European Research Studies Journal
Volume XXIV, Issue 2B, 2021

pp. 78-97

Supply Chain Performance Measurement System of Logistics Service Providers vs. Supply Chain Performance: A Conceptual Framework

Submitted 20/03/21, 1st revision 21/04/21, 2nd revision 16/05/21, accepted 10/06/21

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Abstarct:

Purpose: *This conceptual paper explores the relationship between the generation of logistics service providers (LSPs), the scope of LSP supply chain performance measurement system (LSP SCPMS), and the corresponding impact on the supply chain (SC) performance. We propose that among LSPs applying SCPMSs, the generation of LSPs may affect the scope of LSP SCPMS, which may influence SC performance. Building on extant research, we present a conceptual framework, with the agency theory incorporating SC risk management concept, the resource-based view (RBV) and the rational view, an extension of RBV incorporating social network theory as the framework's foundation. The initial hypotheses in this research proposal are each supported by the respective literature.*
Design/Methodology/Approach: *As a conceptual paper, it is based on the literature review focusing on looking for the research gaps and responding to the recent calls in strategy research.*
Findings: *The scope of LSP SCPMS and potential ramifications of LSP generation for the SC performance is an under-researched topic. In the present paper an attempt to consolidate knowledge on LSP supply chain performance measurement systems and its impact on SC performance has been made. The study as a research proposal makes a two-fold contribution to the discussion. First, it distinguishes the research questions and initial hypotheses. Secondly, a research methodology is proposed where qualitative methods are emphasised.*
Originality/Value: *This study proposal contributes to a better understanding of the relationship between the scope of LSP supply chain performance measurement system and its impact on the supply chain performance, including the context of the LSP generation, which is proposed as a control variable in the study.*

Keywords: *LSP supply chain performance measurement system (LSP SCPMS), logistics service providers (LSPs), supply chain (SC) performance, conceptual framework.*

JEL codes: *M11.*

Paper type: *Conceptual paper.*

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1. Introduction

Currently, intensified globalization and consequent competitive pressures have reemphasized the importance of logistics service providers (LSPs) in managing logistics processes as well as customer and supplier relationships within the supply chain management. This requires them to develop their business performance measurement systems (BPMSs) towards the supply chain performance measurement systems (SCPMSs) the scope of which may depend on the LSP advancement thus whether it operates as a third-party logistics (3PL) provider, or else as a lead logistics provider (LLP) or a fourth party logistics (4PL) provider.

However, the research on the topic of LSP SCPMSs remains scarce as it usually concentrates on SCPMSs of the focal companies orchestrating the supply chains (SCs). At the same time LSPs have an exceptional impact on SC performance as the operators connecting the SC links, and since they operate within a portion of or the whole supply chains of the sectors they serve, they need to develop not only the internal performance measurement systems (PMSs), but also the external SCPMSs. Table 1 provides a summary of the abbreviations used in the article.

Table 1. *Abbreviations used in the article*

Abbreviation	Expansion
SC	supply chain
LSP	logistics service provider
LLP	lead logistics provider
3PL	third-party logistics provider
4PL	fourth-party logistics provider
PMS	performance measurement system
BPMS	business performance measurement system
SCPMS	supply chain performance measurement system
LSP SCPMS	logistics service provider's supply chain performance measurement system

Source: *Own study.*

Today, companies must keep their supply chain under control and manage processes that often exceed their boundaries, if they want to achieve their objectives (Van Hoek, 1998; Brewer and Speh, 2000). Focal firms cannot become world class companies by themselves. To an excessively large extent, their organizational results depend on the partners in the supply chain (Chen and Paulraj, 2004; Li *et al.*, 2005). To this end, the supply chain performance measurement systems enable the adoption of the performance metrics that span different firms and processes. While traditional (internal) PMSs normally target processes and data related to one single firm, SCPMSs should entail inter-firm performance measures (e.g., the metrics crossing the boundaries of the firm within the source and delivery processes).

Therefore they pose great challenges in terms of the need to integrate and share data from multiple firms, the need to coordinate inter-firm processes and infrastructures

and the relationship management of the external SC partners throughout the measurement process (Maestrini *et al.*, 2017). In such a case performance measurement becomes more challenging, since it must serve the purpose of several firms as well as the SC overall. Usually SCPMSs are developed by focal companies (the main SC actors – leading manufacturers or retailers), however taking into account the increasing importance of LSPs in managing logistics processes as well as customer and supplier relationships within the supply chain management, their role in developing SCPMSs is becoming more and more crucial.

