [10]. Indeed, a valid instrument, but crippled by its incapacity to go

beyond the first level of supply, the truly needy tiers remaining neglected [11]. The answer to this issue is Deep Tier Finance, a SCF solution contemporaneously involving multiple tiers of a SC in a coordinated way, through the exploitation of business relationships linking back to the focal company [12]. Deep Tier Finance allows deep layers to avoid the financial discrimination, meanwhile offering advantages also to the focal company, by strengthening the supply chain and providing visibility and power over the deep tiers [12]. Given these characteristics, there is great interest about this topic, but implementations are still scarce, as well as the scientific literature about it [13]. This Thesis aims at investigating this innovative subject, trying to provide more comprehension about it.

2. Literature Review

The Academic Literature Review is structured with a chained-logic, the three links being Supply Chain Management, Supply Chain Finance and Deep Tier Finance, each one necessary for the comprehension of the ensuing. As for the first, definitions of supply

chain and Supply Chain Management are provided [12], followed by a description of the main trends and an in-depth discussion of Sustainable Supply Chain Management. Furthermore, it is also considered an overview of Multi-tier Supply Chain Management and Risk Management in supply chains. Then, the financial problem affecting supply chains introduces Supply Chain Finance [14], further detailed by a framework describing its objects, its actors and its levers. A clear overview of the major solutions explores the main operative principles. Benefits and costs are also discussed, together with the implementational process of a solution [15], the main trends and barriers of Supply Chain Finance. As it is done for Supply Chain Management, a section is dedicated to the concept of sustainability within the topic. Finally, also the potential role of the most innovative technologies is presented. Last link of the chain is Deep Tier Finance [16], identified through the use of a taxonomical framework, given the absence of a formally accepted definition. The main benefits and the barriers in implementation of a Deep Tier Finance solution are eventually presented.

3. Objectives

Through the development of the Literature Review, a large gap concerning Deep Tier Finance emerges. To the extent of the authors knowledge, scarce theory has been developed and validated regarding this innovative topic, few authors debating it. The concept itself of Deep Tier Finance has only roughly been formalized, and no taxonomy or analysis of main solutions is provided, as well as the areas of potential implementation and the connection with sustainable subjects. Caniato, et al. [17] and Xu et al. [13], confirm this lack of literature, and state the necessity to deepen the argument. On the basis of the identified gaps, the authors develop three Research Questions, aimed at developing a comprehensive overview of Deep Tier Finance.

RQ1: What are the Deep Tier Finance solutions?

Through the first research Question, the authors tackle the necessity to assess the nature of the currently existing Deep Tier Financing solutions, analyzing the various operational principles and the involved actors. The response to such question would define the “field of existence” of this topic,

as all the following discussions would be naturally rooted in it.

RQ2: What fosters or hampers the adoption of a Deep Tier Finance solution?

Taking a step back with respect to the Deep Tier Finance solutions, it is necessary to comprehend the factors leading toward the necessity of them, as well as the elements hampering or enabling the implementation. Given this multiplicity of concepts, it was chosen to develop two sub-questions.

RQ2a: What are the drivers of a Deep Tier Finance solution?

It appears to be relevant to grasp the reasons behind a Deep Tier Finance application, understanding what really drives focal companies in providing financing to their whole supply chain.

RQ2b: What are the barriers and the enablers of a Deep Tier Finance solution?

In reflection to the motivations for Deep Tier Finance, fundamental it would be to assess the factors (such as environmental situations or distinctive features of the actors) hindering or fostering the implementation and the functioning of a solution.

RQ3: How can Deep Tier Finance support and foster supply chain sustainability?

In the light of the importance of business sustainability, it is deemed to be relevant the qualification of the direct relation between the two topics. Given the potential extension of the response to such query, two sub-questions are developed.

RQ3a: Which (and how) sustainable practices can be integrated with Deep Tier Finance?

The objective is the acknowledgement of the practices (finalized at fostering sustainability) most frequently connected with Deep Tier Finance instruments, as well as how the integration is carried out in the regard of the solution’s functioning mechanism.

RQ3b: What are the potential sustainable impacts of a Deep Tier Finance solution?

It is necessary to investigate what dimensions of sustainability (Economic, Social and Environmental) are impacted by Deep Tier Finance, and how such reverberations take place.

4. Preliminary Framework

A Preliminary Framework, built on variables extracted from the Literature Review, is developed in order to provide an answer to the Research Questions.

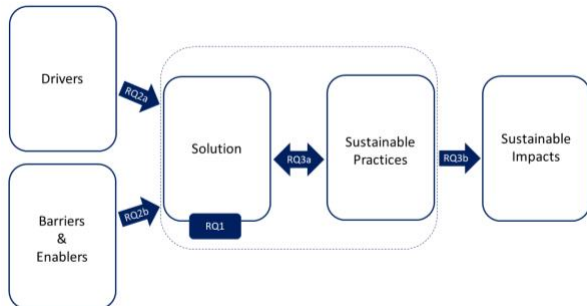


Figure 1: Preliminary research Framework.

