

# **Service led strategies: The case of Port Centric Logistics in UK ports**

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Submitted for the degree of

**Doctor of Philosophy**



Heriot-Watt University  
School of Social Sciences

December 2018

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## **Abstract**

In recent decades organisations have found ways to increase revenue, respond to challenging business environments, sustain relationships with increasingly sophisticated customers, and overcome saturation barriers in core markets, by the implementation of Service-led-strategies (SLS). SLS are strategies that enhance the core offering of organisations with value-added services (VAS). This research builds on previous studies in supply chain management, maritime logistics and operations management literatures to examine the impact of Services-Led-Strategies (SLS) on the competitiveness of UK ports and intermediaries involved with port-centric logistics (PCL).

The main purpose of the study is to contribute to the ongoing research on service-led growth of organisations. Grounded in theoretical assumptions from the extended resource-based theory (ERBT), this research aims to explain the implementation of SLS, and their anticipated impact on UK ports and intermediaries, and to empirically and theoretically underpin the concept of PCL using UK ports and intermediaries as a context. Theoretically, this thesis demonstrates how the co-creation of value and resources among actors in business networks enhance the competitiveness of supply networks.

Methodologically, the research adopts a critical realism paradigm and an abductive research approach using multiple case studies developed through the method of casing and collects data through interviews, observations and documents. The case studies contrast theoretical attributes with practice, and develop new context related propositions. Therefore, this research suggests that flexible qualitative data collection and analysis techniques are appropriate for a holistic, and comprehensive understanding of complex operations and supply chain management phenomena.

The primary contributions of this thesis are an empirically derived and contextualised typology of SLS in a PCL context, which to the best of the author's knowledge has not been provided in the PCL literature so far, and a quadruple framework that investigates the anticipated impact of those SLS on firms. The proposed typology provides managers with a comprehensive understanding of the type of SLS they can implement, the resources and services required and the mechanisms to develop them within the PCL market. Additionally, the research study provides managers with a comprehensive framework to understand the anticipated impact of the implemented SLS strategy.

## **Dedication**

*To Philip H. Ward, who would have been so proud to see this thesis completed.*

## **Acknowledgements**

The completion of the long and lonely journey that resulted in the present thesis would not have been possible without the inspiring guidance and support of many people. For your generous help throughout this research I will be for ever grateful.

First and foremost, my deepest gratitude goes to the two supervisors of this thesis, Dr. Maja Piecyk, and Dr. Nigel Caldwell for their encouragement, constructive feedback and inspiring guidance throughout this research. Their academic integrity, professionalism, and immense knowledge guided me during my doctorate studies.

Many thanks go also to all the members of the Logistics Research Centre, Centre for Sustainable Road Freight, and the School of Social Sciences of Heriot Watt University for their kind advice, care, help and support throughout the various stages of this research. Additionally, a magnitude of thanks is also expressed to all the participants of this study. Without your insightful input this thesis could have never been completed.

Finally, the greatest thanks go to my family in Greece, Germany and Ireland, and my friends around the world that stood tirelessly by me during the most challenging times of this journey and were proud of every accomplishment during this process. For all your moral support and tolerance, I will be forever grateful.

## Research Thesis Submission

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## **Abbreviations**

CA: Competitive Advantage  
CPFR: Collaborative Planning, Forecasting and Replenishment  
CSR: Corporate Social Responsibility  
ECR: Efficient Consumer Response  
ERBT: Extended Resource Based Theory  
EU: European Union  
GPO: Global Port Operator  
IAPH: International Association of Ports and Harbours  
ISO: International Standards Organisation  
ITS: Intelligent Transport System  
JV: Joint Venture  
LSP: Logistics Service Provider  
M&As: Mergers and Acquisitions  
ML: Maritime Logistics  
MT: Maritime Transport  
NDA: Nuclear Decommissioning Authority  
O&SCM: Operations and Supply Chain Management  
OECD: Organisation for Economic Co-operation and Development  
OM: Operations Management  
OS: Operations Strategy  
PA: Port Authority  
PCL: Port Centric Logistics  
POC: Port Operating Company  
PSS: Product Service System  
QR: Quick Response  
RBT: Resource Based Theory  
RBV: Resource Based View  
SBU: Strategic Business Units  
SCA: Sustainable Competitive Advantage  
SCM: Supply Chain Management  
SLS: Service Led Strategies  
TCE: Transaction Cost Economics  
TEU: Twenty Foot Equivalent Units  
TLC: Total Logistics Cost  
TNCs: Transnational Corporations  
UK: United Kingdom  
UNCTAD: United Nations Conference on Trade and Development  
USA: United States of America  
UST: Unified Service Theory  
VAC: Value Added Capabilities  
VAS: Value Added Services  
VMI: Vendor Managed Inventory  
VRIN: Valuable, Rare, Inimitable, and Non-substitutable  
WB: World Bank  
WBPRTK: World Bank Port Reform Toolkit

# Chapter 1 : Introduction

## 1.1 Introduction to the research

This research builds on previous studies in supply chain management (SCM), maritime logistics (ML) and operations management (OM) literatures. The aim of this research is to examine the impact of Services-Led-Strategies (SLS) on the competitiveness of UK ports and intermediaries involved with port-centric logistics (PCL). Intermediaries are defined as entities that facilitate the flow of products between buyers and suppliers by the provision of third party logistics services; as such, transportation and/or warehousing providers, and forwarders among others are considered as intermediaries within supply chains (SC) (Mentzer et al., 2001; Hingley et al., 2015). SLS are defined as strategies that enhance the core offering of organisations with value-added services (VAS) (Bustinza et al., 2015). SLS enable firms to increase revenue, face challenging business environments, sustain relationships with increasingly sophisticated customers, increase growth rates, and overcome saturation barriers in core markets (Davies et al.; 2006, Gebauer et al., 2008; Kowalkowski et al., 2015; Bertoni et al., 2016; Baines et al., 2017; Bustinza et al., 2017; Kowalkowski et al., 2017). Or put differently SLS are strategies that enable co-creation of value and product innovation in collaboration with customers (Smith et al., 2014; Bustinza et al., 2017). VAS refer to augmented service offerings that provide superior value to the user, in addition to the value experienced through the utilisation of core services (Collins, 1986).

Extant manufacturing, and operations management literature has widely investigated “*why*” and “*how*” manufacturers implement SLS (Kowalkowski et al., 2015; Baines et al., 2017). From a manufacturer perspective, SLS are strategies that underpin the transition of the firm from a product supplier to become a *service* (Oliva and Kallenberg, 2003; Lewis et al., 2004; Gebauer and Friedli, 2005; Raddats and Easingwood, 2010), *advanced service* (Baines and Lightfoot, 2014), *product-service system (PSS)* (Tukker, 2004; Baines et al., 2009b; Kreye et al., 2014), *hybrid offering* (Ulaga and Reinartz, 2011), *solution* (Davies et al., 2006; Roehrich and Caldwell, 2012; Gebauer et al., 2013), or *product service innovation* (Bustinza et al., 2017) provider.

Path defining studies such as those of Levitt (1972), Vandermerwe and Rada (1988) and Oliva and Kallenberg (2003) assume a unidirectional transition of the firm along a

product-service continuum. The further manufacturers reposition themselves towards the service-end of this continuum, the greater the relative importance of the services in comparison to the relative importance of tangible products (Kowalkowski et al., 2015). It is anticipated that towards the service-end of the continuum firms will realise increased and more stable profit from additional revenue sources (Wise and Baumgartner, 1999; Neely, 2008; Baines et al., 2009b; Eggert et al., 2014; Cusumano et al., 2015; Baines et al., 2017), increased and sustained competitiveness derived from additional value-added capabilities and differentiation (Mathieu, 2001; Brax, 2005; Malleret, 2006; Fischer et al., 2010; Bustinza et al., 2017), long term relationships with customers (Davies, 2003; Gebauer et al., 2006; Neely et al., 2011; Baines et al., 2017; Kowalkowski et al., 2015) and improved environmental output (Tukker, 2004; Lockett et al., 2011; Wang et al., 2011; Reim et al., 2015; Qu et al., 2016; Gebauer et al., 2017).

However, contemporary understanding about SLS assumes a multifaceted and multidirectional transition of firms implementing SLS; challenging assumptions of path defining studies that proposed a unidirectional positioning of those who implement SLS along the product-service continuum. This novel perspective assumes that firms implementing SLS offer a stratified offering, this further contradicts former studies which assume the provision of a single service type at a time (Kowalkowski et al., 2015; Möller and Parvinen, 2015).

Consequently, SLS will not have same outcomes for all firms. Depending on the trajectory and role of each firm, different markets, and growth opportunities exist. Therefore, firms that implement SLS should consider how each role complements each other and find ways to leverage these roles. Another important aspect of this novel perspective is the recognition that not all customers are interested in advanced service offerings. Consequently, firms that implement SLS should evaluate the demand of customers and provide the appropriate service mix (Kowalkowski et al., 2015; Möller and Parvinen, 2015) to avoid negative financial performance and bankruptcy risks (Benedettini et al., 2015).

Furthermore, the literature review of this study reveals that the SLS literature focuses mainly on the transition of manufacturers, and neglects service providers that move towards the provision of VAS, which alter the way in which customers realise value. Exceptions are the studies of Davies (2004; 2007) and Spring and Araujo (2009) who discuss SLS from a service providers perspective. Davies (2004; 2007) investigates service providers that implement SLS which increase their systems integration

capabilities by getting involved with the design and instalment of equipment sourced by various suppliers (Davies, 2004; Davies et al., 2007). Spring and Araujo (2009) discuss the concept of “*productising*” which refers to service providers branding and marketing products through multiple channels. By this strategy service providers allow self-administration of parts of the service experience, overcome capacity constraints and increase revenue (Spring and Araujo, 2009). Kowalkowski et al. (2017) also discuss the manufacturing centred focus of SLS research, and highlight the need for more research on other industries. Consequently, a research gap is created for service providers which are not involved in the design and production of goods (but use goods as means to deliver their services), and move towards provision of services which lie outside of their core offerings. An example of such service providers can be identified in the UK port and intermediary sector.

Practices such as the UK port privatisation schemes (1981 and 1991) and the national dock labour scheme (late 1940s), as well as relocation of DCs to central parts of the country forced container ports to focus solely on the provision of cargo and ship handling services (Baird, 1995; Asteris and Collins, 2009; Monios and Wilmsmeier, 2014). Therefore, UK container ports did not develop at the same pace with ports in other parts of the world, and consequently lost competitiveness to other mainland ports that became logistics platforms during the 1980s (Pettit and Beresford, 2009).

However, during early 2000s, UK port operators realised that increased benefits could be derived by the on-site provision of logistics-VAS, in addition to their core offerings. Mangan et al. (2008) defined this strategic shift of ports as Port Centric Logistics (PCL). Therefore, the key offering of a port that has implemented PCL is a bundle of traditional port services (e.g. stevedoring, pilotage, stowage, and security) and various logistics-VAS (e.g. container unloading, cross-docking, warehousing, etc.). Consequently, PCL alters the way in which customers realise value from using the port.

The logistics, SCM and ML literature embraced the term PCL since 2008. However, the majority of papers (e.g. Rodrigue and Notteboom (2012), De Langen et al. (2012), and Loh et al. (2017)) use the term only as a definition and do not develop the concept academically beyond the study of Mangan et al. (2008) on PCL (Mason et al., 2015). Exceptions are the papers of Pettit and Beresford (2009), Monios and Wilmsmeier (2012b), Demirbas et al. (2014), Mason et al. (2015) and Okorie et al. (2016). Pettit and Beresford (2009) utilise the conceptualisation of Mangan et al. (2008) for the role of ports within SCs, and propose a taxonomy that shows the warehousing requirements of



ports depending on SC requirements. Monios and Wilmsmeier (2012b) consider PCL as an alternative “*site development strategy*” for Scotland to overcome its “*double peripherality*” and be less dependent on English ports and road transportations. The authors ground PCL in theories derived from economic and political geography and view the concept as a solution for spatial fixes of mobile capital. Moreover, Demirbas et al. (2014) investigate different roles of ports within SCs and explore the multifaceted relationships between port authorities/operating companies (PA/POC) and organisations that utilise ports. In their study, they consider PCL as one interface of the relationship between PA/POC with organisations that utilise ports. Mason et al. (2015) investigated the decisions of a retailer and a LSP to relocate their distribution centres from an inland to a port-centric location and vice versa, to identify which is best for distribution centres services from a decision maker perspective. They conclude that there is no “*generic right answer*”, and that circumstantial characteristics need to be taken into consideration for distribution centre location decisions. Okorie et al. (2016) investigate the type of logistics-VAS offered in four ports in the Netherlands, Lagos, Egypt, and the UK. They argue that LSPs are often involved in the active provision of those services, and that logistics-VAS attract new customers, and positively affect customer retention. Additionally, they acknowledge a paucity of research that investigates the role of VAS in maritime literature.

However, none of the above studies utilise literature that investigates both “*why*” and “*how*” organisations move beyond core offerings and implement strategies enabling them to co-create value with customers. The present study by linking PCL with SLS literature, and adopting the contemporary understanding of multidirectional SLS, proposes a novel perspective in PCL research, and addresses a gap in SLS literature regarding the investigation of the impact of SLS on the competitiveness of service providers.

To facilitate this investigation contemporary views on strategy development are utilised. Researchers acknowledge that superior performance derives from strategic partnerships among firms (Dyer and Singh, 1998; Iyer, 2014). However, dominant theoretical frameworks from organisational sciences, such as transaction cost economics (TCE) and resource based view (RBV), which have frequently been utilised in SCM and OM research (Hitt et al., 2016), do not consider rent generating capabilities that emerge from inter-organisation partnerships (Lewis et al., 2010; Iyer, 2014; Xu et al., 2014). This gap is bridged with the *extended resource based theory* (ERBT) which is an expansion of the traditional RBV. ERBT builds upon the concepts of *relational view* (Dyer and Singh,

1998) and *complementary assets* (Teece, 1986) and investigates the strategic behaviour and performance of partnered firms (Lavie, 2006). Two main arguments of ERBT are that resources which exist outside the boundaries of the firm can be sources of CA, and that alliances enable firms to develop value creating resources, which could not be developed by the firm in isolation (Dyer and Singh, 1998; Ireland et al., 2002; Lavie, 2006; Spring and Araujo, 2013; Xu et al., 2014; Prajogo et al., 2016).

ERBT is considered relevant to investigate the context of this study, which encompasses the view of ports as business networks. In particular, in an effort to re-establish their role in the SC, ports (outside of the UK) implemented various SC integration practices and focused on provision of VAS (Demirbas et al., 2014; Okorie et al., 2016). Consequently, ports transformed from “*pawns in the game*” (Slack, 1993) to “*elements in value driven chain systems*” (Robinson, 2002) and facilitated the view of ports as business networks (Van der Lugt et al., 2013; Mason et al., 2015).

In summary, this thesis investigates contemporary strategic moves of UK ports and intermediaries, referred to as PCL, through the lens of SLS and proposes a novel typology of SLS in this context. Additionally, this research utilises theoretical frameworks from the strategic management literature to underpin empirical investigation of the impact of SLS on service providers. From a theoretical standpoint, this thesis extends existing PCL and SLS literature, and applies the theoretical framework of ERBT in a new context. From a managerial standpoint, this thesis outlines the benefits anticipated by the implementation of each of the SLS included in the proposed typology; and identifies how companies implementing SLS in a PCL context can increase and sustain their competitiveness.

## 1.2 Research Objectives and Research Questions

The following research objectives (RO) and research questions (RQ) (Table 1-1) have been developed to facilitate the achievement of the research aim of this thesis.

<b>RO1: Identify a typology of SLS implemented by UK ports and intermediaries for the provision of on-port logistics VAS.</b>	
RQ1: How do UK ports and intermediaries compete in the contemporary business environment?	Literature review – Chapter 3
RQ2: What type of SLS do UK ports and intermediaries implement to provide on-port logistics VAS?	Empirical analysis – Chapter 5

RQ3: Why do UK ports and intermediaries implement SLS?	Empirical analysis – Chapter 5
<b>RO2: Identify the impact of each SLS on ports and intermediaries that implement them.</b>	
RQ4: What are the financial, strategic, marketing and environmental impacts of SLS on port and intermediaries?	Literature review – Chapter 2
RQ5: How do SLS impact UK ports and intermediaries?	Empirical analysis – Chapter 6

**Table 1-1: Research objectives and research questions**

### **1.3 Research Scope**

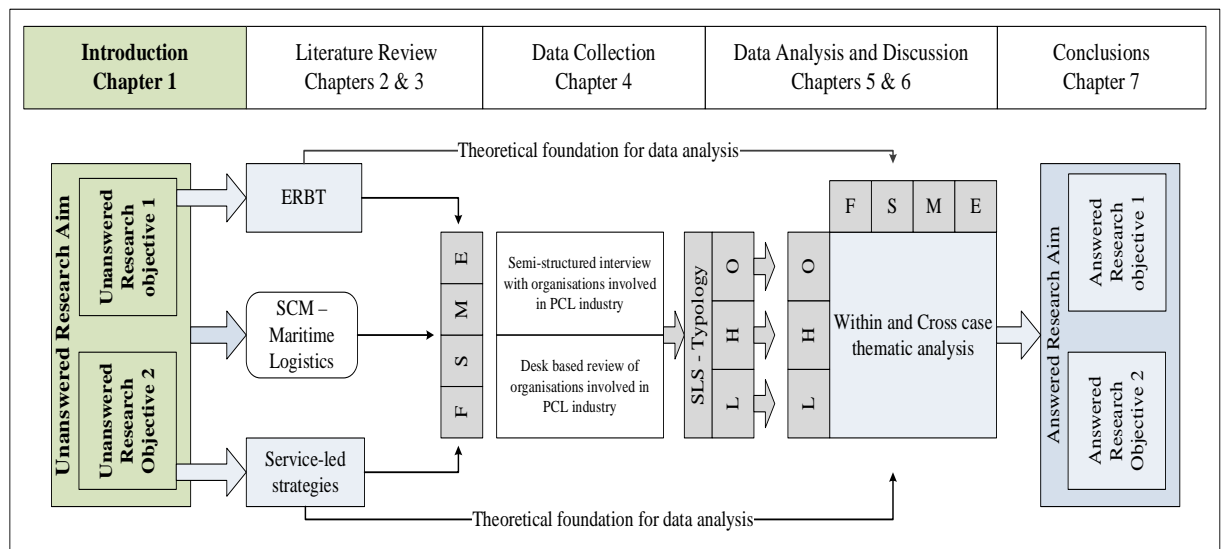
This study investigates the impact of SLS on the competitiveness of UK ports and intermediaries involved with PCL; based on the assumptions that PCL can be perceived as SLS of ports and intermediaries that compete on the provision of logistics-VAS, and that ports are business networks. Therefore, the units of analysis for this research are UK container ports and intermediaries involved with the provision of logistics-VAS. However, since the aim of this research focuses on the investigation of the impact of SLS, participating companies have been researched only in their capacity as providers of logistics-VAS. The determinants of the competitiveness of participating companies for other activities are acknowledged but their consideration is limited to clarifying the nature of the company.

Further, PCL originated in the UK and refers to the provision of logistics-VAS at UK container ports, which operate under a different governance structure in comparison to ports elsewhere. Therefore, the need to consider literature that captures regional characteristics and investigates ports governed under the same governance structure emerges. Consequently, only PCL literature has been reviewed for the creation of the data collection protocol. Maritime and port literature concerning global practices has only been utilised for the clarification of definitions and for framing the competitive contemporary port environment. A caveat from the regional focus of this study is the limited generalisability of the findings from the multiple case studies to a wider business domain or other regions.

### **1.4 Thesis Outline**

This thesis is divided into *seven* chapters. This chapter introduced readers to the background of the research and the aim, scope, objectives and research questions of this thesis. Figure 1-1 depicts the structure of the thesis. The green coloured section of the

figure highlights the current chapter. The same figure is provided at the beginning of each chapter with the relevant chapter highlighted in green.