Therefore, this conceptual study provides a research proposal to investigate the relationship between supply chain performance measurement system of logistics service providers and supply chain performance by answering the following research questions:

Q1: How LSPs handle their SCPMSs including individual internal and external subsystems taking the individual PMS processes into consideration?
Q2: How the LSP SCPMS scope impacts SC performance?
Q3: How the LSP generation (3PL and LLP/4PL) influences the scope of LSP SCPMS?

With this conceptual framework, we respond to the recent calls on developing strategic management theory by joining in the debate regarding the relationship between PMS/SCPMS adoption and actual performance improvement. As regards SCPMSs, apart from valuable exceptions (Mahama, 2006; Cousins *et al.*, 2008), little empirical evidence exists about the actual impact of (external) SCPMSs on SC performance.

We respond also to the recent calls on developing the performance measurement and management theory by proposing a research framework to investigate undiagnosed LSP SCPMSs, including their external subsystems. As regards external SCPMSs, such as multi-tier SCPMSs and many-to-many SCPMSs, there is no literature and research evidence or it is anecdotal (Maestrini *et al.*, 2017). To the best of the Author's knowledge (after initial search of the relevant databases such as Web of Science, Ebsco, Emerald, and Scopus), there are only few studies in SCPMS referring to LSP industry (Choy *et al.*, 2008; Jothimani and Sarmah, 2014), as the majority of LSP studies refer to BPMS (Wang *et al.*, 2015; Domingues *et al.*, 2015), unlike SCPMS.

With the proposed conceptual framework we respond also to the recent calls on developing the performance measurement and management theory which is biased towards inter-organisational studies (Lehtinen and Ahola, 2010). Performance measurement literature emphasizes intra-organizational measures, which conflicts starkly with the emphasis of inter-organisational collaboration dominant in literature addressing extended enterprises (Lehtinen and Ahola, 2010).

Finally, we respond to the recent calls on conducting dyadic (or even network) studies when investigating supply chain performance measurement systems (Maestrini *et al.*, 2017). As a matter of fact, the different actors involved in an SCPMS could have different perceptions and experience different results (Purdy and Safayeni, 2000; Hald and Ellegaard, 2011). Therefore, expanding the unit of analysis from the single company to the buyer-supplier dyad can provide new insights into possible misfits in perceptions and relative behaviours (Maestrini *et al.*, 2017). Thus, in the proposed conceptual framework SC performance will be viewed from a dyadic perspective i.e., LSP's and LSP partner's perspectives. The inter-organisational studies are truly limited in literature on performance measurement. According to e.g. Mortensen and Lemoine (2008), it is especially unusual to include LSPs in supply chain performance measurement studies.

2. Literature Review

2.1 Theoretical Foundation

Although there are several theories and frameworks used in PMS and SC literature (Franco-Santos *et al.*, 2012; Spina *et al.*, 2013), in this paper we adopt a few of them, namely the resource-based view (RBV) theory, the rational view, including the social network theory and the agency theory, including the SC risk management framework.

According to the resource-based view, company's strategic resources including tangible and intangible resources play a vital role in a firm to generate sustainable competitive advantage (Wernerfelt, 1984; Barney, 1991; Teece *et al.*, 1997). One of the competitive advantage measures is firm performance (Haffer, 2002). A PMS, likewise a SCPMS, constitutes a bundle of strategic resources which helps companies to develop organizational capabilities (including dynamic and ordinary capabilities; see Teece *et al.*, 1997) and enhance organizational learning enabling the identification of the areas of concern and success through performance monitoring (Star *et al.*, 2016). In case of LSPs, these capabilities, the development of which is mediated or moderated by SCPMS, refer to as logistics service capabilities and capabilities to shape and exploit networks. The quality of these capabilities determines the LSPs' success including its performance, however it may also impact the success of other SC members influencing SC performance.

The traditional resource-based view argues that supernormal earnings result from resources controlled by a single firm (Barney, 1991). However, the relational view (Dyer and Singh, 1998), an extension of RBV incorporating social network theory (Eisenhardt and Schoonhoven, 1996; Granovetter, 1985) has expanded this focus, with scholarly attention beginning to recognise the importance of resources which lie outside the firm's boundaries (Duschek, 2004; Mathews, 2003). With the proposed conceptual framework, this paper strengthens this theoretical stream. Complementary resource combinations between partnering firms can be a source of

their competitive advantage, with the idiosyncratic nature of the relational assets making it difficult for competitors to imitate (Gulati *et al.*, 2000, via Cousins *et al.*, 2008). This means that collaborative relationships within individual SCs and SC networks, which have been rapidly growing across many industries, may lead to the collaborative advantage.