Such Framework is based on five macro-variables, enclosing the variables. The Macro-variables are “Drivers” (factors or situations leading a focal company toward the adoption of a Deep Tier Finance solution), “Barriers and Enablers” (elements dually connected, which, depending on the situation and their own status, can hamper or enable Deep Tier Finance), “Solution” (the features of a Deep Tier Finance solution), “Sustainable Practices” (the sustainable practices to be potentially integrated with a Deep Tier Finance solution), and “Sustainable Impacts” (indicating which sustainable dimensions are potentially affected by a Deep Tier Finance solution).

5. Research Methodology

The process to realize this Thesis starts from the Literature Review (built on scientific papers, reports, and articles), which allows the identification of the main gaps and the consequent creation of the Research Questions, contemporarily to the recognition of the research variables. Then, it is possible to delineate the Preliminary Research Framework, which puts in relation, in the first place, Research Questions and variables, and, next, the Research Questions among each other. To answer the established Research Questions, an exploratory Case Study approach is employed, given the objective of building new theory. Twelve case studies (reported in Table 1), based on primary sources (interviews with solution providers or focal companies) and secondary sources (reports, conferences, etc.), are proposed. Each case study is examined through a Within

Case analysis, which includes the description of the related Deep Tier Finance solution and a coding process hinged on both the variables exposed in the Research Framework and the new variables arising from single cases. A code is created for each variable, resuming what expressed in the case study in the regard of such variable. The comparison of all the codes linked to the same variable, makes a Cross Case Analysis feasible, trying to identify common patters and differences, and thus understanding truly relevant aspects. The joint evaluation of the Cross Case Analysis results and the Literature Review, enables to remold the Preliminary Framework into a Final Framework, and to present some answers to the Research Questions.

6. Results & Discussion

In the light of the evidences obtained from the examination of the case studies, the Preliminary Framework is reshaped into the Final Framework, which includes also the new variables emerged from the case studies and excludes the original variables which result to be irrelevant.

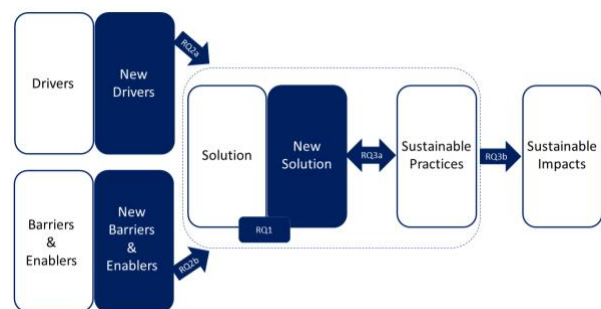


Figure 2: Final Framework

RQ1: What are the Deep Tier Finance solutions?

Through the analysis of the case studies, the authors meet and describes multiple financing schemes, which, in the light of what proposed by Osservatorio Supply Chain Finance [18], can all be considered pure forms of Deep Tier Finance, since all of them show the involvement of the focal company and the employment of a single platform for the whole supply chain. The evaluation of two main characteristics, “Number of involved tiers” (being “Fixed” or “Extensible”) and “Relation” among the actors (being “One to One/Many” or “Many to Many”), allows the development of a taxonomical framework capable of classifying the solutions in four main quadrants. Only three of them are populated by the considered solutions,

and therefore described and represented by an archetype featuring all the most common characteristics.



Figure 3: Taxonomical Framework

The first quadrant (“One to One/Many” and “Fixed”) features an evolution of a traditional Reverse Factoring expanded up to the second tier of suppliers. The second quadrant (“One to One/Many” and “Extensible”) encloses solutions based on the creation of a digital document (capable of triggering an early payment on which the focal company’s creditworthiness would be used for the computation of the discount rate) transmitted downstream in the supply chain as a currency, and solutions allowing deep tiers to address the focal company for obtaining advanced payment, through the exploitation of linkages between tiers as a mean of communication. The third quadrant (“Many to Many” and “Extensible”) encompasses network finance solutions, capable of stabilizing the financial flows within a network by unlocking the capital “stuck” in the network itself.

RQ2a: What are the drivers of a Deep Tier Finance solution?