**Figure 1-1: Thesis outlines and focus of Chapter 1**

**Chapter 2**, entitled “*Strategy development of organisations and the dominance of SLS*”, introduces the theoretical background of the research, and is divided in two sections. The first discusses the current focus of corporate strategy on the analysis of inter-firm alliances as determinants for the realisation of sustainable competitive advantage (SCA). The focus of the thesis on the analysis of contemporary strategies of interconnected organisations dictates the acceptance and extensive discussion of ERBT as a key theoretical foundation, used to ground the empirical findings. The second part of Chapter 2 introduces the concept of SLS, and discusses its development and application by organisations. By a thorough literature review the impact of SLS is identified and summarised in four key themes, namely: financial, strategic, marketing and environmental. These themes are later used as a lens to frame the PCL literature, and in the organisation of the data collection and analysis.

**Chapter 3**, entitled “*Port development and evolution in global supply chains*”, introduces the research context. The chapter reviews the literature on port development, and makes a case for the unique governance structure of UK ports. This leads to a review of the evolution of container ports in the UK until the development of PCL in mid-2000s. PCL represents one contemporary strategy of UK ports and intermediaries. The development of PCL is critically discussed, and extant PCL literature is reviewed under the lens of the four themes identified in Chapter 2. The synthesis of the two literature streams underpins the development of the research objectives and data collection protocol.

**Chapter 4**, entitled “*Research Philosophy and Methodology*” presents and justifies critical realism as the paradigmatic stance of this thesis based on the ontological and epistemological foundations of this research. The current lack of extant work that addresses the research objectives of this research, justifies the use of multiple cases studies as appropriate tools for this study. Further, the abductive nature of reasoning adopted in this thesis and the multiple case study strategy allow for the implementation of the process of “casing”. The remainder of the chapter discusses in detail the data collection and analysis processes, and the issues affecting the quality of this research.

**Chapter 5**, entitled “*Toward a typology of SLS in the context of PCL*”, presents the three emergent case studies of this research, namely: landlord-SLS, operator-SLS, and hybrid-SLS. Each case study represents a different SLS in the context of PCL. For each one of these SLS the involvement of the implementing company in the PCL industry and the supply chain, the main source of revenue from PCL, the spectrum of logistics-VAS provided, and the investments in physical and human capital resources are outlined. Additionally, the motivation to implement each SLS is also examined.

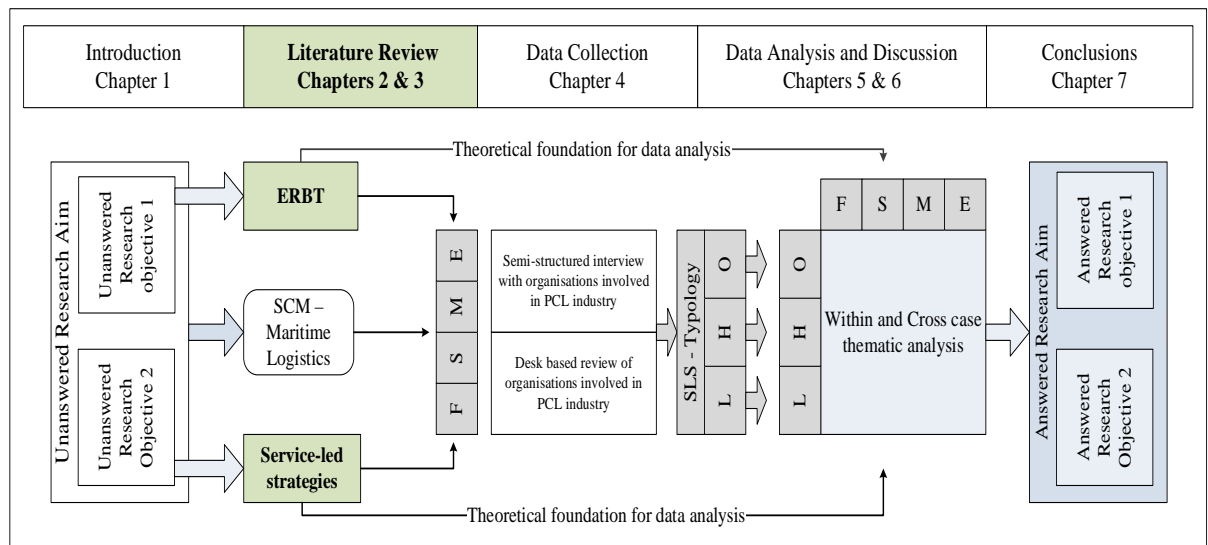
**Chapter 6**, entitled “*Analysis and Discussion*”, is divided into four main sections. Each section evaluates the impact of each SLS from a different perspective (RO2). For each of these themes the findings are discussed in the light of the existing literature, as outlined in Chapters 2 and 3. Summative tables at the end of each section highlight the contributions of the findings to the three literature streams that inform this research.

**Chapter 7**, entitled “*Conclusion*”, concludes the thesis by summarising in the light of the research objectives the key findings of the research. The theoretical and practical implications of the study are also highlighted. The chapter concludes by outlining the limitations of this research and providing directions for future research.

### **Chapter Summary**

This chapter provided the background of this research by presenting a comprehensive introduction, the research aims, objectives and questions, the research context and an outline of the structure of this thesis. The following chapter reviews the literature on the development of the strategy of organisations and SLS.

## Chapter 2 : Strategy development of organisations and the dominance of service led strategies



**Figure 2-1: Thesis outline and focus of Chapter 2**

Chapter 2 introduces the theoretical background of this research by reviewing extant literature on strategy development and SLS (see Figure 2-1), and partially addresses RO2. Initially, the concept of corporate strategy, and its development are discussed. Predominant assumptions and theoretical frameworks are also examined, and definitions of key terms are provided. The focus of the thesis on the analysis of strategies of organisations involved in networks, dictates the examination of theoretical frameworks that acknowledge the existence of value generating resources beyond firm boundaries, such as the ERBT (Section 2.1.4). Key assumptions of ERBT are used to synthesise a framework that underpins the empirical analysis of the thesis.

Thereafter the concept of SLS, its development and application by organisations are critically discussed (Section 2.2), and definitions of product, services and offering are provided. Thereafter, by a thorough critical literature review a research gap is identified for service providers which are not involved in the design and production of goods (but use goods as mean to deliver their services), and move towards the provision of services which lie outside of their core offerings. From the review of the extant literature the impact of SLS is identified and summarised in four key themes, namely: financial, strategic, marketing and environmental (Section 2.2.4). These themes are used as a lens to frame the PCL literature, and to organise the data collection protocol. Additionally, the four themes provide the basis for the analysis of the impact of SLS (RO2). The section also outlines the risks to implement SLS, and highlights the fundamental changes firms

need to attain for a successful SLS implementation. Additionally, Section 2.2.5 highlights the novel perspectives on SLS, which allows RO1 to be developed.

## **2.1 Firm's Strategy**

Definitions of strategy are abundant; for example, Andrews (1971, p.28) defines strategy as *"the pattern of major objectives, purposes or goals and essential policies or plans for achieving those goals, stated in such a way as to define what business the company is in or is to be and the kind of company it is or is to be"*. Additionally, Caves (1980, p.67) characterises strategy as a unified concept with roots in the study of business decision making, and argues that the aim of strategy is to enable managers to construct a long-term plan that will *"assure the maximal attainment of the firm's objectives"* in the form of a simple and operational method. Mintzberg and Waters (1985) argue that strategy has been defined as a pattern in a stream of decisions. Their definition offered the operationalisation of the concept and stimulated research in strategy formation of organisations. Fahy (1996, p.25) defines strategy as the *"challenge of matching resources and strengths with the opportunities existing in the environment"*.

From the above it is apparent that a plethora of definitions about strategy exist. Hambrick and Fredrickson (2005, p.52) argue that strategy is still used *"as whatever one wants it to mean"*, even though multiple frameworks explaining strategy have been developed since the debut of the concept in literature. That is, because all the tools developed to define strategy do not provide in effect a clear understanding of *"what actually constitutes a strategy"*, or what its outcome should be (Hambrick and Fredrickson, 2005, p.51).

Conversely, another literature stream argues that consensus is not required in science, because the plethora of strategy definitions fosters practitioners and academics to manoeuvre among the field of strategic management (Mintzberg, 1987). That is, because different definitions create a holistic multifaceted perception of strategy. The definition of strategy influences the way a certain change/action will be interpreted. Thus, different definitions of strategy must be used to achieve a better and deeper understanding of the processes formed by strategy (Mintzberg, 1987, Barry and Elmes, 1997).

Nevertheless, contemporary research shows that the need for the creation of a common accepted language in the field of management fosters the trend towards the unification of strategy definitions (Bowman et al., 2002, Markides, 2004, Ronda-Pupo and Guerras-Martin, 2012). For this reason and for the purpose of clarity in the remainder

of the thesis, strategy will be considered as “*the dynamics of the firm’s relation with its environment for which the necessary actions are taken to achieve its goals and/or to increase performance by means of the rational use of resources*” (Ronda-Pupo and Guerras-Martin, 2012, p.182).

The remainder of this section critically reviews the development of corporate strategy since the emergence of this concept in the business environment.

### **2.1.1. 1950s – 1970s: Development of the concept and the “Intended Strategies”**

Strategy as a term emerged in the business world during the 1950s as a response to environmental discontinuities. However, the concept was not widely accepted by scholars and practitioners since the preliminary understanding of strategy was confounded with the military use of the term, which is “*the science and the art of deploying forces for battle*” (Ansoff, 1984, p.31). That is because the word strategy derives from the Greek word “*strategos*”, which means the general in military language (Evered, 1983; Mintzberg, 1987). Moreover, the usefulness of strategy has been doubted in academia and in industry because the necessity of its usage and the outcome of its adoption for firms were not understood (Ansoff, 1984).

The term strategy first appeared in business literature in the work of Von Neumann and Morgenstern “*Theory of Games and Economic Behaviour*” in 1944 (Ronda-Pupo and Guerras-Martin, 2012). However, the first published definition of strategy in a management concept appeared several years later in the book “*The Practice of Management*” by Peter Drucker (1954). One work that steered the focus of economists to individual firms rather than the marketplace was “*The theory of the growth of the firm*” by Edith Penrose (1959). Her most noticeable contribution was the argument that what occurs within a firm is equally important to what occurs in the external environment of the firm (Lowson, 2002). Penrose (1959) argued that the use of the resources and the historical development of a firm are determinants for the growth and future of the firm. This argument was further supported by Chandler (1962), who grounded the understanding of firms’ strategy on the historic development of the firm.

In the 60s and 70s strategy development was underpinned by strategic tools and analysis of consultants. When firms adopted multidivisional structures, managers turned to consultants for the development of strategic tools. Such tools generate plans and goals that enable managers to overcome the challenges of allocating appropriate resources among the divisions of the firm (Rumelt et al., 1991). One of the most pre-eminent consultants was the Boston Consulting Group, which introduced the portfolio planning



tool of Growth/Share Matrix, and the experience curve (Herrmann, 2005). These tools enabled firms to define their objectives and plans in accordance with their competing market and be able to surpass competition (Rumelt et al., 1995). Another important tool developed during this period is the famous SWOT analysis, by Andrews (1971). SWOT analysis identifies the strengths and weaknesses of a firm and proposes ways that they can be adapted to comply with the threats and opportunities that exist in the firm's environment (Pickton and Wright, 1998).

An important contribution in strategy development is the addition of the concepts of distinct competence, company mission and business definition within the definition of strategy (Andrews, 1971; Herrmann, 2005). A derivative of this development is the identification of firm's resource and competencies that have potentials to become sources of competitive advantage (CA) if environmental opportunities are correctly exploited. Consequently, firms should evaluate their competencies and resources and identify those that can outperform relevant resources and competencies of competitors, because these resources and competencies can generate CA (Andrews, 1971; Peteraf, 1993).

In the first decades following its emergence, strategy was perceived as a response to the need of top managers to categorise and evaluate the unstructured plethora of daily events and decisions about the firm's position within its business environment (Ronda-Pupo and Guerras-Martin, 2012). In this period, the "*design or classical school*" of strategists emerged. The consensus of this grouping is that top managers of the firm are responsible to form strategy, because they can objectively assess the firm, its resources and its environment in a way that enables the augmentation of success in an unstable future. The strategies that have been developed under this process are called "intended strategies". Moreover, the most distinct notion of the classic school is that "*formulation and implementation work together (the former planning the latter) in a logical and rational progression taking into account all possible demands*" (Lowson, 2002, p.44).

### **2.1.2. 1970s- 1980s: Focus on process, Emergent, and Market-Driven Strategies**

During this decade an opposing school of strategists emerged, they are called the "*process school*". The key representative of this school is Mintzberg (Mintzberg and Waters, 1985). The main notion of this group of strategists is that strategy will incrementally emerge from everyday activities and decisions of firm members, rather than from static strategic planning exercise conducted by top managers (Mintzberg and Walters, 1978). During this period the contrast between strategy formulation and implementation is obscured (Lowson, 2002).

The rise of emergent strategies is attributed to the dissatisfaction of managers caused by the inability of intended strategies to predict environmental uncertainty. The result of this inability was that strategic planning was limited to a ‘goal-setting exercise’, unable to capture a firm’s competitive advantages (Herrmann, 2005). Additionally, difficulties in implementing the highly sophisticated planning inherent in intended strategies favoured the development of the process school and strategy development based on incremental changes (Quinn, 1980).

During the 1980s another significant aspect of strategy development appeared. That is the development of the “market/industry view” of strategy, where strategists shifted their attention from firm’s structure towards environmental opportunities (Hoskisson et al., 1999; Lowson, 2002). Much of this shift is attributed to the inspirational work of Porter (1980), who provided the first dominant design in strategic management, based on ideas from industrial organisations economics (Herrmann, 2005), and the structure-conduct-performance tradition (Rumelt et al., 1991). Porter (1980) introduced the five forces model<sup>1</sup>, and the generic strategies based on the argument that the competing market of a firm is more important than the industry this firm belongs to. The generic strategies are cost leadership, differentiation and focus (Porter, 1980). The market driven view of strategy has been widely accepted and implemented by companies during the 1960s-1980s, when consideration regarding external sources of CA has been the dominant view of strategists (Hoskisson et al., 1999). A market driven view of strategy still remains highly applicable in the contemporary business environment, even though many aspects of this view have been rejected (Lowson, 2002).

Another distinct characteristic of the 1970s-1980s period is that strategists combined studies of strategic management with other disciplines (e.g. economics, organisation theories, finance, and accounting). This combination of various disciplines fostered the development of theoretical frameworks that define the strategic management foundations (Barney, 1991; Iyer, 2014)<sup>2</sup>.

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<sup>1</sup> The five forces are: threat of potential entrants, level of rivalry among existing competitors, product substitution, buyers’ bargaining power, and suppliers’ bargaining power (Porter 1980).

<sup>2</sup> Some of these theories are: Transaction Cost Economics, Agency Theory, Economic Game Theory, Evolutionary Theory, Contingency Theory, Resource Dependence Theory, among others, that shaped the domain of strategic management. However, due to space limitations and limited relevance with this research, these theories are not discussed further.

### 2.1.3. 1980s – 1990s: Resource Based View of the Firm

During the 1980s strategists shifted their attention away from market based view and emphasised firm's resources and capabilities (Lowson, 2002). The most influential theory that emerged during this period is Resource Based View (RBV). The development of RBV is attributed to Birger Wernerfelt (1984), who, based on the work of Penrose (1959), views firms as a bundle of value generating resources tied "semi-permanently" to the firm (Lockett et al., 2009). Scholars, such as Wernerfelt (1984), Barney (1986a, 1986b, 1991), Dierickx and Cool (1989), Peteraf (1993), and Teece et al. (1997) among others, justify the superior performance of firms as due to internal differentiation rather than firms' dependency upon market's structure.

A key differentiator of RBV compared to other organisational theories is that RBV considers the nature of firms instead of explaining their existence (Lockett et al., 2009; Hitt et al., 2016). Or put differently, RBV is a model that can explain how firms compete (Peteraf, 1993) and answer the questions "why firms are different", and "how firms achieve and sustain competitive advantage" (Hoskisson et al., 1999; Xu et al., 2014). Further, RBV helps a firm to decide which resources of the firm can act as differentiators (Wernerfelt, 1984; Hitt et al., 2016).

RBV is developed on two key attributes, namely: path dependency, which means that past decisions of a firm determine future opportunities (Lockett and Thompson, 2001; Lockett et al., 2009), and firm heterogeneity, which means that even in the same industry firms are different because they do not possess the same strategic resources (Barney, 1991; Lockett et al., 2009). Consequently, firms can develop "isolating mechanisms" and create "resource position barriers" which will protect economic rents<sup>3</sup>(Lavie, 2006).

Further, RBV provides direct insights for the determination, exploitation and development of firm opportunity sets (Lockett and Thompson, 2001), which are the processes that determine the strategy of a firm (Andrews, 1971). According to Teece et al. (1997) and Hitt et al. (2016) RBV is focused on how strategists can exploit existing firm specific internal and external assets and develop new capabilities. RBV has been widely accepted by strategy and management researchers, and since the 1980s dominates research in these fields. Hitt et al. (2016, p.80) maintain that RBV has been used "*in one of every 12 articles*" in SCM and OM research published after 2007. Before expanding on RBV some basic terms must be defined for clarity purposes.

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<sup>3</sup> The use of the word rent refers to the economic profit of a firm. It is used by economists and business strategists to distinguish from the accounting profit and as a measure of performance (Grant, 2005).

## Resources

A *resource* can be defined as any basic element which lies under the control of the firm with the purpose of organising the operational processes of the firm towards excellence (e.g. persons, machines, raw materials, knowledge, brand image, patents) (Lowson, 2002). A useful classification of firm's resources in physical, human and organisation capital is provided by Barney (1991) (Table 2-1).

<b>Physical Capital Resources</b>	<b>Human Capital Resources</b>	<b>Organisational Capital Resources</b>
- Technology	- Training	- Formal reporting structure
- Firm's plant and equipment	- Experience	- Formal and informal planning
- Geographic location	- Judgement	- Control and coordination systems
- Access to raw materials	- Intelligence	- Informal intra and inter firm group relations
	- Relationships	
	- Managers insights	
	- Workforce	

**Table 2-1: Firm's resources categorisation, adapted from: Barney, 1991**

Apart from Barney's (1991) classification, resources can be distinguished as *tangible* or *intangible*. The paradox of RBV lies exactly at this distinction, because intangible resources are considered as most value generating resources and primary source for the realisation of CA; however, their nature makes them relatively immeasurable and inimitable (Herrmann, 2005, Molloy et al., 2011). Intangible resources have the following three distinct characteristics (Molloy et al., 2011):

- Repetitive usage might improve intangible resources rather "weaken" them. Thus, intangibles resources are expected to yield benefits for longer periods compared to tangible resources.
- Intangible resources can be used simultaneously by multiple managers.
- Intangible resources are characterised by immateriality, which is not easily exchangeable since such resources are often inseparable from the owner.

The immateriality of intangible resources prevents the existence of efficient markets for such resources; fact that has a twofold implication on firms (Molloy et al., 2011). The first implication is that firms will develop internally intangible resources through a mixture of social and organisation processes, which are idiosyncratic and path dependent. The idiosyncrasy and path-dependency of the processes will reflect in heterogeneity among firm resources. Furthermore, as intangible resources are untradeable heterogeneity of intangibles among firms of the same industry is enhanced (Barney, 1991). The second implication is financial and temporal inefficiencies that will be created for rivals trying to imitate or substitute the intangible resource (Molloy et al., 2011). Additionally, use of the

same or similar resources by rivals will result in profits but not value for them (Barney, 1991).

Further, resources can be considered as *static* or *dynamic*. Static are those that after settlement are considered as a permanent stock or asset for their entire life cycle. Conversely, dynamic resources can be considered the firm's learning capacity that can potentially create future opportunities (Teece et al., 1997; Barney, 1991; Peteraf, 1993; Lockett et al., 2009).