Thus, since a PMS can be a source of a competitive advantage of a single firm e.g., a LSP, a SCPMS may be considered within a framework of the collaborative advantage (Dyer and Singh, 1998), rather than one of the competitive advantage, as influencing a SC performance it may generate advantages to all SC actors. The collaborative advantage is a resource that requires a long-term orientation and may ultimately create greater benefits than a traditional zero-sum based approach to competition (Dyer, 2000). Through cooperation, partners can profit from rents that can only be generated by working jointly (Cousins *et al.,* 2008). The ability of the LSP to derive these relational rents is at least, in part, dependent on how effective the LSP SCPMS is in building and leveraging collaborative partnerships within the SC. This paper heads at least, in part, towards answering this question as it focuses on the impact of LSP SCPMS on operational and relationship SC performance.

When it comes to the agency theory (Eisenhardt, 1989; Jensen and Meckling, 1976), it deals with the problems of creating a contract governing an exchange between individuals, called 'agent' and 'principal', who have divergent interest. The principal-agent problem occurs when agents are motivated to act in their own best interests, which are contrary to those of their principals. Supply chain partner relationships closely resemble this kind of problem (Natour *et al.,* 2011). Therefore, the agency theory may be used to examine such aspects of supply chain management as supply risk, information sharing or outsourcing across the supply chain (Logan, 2000), where the LSPs play the role of agents. The examples of major causes of conflict in supply chain relationships are goal conflict, asymmetry of information and incentive misalignment (Cao and Zhang, 2011, Simatupang *et al.,* 2002).

We assume that one of the mechanisms which may be used to align the interests of the supply chain partners is performance measurement implemented as part of the supply chain performance measurement system developed by the LSP who connects the supply chain links. In this case, the SCPMS establishes information mechanisms that improve transparency and accountability across the supply chain reducing the information asymmetry. As such SCPMS may become a tool for supply chain risk monitoring as the risk in the supply chain can stem from the information asymmetry and inability to monitor performance (Eisenhardt, 1989).

According to Andreas (2013) having a supply chain risk management strategy is not a common business practice. One such strategy is to transfer logistics uncertainties and risks to the LSP (Zsidisin and Ritchie, 2009). Comparing to risks associated with more independent or isolated decision situations which concern individual SC actors, the supply chain-related risks are much more characterised by the inter-connectivity

(Ritchie and Brindley, 2007). That is why some of these risks may be easier to manage for the logistics service provider because of the integration facilitator's role it plays in the supply chain. The failure of a supplier to deliver the right quantity, at the right time or irregular patterns of demand are the examples of SC risks that LSPs may easily mitigate and hence improve supply chain performance through its performance measurement.

2.2 Logistics Service Providers

Logistics service providers, also called third-party logistics (3PL) providers, provide a variety of logistics related services, including, for instance, transportation, warehousing, distribution and freight consolidation (Domingues *et al.*, 2015), which may be supplemented by high added value activities like co-manufacturing, co-packing, crossdocking, pooling, reverse logistics, after-sales support and customer service (e.g., customs brokerage) (Jayaram and Tan, 2010). This means that they are usually associated with the offering of multiple, bundled logistics services, rather than just isolated transport or warehousing functions (Leahy *et al.*, 1995).

In view of the above, logistics service providers were initially 3PLs. However more recently, a new generation of providers, called lead logistics providers (LLPs) and fourth party logistics (4PL) providers, have radically altered the logistics industry. LLPs and 4PL providers may be 3PLs that diversify their offer, management consulting firms, supply chain specialists (global supply chain management) or IT services companies (Fulconis and Paché, 2018). Companies originally specializing in financial services, IT services and management consulting entered the market of logistics services by developing competences in information systems and supply chain planning (Selviaridis and Spring, 2007).

LLPs and 4PL providers notably offer complete logistics service without necessarily possessing the physical assets (means of transport, warehouses, etc.). They may be defined as the single connection between a customer and the logistics operators, being responsible for hiring other 3PL and 2PL, and managing the logistics process end-to-end (Lu and Su, 2002 cited in Krakovics, 2008). Whether they own the means of production, warehouses and trucks (the case of LLP) or not (the case of 4PL provider), these LSPs mobilize their logistics engineering competencies to optimize flows and select the best providers. LLPs and 4PL providers are gradually becoming orchestrators within individual supply chains and in the supply chain networks (Fulconis and Paché, 2018).

This means that advanced LSPs are able today to radically transform the organization and functioning of supply chains. Especially LLPs and 4PL providers are capable of using their acquired monitoring expertise to implement innovative logistical architectures without the need to possess multiple physical assets, or resources (Fulconis and Paché, 2018). These providers are supply chain service providers that participate rather in supply chain co-ordination than operational

services (Van Hoek and Chong, 2001). They are highly information based and co-ordinate multiple asset-based players on behalf of their clients.