Drivers for Deep Tier Finance are numerous and different in nature. Some can be grouped under the concept of “financial” drivers (Supplier’s Inability to access financing, C2C Cycle, NOWC, etc.), and prove themselves as truly relevant. Among the non-financial drivers, “Development of visibility” seems to be an important need, causing focal companies to implement these instruments in order to exploit their capability in “Mapping”, which consists in defining the nodes of the supply chain (an ability of second and third quadrants’ solutions only), and “Tracking”, which consists in gathering and transmitting data from the single node (an ability of first and second quadrants’

solutions only). Deep Tier Finance appears to be implemented also with the goal of protecting specific branches of the supply chain which produce goods particularly valuable for the focal company’s business. Finally, also “Sustainability requirements”, imposed by the external environment, motivates the expansion of Deep Tier Finance, but only for solutions in the first and second quadrants.

RQ2b: What are the barriers and the enablers of a Deep Tier Finance solution?

Initially assuming every element to possibly be both a barrier or an enabler, it is noticed that further complexity must be taken into account, as each variable appears to have a different behavior depending on the type of solution. Variables appear to have a state (a barrier, an enabler or a prerequisite) and a nature (dual or single). A dual nature consists in being a barrier or an enabler (depending on the state of things) and potentially change over time. A single nature consists in remaining unalterably a barrier or an enabler or a prerequisite.

RQ3a: Which (and how) sustainable practices can be integrated with Deep Tier Finance?

Results agree on three main practices to be integrated with Deep Tier Finance solutions, these being sustainability assessment, incentivization and development programs. As for supplier sustainability assessment, it can be integrated with Deep Tier Finance in two main forms. The first case is a “data-for-benefit” model, requiring specific information to suppliers in exchange for benefits provided through the DTF solution (i.e., lower credit rates). In the second case, sustainability assessment conditions Deep Tier Finance, determining the benefits suppliers can reap from it: a logic of incentivization is consequently imposed, and sustainable practices are promoted through rate discrimination (sustainable actors obtaining better financing conditions) or exclusion from the Deep Tier Finance scheme. Finally, it is also possible to launch development programs through the solution, in order to develop the supply chain nodes’ knowledge about sustainability.

RQ3b: What are the potential sustainable impacts of a Deep Tier Finance solution?

Deep Tier Finance solutions appear to positively impact the whole sustainability spectrum. Economic sustainability is fostered at three

different levels, firstly providing benefits for the SMEs, then improving the resilience of supply chains and finally strengthening the whole economy. Social sustainability can be indirectly influenced through the improved SME's condition, or directly tackled via development programs. Finally, Deep Tier Finance promotes environmental sustainability by reporting useful data, by rewarding it, by imposing it or by supporting green investments.

7. Conclusions

This Thesis is an answer to the existing gap in literature for what concerns Deep Tier Finance, hence aims at developing a theoretical contribution. Through the classificatory framework, it delineates a perimeter within which to build the next researches. Furthermore, it relates Deep Tier Finance to the environment, and

highlights how the latter affects it, defining challenges, supportive elements and prerequisite, depending on the type of solution, meanwhile providing more details about its linkages with sustainability, bridging Deep Tier Finance with Sustainable Supply Chain Finance. Symmetrically to the creation of new theory, this Thesis also presents strong managerial implications. Mainly addressing focal companies, it enriches their comprehension of the possible Deep Tier Finance typologies, but also provides tools for choosing the best solution, depending on needs and environmental conditions. Despite the important contents, this Thesis suffers of some limitations, having relied mostly on the opinion of solution providers and focal companies, therefore being potentially defective on the side of suppliers and financial actors. Their involvement in future researches, as a more quantitative quantification of costs and benefits, and a major focus on specific aspects, might be a fundamental enrichment.

Appendix

Case	Type of Actor	Nature of Source	Interviewee's role	Macro-Variables considered
A	Fintech Company	Primary and Secondary	Chairman	Drivers; Barriers and Enablers; Solution; Sustainability
B	Fintech Company	Primary and Secondary	Co-Founder	Drivers; Barriers and Enablers; Solution; Sustainability
C	Technology Company	Primary and Secondary	SVP Data & Analytics	Drivers; Barriers and Enablers; Solution; Sustainability
D	Technology Company	Primary and Secondary	Head of BD	Drivers; Barriers and Enablers; Solution; Sustainability
E	Fintech Company	Secondary	-	Drivers; Solution; Sustainability
F	SCF provider	Secondary	VP Network & partnership	Drivers; Barriers and Enablers; Solution; Sustainability
G	Consortium	Secondary	-	Drivers; Barriers and Enablers; Solution; Sustainability
H	Fintech Company	Secondary	-	Drivers; Barriers and Enablers; Solution; Sustainability
I	Fintech Company	Secondary	-	Drivers; Barriers and Enablers; Solution; Sustainability
J	Merchant Enablement Services Provider	Secondary	-	Solution
K	Focal Company	Primary	Senior Credit Manager	Drivers; Barriers and Enablers; Solution; Sustainability
L	Fintech Company	Primary	CEO	Drivers; Barriers and Enablers; Sustainability

Table 1: Case Studies.

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