### ***Capabilities***

The term capabilities can be encountered in literature under many forms; for example Gebauer et al. (2013) distinguish between operational or dynamic capabilities, while Kreye et al. (2014) distinguish between contractual and relational capabilities. However, the purpose of the present section is not to provide a classification of each capability type but to define the term capabilities in its generic sense for clarity. As such the term capabilities is used to describe what firms can do. Consequently, capabilities can determine the base for the durable strategy of the firm (Grant, 1991; Grant, 2005). Additionally, the term organisational capability is used to describe the bundle of resources that work together, and determine what firms can achieve, as well as they can confer CA to the firm (Grant, 1991; Grant, 2005). Capabilities are firm specific and can be developed over time. However, capabilities are not easily tradable as they tend to be "*information based or intellectual assets*", thus they are intangibles (Fahy, 1996, p.29).

Capabilities can create value on their own or can increase the value of a resource (Hoopes et al., 2003). Tsang (2000) argues that capabilities belong to a unique category of organisational resources and they cannot be tied up to individuals. Moreover, a capability can be good or bad; consequently, if a specific capability is "good" and it can be considered superior from a respective capability of competitors, then it can become the competence of the firm (Tsang, 2000).

### ***RBV and Sustainable Competitive Advantage***

The key assumption of RBV is that a resource or a bundle of resources can be the source of CA for the firm. However, the distinction between the "existence" and the "use" of the resource must be made, as often resources are considered to be value-added only by their sole existence (Molloy et al., 2011). The main reasoning behind this idea is the heterogeneity of resources. Controversially, according to the original ideas of Penrose (1959), value will be created by the appropriate use of the resource or the bundle of

resources that will be created based on each firm's strategy. Thus, the provision of the best resources without the appropriate use of them is not guaranteed to create value (Molloy et al., 2011).

As already discussed, the unit of analysis of RBV is the resource and the aim of the theory is the identification of the extent that this resource could be a potential source of sustainable competitive advantage (SCA) for the firm. Barney (1991) developed a framework based on the work of Dierickx and Cool (1989) who argued that the possession of resources that are non-tradable, inimitable, and non-substitutable can create CA. CA in this sense is measured as above normal rents (Lavie, 2006). Barney's (1991) contribution to this framework was the development of four conditions that a resource must meet to be considered as source of SCA. According to his framework the resource must be valuable, rare, inimitable, and non-substitutable (VRIN or VRIO) (Lockett et al., 2009; Hitt et al., 2016).

In particular, a resource is considered as *valuable* if by its usage exploitation of opportunities and/or neutralisation of threats existing in the environment of the firm occurs (Barney, 1991). Furthermore, a resource is considered as *rare* when its supply is limited and when it is not equally possessed among the existing and future competitors. Furthermore, a resource will be characterised as *inimitable* when its duplication by competitors is not easy. Three reasons exist as to why a competitor can face difficulties in the replication of a certain resource. These reasons are related with "*unique historical conditions*" in terms of the position of the firm in time, space and the history of the firm, causal ambiguity, and social complexity (Barney, 1991, p.107). Moreover, a resource will be characterised as *non-substitutable* if it cannot be easily replaced by another resource. The resources which meet the aforementioned conditions are expected to be sources of Ricardian rents for the firm, thus sources for CA (Lockett et al., 2009; Hitt et al., 2016). Furthermore, problematic replication of these resources by competitors implies the potentials for SCA over a long period. According to Grant (2005, p.136), Ricardian rent is defined as "*the return earned by a scarce resource over and above the cost of bringing it into production*".

Another significant contribution to the conditions for the creation of SCA by firm's resources has been made by Peteraf (1993). According to her work resource heterogeneity, ex-post and ex-ante limits to competition, and imperfect resource mobility are the conditions that resources must create to generate rents for the firm.

**Heterogeneity** as already discussed implies that even within the same industry firms will provide offerings that possess different bundles of resources and capabilities. Moreover, heterogeneity means that firms with different capabilities can compete in the market-place and have the potential to breakeven. However, firms in possession of marginal resources are limited to breakeven. Superior rents can be earned only by firms which are in possession of superior resources (Peteraf, 1993). **Ex-post limits to competition** means that it is not only important for a firm to achieve a superior performance because of its proprietary resources; but the firm needs to be capable to impose limits on competitors to sustain this superior position and rents (Peteraf, 1993). **Imperfect resource mobility** implies that the resources which cannot be traded will be characterised as perfectly immobile. Particularly resources that do not have well defined property rights, or are characterised by “bookkeeping feasibility” can be considered as imperfectly mobile resources (Dierickx and Cool, 1989). The same applies for resources which are idiosyncratic, in the sense that outside of the boundaries of the firm they have no use, or when they are specialised to a specific firm. The last condition a firm must meet to attain CA is the existence of ex-ante limits to competition. **Ex-ante limits to competition** means that limited competition for a specific position must exist before a firm can establish superior resource position (Peteraf, 1993).

A contemporary notion supported by Combs and Ketchen (1999), Hoopes et al. (2003) and Lockett et al. (2009), among others, is that for RBV, ultimately resources should be important, valuable to the firm and not easily imitable by rivals. Accordingly, the rareness of the resource will be of significance only if the resource is valuable and inimitable from the competitors.

### ***Reflection and critique of RBV's contribution to strategy and management research***

RBV enhanced the understanding of the importance of the role of strategy to firms. However, the contribution of the theory is argued to dominate the conceptual landscape of research as the relationship of the theory with data is problematic. In particular, the “problem” lies in the consistent operationalisation of RBV's concepts among firms (Hoopes et al., 2003). Opponents of the theory often criticise that RBV, when viewed through the VRIN framework, is a typology rather than a theory, because it omits causality and is static (Kogut, 2008). Foss (1998) criticises RBV for terminological ambiguity, as the terms resources, capabilities and competencies have been used by strategists in liberal manners and different meanings have been given to the same terms. Thus, according to the same author RBV cannot be considered a coherent perspective.

More recently Kraaijenbrink et al. (2010) summarised the most common points of critique of RBV (See Table 2-2). However, regardless of critique RBV is one of the most predominant, most cited and most implemented theories in strategy and management literature (Spina et al., 2013; Iyer, 2014; Hitt et al., 2016).

<b>Point of critique</b>	<b>Selected representatives of critique</b>
The managerial implications and operational validity of RBV are limited	Priem and Butler (2001a), Connor (2002), Lado et al. (2006)
RBV imposes an infinite search for higher order capabilities/resources	Collis (1994), Priem and Buttler (2001a)
The applicability of RBV is limited due to constrained generalisability, irrelevance for small firms with insignificant market power, and inability to acquire resources that lead to SCA.	Gibbert (2006), Connor (2002), Miller (2003)
SCA is infeasible in practice	Eisenhardt and Martin (2000), Fiol (2001)
RBV is not a theory of the firm	Foss (1998), Mahoney (2001), Priem and Buttler (2001a)
VRIN conditions are neither necessary and sufficient nor support empirically the realisation of SCA	Foss and Knudsen (2003), Armstrong and Shimiu (2007), Newbert (2007)
The explanation of the value of a resource is tautological and indeterminate	Priem and Butler (2001a, 2001b), Locket et al. (2009)
The definition of resource is too inclusive and ambiguous	Priem and Butler (2001a)

**Table 2-2: Eight points of critique for RBV, adapted from Kraaijenbrink et al. 2010**

#### **2.1.4. 1990s – 2000s extensions of RBV**

By the beginning of the 1990s' the notion that resources and capabilities are crucial elements in the research towards the sources of SCA of firms was common among scholars of the field (Barney et al., 2011). Additionally, RBV was established as a theory and has been widely referred to as Resource Based Theory (RBT) in the relevant publications, even though, as discussed earlier, several scholars expressed opposing views. For the remainder of this thesis RBV will be referred to as RBT.

Moreover, the 1990s-2000s period witnessed the emergence of new theories based on RBT. Among others these theories are: the Knowledge based view (KBV) (Grant, 1996), the dynamic capabilities (Teece et al., 1997; Eisenhardt and Martin, 2000), the Natural Resource Based View (NRBV) (Hart, 1995), and the extended RBT (ERBT) (Lavie, 2006).

An extensive discussion about the key assumptions and application in research and practice of the first three theories is considered as irrelevant to the aims and objectives of the present thesis. Therefore, they will not be further discussed. On the contrary, the remainder of this subsection provides a thorough discussion on the key assumptions and



application of ERBT. That is, because ERBT is a theory that extends the key assumptions of RBT in the wider context of business networks (Slack and Lewis, 2008; Xu et al., 2014); therefore, is considered as mostly relevant to underpin the investigation of SLS of interdependent organisations, such as UK ports and intermediaries.

### ***Extended Resource Base Theory (ERBT)***

The increase in the creation of interfirm alliances<sup>4</sup> that occurred after the 1980s has reformed the contemporary business environment; where firms are considered as parts of networks. Thus, firms are engaged in “*social, professional and exchange relationships*” with other firms which are embedded in the same network (Gulati et al., 2000, p.203). Moreover, the increased and accelerated development of globalisation, as observed in recent decades, results in highly complex markets (Ireland et al., 2002). These trends create a resource gap in organisations (Grant, 1991), particularly between the strategic goal of a firm and its idiosyncratic resources (Mathews, 2003b). Consequently, firms are no longer able to possess all resources needed for effective competition in all markets. Particularly in fast cycle markets independently acting firms often cannot possess the resources and capabilities which would enable them to compete equally or seek CA (Ireland et al., 2002). Therefore, firms develop external relationships to acquire resources and capabilities (Singh and Mitchell, 1996; Stuart, 2000; Squire et al., 2009).

However, as the key focus of RBT has been on the single firm and its proprietary resources, resources residing outside of firm boundaries have been neglected (Das and Teng, 2000; Arya and Lin, 2007; Squire et al., 2009; Lewis et al., 2010; Barney et al., 2011; Spring and Araujo, 2013; Prajogo et al., 2016). Moreover, the narrow focus of RBT towards the ownership and control of resources endangers the crucial contribution of the resources of the interconnected firms (Lavie, 2006; Xu et al., 2014). Therefore, it can be argued that a potential conceptual disconnection between RBT and the view of firms as members of business networks is created (Lewis et al., 2010). Thus, the need to expand the view of RBT outside firm’s boundaries has been created.

This theoretical gap is filled with the development of ERBT. ERBT beyond extending the focus of RBT, aims to fill the gap in theory between the so called traditional

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<sup>4</sup> Interfirm alliances are defined as voluntary agreements between firms which exchange/share resources, and collaborate in the co-development or provision of offerings, which include services, products and technologies. Various forms of alliances exist, namely joint ventures (JV), franchises, contracts of long term marketing and licensing, agreements of mutual trade, R&D partnerships and affiliation in research consortia (Ireland et al. 2002, Lavie 2006, Gulati 2007).

theories of the firm and enable research on the strategic behaviour and performance of allied firms (Lavie, 2006; Prajogo et al., 2016).

Therefore, ERBT is considered as the most appropriate theoretical framework to underpin the present research. That is because contemporarily ports are perceived as parts of business networks or clusters of interdependent organisations (De Langen, 2004; Van der Lugt et al., 2013; Mason et al., 2015), which cooperate for the holistic development of the system. Additionally, the recent phenomenon of combined product-service offerings (discussed in Section 2.3 as SLS), is highly linked with inter-organisational synergies (Martinez et al., 2010; Bustinza et al., 2017). The remainder of this section provides a discussion of the theoretical constructs of ERBT, a review of its application in relevant literature and the development of a theoretical framework that is used to underpin the empirical investigation of this thesis.

#### *Theoretical constructs of ERBT*

ERBT is based on the concepts of *complementary assets* (Teece, 1986), *relational view* (Dyer and Singh, 1998), and *network resources* (Gulati, 1998), and addresses the question neglected by RBT regarding the origin of value generating resources (Gulati et al., 2000; Spring and Araujo, 2013).

*Complementary assets* are additional resources that are needed in conjunction with existing know-how and capabilities for the achievement of innovation (Teece, 1986; Rothaermel, 2001). Complementary assets can be categorised as generic, specialised and co-specialised. *Generic complementary assets* are “*general purpose assets*” which do not require alteration for innovation. *Specialised complementary assets* are “*those where there is unilateral dependence between the innovation and the complementary asset*”; whereas, *co-specialised complementary assets* are “*those for which there is a bilateral dependence*” (Teece, 1986, p.289).

*The Relational view* emphasises dyad/network routines and processes which are considered as significant units of analysis for the explanation of CA (Dyer and Singh, 1998; Dyer and Nobeoka, 2000; Prajogo et al., 2016). This aspect differentiates the relational view (and in extension ERBT) from market driven strategies and RBT, which explain CA in a single industry or company respectively. CA in the case of the relational view (and in extension ERBT), is realised by the creation of *relational/quasi rent*; which is defined as “*supernormal profit jointly generated in an exchange relationship that cannot be generated by either firm in isolation and can only be created through joint idiosyncratic contributions of the specific alliance partners*” (Dyer and Singh, 1998,

p.662). However, relational rents cannot be generated by adversarial commercial relationships, as these relationships are not rare or inimitable in their nature. Therefore, partnerships are crucial for CA creation based on relational rents (Dyer and Singh, 1998). The importance of inter-firm relationships in the potential realisation of CA is also emphasised in Araujo et al. (1999), Jap (1999), Iyer (2014), and Hitt et al. (2016).

Moreover, the creation of relational rents is dependant upon the combination, exchange, or investment of idiosyncratic assets, knowledge, and resources/capabilities, from alliance partners and/or the employment of effective governance<sup>5</sup> (Dyer and Singh, 1998). Further research on the realisation of relational rent suggests that **organisational centrality** is an important factor that can enhance access to rents (Arya and Lin, 2007; Moxham and Kauppi, 2014). Organisational centrality refers to how central can be considered the position of the firm in relation to its network partners (Arya and Lin, 2007). The degree of centrality is related to the number of connections of the firm within the network. Consequently, high centrality of a company implies a high number of connections.

However, an increased number of intra-network connections create several underlying threats for the firm. For example, high centrality can limit the firm's ability to identify alternative opportunities in a dynamic environment due to the existence of constraints and overreliance on current relationships that require increased attention and commitment of resources (Ibarra, 1993; Arya and Lin, 2007).

Relational rents can only be created from resources that are "*intentionally committed and jointly possessed by the alliance partners*" (Lavie, 2006, p.645). These resources would involve all shared resources of the firm and its alliance partners. Therefore, the value of the shared resources determines the contribution of relational rents to the outcomes of the alliance. In particular, the proportion of relational rent that the firm will appropriate is determined by five factors (Lavie, 2006); which are:

- i. The **relative absorptive capacity of the firm**; defined as the dynamic learning capability of the firm in relation to its ability to acquire, assess, assimilate, and commercially exploit external knowledge (Cohen and Levinthal, 1990; Zahra and George, 2002; Martín-de Castro, 2015). Each firm's absorptive capacity is different due to its path dependency, bundle of proprietary

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<sup>5</sup> The governance is characterised effective when it results in lower transaction cost or it allows the creation of rents by the collegial amalgamation of assets, knowledge or capabilities (Dyer and Singh 1998).

resources and heterogeneous communication channels. Consequently, the higher the level of the absorptive capacity of each firm in relation to its alliance partners, the higher the proportion of appropriated relational rents will be (Lavie, 2006).

- ii. The *relative scale and scope of resources*. Relational rents are extracted from shared complementary resources. Additionally, across alliances the degree of overlap of shared resources of partners varies. Therefore, relational rents will be higher for alliances with increased levels of resource complementarity (*complementary alliances*), rather than alliances with similar resources among partners (*pooling alliances*) (Dyer and Singh, 1998). In particular, considering the resource heterogeneity assumption of Barney (1991) each company has a set of idiosyncratic resources. Therefore, if the shared resources of the firm are a subset of the internal resources of its alliance partner; the potential benefit of the firm from the jointly generated rent will be greater of that of its partner. The reason for that is that the partner will already have access to the shared resources of the firm. Consequently, “*the smaller the scale and scope of the focal firm’s shared resources relative to those of its partner, the higher the proportion of relational rents appropriated by the focal firm will be*” (Lavie, 2006, p.646).
- iii. The *contractual agreements*, a “promise” between two or more bounded entities to the degree that a deviation from this commitment will come at a cost (Argyres and Liebeskind, 1999). A simple exchange agreement without specific enforcement mechanisms cannot be considered as a contractual commitment. These enforcement mechanisms are designed to detect and punish any contractual renegeing by any of the parties (Argyres and Liebeskind, 1999). Lavie (2006) argues that usually alliance members are tied by the agreements of the contracts signed at the time of the formation of the alliance. Furthermore, Reuer and Ariño (2007) argue that alliance contracts are usually complex and that their complexity is dependent upon asset specificity. Alliance contracts can determine payoff structures and proprietary information and specify the review, mediation and termination clauses of the agreement. Furthermore, the distribution of common benefits and various formal safeguards will be ex-ante determined by these agreements. A favourable contract can grant exclusive access on network resources to a

single company, while it can also secure a relatively high proportion of returns from joint activities. Additionally, a favourable contract can protect the idiosyncratic resources of a firm from exploitation by alliance partners by providing the specific definition of what the shared resources will be. Furthermore, contractual agreements can legally secure confidential information, proprietary technology and the investments of the company in the alliance (Lavie, 2006; Reuer and Ariño, 2007).

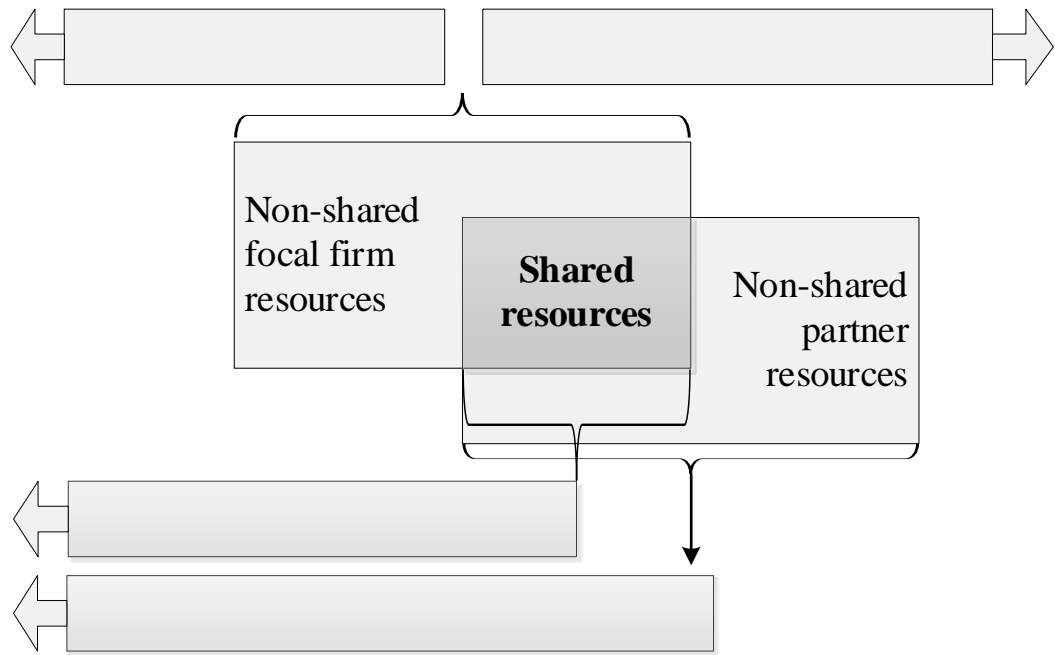
- iv. The ***relative opportunistic behaviour***. It is acknowledged that contracts are not exhaustive, particularly for future developments (Williamson, 1975; Dyer and Singh, 1998). Therefore, to protect themselves from opportunistic behaviour, in terms of unequal rent extraction by a single partner, firms pose informal safeguards and trust-building initiatives (Dyer and Singh, 1998; Lavie, 2006). Lavie (2006) distinguishes several opportunistic behaviours of alliance partners. These include the tendency of a single partner to deviate from the mutual agreements, reduce investments in joint activities, and exploit partners' commitments for self-interested objectives that can lead to superior short-term private benefits. Consequently, the higher the level of relative opportunism imposed by a firm in comparison to its alliance partners, the higher the appropriated relational rent of this firm will be (Lavie, 2006). However, high opportunism by a single company within the alliance will result in less ex-ante relational rents for that firm, in that the alliance partners of this firm will realise its behaviour. Thus, they will reduce the level of collaboration and knowledge transfer. Collaboration and knowledge transfer are the base upon which relational rents are created (Dyer and Singh, 1998). Therefore, the identification of opportunistic behaviour will lead to a potential exclusion of that party from future collaboration.
- v. The ***relative bargaining power***. Bargaining power is defined as the ability of one party to leverage the terms and conditions of a contract or subsequent contracts in its favour, because of its possession of rare and valuable strategic resources (Argyres and Liebeskind, 1999; Sheu and Gao, 2014). Lavie (2006) argues that during the formation of an alliance and the subsequent contract formulation firms rely on their bargaining power. However, contractual agreements are considered incomplete. Additionally, the relative bargaining power of alliance partners during the course of the alliance is dynamic.