In today's competitive business environment, logistics service providers (LSPs) play a critical role of the operators connecting the supply chain links in the SCs of their customers (Liu *et al.*, 2010), affecting the SC performance. LSPs play also a key role in facilitating supply chain integration (Mortensen and Lemoine, 2008; Knemeyer and Murphy, 2004) and in some cases even managing entire supply chains (Jayaram and Tan, 2010). Some researchers claim that a supply chain will not be effective unless LSPs measure and monitor the company performance in a flow of functions (such as transportation and warehousing) rather than individual activities (Robertson *et al.*, 2002). To manage the SC of their customers effectively, LSPs need to constantly analyse the data collected from various sources and convert them into actionable information. This requires them to develop their business PMSs towards the SCPMSs.

We assume that the scope of logistics processes as well as SC member relationships which need to be measured and monitored within LSP SCPMS may depend on the LSP advancement thus whether it operates as a 3PL provider, a LLP or a 4PL provider. This means that along with the evolution of logistics outsourcing, particularly the emergence of 4PL providers whose competency is mainly to monitor supply chains, specifically supply chain networks (Fulconis and Paché, 2018), there is also a growing need for LSP SCPMS development.

2.3 LSP Supply Chain Performance Measurement System

The literature on internal PMSs historically unveils a tortuous path between the system adoption and actual performance improvement (Neely, 2005; Melnyk *et al.*, 2014). On the one hand, strategy research indicates that the use of performance measurement systems is frequently recommended for facilitating strategy implementation and enhancing organisational performance (e.g., Davis and Albright, 2004). This view coincides with the findings of business based research (Buckingham and Coffman, 1999; Lingle and Schiemann 1996; Haffer, 2014). On the other hand, there is evidence that PMS can adversely affect performance.

Melnyk *et al.* (2014) made an attempt to resolve this management and research paradox by focusing on the issue of 'fit'. They argue that in today's dynamic and turbulent environment, changes in either the business environment or the business strategy can lead to the need for new or revised measures and metrics. The other stream of research emphasizes the relevance of 'integrated measurements' to business results improvement which means the necessity to use both the financial and non-financial measures designed according to e.g., four perspectives of balanced scorecard for the decision making (Lingle and Schiemann 1996; Haffer, 2014). However, these findings concern the internal PMSs. In case of SC measurements, 'integrated measurements' will mean measurements conducted not only within the

internal PMSs but also within the components of external SCPMSs. As regards SCPMSs, apart from valuable exceptions (Mahama, 2006; Cousins *et al.*, 2008), little empirical evidence exists about the actual impact of (external) SCPMSs on SC performance.

The issue of measuring performance along the supply chain has been raised, probably for the first time, only in the late '90s of the previous century (Van Hoek, 1998). Also one of the first SCPMS frameworks was proposed in 1999 (Beamon), whereas the previous articles had only focused on the costing models for inter-firm activities (Cavinato, 1992; Ellram and Feitzinger, 1997).

The definition of SCPMS goes beyond the one of the BPMS. While a BPMS is a set of metrics used to quantify the efficiency and effectiveness of actions aimed at supporting the implementation of strategies at various levels, a SCPMS is defined as 'a set of metrics used to quantify the efficiency and effectiveness of supply chain processes and relationships, spanning multiple organizational functions and multiple firms and enabling SC orchestration' (Maestrini *et al.*, 2017). Thus a SCPMS is a much more complex system comparing to a BPMS which is usually referred to as one of the SCPMS components namely the internal SCPMS. In such a case it targets the source-make-deliver processes performed by a single company. Instead, the external subsystems target supply chain processes and relationships that involve suppliers and customers (Maestrini *et al.*, 2017). As regards external subsystems they could be further complicated when multiple tiers are considered, extending beyond the buyer-supplier dyad and configuring multi-tier or many-to-many SCPMSs.