Therefore, the ever changing relative bargaining power of alliance members determines the proportion of relational rent that will be appropriated by the relative strongest member (Lavie, 2006).

Furthermore, Lavie (2006) identifies three additional types of rent that can be realised by the firm from shared and non-shared resources. The first is the *internal rent*, which is the combination of Ricardian and quasi rents that can be realised by the proprietary resources of the company (Peteraf, 1993), and are exclusively retained by the firm (Moxham and Kauppi, 2014). The Ricardian rent will derive from the rare internal strategic resources of the company (Lavie, 2006). Additionally, quasi rent will derive from added value extracted from the company's strategic resources, given the possibility to access the complementary resources of the interconnect firms within the alliance (Arya and Lin, 2007). Therefore, it is argued that a company leverages the value of its proprietary strategic resources by accessing the complementary resources of its alliance partners (Lavie, 2006).

The second type is the *inbound spillover rent*, which is an additional type of rent private to the firm (Moxham and Kauppi, 2014). This rent relates to the unintended gains of the firm, such as reputational and knowledge gains (Arya and Lin, 2007; Lewis et al., 2010; Moxham and Kauppi, 2014), derived from both the shared and unshared resources of the network partners (Lavie, 2006). Lavie (2006) argues that inbound spillover rent is often related to strategic collaboration of competitors within horizontal alliances. It is highlighted that contractual instruments cannot prevent knowledge leakage. Only mutual trust, conflict resolution mechanisms and the good faith of the firm can prevent the unintentional leakage of knowledge. Therefore, attention is drawn upon those partners with opportunistic behaviour. Further factors to be considered are the bargaining power and absorptive capacity of the firm in terms of realising rents from network resources in a non-concessional way (Lavie, 2006).

The third type is the *outbound spillover rent*, which refers to unintentional beneficial leakage from the firm that can be appropriated by its alliance partners for the creation of spillover rents (Lavie, 2006; Moxham and Kauppi, 2014). Figure 2-2 depicts the four types of rents that can be realised by the firm regarding the shared (network) and non-shared resources within an alliance. Figure 2-2 is further used in Chapter 6 for the determination of the financial and strategic impact of SLS to the firm (RO2).



**Figure 2-2: Rents extracted by the firm in an alliance, source: Lavie, (2006, p. 644)**

The third theoretical construct of ERBT is *network resources*. The term is coined by Gulati (1999), who argues that network resources do not exist within firm boundaries, but rather emerge from inter-firm networks that the firm belongs to. Moreover, network resources can be considered as a specific form of a firm's resource, which according to Barney (1991) can represent the strengths upon which a firm will realise and apply its strategy.

Network resources are information rich resources that differ from internal resources (Gulati, 2007). Furthermore, the impact of the amount of network resources that are available to the firm and the influence of them regarding the strategic behaviour of the firm is reflected in changes to the opportunity set of the firm. These changes will be triggered by network resources (Gulati, 1999). Moreover, the unique historical experience and path dependency related with the frequency of past ties and partners' identity are crucial components which can result in the creation of network resources. This type of resources has been so far neglected by research that has applied RBT (Gulati, 1999).

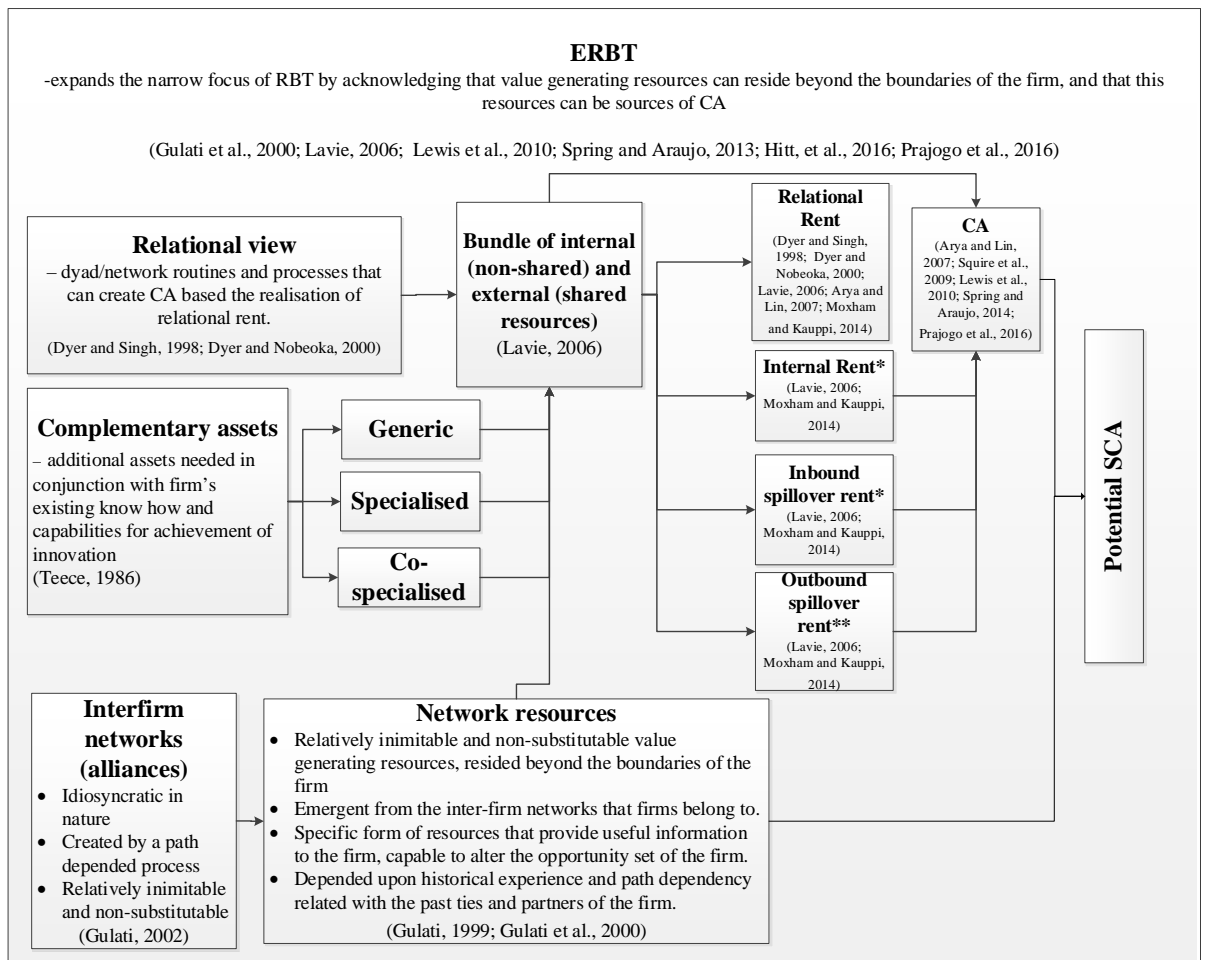
Grounded in the term network resources, Gulati et al. (2000, p.207) argue that the network a firm is part of "*can be thought of as creating inimitable and non-substitutable value (and constraint!) as an inimitable resource by itself, and to access inimitable resources and capabilities*". Thus, within the network of the firm's relationships, a crucial resource responsible for the creation of inimitable value generating resources

exists. Moreover, the same authors propose a framework that views network structure, network membership and tie modality as inimitable resources.

The notion followed by Gulati et al. (2000) for the development of the “network aspects framework” is that the network of the firm can create CA. That is because the network allows the firm to access key resources that exist in its wider environment. Moreover, business-networks are idiosyncratic and path dependent. Thus, imitation or substitution of business-networks by competitors is difficult. Consequently, network resources are also idiosyncratic, because they are generated through the unique networks of the firm. Therefore, network resources are relatively inimitable and non-substitutable as well. Consequently, the combination of a firm’s network and the network resources leads to SCA (Gulati et al., 2000). More recently, Arya and Lin (2007) also assert that organisations, which are members of network structures, can enjoy superior advantages and benefits in comparison to organisations that are not members of such structures.

From the discussion on the theoretical constructs of ERBT above, it is evident that one of the main arguments of ERBT is that resources which exist outside the boundaries of the firm can be sources of CA (Dyer and Singh, 1998; Lavie, 2006; Spring and Araujo, 2013; Spring and Araujo, 2014; Prajogo et al., 2016). Additionally, it can be argued that alliances enable firms to develop a bundle of value creating resources which could not be developed by the firm in isolation (Ireland et al., 2002) and that these resources in combination with the path-dependent and idiosyncratic network of the company can potentially lead to SCA (Gulati et al., 2000; Arya and Lin, 2007; Prajogo et al., 2016; Hitt et al., 2016). These views question the necessity for ownership and control of rent generating idiosyncratic resources of the firm. Consequently, they also question one of the key assumptions of RBT in regard to the creation of resource-position barriers (Lavie, 2006). The discussion of the theoretical constructs of ERBT allows Figure 2-3 to be developed. Figure 2-3 summarises the theoretical constructs of ERBT and is further used in Chapter 6 to underpin the empirical investigation of this research.





**Figure 2-3: Theoretical foundations of ERBT, source: authors own**

### Application of ERBT in relevant research

Various studies<sup>6</sup> support that the CA of interconnected firms is influenced by the resources of network partners. This proposition contradicts some key ideas of RBT, thus ownership and control of resource are not necessities. Instead, given that resources are inimitable and non-substitutable, the accessibility of resources which will enable utilisation, employment and resource benefits enjoyment, becomes relevant (Lavie, 2006; Lewis, 2000; Lewis et al., 2010; Prajogo et al., 2016).

Furthermore, several studies acknowledge the importance of the co-existence of internal and external resources in CA creation (Arya and Lin, 2007; Squire et al., 2009; Lewis et al., 2010; Spring and Araujo, 2014; Xu et al., 2014; Prajogo et al., 2016; Hitt et al., 2016). For example, Lewis et al. (2010) conducted a longitudinal case study on a US food manufacturer and identified that the firm sustained its competitive edge by synchronising bounded and network resources. Additionally, they highlight that in many instances the identification and development of network resources can occur in a faster

<sup>6</sup> Please refer to Appendix B for a review of studies applying ERBT

cycle in comparison with identification and development of internal proprietary resources, which usually occurs on a sequential and iterative development cycle. Similarly, Xu et al. (2014), identified that supplier integration and access to resources of suppliers can enhance the performance of the firm.

Moreover, in accordance with the arguments of Spring and Araujo (2013), a review of papers adopting ERBT reveals that the ERBT literature is limited and the majority is based on the predominant view of RBT and the notion of rent generation derived by static resources. An exception to the norm of rent generating static resources, is the work of Mathews (2003a; 2010). His work is involved with a dynamic view of resource development and transfer among firms. In particular, Mathews (2003a; 2010) asserts that the manager has a significant role in terms of the identification of resources which he does not possess but is aware of their existence.

Another outcome of the review of selected publications that apply ERBT is that many are involved with the accumulation of VRIN resources to explain CA. Exceptions are the papers of Spring and Araujo (2013; 2014) who justify the superior performance of their case organisations by considering the views of Penrose (1959) on resources. In particular, Penrose (1959) asserts that resources can be perceived as bundles of potential services. She bases this premonition on the assumption that resources are those tangible elements that a firm purchases, leases or creates for internal use and the human capital employed in order to effectively incorporate them within the firm. Moreover, according to her view services are the outcomes of these resources upon the firm's productive operations.

Additionally, the review of selected studies that apply ERBT reveals that many publications are focused on the identification of the reasons that motivate firms to form alliances by utilisation of assumptions from TCE. However, these aspects are not considered relevant to this thesis, therefore are not discussed in detail. Thus, for this thesis the main theoretical foundation of ERBT related to the identification of critical resources outside of firm boundaries, and the realisation of CA based on the generation of relational rents [and other types of rent i.e. internal, inbound spillover rent, outbound spillover rent] will be taken into further consideration. Finally, the analysis of the studies that apply ERBT reveals that ERBT has not been applied in research in a Maritime Logistics (ML) context.

### **2.1.5 Summary of strategy development**

The literature review on strategy development shows that the focus of strategy has changed over the decades since the concept “debuted”. Initially strategies enabled firms to achieve their goals. In later stages, strategies aimed to guide firms in performance improvements (Ronda-Pupo and Guerras-Martin, 2012). Hermann (2005) argues that changes and evolution in academia, in a firm’s environment and in managerial practices, show that the focus of strategic management has concentrated on knowledge acquisition and learning of firms, as well as on the ways firms create SCA in highly innovative environments. Nowadays, strategy is one of the most common subjects to be taught and studied, but ironically is also one of the least understood (Ronda-Pupo and Guerras-Martin, 2012).

For this thesis the most relevant contribution in strategic thinking has been the need to seek value generating strategic resources outside of the boundaries of the firm and particularly in the direct network of the firm. ERBT is the theory that encompasses this view, which as discussed earlier in this chapter has been viewed as an extension of RBT and builds upon the relational view, the concept of complementary assets and the network resources.

## 2.2 Service led strategies (SLS)

In recent decades organisations have found ways to increase revenue, respond to challenging business environments, sustain relationships with increasingly sophisticated customers and overcome saturation barriers in core markets (Gebauer et al., 2008; Baines et al., 2017; Gebauer et al., 2017). An increase in the provision of VAS to enhance the offerings of companies has been noticed as a response to these challenges (Gebauer et al., 2006; Bustinza et al., 2015; Adrodegari and Saccani, 2017). Because of this trend services are embodied in goods and delivered through them. Or put differently, products can be considered “*as appliances for service provision*” (Vargo and Lusch, 2008, p.256). In particular, the supply of a specific product to a customer triggers the transition of this product through a series of value creating processes (Lusch, 2011; Adrodegari and Saccani, 2017). Throughout this process pipeline the product is integrated with various resources to provide a certain flow of service. Therefore, the supplier is authoritatively required to streamline the integration of resources necessary for service provision (Lusch, 2011). Extending this notion to view ports and intermediaries (the context of this thesis) from a “*service-dominant*” logic, it can be argued that products can be perceived as the mechanism that triggers the provision of port and logistics services.

The dominance of the service sector does not only affect service oriented companies, but also manufacturers which add value to their products by the provision of VAS (Vandermerwe and Chadwick, 1989; Oliva and Kallenberg, 2003; Baines et al., 2009b; Smith et al., 2014; Kowalkowski et al., 2017; Gebauer et al., 2017). Scholars engaged explicitly with this phenomenon in the 80s by “*focusing on the unique organisational dynamics of the service sector*” (Bowen et al., 1989, p.75). However, ever since the early 60s the participation of services in the gross domestic product of developed economies increased while the share of manufacturing declined (Wise and Baumgartner, 1999). Consequently, it can be asserted that the engagement of academic literature with the importance of services in a manufacturing environment lagged.

The dominance of the service-sector over the manufacturing-sector is apparent not only in developed economies that followed a post-industrialisation direction, but also in developing economies (Slack, 2005). Most of the OECD countries during the 2000s employed more than 50% of their work force in the service sector. This observed dominance of the service sector partly depends on traditional services (i.e. finance and legal) but also on the noticeable number of organisations, mostly in the manufacturing sector, that move towards service transactions (Cook et al., 2006).

Regarding the UK, the research area of the present study, services contribute 77.8% of UKs GDP, while the contribution of manufacturing which is measured within the production sector is equal to 15.2% (Office for National Statistics, 2014). Figure 2-4 shows the quarterly change of each of the components of GDP, namely the sectors of services, production, construction and agriculture.

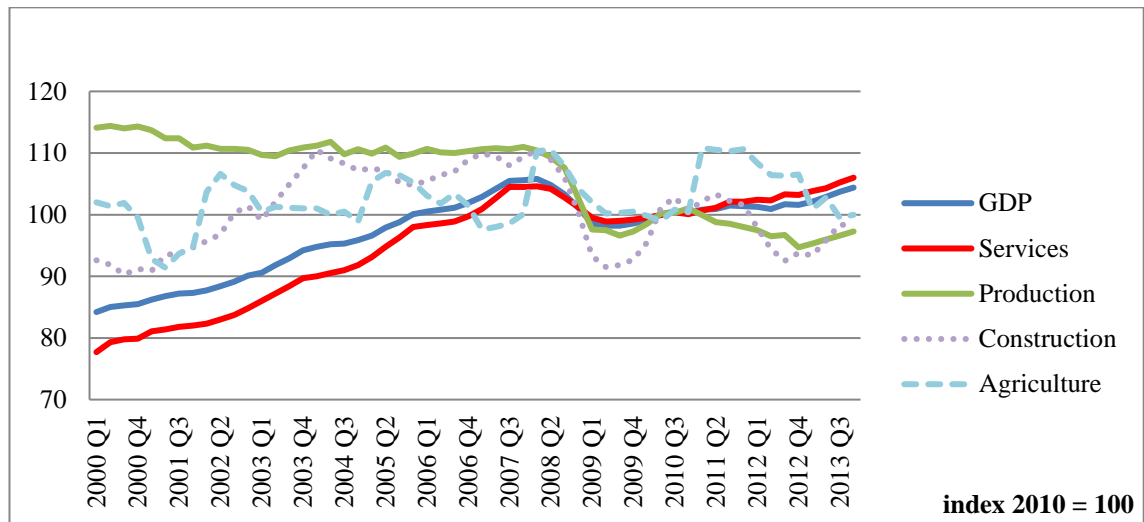


Figure 2-4: UK's GDP and main components, Q4 2013, source: Office for National Statistics, 2014

Recent studies show that between 1988 and 2015, 232 journal articles engaged directly with the integration of products and services and at least 70 with closely related topics (Baines et al. 2017). Several of these papers were published in special editions of academic journals such as *Industrial Marketing Management (IMM)* and *International Journal of Operations & Production Management (IJOPM)* and originated from various research groups around the UK which are devoted to the investigation of this phenomenon. However, it should be noted that the research interest between marketing and operations management scholars differs. In particular, the former tends to focus mostly on the market and customer relationship expansion opportunities, while the latter focuses more on the optimisation of service operations and processes (Kowalkowski et al., 2015). Additionally, even though SLS research has flourished over the recent decades, Kowalkowski et al. (2017, pg. 83) argue that the SLS literature “*still lacks a strong theoretical foundation*”. Consequently, the use of ERBT to theoretically underpin the primary research findings of this thesis, paves the road for the theoretical grounding of SLS literature.

Regardless of discipline, the majority of SLS research is involved with manufacturers moving towards the service end of the product–service offering spectrum e.g. (Wise and Baumgartner, 1999; Davies, 2003; Oliva and Kallenberg, 2003; Brax, 2005; Matthyssens

and Vandenbempt, 2010; Baines et al., 2011; Zahir et al., 2013; Baines and Lightfoot, 2013; Eggert et al., 2014; Bustinza et al., 2015; Gebauer et al., 2017). Exceptions are the studies of Davies (2004; 2007) and Spring and Araujo (2009) who discuss SLS from a service provider perspective. Davies (2004) and Davies et al. (2007) showed how service providers that implement SLS increase their systems integration capabilities by getting involved with the design and instalment of equipment sourced by various suppliers. Additionally, Spring and Araujo (2009) discuss the concept of “*productising*” which refers to service providers that brand products and market them through multiple channels without the presence of the service provider (e.g. branded pizzas sold in retail outlets, or bottled products of famous hairdressers). By this strategy service providers allow self-administration of parts of the service experience, overcome capacity constraints and increase revenue (Spring and Araujo, 2009). Consequently, a research gap is created for service providers which are not involved in the design and production of goods (but use goods as means to deliver their services), and move towards the provision of services which lie outside of their core offerings. An example of such service providers can be identified in the UK port and intermediary sector.