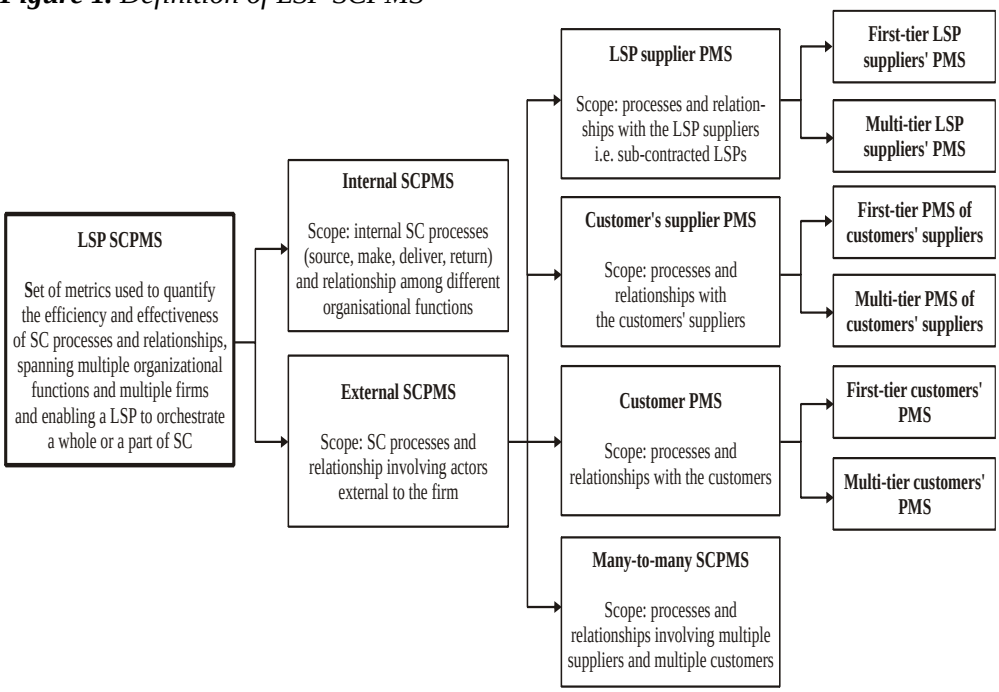
Despite the increased interest in applying and improving SCPMS, the number of researchers investigating the whole life cycle (design, implementation, use and review) of SCPMSs is still not sufficient, as most papers focus on the SCPMS design phase, with particular emphasis on the identification and description of metrics (Maestrini *et al.*, 2017). In the case of the most sophisticated SCPMSs equipped with external SCPMSs, such as multi-tier SCPMSs and many-to-many SCPMSs, there is no literature and research evidence or it is anecdotal (Maestrini *et al.*, 2017). To the best of the author's knowledge, there are also only few studies in SCPMS referring to LSP industry (Choy *et al.*, 2008; Jothimani and Sarmah, 2014), as the majority of LSP studies refer to BPMS (Wang *et al.*, 2015; Domingues *et al.*, 2015), unlike SCPMS. At the same time, since LSPs may operate within the whole supply chains of the sectors they serve, they need to develop not only the internal, but also the external SCPMSs.

Hence, LSPs, being a strategic SC member of their customers, may develop not only critical performance indicators set for assessing their logistics operations, but may also create a PMS for measuring the capability of other members within the chain by focusing on sub-contracted LSPs and customers' suppliers (Choy *et al.*, 2008). In such a case they need to develop the external subsystems of their SCPMSs which

enable them to orchestrate a whole or a part of SC depending on their advancement as the LSPs, reflected in three generations of providers: from 3PL through LLP to 4PL.

In view of the above, we propose to define LSP SCPMS, via Maestrini et al. (2017), as a set of metrics used to quantify the efficiency and effectiveness of SC processes and relationships, spanning multiple organizational functions and multiple firms and enabling a logistic service provider to orchestrate a whole or a part of SC. Following the example of Maestrini *et al.* (2017), we decompose also LSP SCPMS into the internal and external components (a LSP supplier PMS, a customer PMS, a customer's supplier PMS). In such a case LSP SCPMS may take different forms, from an internal, through a first-tier and a multi-tier to a many-to-many SCPMS (Haffer, 2018) as shown in Figure 1.

Figure 1. *Definition of LSP SCPMS*



Source: *Haffer, 2018.*

2.4 Supply Chain Performance

Supply chain performance is most often considered in two dimensions, the operational performance and relationship performance. The SC operational performance measurements are often classified into four categories, cost, quality, time and flexibility (Shepherd and Günter, 2006; Bamford and Forrester, 2010). These categories find their expression also in the LSP operational (also called logistics) performance concept. Scholars note that LSP logistics performance, which

is most typically measured by indicators related to customer service (customer complaint, customer response time, customer satisfaction, reputation), delivery operations (operating costs, on-time delivery, frequency of delays), freight safety (damages, lost freight) and information accuracy (billing/transit/delivery information), forms the core of the concept of SC performance (Fawcett and Cooper, 1998; Najmi and Makui, 2012; Wang *et al.*, 2015).

However, over 90% of the LSPs studied by Wilding and Juriado (2004) were considering a further development of measures. Langley and Capgemini (2009) reported that environmental metrics are gaining in importance among LSPs. When it comes to the relationship performance it is usually described by such relationship characteristics as collaboration, commitment and trust (Maestrini *et al.*, 2017), however, several contributions specifically tackle this last dimension, investigating how to assess the relationship goodness (Giannakis, 2007; Kim *et al.*, 2010).