The remainder of this chapter provides a critical review of extant SLS literature. However, it should be mentioned that this review does not intend to be exhaustive. Rather it aims to be suggestive to provide a comprehensive understanding of the concept and its features, and set the theoretical background for the investigation of the impact of SLS on UK ports and intermediaries (RO2).

### **2.2.1 Product and Service differences**

For clarification purposes the definitions of products, services and offerings are provided. Products can be put on the goods-service continuum (Rathmell, 1966; Oliva and Kallenberg, 2003). One end of this continuum represents pure products while the other end represents pure services. However, most of the products fall between these two ends. Thus, goods supported by services and services supported by goods exist. Consequently, the boundaries of goods and services become less distinctive because most of the products embed service components and most of the services are based on the existence of products (Fahy, 1996; Ng et al., 2012).

*Products* are tangible objects with existence that can be perceived in time and space and they can be possessed (Shostack, 1982). Products are typically regarded as material artefacts (Baines et al., 2009b), and will be perceived as such for the remainder of this thesis.

On the other hand, the definition of *services* usually is based on what does not constitute a service (Baines et al., 2009b; Spring and Araujo, 2009; Ng et al., 2012). Services are often characterised as fuzzy and challenging in their precise definition (Slack, 2005). Services exist only in time, cannot be possessed and can only be experienced, created or participated in (Shostack, 1982; Ng et al., 2012). Additionally, services are labour intensive activities (Vandermerwe and Chadwick, 1989). In the service management literature services are characterised by intangibility, heterogeneity, inseparability and perishability (Lovelock and Gummesson, 2004). These attributes are referred to by the term “*IHIP characteristics*” of services. Spring and Araujo (2009), Nie and Kellog (1999) and Ng et al. (2012) argue that the use of the IHIP characteristics dominates the OM literature. However, several studies confront the use of IHIP characteristics as the main definition of services. The main reason is that the IHIP characteristics neglect the non-ownership nature of services. Vargo and Lusch (2004) argue that the weakness of the IHIP characteristics definition of services is reflected in the creation of inappropriate normative strategies.

A second definition for services is widely used in OM literature, the “Unified Service Theory (UST)” of Sampson (2000). The UST diverges from the IHIP and is based upon the idea that significant inputs are provided in the production of services by the customer. However, the UST does not explain SLS as it does not include the rental/access paradigm that is a key component of SLS (Spring and Araujo, 2009).

For the remainder of this thesis services will be perceived as “*an economic activity that does not result in ownership of a tangible asset*” (Baines et al., 2009b, p.554).

Van Biema and Greenwald (1997) point out three main differences between manufacturing and service sectors. The first difference lies between the ranges of service activities compared to a manufacturer. Thus, it is important to understand what kind of services the company aims to provide and find the most suitable way to deal with each one of them (Kowalkowski et al., 2015). The second difference is that “*service jobs are inherently multifunctional in a way that manufacturing jobs often are not*” (p.93). The caveat of which is that the productivity of one employee on all the different activities will not be the same. Therefore, the way to monitor, control and improve the performance of the employee turns out to be a complex task.

The third difference according to Van Biema and Greenwald (1997) is that service activities depend upon capacity and cannot rely on inventory in cases of unanticipated demand changes, whereas manufacturing capacity can rely on physical inventory to

overcome such variability in demand. Thus, it is crucial for managers to correctly anticipate the level of capacity required to accommodate demand. Moreover, another difference between the service and manufacturing sectors lies heavily on the fact that while in service facilities the production and delivery activities are in many cases inseparable, in manufacturing these activities are separated (Brentani, 1991; Ng et al., 2012).

Finally, before SLS are defined and discussed the term *offering* must be clarified. For the remainder of this thesis the definition of offering according to Kotler (2003), Brax (2005) and Adrodegari and Saccani (2017) will be used. Thus, offering will refer to the goods, services, information, and/or possible combinations of these that can be offered to customers by an organisation. Accordingly, the aggregation of all the offerings of an organisation will be called the total offering. Table 2-3 summarises the definitions for products, services and offerings that will be used for the remainder of this thesis.

	<b>Definition</b>	<b>Characteristics</b>	<b>Sources</b>
<b>Products</b>	Material artefacts	<ul style="list-style-type: none"> <li>- Existence in time and space</li> <li>- Possession</li> <li>- Potential to be resold</li> <li>- Inventory can be held</li> <li>- Transportable</li> <li>- Production and delivery can be separated</li> <li>- Capital intensive</li> </ul>	(Shostack, 1982), (Baines et al., 2007), (Baines et al., 2009b), (Lowson, 2002)
<b>Services</b>	Economic activities not resulting in the possession of tangible assets	<ul style="list-style-type: none"> <li>- Existence only in time</li> <li>- Fuzzy and challenging to define</li> <li>- Cannot be possessed</li> <li>- Multifunctional</li> <li>- Depending on capacity</li> <li>- Production and delivery inseparable in many cases</li> <li>- Labour intensive activities</li> </ul>	(Baines et al., 2009b), (Shostack, 1982), (Slack, 2005), (van Biema and Greenwald, 1997), (Brentani, 1991), (Vandermerwe and Chadwick, 1989), (Lovelock and Gummesson, 2004), (Vargo and Lush, 2008), (Spring and Araujo, 2009), (Ng et al., 2012)
<b>Offerings</b>	Goods, services, information, and/or possible combinations of these that can be offered to the customers by an organisation		(Kotler, 2003), (Brax, 2005), (Adrodegari and Saccani, 2017)

**Table 2-3: Products, Services and Offerings, source: (authors own)**



### 2.2.2 SLS defined

SLS are defined as the strategies that enhance the core offering of organisations with value-added services (VAS). VAS refer to augmented service offerings that provide superior value to the user, in addition to the value experienced through the utilisation of core services (Collins, 1986). VAS enable organisations to increase revenue, respond to challenging business environments, sustain relationships with increasingly sophisticated customers, increase growth rates and overcome saturation barriers in core markets (Sawhney et al., 2004; Davies et al., 2006; Gebauer et al., 2008; Kowalkowski et al., 2015; Bertoni et al., 2016; Baines et al., 2017; Bustinza et al., 2017). Or put differently SLS are the strategies that enable the co-creation of value in collaboration with the customer (Smith et al., 2014; Bustinza et al., 2017).

This phenomenon has been initially discussed by Levitt (1972) as the “*production-line approach*” and later defined by Vandermerwe and Rada (1988) as “*servitisation*”. Other authors refer to this phenomenon as “*transition from products to services*” (Oliva and Kallenberg, 2003), “*Product-Service systems (PSS)*” (Mont, 2002; Wang et al., 2011), “*service infusion*” (Ostrom et al., 2010; Kowalkowski et al., 2012), “*integrated system solutions*” (Davies, 2004), or as “*Pay-per-use (PPU) services*” (Gebauer et al., 2017). However, since the mid-2000s servitisation and PSS literature streams have merged, because of the common research interests of the two literature streams (Baines et al., 2017). The majority of literature reviewed in this Chapter is associated with these two terms.

The term servitisation was coined in 1988 by Vandermerve and Rada and is defined as the practice of adding value to the core offerings of the firm by providing services (Vandermerwe and Rada, 1988). The notion behind the term servitisation has been propounded by Levitt (1983), who argued that business transactions will be replaced with the provision of integrated product-service offerings. These offerings will create the base for the development of partnerships between buyer and supplier. Vandermerve and Rada (1988) build on this idea and assert that servitisation can become a “total market strategy”. Slack (2005, p.326) interprets the term servitisation as “*any strategy that seeks to change the way in which product functionality is delivered to its markets*” and highlights the potential lifeline expansion it can give to manufacturers which face competitive pressure.

Gebauer and Friedli (2005) and Zahir et al. (2013) argue that VAS enable manufacturers to differentiate their manufacturing offerings. This differentiated mix of services and products will deviate supplier comparison on price competitiveness only

(Malleret, 2006; Bustinza et al., 2015). Thus, the adoption of a SLS can be perceived as a differentiation strategy or as a competitive manufacturing strategy (Baines et al., 2009b; Bustinza et al., 2017).

The majority of the servitisation definitions found in the relevant literature are in accordance with the definition of Vandermerwe and Rada (1988) except from the definition provided by Lewis et al. (2004). They argue that any strategy that alters the way products' functionality is offered to customers can be defined as servitisation. This particular view of servitisation provides another linkage between the servitisation and PSS literature streams (Baines et al., 2009b).

PSS is a concept involved in debates on sustainability and shrinkage of environmental footprint of B2C and B2B markets (Tukker, 2004; Lockett et al., 2009; Wang et al., 2011). The main idea of PSS is the reduction of material consumption by the trade of performance instead of the trade of goods (Stahel, 1998). PSS are defined as integrated product and service offerings that deliver value in use (Baines et al., 2007; Qu et al., 2016). Wang et al. (2011) and Reim et al. (2015) argue that the increasing interest of scholars and practitioners towards PSS is related to the sustainability achievements, organisations improvements and improved customer service that are associated with the concept. Tukker (2004) argues that PSS can act as enablers for decoupling the environmental pressure, caused by economic growth, through increased focus on the use of assets rather than their ownership.

The following definition encompasses both literature streams, and is the one that will be used for the remainder of this thesis in any reference to servitisation, and SLS in extent. *"Servitisation is the innovation of an organisations capabilities and processes to better create mutual value through a shift from selling products to selling PSS"*(Baines et al., 2009b, p.555). According to the definition of an organisation's offerings which was provided earlier in this chapter and the definition of servitisation provided here the main offering of an organisation following a servitisation strategy will be regarded as a PSS.

### **2.2.3 Development of the concept of manufacturing centred SLS**

Ever since the concept of SLS was introduced scholars embraced it and researched it as a competitive manufacturing strategy (Baines et al., 2009a; Adrodegari and Saccani, 2017). SLS do not undermine manufacturing. On the contrary, manufacturing is perceived as a basic component of providing service value to customers (Slack and Lewis, 2008). Moreover, SLS are characterised as a key strategic choice for manufacturers which aim to achieve differentiation in their competitive environment by the inclusion of VAS in

their offerings (Zahir et al., 2013; Bustinza et al., 2017). SLS tend to apply strategic weight to services, an approach that directly opposes the practice of offering services as add-ons to product offerings (Mathieu, 2001; Matthyssens and Vandenbempt, 2010; Visnjic Kastalli et al., 2013).

The notion of providing services as add-ons to the basic product was common industry practice before the SLS-era and was part of the marketing strategy of organisations (Wise and Baumgartner, 1999; Kowalkowski et al., 2017). The typical service offerings of manufacturers would be mostly concentrated in after sale services (e.g. installation, maintenance and repair), thus the main value for the organisation would be derived from the actual product and not the accompanied services (Gebauer et al., 2006; Baines et al., 2009b). However, the adoption of SLS by many organisations led to the integration of advanced VAS in their offerings (Kowalkowski et al., 2017). This practice widened the spectrum of services now provided by manufacturers. The spectrum of services incorporated in manufacturing centred SLS can be summarised in the services presented in Table 2-4 .

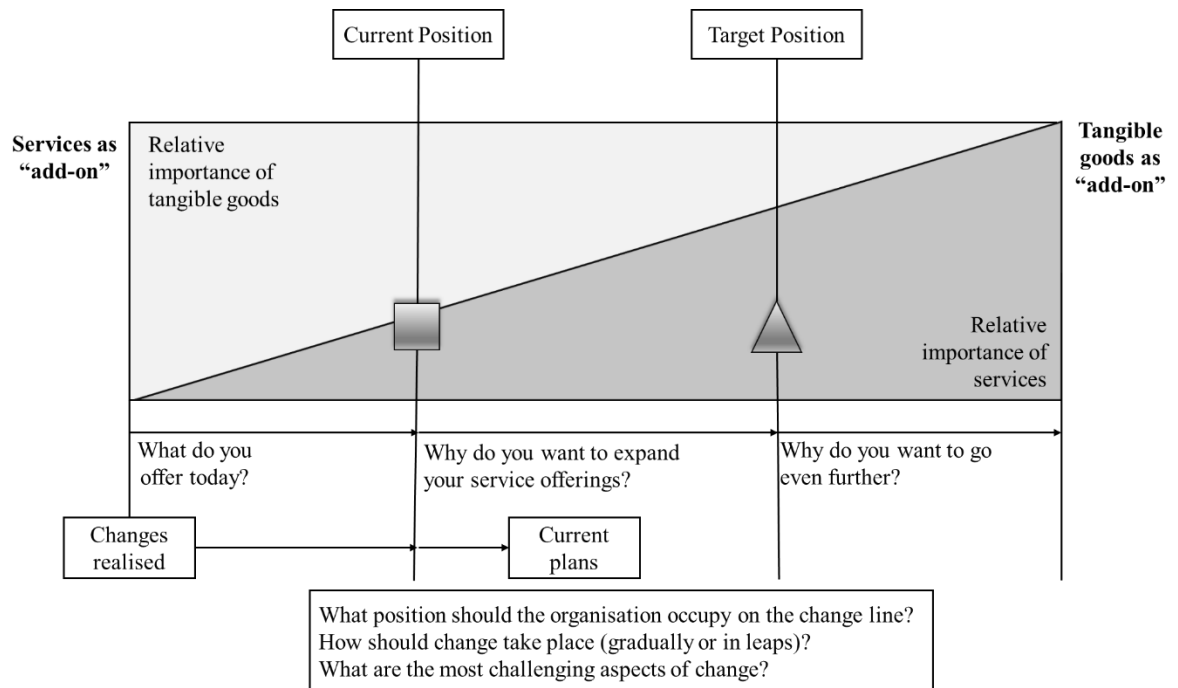
<b>Services incorporated in manufacturing centred SLS</b>	
Consulting and training services	Outsourcing and operating services
Design and development services	Procurement services
Financial (loans) and leasing services	Property and real estate
Installation and implementation services	Retail and distribution services
Supply of spare parts	Systems and solutions
Maintenance, repair, and support services	Transportation and trucking services
Telematics control, diagnostics, and systems updates	Insurances

**Table 2-4: Services incorporated in manufacturing centred SLS,**  
**Adapted from: (Neely, 2008; Slack and Lewis, 2008; Neely et al., 2011; Cusumano et al., 2015).**

The offering of these services is considered as a value-added activity. These practices decrease the contribution of the product towards the total revenue derived by the offerings of the organisation (Vandermerwe and Rada, 1988; Oliva and Kallenberg, 2003; Gebauer and Friedli, 2005; Baines et al., 2009b; Ulaga and Loveland, 2014).

Figure 2-5 depicts the transition of an organisation from providing services as add-ons to the product offerings to the other end of the product-service continuum which considers products as add-ons to services. The two ends of this continuum represent

extreme situations. Most organisations fall in-between the two ends. However, SLS lead many companies towards the “service” end (Oliva and Kallenberg, 2003; Kowalkowski et al., 2017). The move towards the service end of the continuum is anticipated to improve resource productivity in the short-term, and lead towards a dematerialised society in the long-term (Cook et al., 2006; Reim et al., 2015).



**Figure 2-5: The product service continuum, source: (Oliva and Kallenberg, 2003, p.162)**

One main goal of “servitised” companies is to offer “tailored solutions” to customers rather than pure product offerings. Provision of tailored solutions can potentially lead companies to seek products and innovation outside of their offerings’ width by collaborating with external vendors to provide suitable solutions to customers (Davies, 2003; Bustinza et al., 2017). This practice characterises SLS as customer centric (Baines et al., 2009b). Two elements attribute customer centricity to servitisation. The first one is the move from services as add-ons to the offering of “*end-user’s processes oriented services*” (Oliva and Kallenberg, 2003, p.168). The second element is the development of customer relationships as opposed to transactions (Ostrom et al., 2010; Kowalkowski et al., 2015; Baines et al., 2017).

The offerings of organisations after the implementation of SLS can be classified in three categories, namely product oriented PSS, use oriented PSS and result oriented PSS (Cook et al., 2006). These offerings are supposed to meet demand and result in a reduced amount of resources, and reduced production, use and disposal impact. This classification of PSS is adopted by the majority of researchers (Wang et al., 2011; Reim et al., 2015).

***Product oriented PSS*** regard the offerings where the ownership of the tangible elements is transferred to the customer, whilst the provider ensures the utility of the artefact and is responsible to provide the services included in the service agreement over an agreed period. Some examples of this category of PSS are warranties and maintenance contracts. This type of services can provide an increased artefact lifetime and improve resource productivity (Cook et al., 2006; Reim et al., 2015).

***Use oriented PSS***, regard the offerings where the tangible elements are owned by the supplier and the customer is provided with the right to use the artefact for an agreed time (Reim et al., 2015). Again, in this case warranties and maintenance contracts are considered as typical examples. The difference with the previous category arises in the fact that “*high use intensity of material artefacts*” is considered to support improvements in the productivity of the resource (Cook et al., 2006, p.1456).

***Result oriented PSS***, regard offerings where the customer is provided with the utility of the PSS rather than with the use of the artefact. The actual ownership and operation of the artefact remains the responsibility of the supplier. The benefit for the supplier in this case is the functional optimisation of the asset which enables the total control of the entire life time of the asset and can result in technological, organisational and market innovations (Cook et al., 2006; Reim et al., 2015).

The aforementioned classifications of PSS represent the evolution of the offerings of servitised manufacturers (Wang et al., 2011). This classification also shows the re-recognising and re-understanding of business models, strategy development and the value targets of manufacturers among their transition to service providers (Reim et al., 2015; Adrodegari and Sacconi, 2017). The classification of the offerings of a servitised manufacturer provided by Baines and Lightfoot (2013) and Baines et al. (2017) is in alignment with the PSS classification discussed earlier. According to these authors manufacturers offer base, intermediate and advanced services. The focus of these services is on product provision, condition maintenance and outcome assurance respectively. Furthermore, this categorisation is based on the level of organisational stretch that is required from manufacturers beyond their core production competencies to deliver services.

SLS can contemporarily be described by five underlying trends as shown in Figure 2-6. The attributes presented in the right-hand side of Figure 2-6 act as supplements to those in the left-hand side instead of replacing them.

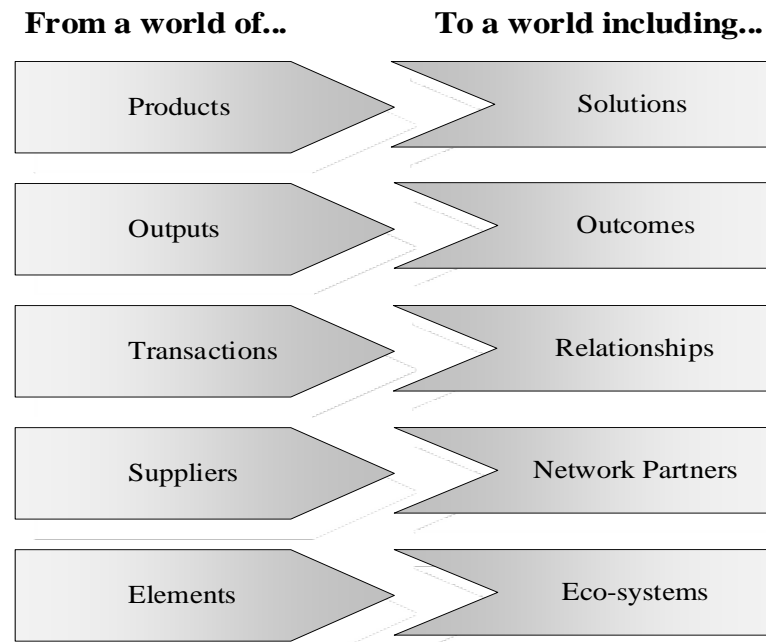


Figure 2-6: The shift to services, adapted from: (Neely et al. 2011)

#### 2.2.4 The impact of manufacturing centred SLS

This section provides a discussion regarding the impact of manufacturing centred SLS as identified in the “*servitisation*” and “*PSS*” literature. The identification of the impact of manufacturing centred SLS will provide the initial framework for the identification of the impact of SLS of service providers and will partially address RO2. Baines et al. (2009b) conducted a clinical review of the “*servitisation*” literature and identified three main impacts. These are: financial, strategic and marketing impacts. This threefold impact has also been discussed by Kowalkowski et al. (2017), who reviewed the past, and present research on SLS, and outlined future research avenues. An additional type of impact is provided by Zahir et al. (2013), who related competitiveness with the environmental pressures faced by organisations. As discussed earlier in this chapter the development of the PSS literature has roots in the debate about sustainability and shrinkage of the carbon footprint (Tukker, 2004). Additionally, the definition of SLS followed in this thesis encompasses PSS as the offering of “*servitised*” organisations. Therefore, the consideration of the environmental impact of SLS in the theoretical framework of this study is appropriate. Moreover, the addition of the environmental perspective in the development of a framework for the assessment of the impact of SLS addresses the call for more research on the environmental impact of SLS by Qu et al. (2016).