3. Research Methodology Proposal

3.1 Research Design

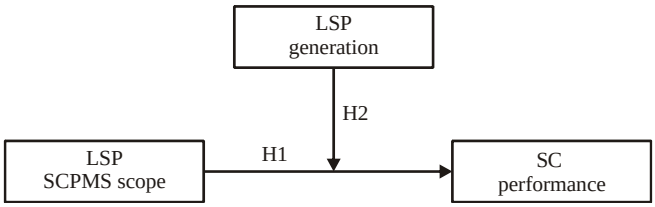
Following the above-mentioned theoretical considerations, the proposed conceptual framework aims at exploring the handling of the processes of LSP supply chain performance measurement system and the impact of its scope on supply chain performance viewed both from the perspective of the logistics service providers and their key account customers/partners. It is proposed that among LSPs applying SCPMSs, the generation of LSPs may affect the scope of LSP SCPMS, which may influence SC performance.

In order to achieve the research objective and answer the research questions we suggest to conduct an exploratory in-depth qualitative investigation in the form of a multiple-case study research. According to Orton (1997) and Hyde (2000) the reality of the case research activity is recognised as a 'cycling' of inductive-deductive approaches in a wide variety of diverse contexts including organizational process research and international business. Thus, we suggest to use case research for both theory testing and theory development. In the context of the proposed conceptual framework, a deductive approach to theory generation means generating a series of initial hypotheses about the LSP SCPMS characteristics and its impact on SCperformance and then testing the validity of them using the multiple-case experiences. An inductive approach to theory generation would involve reviewing the empirical evidence of the LSP SCPMS cases to generate a series of propositions or new hypotheses formed from patterns of common experience. The proposed initial hypotheses are as follows:

H1: There is a positive impact of the LSP SCPMS scope on SC performance.
H2: LSP generation moderates the relationship between LSP SCPMS scope and SC performance.

Figure 2 sets out a proposed conceptual framework, constructed from unpacking initial hypotheses on the LSP generation, the scope of LSP SCPMS and the SC performance.

Figure 2. *Conceptual framework*



Source: *Own study.*

Logistics service providers are important actors for creating logistics performance in supply chains. Despite that, there has been little previous research into studying how they handle the SCPMS processes (Forslund, 2012) and what the LSP SCPMS scope is (Jothimani and Sarmah, 2014). There is also limited evidence showing the impact of their SCPMSs on SC performance. Therefore we advance a hypothesis 1 (H1).

Basing on the proposed research framework we suggest to gather exploratory descriptions showing how LSPs handle their SCPMSs including individual internal and external subsystems taking the individual PMS processes (according to Franco-Santos *et al.,* 2007; Braz *et al.,* 2011) into consideration. The PMS processes can be grouped into five categories: (1) selection and design of measures, (2) collection and manipulation of data, (3) information management, (4) performance evaluation, and (5) system review (Braz *et al.,* 2011). We expect these exploratory descriptions to help identify the scope of the LSP supply chain performance measurement system (LSP SCPMS scope). We use the term LSP SCPMS scope to address the scope of SC measurements conducted by LSPs.

We use the term SC performance to address two measures of SC, namely, the operational performance and relationship performance. Actually, in both cases, in assessing the operational and relationship performance, we suggest to take the perspective of LSP and its key account customer/partner.

We use the term LSP generation to address two generations of LSPs namely 3PL provider as well as LLP and/or 4PL provider (Fulconis and Paché, 2018). We anticipate that along with the increase of LSP generation the demand for precise information concerning different links of supply chains which are served by LSPs is getting higher and higher and requires greater development of the external subsystems of their SCPMSs. To this end we advance a hypothesis 2 (H2). This hypothesis is supported by the empirical evidence showing that 4PLs implement ICT-platforms based on web services (Yongbin and Qifeng, 2011, Mehmann *et al.,*

2013) which allow them to develop comprehensive supply chain solutions offered to the customers in modern logistics environment. They may be used to create a SCPMS for measuring the capability of other members within the chain by focusing on sub-contracted LSPs, customers and customers' suppliers (Choy *et al.,* 2008).

Another empirical evidence supporting H2 shows that one of the internal factors moderating the relationship between PMS and firm performance is organizational structure (Lee and Yang, 2011). Thus, with hypothesis 2 we suggest to investigate whether it is true that LSP generation is a moderator of the relationship between LSP SCPMS scope and SC performance.