### ***Financial impact***

A common notion of SLS literature is that additional revenue opportunities exist in the downstream supply chain (Wise and Baumgartner, 1999; Neely, 2008; Cusumano, 2008; Baines et al., 2009b; Baines and Lightfoot, 2013; Smith et al., 2014; Cusumano et al., 2015; Bertoni et al., 2016; Baines et al., 2017; Kowalkowski et al., 2017). The revenue opportunities that derive from the provision of VAS are anticipated to have greater profit margins, and are not asset based in comparison to the core processes of those organisations. To support this argument authors, such as Oliva and Kallenberg (2003), Gebauer and Friedly (2005), Araujo and Spring (2006; 2013), Eggert et al. (2014), and Gebauer et al. (2017), examined manufacturers with high capital intensity for their production, such as aerospace, automotive or locomotive manufacturers.

The sale of products only tends to be characterised as one-off transaction and is not repeated in frequent time intervals (Malleret, 2006). Consequently, the turnover of manufacturers is dependant upon the fluctuations and uncertainty of demand. However, the provision of services is reflected in buyer-supplier contractual agreements; a fact that mitigates demand fluctuations caused by the nature of products' sales. Therefore, the sources of income of the manufacturer will substantially increase and stabilise in the long-term (Davies, 2004; Bustinza et al., 2017). Oliva and Kallenberg (2003) and Slack (2005) also support the argument that services can be regarded as a more stable revenue source. The main reason for this stability is the resistance of services to economic cycles that are responsible for the need of firms to invest and purchase, and their ability to provide growth even in mature markets. Brax (2005), Baines et al. (2009b), Gebauer (2011), and Zahir et al. (2013) also agree with the potential of product-service offerings to overcome the effect of a mature market and argue that these offerings can provide stable revenue sources also during unfavourable economic cycles. Table 2-5 summarises the financial impacts of manufacturing centred SLS.

<b>Financial Impact</b>	<b>Relevant Sources</b>
Higher profit margins of services compared to products	Wise and Baumgartner (1999), Oliva and Kallenberg (2003), Malleret, (2006), Johnson and Mena (2008), Cusumano (2008), Baines et al. (2009b), Gebauer (2011), Zahir et al. (2013), Spring and Araujo (2013), Baines and Lightfoot (2013), Smith et al. (2014), Cusumano et al. (2015), Bertoni et al. (2016), Gebauer et al. (2017), Baines et al. (2017), Kowalkowski et al. (2017).
VAS as stable source of revenue	Sawhney et al. (2004), Brax (2005), Slack (2005), Malleret (2006), Neely (2008), Johnson and Mena (2008), Baines et al. (2009b), Gebauer (2011), Zahir et al. (2013), Bustinza et al. (2017).

**Table 2-5: Financial impact of SLS, source: (author's own)**

However it should be mentioned that the positive impact of manufacturing centred SLS has been challenged by recent studies such as Ulaga and Loveland (2014) and Benedettini et al. (2015). The reasons as to why SLS can result in unfavourable financial results are further discussed in Section 2.2.5.

### ***Strategic Impact***

Baines et al. (2009b) argue that the majority of the extant SLS literature unanimously agrees upon the belief that SLS is a means for manufacturers to achieve CA. The CA is realised by the exploitation of the additional value-added capabilities attributed to the firm that implements a SLS (Adrodegari and Saccani, 2017; Gebauer et al., 2017).

Moreover, Vandermerwe and Rada (1988), Oliva and Kallenberg (2003), Brax (2005), Malleret (2006), Baines et al. (2009b), Fischer et al. (2010), Adrodegari and Saccani, (2017) and Bustintza et al. (2017) among others, argue that SLSs have the potential to enable organisations to differentiate and achieve CA. Organisations competing in the same industry can achieve competitive advantage if they operate under a different value chain compared to their competitors (Porter, 1985). Competition based purely on product innovation, investments in superior technology and low prices is not sustainable. Consequently, an integrated product and service offering can enhance differentiation compared to competitors; in that, services add value to the product offering of the organisation making it a customised offering. Consequently, it can be argued that customised product offerings increase the barriers for competition (Mathieu, 2001; Baines et al., 2009b; Fischer et al., 2010; Bustintza et al., 2015).

Furthermore, the VAS incorporated in SLS have the potential for the realisation of SCA (Oliva and Kallenberg, 2003; Adrodegari and Saccani, 2017). That is because services are less imitable by competitors due to their ambiguity and labour dependency. According to Barney's (1991) VRIN framework, inimitability is one of the four characteristics that a resource must possess to enable the realisation of SCA. Table 2-6 provides a summary of the strategic impact of SLS as it was identified in the relevant literature.



<b>Strategic Impact</b>	<b>Relevant Sources</b>
CA by additional value-added capabilities	Oliva and Kallenberg (2003), Baines et al. (2009b), Gebauer et al. (2017), Adrodegari and Saccani (2017).
SCA based on the inimitability of resources	Oliva and Kallenberg (2003), Gebauer and Friedli (2005), Gebauer et al. (2006), Matthyssens and Vandenbempt (2010), Adrodegari and Saccani (2017).
CA based on differentiation	Vandermerwe and Rada (1988), Oliva and Kallenberg (2003), Brax (2005), Slack (2005), Gebauer et al. (2006), Gebauer and Friedli (2005), Malleret (2006), Baines et al. (2009b), Fischer et al. (2010), Matthyssens and Vandenbempt, (2010), Bustinza et al. (2015), Adrodegari and Saccani, (2017), Bustinza et al. (2017).

**Table 2-6: Strategic Impact of SLS, source: (author's own)**

### ***Marketing Impact***

Apart from the financial and strategic impact, SLS impact manufacturers from a marketing perspective. Inclusion of VAS in their main offerings enables manufacturers to leverage existing marketing opportunities. These marketing opportunities exist because customers demonstrate increased interest toward VAS (Gebauer et al., 2006; Bustinza et al., 2017). Therefore, SLS can be regarded as response towards these opportunities (Ostrom et al., 2010).

Moreover, manufacturers have the advantage of tacit knowledge regarding the requirements of their products in maintenance and spare parts. This tacit knowledge can be regarded as one of the VAS of their SLS. Such VAS provide the manufacturer with the opportunity to get insights about customers' specific needs and consequently adjust offerings accordingly (Baines et al., 2009b). One peculiarity of this phenomenon is that customers require more services today, but they want these services to be accompanied by the products they require. Thus, the increased demand for products is reflected in increased demand for services. This means that services are not perceived as labour intensive activities, but instead they are embedded services or services delivered through products (Vandermerwe and Chadwick, 1989).

Moreover, Davies (2003) refers to the integration of products and services as customer specific packages. Offerings of such tailored solutions to customers tend to influence purchasing decisions and attract new customers (Mathieu, 2001; Bustinza et al., 2017), lock-in customers and create customer loyalty (Vandermerwe and Rada, 1988; Bustinza et al., 2017), and yield to a repetition of sales (Mathieu, 2001; Malleret, 2006; Cusumano et al., 2015). Moreover, the practice of repeated sales and the subsequent dependency upon the supplier reforms the nature of transactional relationships between buyer and suppliers to long term partnerships (Oliva and Kallenberg, 2003; Neely et al.,

2011; Kowalkowski et al., 2015; Kowalkowski et al., 2017). However, attention must be paid to the number of strategic partnerships a firm endeavours to sustain. That is because the number of viable strategic collaborations a firm can sustain is not infinite (Zolkiewski, 2004; Kowalkowski et al., 2015).

The increasing demand for services created the need to outsource part of the service offering (Oliva and Kallenberg, 2003). Due to a certain number of factors that increase pressure on manufacturers' core markets, they tend to outsource a proportion of their service offering. Such factors can be the need for advanced flexibility, increased complexity of technological developments that triggers specialisation and the move towards more precise core competencies. Thus, often manufacturers create partnership networks. The network partners will be responsible for the provision of complex VAS, a fact that frees capacity for the manufacturer to concentrate on overcoming core industry challenges (Neely et al., 2011). However, it should be noted that firms can collaborate for one project but compete for another one. Additionally, regulations and legislation affect the collaboration, the roles and the responsibilities of partners in those networks (Neely et al., 2011).

Table 2-7 summarises the marketing impact of SLS as identified in extant literature.

<b>Marketing Impact</b>	<b>Relevant Sources</b>
Response to increased demand for VAS	Gebauer et al. (2006), Ostrom et al. (2010), Bustinza et al. (2017).
Enhanced service offerings as tailored solutions	Vandermerwe and Chadwick (1989), Davies (2003), Davies et al. (2006), Davies et al. (2007), Baines et al. (2009b), Cusumano et al. (2015).
From transactional relationships to long term partnerships based on customer loyalty and supplier dependency	Vandermerwe and Rada (1988), Mathieu (2001), Oliva and Kallenberg (2003), Malleret (2006), Davies et al., (2006), Neely et al. (2011), Kowalkowski et al. (2015), Bertoni et al. (2016), Bustinza et al. (2017), Kowalkowski et al. (2017).

**Table 2-7: Marketing Impact of servitisation, source: (author's own)**

### ***Environmental Impact***

The offering of a "servitised" company is a product-service bundle. Such an offering is anticipated to trigger a more environment-friendly model for conducting business. That is because the service industries are considered less environmentally harmful in comparison to other industries (Goedkoop et al., 1999; Mont, 2002; Reim et al., 2015; Qu et al., 2016).

Furthermore, a service based offering will result in decreased environmental output because customers will purchase the use of the product rather than the product per se

(Baines et al., 2007). Consequently, the manufacturer will still be responsible for the maintenance and service of the asset. Thus, the manufacturer will be aware sooner of any operational inefficiencies and will be able to provide improvement to overcome them more efficiently. As a result, waste and material consumption during the life cycle of the product should be reduced. Those incremental efficiency improvements will have an impact on the life cycle of capital goods and result in reduced consumption of energy and consumables during the use of the asset (Tukker, 2004; Reim et al., 2015). Consequently, the total cost and the environmental impact of the product-service offering are expected to be reduced as well (Baines et al., 2007; Qu et al., 2016; Bertoni et al., 2016; Gebauer et al., 2017). Furthermore, the provision of a sustainable product-service offering meets one of the three criteria of the triple bottom line that has been of high contemporary international concern. In particular, production and consumption must achieve the optimum balance amongst environmental protection, social fairness and economic welfare (Wang et al., 2011; Bertoni et al., 2016).

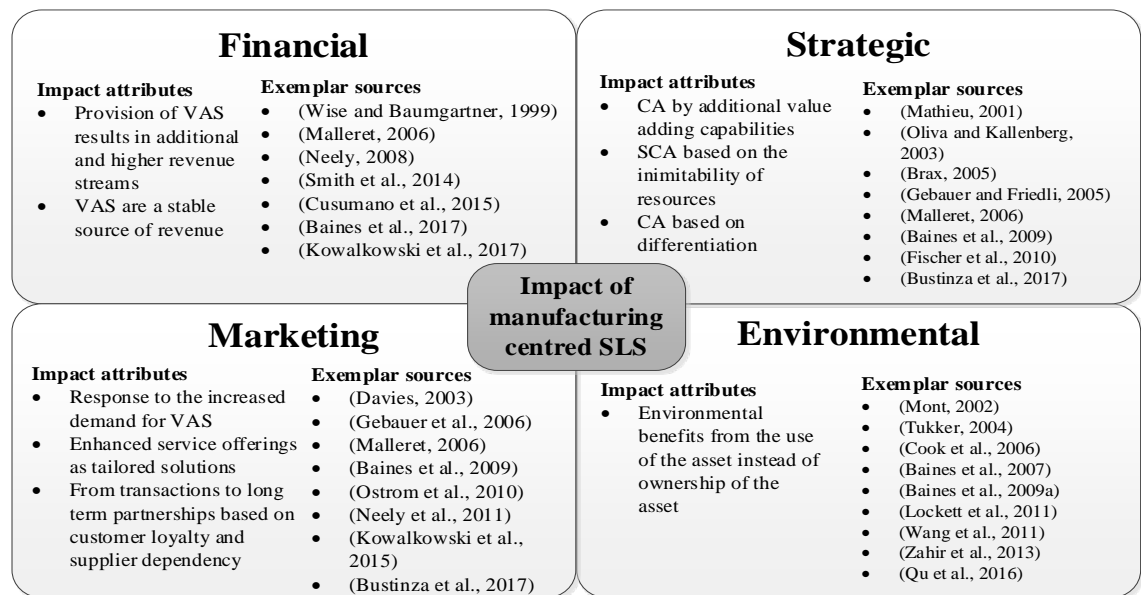
However, the positive environmental impact of a manufacturing centred SLS can be compromised if the incentives of SC members are misaligned. To prove the aforementioned argument Lockett et al. (2011) examined the relationships of a manufacturer with two members of its SC and identified that the particular SLS encouraged a less sustainable policy of new components' fittings rather than repairs of faulty compartments of assets. Misalignment of incentives across the SC triggered the adoption of this policy. The notion that bundles of product-service offerings might not meet the anticipated environmental output is also supported by Tukker (2004) and Reim et al. (2015), who assert that the environmental benefits of such offerings are only marginal at best. Therefore, it can be argued that the actual environmental impact of a SLS in practice is less than what literature anticipates. The inconclusiveness of the environmental impact of SLS, has triggered Qu et al. (2016) to call for more research on the environmental impact of SLS. Therefore, the incorporation of an environmental perspective in the investigation of the impact of SLS on the companies that implement them addresses this gap. Table 2-8 summarises the environmental impact associated with the transition towards product-service offerings.

From the discussion above it is obvious that a manufacturing-centred SLS will trigger financial, strategic and marketing impact for the firm. It is also expected that an environmental impact will be also realised. However, current research shows that these expectations will not be fulfilled at the anticipated level.

<b>Environmental Impact</b>	<b>Relevant Sources</b>
Environmental benefits from the use of the asset instead of ownership of the asset	Goedkoop et al. (1999), Mont (2002), Tukker (2004), Cook et al. (2006), Baines et al. (2007), Neely (2008), Baines et al. (2009a), Lockett et al. (2011), Wang et al. (2011), Zahir et al. (2013), Reim et al. (2015), Bertoni et al. (2016), Qu et al. (2016).

**Table 2-8: Environmental impact of servitisation, source: (author's own)**

The four themes identified in this section and the literature supporting each theme are summarised in Figure 2-7. The four themes will be used in Chapter 3 as a lens to frame the literature of PCL and as the key attributes for the development of the data collection protocol of this thesis. Additionally, the four themes provide the basis for the analysis of the impact of SLS for the implementing company. The next section highlights the implementation challenges of a SLS and the required changes organisations are expected to accomplish to overcome them.



**Figure 2-7: The impact of SLS for the firm, source: (author's own)**

### 2.2.5 SLS implementation challenges and required organisational changes

The notion that those who implement a SLS are required to undergo a magnitude of organisational changes to overcome the challenges of implementing a successful SLS are discussed by most of relevant publication ever since the seminal publication on the concept in 1988 by Vandermerwe and Rada.

The review of the relevant literature reveals that successful implementation of a SLS requires changes of strategy, operations, value chains, technologies, business models, organisational structure, people for supporting cultural shifts in the organisational

blueprint, risk assessment strategies, and system integration capabilities (Wise and Baumgartner, 1999; Oliva and Kallenberg, 2003; Gebauer et al., 2006; Zahir et al., 2013; Benedettini et al., 2015; Bustinza et al., 2017; Kowalkowski et al., 2017; Baines et al., 2017). In line with these changes organisations must also attain a sustainable flow of innovation regarding the nature of the offerings to customers and in all the stages between the design and actual sale of products and services (Zahir et al., 2013; Bustinza et al., 2017).

Firms implementing SLS will often encounter three common risks (Slack, 2005). These are the risks associated with i) the diversion of financial resources from other processes, ii) the increased cost related with the establishment of service networks and iii) the cost associated with market positioning. Furthermore, researchers such as Brax (2005), Neely et al. (2011), Benedettini et al. (2015) and Adrodegari and Saccani (2017), among others, highlight the need to build appropriate organisational capabilities, culture, business models and risk mitigation strategies for a successful implementation of SLS. Failure to adopt organisational capabilities, culture, business models, and risk mitigation strategies to supplement the implemented SLS will result in realisation of the so called “*servitisation paradox*”. Servitisation paradox is defined as the situation where a SLS did not yield the anticipated increased and additional revenue, even though services are perceived as secure sources of revenue (Reinartz and Ulaga, 2008; Gebauer and Friedli, 2005; Brax, 2005; Spring and Araujo, 2013; Benedettini et al., 2015; Ulaga and Loveland, 2014).

Most commonly the difference between anticipated revenue and the actual revenue earned from services is attributed to the increased labour cost, working capital and net assets of those who implement a SLS in comparison to traditional manufacturing firms. Thus, the revenues generated by firms implementing SLS cannot cover the amount of excess investments compared to the investments made by traditional manufacturers (Neely, 2008; Benedettini et al., 2015). However, smaller firms (less than 3,000 employees) often do not face the same issue as their SLS revenue is higher than the revenue generated by product sales.

Another common observation of unsuccessful SLS-implementation is that the service offering is less supported compared to the product offering. The decreased level of support leads to the failure of service operations and prevents the implementation of successful and profitable SLS (Brax, 2005). Thus, the need to refocus the attention of the entire firm is a necessity for the implementation of servitisation. Even in the case that the

manufacturer offers services free of charge as complements to the purchase of the main product, the level of quality for the services is important. As bad service quality has direct influence through decreased sales of products (Brax, 2005). Table 2-9 summarises the most common challenges that prevent those who implement a SLS to recoup the anticipated return level from their SLS.

<b>Categories</b>	<b>Factors</b>
<b>Shifting mind-sets</b>	<ul style="list-style-type: none"> <li>• Of marketing – from transactional to relational marketing and relationship maintenance</li> <li>• Of sales mechanisms - from merchandising products to selling service contracts and capability</li> <li>• Of customers - from ownership of the product to ownership of the outcome</li> </ul>
<b>Timescale</b>	<ul style="list-style-type: none"> <li>• Managing and delivering multi-year partnerships, and competitive time to market of new offerings</li> <li>• Managing and controlling long-term risk and exposure</li> <li>• Modelling and understanding the cost, profitability and accounting implications of long-term partnerships</li> </ul>
<b>Business model and customer offering</b>	<ul style="list-style-type: none"> <li>• Understanding what value means to customers and consumers, not producers and suppliers</li> <li>• Developing the capability to design, cost, and deliver services rather than products, and to resolve problems with business partners.</li> <li>• Developing a service culture</li> <li>• Embedding all the above into the restructuring to a service organisation</li> </ul>

**Table 2-9: Challenges and risks of servitisation, adapted from: (Neely, 2008; Benedettini et al. 2015)**

Additionally, it should be mentioned that the contemporary understanding about SLS assumes a multifaceted and multidirectional transition for those who implement a SLS (Kowalkowski et al., 2015; Möller and Parvinen, 2015); challenging the assumptions of path defining studies that proposed a unidirectional positioning of firms implementing SLS along the product-service continuum (e.g. Vandermerwe and Rada, 1989; Oliva and Kallenberg 2003). This novel perspective assumes that those who implement a SLS offer a stratified service offering, thus further contradicting former studies (e.g. Raddats and Easingwood, 2010; Matthyssens and Vandenbempt, 2010) which assume the provision of a single service type at a time. Under the novel perspective firms that implement a SLS might become availability providers, performance provider or industrialisers, and provide different types of offerings (Kowalkowski et al., 2015; Möller and Parvinen, 2015).

The most prominent consequence of this insight is that the implementation of a manufacturing centred SLS will not have the same outcome for every firm. Depending on the trajectory and role of each firm, different market, and growth opportunities exist. Therefore, those who implement SLS should consider how each role complements each

other and find ways to leverage each one of these roles. Another important aspect of this novel perspective is the recognition that advanced service offerings might not be required by all customers (Kowalkowski et al., 2017). Consequently, those who implement SLS should decide whether they need to concentrate their resources on commercialisation of less complex service offerings or to develop advanced/complex offerings (Kowalkowski et al., 2015; Möller and Parvinen, 2015), to avoid the servitisation paradox and bankruptcy risks (Benedettini et al., 2015).

The novel perspective of multidirectional and multifaceted development of organisations depending on their SLS is of high relevance for the present study. That is because it triggers the inquiry regarding the existence of similar multidirectional and multifaceted SLS in the port and intermediary sectors. Extant PCL literature suggests that ports turn to the provision of VAS to extend their control and change their role within the SC (Mangan et al., 2008; Pettit and Beresford, 2009; Monios and Wilmsmeier, 2012b; Demirbas et al., 2014; Mason et al., 2015; Okorie et al., 2016). However, this literature stream does not discuss extensively which trajectories ports follow to achieve that. Consequently, the following research objective can be proposed:

RO1: Identify a typology of SLS implemented by UK ports and intermediaries for the provision of on-port logistics VAS.

## **Chapter Summary**

This chapter provided an extensive literature review on two main topics. The first part critically reviewed the development of the concept of corporate strategy. The changes which occurred in the understanding of the topic between 1950 and the contemporary development of strategy formulation were reviewed. Contemporary theories, such as ERBT, support the assumption that strategic resources exist beyond the boundaries of the firm; and that network partners can achieve CA by accessing resources of their network partners. The theoretical constructs of ERBT and RBT, as outlined in this chapter, will be used to underpin the empirical findings of this research. Consequently, the use of ERBT to theoretically underpin the primary research findings of this thesis, paves the road for the theoretical grounding of SLS literature (Kowalkowski et al., 2017).

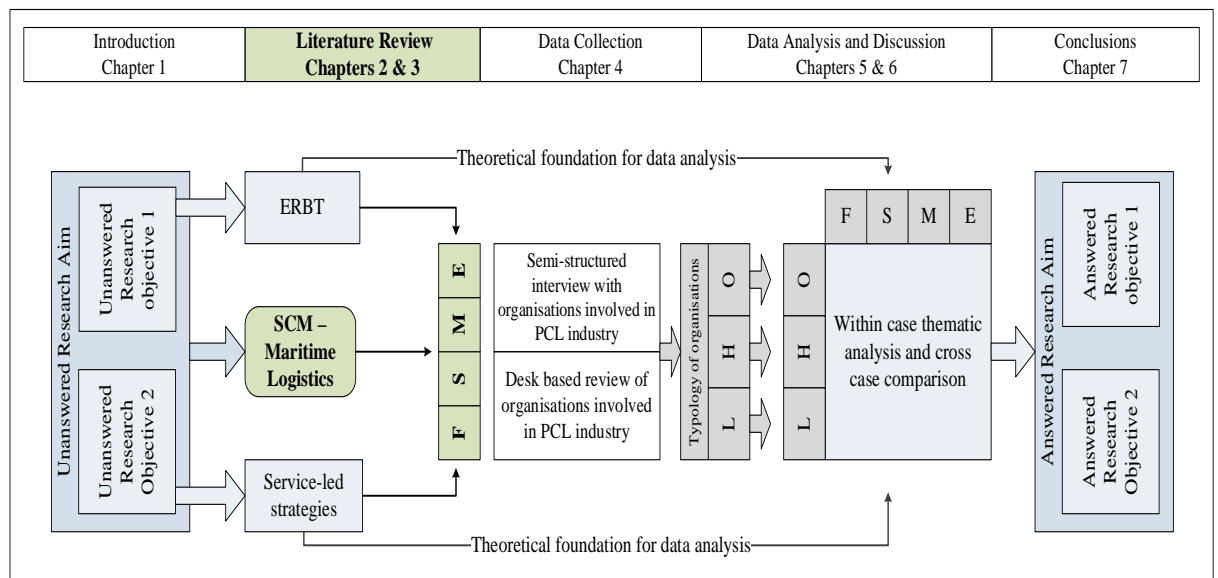
The second part of this chapter focused on identifying the impact of manufacturing centred SLS on firms. From a critical review of the extant literature the impact of SLS for manufacturers has been identified and divided into four key themes; namely financial, strategic, marketing and environmental impact. The addition of the environmental perspective addresses the call of Qu et al. (2016) for more research on the environmental

impact of SLS. These themes are used in Chapter 3 as a lens to frame the literature of PCL and as the key attributes for the development of the data collection protocol of this thesis. Additionally, the four themes provide the basis for the analysis of the impact of SLS for UK ports and intermediaries. Thus, addressing the call of Kowalowski et al. (2017) for extending SLS research beyond its manufacturing focus.

Furthermore, organisational changes required for a successful SLS implementation were outlined and the novel perspective of multidirectional and multifaceted development of an organisation depending on their SLS was highlighted. This novel perspective and the research gap in SLS of service providers shape the research objectives and scope of the present research.



## Chapter 3 : Port development and evolution in global supply chains<sup>7</sup>



**Figure 3-1: Thesis outline and focus of Chapter 3**

Chapter 3 introduces the context of this research by reviewing extant PCL literature (See Figure 3-1). PCL lies within the wider context of maritime logistics and SCM, and is a term used to describe the provision of logistics-VAS within port environments. Therefore, in Section 3.1 definitions of key concepts related to maritime transport, and maritime logistics with a focus on ports extensively used in this thesis are introduced and defined for clarity. Section 3.2 discusses the development and evolution of ports and their role in global SCs. The current state of the industry is discussed, and main forces causing the need of ports to change their strategies to regain their SC power are presented. The evolutionary development of ports is examined under three perspectives, namely port privatisation, ports as elements of logistics systems, and the emergence and development of global port operators. This multifaceted review of the evolutionary development of ports provides a robust understanding of the industry and clearly frames the unique paradigm of UK ports concerning their ownership and management mandates.

The third part of the chapter focuses on PCL, which is the example case in this thesis. PCL is perceived as a SLS of UK ports and intermediaries. A comprehensive review of extant PCL literature under the lens of the four themes identified in Chapter 2 creates the

<sup>7</sup> An earlier version of this chapter has been published as a book chapter in: Valantasis-Kanellos, N. and Song, D.W. (2015) 'Port Centric Logistics in concept and practice', in Song, D.W. and Panayides, P.M., eds., *Maritime Logistics: A Complete Guide to Effective Shipping and Port Management*, 2nd ed, London and Philadelphia: Kogan Page, 243-274

key constructs for data collection, and the base for the analysis of empirical findings. The key attributes of the data collection protocol are presented at the end of the chapter.

### **3.1 Maritime Transport and Maritime Logistics**

The definition of Maritime Logistics (ML) comprises two key areas; Logistics-and-SCM and Maritime Transport (Panayides, 2006). For clarity purposes, logistics can be defined as: *“that part of SCM that plans, implements, and controls the efficient, effective forward and reverse flow and storage of goods, services and related information between the point of origin and the point of consumption in order to meet customers' requirements”*(CSCMP, 2013). SCM can be defined as:

*“the planning and management of all activities involved in sourcing and procurement, conversion, and all logistics management activities. Importantly, it also includes coordination and collaboration with channel partners, which can be suppliers, intermediaries, third party service providers, and customers. In essence, supply chain management integrates supply and demand management within and across companies”* (CSCMP, 2013).

The notion that logistics and SCM are value-adding activities, and means for firms to gain CA and experience increased benefits by the closer collaboration of SC partners is followed. A brief discussion on Maritime Transport (MT) and its role within the global supply chains is provided in the following section. Then the complete definition of ML and their scope will follow. Finally, the key components of the ML system will be identified and discussed.

#### **3.1.1 Maritime Transport and Containerisation**

Maritime transport (MT)<sup>8</sup> is the mode of freight transport *“responsible for carrying and handling cargoes across the ocean”* (Lee et al., 2012, p.10). More than 80% of world’s international trade, and 70% of the value of the total global trade is transported by waterborne consignments and handled by ports globally (UNCTAD, 2017). Thus, MT is characterised as *“the backbone of international trade and a key engine driving globalisation”* (UNCTAD, 2013, p.xiii). Various types of freight are transported by vessels across the oceans. These are classified as: *“liquid bulk, dry bulk, unitised freight, and other general freight”* (Mangan et al., 2008, p.30). This thesis will focus on unitised freight.

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<sup>8</sup> The function of MT referring to passenger transportation will not be taken into consideration in this thesis as it is irrelevant with its scope.

The introduction of unitised loads revolutionised the transportation of freight since the 1960s, and resulted in the growth of global commerce (Stopford, 2009). The International Standards Organisation (ISO) containers<sup>9</sup> and the pallets were the two forms of unitised load that have been most widely adopted (Rushton et al., 2017). For the interest of this thesis the implications of the adaptation of the ISO containers will be discussed.

A container is “*a large standard size metal box into which cargo is packed for shipment aboard especially configured transport modes*” (Rodrigue et al., 2013a, p.371). The design of containers encompasses their movement by common handling equipment. Thus, containers can be transferred among various transportation modes (e.g. vessels, rail, trucks and barges) quickly, and with minimised labour use. Containers are not the cargo that is transported, but they are the transfer unit of the cargo (Rodrigue et al., 2013a).

Containers enable freight transport to be conducted with less product packaging, less damaging and higher productivity (Vis and De Koster, 2003). Additionally, the use of containers replaced labour intensive systems, and increased the productivity of ports and vessels, but required enormous resource commitments (Loh et al., 2017). This high resource commitment, led ship owners to maximise the utilisation of vessel sea time. In Europe, this practice meant that ship owners aimed to serve both UK and north continental European ports within the same run, to achieve the highest possible load factors. This led to the development of container ports at the south east corner of the UK (Asteris and Collins, 2009; Monios and Wilmsmeier, 2014).

Further effect of containerisation is the realisation of economies of scales, fact that justifies the ever increasing (although with a limit) size of container vessels (Parola and Sciomachen, 2005; Ting et al., 2016; Monios et al., 2018). Additionally, the use of containers enabled the standardisation among different transportation mode interfaces, fact that triggered the advent of intermodal transportation and the subsequent door to door distribution (UNCTAD, 1992; Rondinelli and Berry, 2000; Iannone, 2012).

Figure 3-2 below depicts the development of seaborne trade in selected years between 1980 and 2016, based on the annual review of MT of UNCTAD (2017). The increased contribution of container seaborne transportation is clearly visible. In 2016 it represented the 17% of the international seaborne trade compared to the 3% in 1980. The

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<sup>9</sup> The credits for the introduction of containers in maritime transportation are attributed to Malcolm McLean, a haulier that envisaged and realised the conception of container transportation on vessels by converting a tanker ship in a way that could carry containers (Levinson 2006; Okorie et al., 2016).

importance of containerised transportation for logistics systems, as discussed above, justifies the focus of this study on containerised MT.

MT is considered as one key component of a logistics system as it enables the connection of *"widely dispersed transportation linkages between consigners and consignees"*, and can be considered as a *"bridge"* between different entities in a SC (Lee et al., 2012, p.11). Therefore, MT must be in accordance with the SC flows to enable seamless flow of goods in the pipeline. This view of MT as an integrated part of the logistics flow has set the base for the development of Maritime Logistics (Panayides, 2006; Nam and Song, 2011; Lee et al., 2012; Panayides and Song, 2013; Lam, 2015).

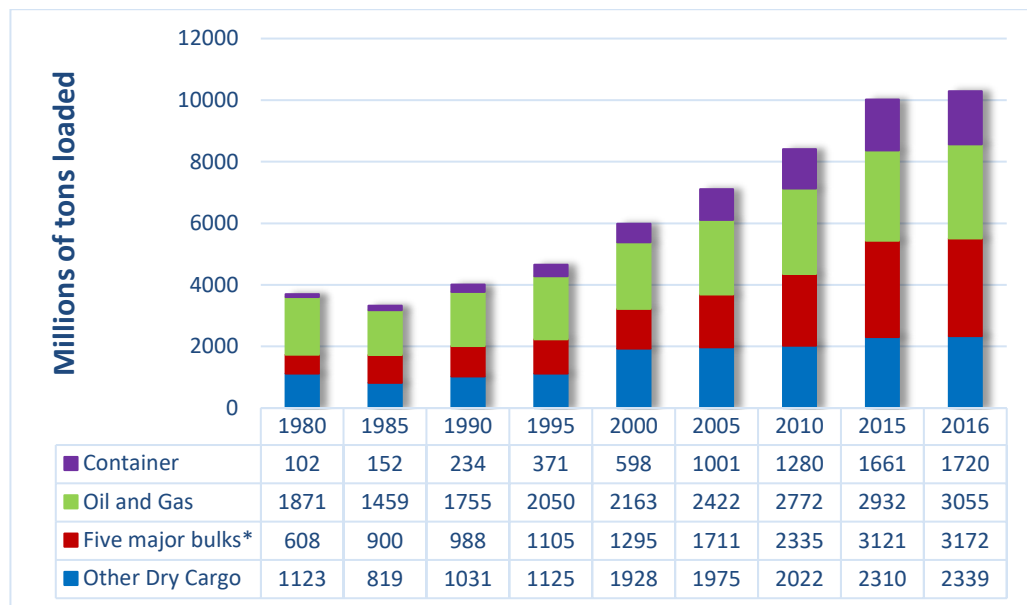


Figure 3-2: Development of the international seaborne trade, source: (UNCTAD, 2017)<sup>10</sup>

### 3.1.2 Maritime Logistics (ML)

ML can be defined as *"the process of planning, implementing and managing the movements of goods and information involved in the ocean carriage"* (Lee et al., 2012, p.11). This definition resembles the CSCMP (2013) logistics definition, in that it highlights the importance of managing not only resources and goods, but also information associated with the carriage of cargo among seaports. ML, focuses on increasing the efficiency, reliability and responsiveness of those processes, and reducing their cost and environmental output of MT (Panayides and Song, 2013). The following section critically discusses the core components of the key players of a ML system, and highlights their main functions and supporting activities as parts of a ML system.

<sup>10</sup> Five major bulks: iron ore, grain, coal, bauxite/alumina and phosphate rock

### 3.1.3 Maritime logistics operators

Table 3-1 summarises the main functions and supporting logistics services of key players in the ML system. The integration of transport and emergence of containerisation profoundly modified the core activities and relationships amongst the key players in ML systems (Fremont, 2009; Notteboom et al., 2017).

	<b>Shipping Lines</b>	<b>Port/Terminal Operators</b>	<b>Freight Forwarders</b>
<b>Main function</b>	Moving cargo between ports	Shipping reception; Loading/unloading cargoes; Stevedoring; Connecting to inland transportation	Booking vessels; preparing for requisite documents for ocean carriage and trade, on behalf of shippers
<b>Supportive logistics services</b>	<i>Documentation relating to sea trade; Container tracking and information; Intermodal service</i>	<i>Warehousing; Offering a distribution centre; Testing; Assembly; Repairing; Inland connection</i>	<i>Inventory management; packaging; warehousing</i>

**Table 3-1: Main function & supportive logistics services of ML key players, Adapted from: (Lee et al. 2012)**

#### *Shipping Lines*

The main role of shipping lines is the transportation of cargoes between ports. Services such as container track and trace, completion of sea trade related documentation and intermodal transportation are considered as supportive logistics services provided by shipping lines. The provision of logistics-VAS by shipping lines increased their level of vertical integration in SCs (Lee et al., 2012). There are many reasons for shipping lines engagement in vertical integration (Fremont, 2009; Lam, 2015; Notteboom et al., 2017). First of all, achieving sustainable margins only by reducing maritime cost is not a viable solution, thus, shipping lines move into vertical integration of logistics services as a new source of income. Additionally, by taking control over the inland transportation shipping lines can reduce the total transport cost (Notteboom, 2002; Lam, 2015). Furthermore, vertical integration reduces the dependence of shipping lines on freight forwarders. That is because it enables shipping lines to develop direct relationships with their suppliers, as they are able to capture cargo at source (Fremont, 2009). Additionally, shipping lines can achieve higher service levels, and provide a wider spectrum of services if they integrate vertically in the SC (Panayides et al., 2012; Álvarez-SanJaime et al., 2013).

Despite the plethora of benefits, the level of vertical integration of shipping lines remains limited (Fremont, 2009). Baird's (2012) taxonomy of the logistics offering of the top 20 shipping lines further supports this argument, as it shows that only a small number

of shipping lines can be considered as comprehensive global logistics services providers (e.g. Maersk Line, APL and NYK). The majority of liners offer a limited selection of logistics services (e.g. MSC, Evergreen), with the exception of a small group that can be characterised as regional logistics services providers (e.g. Cosco, OOCL) (Baird, 2012).

Conversely, the container shipping industry has been characterised by increased levels of horizontal integration (Notteboom and Winkelmanns, 2001; Ting et al., 2016) in the form of mergers and acquisitions (M&As); resulting in decreased number of deep-sea container transportation operators (Wiegmanns et al., 2008). As the size of the remaining companies increased, both due to M&As and organic growth. the liner shipping industry became dominated by the so called “megacarriers” (Ting et al., 2016).

### ***Freight Forwarders***

Freight forwarders are mainly engaged with the booking of vessels and the preparation of the documentation needed for international sea trade (Lee et al., 2012). They are responsible for receiving shipments from consignors, contracting consignments between ports of embarkation and debarkation, arrangement of documentation needed for consignments, and making arrangements regarding the delivery of shipments to consignees (Rodrigue et al., 2013a). Inventory management solutions, packaging and warehousing can be considered as supportive logistics services provided to shippers (Lee et al., 2012). Freight forwarders are often hired by the shippers because of the complexity of the import and export documentations (Rushton et al., 2017). Some freight forwarders will also be responsible for the actual consignment of the cargo. The level of responsibility of the freight forwarder is determined by the Incoterm used for each consignment. A key function of freight forwarders is to “*accept less than truckload (LTL) from shippers and combine them into full truckloads*” (Rodrigue et al., 2013a, p.376). In these cases the freight forwarder acts as *consolidator* or *groupage operator* (Brodie, 2006). The decision of the shipper to engage a freight forwarder to accommodate the needs of the shipment is comparable with the strategic decision of outsourcing (McKinnon, 2014).

### ***Ports***

Ports receive ships and execute all operations related to the bilateral transfer of cargoes from sea to land. Services as the provision of warehousing, testing, assembly, repairs and inland transport are supportive logistics services that can be provided by ports (Lee et al., 2012; Okorie et al., 2016). The reasons why ports alter their strategies to include provision

of such services are discussed in the following sections. However, to clarify the meaning of the port for the remainder of this thesis, the basic definition of the port is introduced below.

### ***Definition of the port***

In simple words, ports are the places where “*the essential function of exchanging cargo between ships and shore*” occurs (Robinson, 2002, p.251). Put differently ports are “*areas where ships are brought alongside land to load and discharge cargo – usually a sheltered deep-water area such as a bay or river mouth*” (Stopford, 2009, p.81). Additionally, ports are considered as four-modal nodes, where waterborne and land transport can converge (Paixão and Marlow, 2003; Almotairi and Lumsden, 2009; Vonck and Notteboom, 2016).