3.2 Research Approach

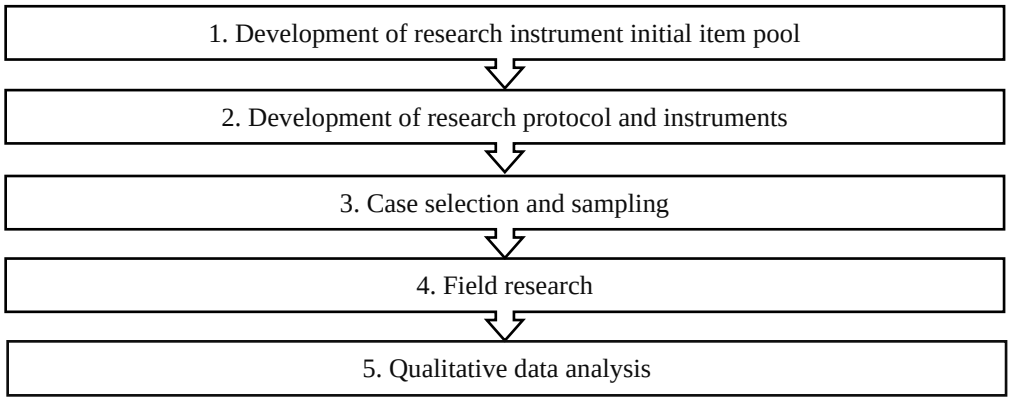
Taking into account research problem which is under discussion we suggest to mobilize qualitative methods. In proposed research project we are focusing on LSP SCPMSs thus, although we investigate what is happening in different supply chains, we take first of all a perspective of LSP industry. Limited empirical evidence about how LSPs are handling SCPMS processes, which makes the subject of the research practically undiagnosed, makes exploratory qualitative research very appropriate option.

We suggest to use a multiple-case study research for both theory testing and theory development as we are going to test the initial hypotheses and formulate the case study propositions. Despite the exploratory character of the research we assume that our initial hypotheses are needed to guide us into the right path. They help us in narrowing down the scope of the study, putting boundaries of the issue being studied (Teegavarap and Summer, 2008). As we suggest to use replication logic in case selection, we expect that cases which confirm an emergent relationship will enhance confidence in the initial hypotheses and theory. In such a case we suggest to go one step further and examine the underlying reasons in each case as to why things are happening and what the theoretical reasons are.

Following the inductive approach we suggest next to formulate case study propositions i.e. shaping new hypotheses from the data. During the process of case research, overall concepts and possible relationships between variables will begin to emerge. This is an iterative process, whereby the emergent frameworks and hypotheses are compared with the data from each case.

At this stage, it will likely be possible to obtain new or refined hypotheses (e.g., regarding the LSP SCPMS scope as compared to the focal firm's SCPMS scope) and constructs (e.g., our working definition of LSP SCPMS may be changed) (Voss *et al.,* 2002, Yin, 2003). Five consecutive phases of the data collection and data analysis are outlined in Figure 3 on the work plan general outline.

Figure 3. *Work plan general outline*



Source: *Own study.*

3.3 Data Collecting Methods

Data collection encompasses the first four phases of the work plan structure.

Development of research instrument initial item pool: The objective of this phase is developing a database that offers conceptualizations, empirical tests and dimensionality of relevant constructs namely, LSP SCPMS scope, LSP generation and SC performance. Therefore we suggest to conduct a typical literature review with reference to the last two constructs mentioned above. Conducting a systematic literature review is suggested to determine the knowledge base on the topic of LSP SCPMS. In order to cover the current body of knowledge the data should be gathered using the relevant databases such as Web of Science, Ebsco, Emerald, and Scopus.

Development of research protocol and instruments: The objective of this step is to design structured interview questionnaires which are expected to be backed up by unstructured interviews and interactions when conducting multiple-case study research. Additionally a research protocol should be developed. It contains, but is more than, the research instruments. It also contains the procedures and general rules that should be used in applying the instruments, and indicate who or from where different sets of information are to be sought. We suggest to address triangulation approach when developing the research protocol and instruments (McCutcheon and Meredith, 1993). Therefore multiple respondents should be interviewed in each LSP to capture different viewpoints.

Case selection and sampling: The objective of this phase is creating a sample frame to help uncover, confirm, or qualify the basic processes and constructs that underpin the proposed research namely LSP SCPMS scope, LSP generation and SC

performance. The research sample should be collected from the representatives of LSP industry. It is worth to identify and generate separate lists for each of two categories of LSPs, namely 3PLs and LLPs/4PLs. We suggest to examine three large representatives for each of two mentioned LSP generations. The next step after gaining access to 6 large LSPs will be gaining access to their partners (e.g., a key account customer, a key subcontracted LSP, a customer's supplier). We suggest to examine one partner per one LSP and select them on the basis of the identified collaboration between both parties connected with mutual development of external SCPMS.

Field research: The objective of this phase is to run an exploratory in-depth qualitative investigation which will take the form of a multiple-case study conducted with 6 large LSPs. This is the first step of this phase. The second step are in-depth interviews with 6 LSP partners, one for each LSP examined. Following the research triangulation approach we suggest to use and combine different methods to study the same phenomenon. We advise to document the raw data carefully, code them with standard codes and group by construct category. It is good to code data in three steps (Corbin and Strauss, 1990): open coding, axial coding and selective coding.

3.4 Methods for Analysing Data

Data analysis encompasses the last phase of the work plan structure.

Qualitative data analysis: This phase is aimed at testing the respective hypotheses and shaping the new ones through the focus on theory building. We suggest to conduct two steps of the analysis: the analysis within case data, and searching for cross-case patterns.

3.5 Reliability, Validity, Generalization

There are several risks which may influence reliability, validity and possible generalization of the findings in the proposed project. We advise to address these specific risks on each of the project phases as described below.

Development of research instrument initial item pool: A typical literature review and a systematic literature review were suggested on this stage. A typical risk connected with literature reviews is related to the validity of keywords selected for databases search. In order to address this risk we advise to adopt a research triangulation approach at each critical step, that is for keyword selection, elimination criteria and papers retrieval.

Development of research protocol and instruments: A typical risk connected with this stage is insufficient level of the reliability and validity of case research data. We suggest to address this risk by designing a research protocol, applying triangulation

approach when developing the research protocol and instruments and conduct a pilot-testing for them.

Case selection and sampling: The risk associated with this phase relates to misjudging the representativeness of a single event and exaggerating easily available data that may occur in single cases. We advise to address this risk by examining multiple cases, instead of a single case, that can both augment external validity and help guard against observer bias (Voss *et al.,* 2002). Taking into consideration the scope of the research we suggest to use replication logic when selecting cases in order to increase external validity (Yin, 2003). Multiple cases resemble multiple experiments which means that multiple-case studies require replication logic, not sampling logic.

Field research: A typical risk connected with case research is the risk of inadvertently breaching confidentiality or gathering biased information. We advise to address this risk by following sound guidelines and a roadmap for operations management researchers wishing to design, develop and conduct case-based research (Voss *et al.,* 2002). Following the research triangulation approach we suggest to use and combine different methods (e.g., questionnaires, interviews, direct observations, informal conversations, attendance at meetings, surveys administrated within the organisation, content analysis of documents and review of archival sources) to study the same phenomenon, which is an underlying principle in collection of data in case research. In this way data reliability and constructs' validity may be increased. Another way through which the data reliability may be increased is using case study protocol and multiple investigators. The accuracy of the documentation, and at the same time construct validity may be also increased by letting the key informants review draft case study reports.

Qualitative data analysis: This phase is aimed at testing the respective hypotheses and shaping the new ones through the focus on theory building. The risk is connected with data quality and the results connections with hypotheses. We suggest to address this risk first by following sound and rigorous procedures for case-based research (as mentioned in the previous phases), second by conducting two steps of analysis: analysis within case data, and searching for cross-case patterns which is essential for enhancing the generalisability of conclusions drawn from the cases.

The cross-case analysis and searching evidence for 'why' behind relationships through pattern matching and explanation building will help to increase the internal validity of the findings. In the theory development research, it is important to review the emergent theory against the existing literature (Voss *et al.,* 2002). That is why the proposed research was built on existing theory and should be finished with confrontation of the research results with literature. This should lead to the increased quality and validity of the findings. In view of the above, we suggest to apply the analytical generalization concept to generalize the findings of a study and create theory concerning examined population i.e., LSP industry.

3. Conclusion

The proposed conceptual framework may contribute to filling a significant gap in management theory, related with the LSP SCPMS recognition. While there are sparse studies addressing focal firms' SCPMSs, similar research in LSP SCPMS is vastly missing. The proposed framework fits in the debate regarding the relationship between the SCPMS adoption and the actual SC performance improvement (Maestrini *et al.*, 2017) and responds to the recent calls on developing a strategic management theory and conducting inter-organisational (dyadic) studies when investigating SCPMSs. It is expected that the research results generated on the basis of this framework will help to fine-tune and operationalize the LSP SCPMS concept that we initially defined in the working definition, proposed via Maestrini *et al.* (2017).

As a research approach in-depth qualitative investigation in the form of a multiple-case study is suggested. This will give a chance to gather exploratory descriptions showing how LSPs handle their SCPMSs including individual internal and external subsystems taking the individual PMS processes into consideration. The proposed framework allows us also to look for the differences in the LSP SCPMSs developed by two different kinds of LSPs namely 3PLs and LLPs or 4PLs. Finally, it enables us to investigate the impact of LSP SCPMS on SC performance viewed from a dyadic perspective i.e. LSP's and LSP partner's perspectives.

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