Ports generate trade and commerce, and trigger the creation of work positions internally (e.g. dockworkers and managerial positions) and externally; thus, are regarded as regional “economic catalysts” or “clusters of economic activity” (Wood et al., 2002; Song and Parola, 2015). That is because the main function of ships and cargo accommodation that takes place at a port attracts economic activities and companies (e.g. shipping lines, freight forwarders and LSPs) at the proximity of the ports (De Langen, 2004). All these co-located companies collaborate to provide value to end-customers, and create the diversified port offering (Carbone and Martino, 2003; De Langen and Sharypova, 2013; Song and Parola, 2015). Distinct are the cases where port terminal operators integrate with LSPs for the facilitation of door-to-door services (Van Der Horst and De Langen, 2008; Notteboom and Rodrigue, 2012; Parola et al., 2014).

Van der Lugt et al. (2013) draw upon various definitions of ports and argue that ports are business networks. Within these networks, companies are interdependent for the holistic development of the system. Thus, inter-network relationships are of extreme importance. The view of ports as business networks justifies the selection of ERBT as an appropriate theory to underpin the empirical findings of this thesis.

A single taxonomy for the classification of ports does not exist because ports differ in structure, roles, functions, spatial differences, governance and institutional organisation. Variation in these terms can also exist within a single port, as the scope and nature of the activities and services performed within the port can vary widely. The functions and roles which ports are called to play are determined by political, geographical, economic and social dimensions (Bichou and Gray, 2005; Vonck and Notteboom, 2016). Consequently, port research tends to analyse ports case-by-case taking into account such factors (Chlomoudis et al., 2003; Acciaro et al., 2014).

To overcome the lack of a uniform port structure model and to facilitate the understanding of ports, OECD (2011) propose a simplified port structure (Figure 3-3), which is used as a guideline for definitions and discussion of key components of ports.

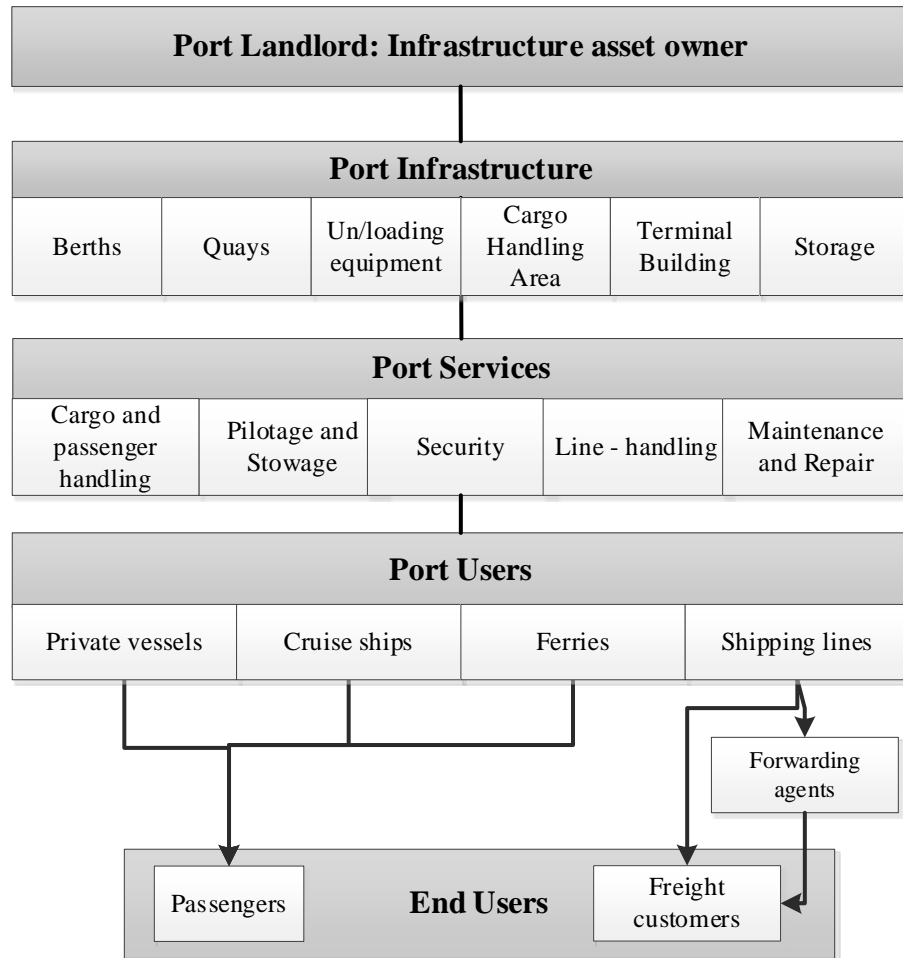


Figure 3-3: Port's structure, adapted from: OECD, 2011

### ***Management and ownership of ports***

Ports are managed by Port Authorities (PAs), who are responsible for the provision of the services needed to accommodate ships (Mangan et al., 2008; Verhoeven, 2010; Monios and Bergqvist, 2015). Thus, they plan, authorise, coordinate, control and in some cases provide all port services (OECD, 2011). PAs construct and maintain port infrastructure which is then provided to other private entities under the form of leases or concessions (Dooms et al., 2013). Infrastructure investments develop the capabilities and competencies of the port, and consequently increase its performance. The return on this investment for the PA derives from land rent and port dues (Van der Lugt et al., 2013). Furthermore, PAs aim to enhance the competitiveness of port clusters, and focus to secure cargo business by the development of efficient intermodal systems (Woo et al., 2011; Dooms et al., 2013; Ferrari et al., 2015; Vonck and Notteboom, 2016).



Most PAs around the world are public or semi-public organisations (Baird, 2002; Verhoeven, 2010; Notteboom et al., 2015). Regarding *public PAs* two schemes exist. The first is the *centralised port governance* scheme, where the government of a country is responsible for the management and operations of ports. The second scheme is the *decentralised port governance* where the management and operation of ports is the responsibility of regional or municipal public authorities (e.g. China) (Juhel, 2001; Cullinane and Song, 2002; Monios and Bergqvist, 2015; Ferrari et al., 2015).

However, in the UK, ever since the port privatisation schemes implemented during the governance of Margaret Thatcher in the 1980s (Verhoeven, 2010), and with the Ports Act in 1991 (Baird, 1995), PAs are privately owned organisations. Similar examples have been witnessed only in Australia and New Zealand (Dooms et al., 2013; Ferrari et al., 2015).

Contemporarily, regardless of ownership and governance status, PAs are perceived as hybrid organisations; i.e. they are ruled by public and private law (Verhoeven, 2010; Van der Lugt et al., 2013; Notteboom et al., 2015). PAs can manage ports in different countries. These PAs are referred to as global port operators (GPO) (Mangan et al., 2008; Notteboom and Rodrigue, 2012) and are discussed in Section 3.2.

Ownership, structure and mandate are determinant factors that shape the objectives which guide the final actions of the PA (Heaver et al., 2001; Notteboom et al., 2015). Ports may have various forms of ownership. The entity that owns the port is referred to as the *port landlord*, who owns the land and often the infrastructure of the port. It is possible that the PA is also the landlord, but examples exist where the PA and landlord are different organisations (OECD, 2011).

Some ports are managed by the government of the country they are located in, while others are run by private companies. Only a few examples of entirely public or private ports exist (Cullinane et al., 2002; Stopford, 2009; Ferrari et al., 2015). The dissimilarity of port ownership models obstructs the development of a common approach to ports (Monios and Bergqvist, 2015). This is also prevalent among ports with resembled functions and roles (Bichou and Gray, 2005). Diversity in ownership and organisational structure among ports exists because ports have been developed under the influence of various social, political, cultural, commercial and military circumstances (Thomas, 1994; Ng and Pallis, 2010); or put differently the development of port trajectories and their divergent governance structures are related to the concepts of path dependency and lock-in (Notteboom et al., 2013a).

Various attempts for the creation of a port ownership and management typology have been made by maritime researchers, driven by the work of Goss (1990a) who challenged the need for public sector PAs (Verhoeven, 2010). Contemporarily, it is common knowledge that port governance is a determinant of competitive port performance. Authors assert that the involvement of the private sector in the ownership and management of ports results in efficient PA operations (De Langen, 2004; Pallis and Syriopoulos, 2007; Monios and Bergqvist, 2015); and that efficient PA operations can yield national CA in international commerce (Tongzon and Heng, 2005).

The debate regarding the privatisation of ports is supported by the views presented in Smith's (1776) *Wealth of Nations*. The main rationale is that with only a limited involvement of the government, individuals driven by motives of competition and profit will serve the public interest and simultaneously fulfil their own interest. Therefore, private ownership improves productivity and efficiency, and enhances economic performance (Cullinane and Song, 2002; Monios and Bergqvist, 2015). Regardless of their ownership structure, PAs should provide a certain set of facilities and services, as summarized in Table 3-2.

<b>Infrastructure</b>	Approach channel, breakwater, locks, berths
<b>Superstructure</b>	Surfacing, sotrage (transit sheds, silos, warehouses), workshops, offices
<b>Equipment</b>	Fixed: ship-to-shore crane, conveyor belts, etc. Mobile: straddle carriers, forklifts, tractors, etc.
<b>Services to ships</b>	Harbour master's office (radio, vessel traffic system etc.), navigational aids, pilotage, towage, berthing/unberthing, supplies, waste reception and disposal, security
<b>Services to cargo</b>	Handling, storage, delivery/reception, cargo processing, security

**Table 3-2: Facilities and Services of by ports, source: (UNCTAD, 1995, p.27)**

However, in the era of SC competition ports offer facilities and services that accommodate the needs of the SCs that pass through them. Consequently, many ports differentiate their offering and focus on the provision of more services than the traditional port services (Bichou and Gray, 2005; Okorie et al., 2016).

With respect to the entity offering the facilities and services presented in Table 3-2 various models have been developed. Initially, ports were categorised into the comprehensive and the landlord ports (Goss, 1990c; Heaver, 1995). Later conceptualisations distinguished three port models: the service port, tool port and landlord

port (Cullinane and Song, 2002; Ferrari et al., 2015), a classification referred to as the *traditional port organisation models* (Baird, 2000; Chen, 2009).

The rise of port privatisation schemes necessitated the re-conceptualisation of port models to reflect the fundamental institutional and organisational changes which occurred after ports privatisation (Baird, 2000; Monios and Bergqvist, 2015). Various authors proposed different models that incorporate the private sector in the conceptualisation of ports. Baird (1995) proposed a *port function privatisation matrix* that divides the functions of ports into three categories, namely: the port landowner function, the port utility function and the port regulatory function. Baltazar and Brooks (2001) propose a modification of Baird's model, distinguishing the regulatory functions from the port functions. However, their matrix has not been validated (Brooks and Cullinane, 2007). Thus it will not be discussed further.

The model most referenced in the literature, is the one proposed by World Bank (2007) (Debie et al., 2013; Monios and Bergqvist, 2015). World Bank (2007) expanded the traditional port organisation model to incorporate the private sector. The four port models are defined as:

- ***Service (or pure public) port***: the public PA is the owner of port land and assets, and is responsible for management and operations of the port; it is possible some of the cargo handling services to be conducted by an independent public entity (Brooks and Cullinane, 2007) (e.g. ports in Ukraine and Israel, and the port of Shanghai (Baird, 2005; Mangan et al., 2008; Ferrari et al., 2015)).
- ***Tool ports***: the public PA is responsible for the development and maintenance of port's infrastructure and superstructure. Some on board, quay and apron operations are performed by private organisations (e.g. ports in South Africa) (Brooks and Cullinane, 2007; Ferrari et al., 2015).
- ***Landlord (or regulatory) ports***: the role of the public PA is limited only in the provision and maintenance of basic infrastructure and crucial services (e.g. fire services, security etc.), while private or public organisation are responsible for the provision of all the other facilities and services (Cullinane et al., 2002). The vast majority of the PAs around the world operate under the landlord port model (e.g. ports in Spain, France and Germany, and the ports of Rotterdam, Antwerp, New York and Singapore (Goss, 1990b; Baird, 1995; World Bank, 2007; Debie et al., 2013; Dooms et al., 2013; Ferrari et al., 2015)).

- **Private ports:** the private sector is responsible for the regulatory, capital related and operational activities of the port, and is the owner of the port land (i.e. the government has no interest in any of the port activities) (Brooks and Cullinane, 2007; Chen, 2009). This model is highly applicable to UK ports (Baird, 2005; Notteboom et al., 2017) and to ports in Australia and New Zealand (Dooms et al., 2013; Ferrari et al., 2015).

Table 3-3 presents the allocation of responsibilities among the four port models as suggested by the World Bank.

<b>Responsibilities</b>	<b>Service</b>	<b>Tool</b>	<b>Landlord</b>	<b>Private</b>
<b>Infrastructure</b>	Public	Public	Public	Private
<b>Superstructure</b>	Public	Public	Private	Private
<b>Port labour</b>	Public	Private	Private	Private
<b>Other functions</b>	Majority public	Mixed	Mixed	Majority private

**Table 3-3: Allocation of Responsibilities based on the World Bank Port Reform Toolkit, source: (Brooks and Cullinane, 2007, p. 410)**

Models are general in their construction and consequently decontextualised. They do not provide a grasp of a port’s strategic intent, input into the economy, and distribution of responsibility for regulatory monitoring (Brooks and Cullinane, 2007; Debie et al., 2013; Monios and Bergqvist, 2015). Therefore, they can be treated only as starting points towards the understanding of the allocation of infrastructure and superstructure investment responsibilities, and the allocation of the managerial and operational functions of the port.

### ***Port Privatisation in the UK***

This study investigates the impact of SLS on the competitiveness of UK ports and intermediaries involved with PCL based on the assumptions that PCL can be perceived as SLS of ports and intermediaries that compete on the provision of logistics-VAS. Thus, a discussion about the governance structure of UK ports is appropriate. The previous section highlighted that most ports operate according to the landlord port model. Most UK container ports are completely privatised (Baird, 2002; Cullinane et al., 2002; Baird, 2005; World Bank, 2007; Verhoeven, 2010; Dooms et al., 2013; Baird, 2013; Debie et al., 2013; Ferrari et al., 2015; Notteboom et al., 2017; Chen et al., 2017). This section elaborates on the reasons that led to the contemporary status of UK ports, and identifies the impact of the implementation of complete privatisation on UK ports.

During the 1970s, prior to any privatisation attempt, the UK had more than 250 PAs and approximately 1,400 companies involved with stevedoring, towage and warehousing activities (Cullinane and Song, 2002). Four different port types existed, these were the public or nationalised ports, the trust ports, the municipal ports and the company ports (Thomas, 1994; Cullinane and Song, 2002). UK public ports, in contrast to public ports in other countries, were financially independent from the government. They were required to cover their operational costs and to finance any investments without subsidies or any other government financial support (Liu, 1995). Further, UK public ports were also free from any managerial government interference. To that extent, UK public ports were perceived as private ports bar that they were non-profit organisations, and that customers had the right to appeal if they thought that the port prices were unfair (Liu, 1995).

In 1947 the creation of the British Transport Docks Board and National Dock Labour Scheme oversaw the nationalisation of the British port industry (Suykens and Van De Voorde, 1998; Asteris and Collins, 2009). The labour scheme aimed to provide balance among the bargaining power of employers and employees in the most important UK ports. Additionally, the scheme aimed to reserve the so called “dock-work” activities of Registered Dockers. These arrangements granted several privileges such as standardised payment even in periods when no work was available.

The scheme adversely affected the reliability, efficiency and costs of UK ports, which, in combination with the developments of containerization, resulted in loss of competitiveness against ports in mainland Europe (Asteris and Collins, 2009). Shipping lines serving UK ports implemented a threefold strategy to overcome the barriers set by the scheme. Initially, shipping lines favoured calls at ports not included in the labour scheme. As a consequence, during the 1960s, the free port of Felixstowe developed rapidly (Baird, 1999). Secondly, shipping lines preferred to tranship products through continental ports which were not protected by similar labour schemes. Thirdly, shipping lines campaigned against these constraints.

The full privatisation scheme of UK ports was implemented for four main reasons (Cullinane and Song, 2002; World Bank, 2007; Chen et al., 2017):

1. Poor financial performance of the ports.
2. Need to modernise outdated institutions and installations, and meet demand.
3. Aim to achieve financial stability and targets with the increasing flow of private funds, whilst reducing public spend.

4. Establishment of labour stability and rationalisation which would be followed by a higher degree of labour participation in the new organisations.

The Transport Act 1981 overlooked the first UK port privatisation scheme (Suykens and Van De Voorde, 1998; Chen et al., 2017). The Act included the managerial take-over of 19 ports, managed by the British Transport Dock Board, by the newly formed Associated British Ports (ABP). ABP was controlled by the Associated British Port Holding, a government formed organisation. In 1983, 49% of the company's shares were offered to private investors. Thus, Associated British Ports PLC was formed, which had no "*authority over the directors of ABP with respect to the exercising of their statutory powers and duties as a port authority*" (Cullinane and Song, 2002, p.70). The abolishment of the labour scheme was perceived as a prerequisite for the implementation of privatisation in the UK ports (Goss, 1998). No distinction among PAs statutory duties and economic functions, and the port activities was made by the government's policy regarding the extent of the level of privatisation of ports at that time (Chen et al., 2017).

A further decision to privatise the remaining public ports was made in 1991 by the UK government (Suykens and Van De Voorde, 1998; Chen et al., 2017). The Port Act 1991 enabled the government to force any remaining trust port "*to transfer their rights, duties, assets, and liabilities to companies formed under the Companies Act, which would then be sold to some other company*" (Goss, 1998, p.67). The preferred scheme supported by the government was the management-employee buy-out (Farrell, 2013). In 1992, five trust ports decided voluntarily to be sold, these were the Ports of Tees and Hartlepool, Clyde, Forth, Medway and the Port of London (Tilbury) (Baird, 2002). In 1993, the Secretary of State for Transport, driven by the Ports Act power, forced the remaining trust ports, with an annual turnover above £5 million, to pursue privatisation (Baird, 1995). However, no other port has been privatised since 1997, despite an unsuccessful attempt to privatise the port of Dover in 2012 (Chen et al., 2017).

The Port Act 1991 focused on the privatisation of trust ports, and was applied to most PAs, which had the right to form a limited company that could take-over the property, rights, liabilities and operations owned by the PA. The Department of Transport intended to sell those ports by competitive tenders to achieve the highest possible price (Baird, 1995). However, the acquisition prices of those trust ports were low, leading to the ever since attained "get rich quick" image of the port sector (Farrell, 2013). Four reasons are accountable for the low prices:

- Wrong perception that ports are unprofitable, even though the low incomes of trust ports was later attributed to the early 1990s' economic recession.
- Anticipated increased competition caused by the ending of the National Dock Labour Scheme.
- The bad structure of the privatisation process and the fact that the government preferred the management-employee buy-out teams discouraged potential investors.
- Under-valued ports' land surplus, which after the urban regeneration schemes experienced huge increases in value because of potential development activities.

The increased profits of UK ports ever since the various deregulations and privatisation schemes, attracted the interest of the banking community. UK ports have been sold to international private equities (PE) under highly leveraged transactions (Notteboom et al., 2017). As a result, port profits were used to pay-off those transactions. Consequently, the developments of new advanced port infrastructure was prevented, which could contribute in the potential loss of competitiveness of UK ports (Baird, 2013; Chen et al., 2017). The requirement of the UK Department for Transport for ports to contribute to the development of road and rail infrastructure, and to be part of lengthy and expensive public enquiry processes caused further delays in the development of new port infrastructure (Baird, 2013). Concerns about the latest buyouts of ports by PEs are discussed by Wilmsmeier and Monios (2013) who argue that there is an ongoing debate about public money spent on the improvement of transportation infrastructure that will be utilised by privately owned entities. However, this debate is not within the scope of this thesis; hence, this issue will not be discussed further.

From the discussion above it can be asserted that UK ports belong to a unique category of private ports that does not exist anywhere else in the world. Furthermore, several disadvantages were identified regarding the UK port governance model. These are related to the lagged development of UK ports. Regardless of these concerns, UK container ports appear to adopt a strategy which proves to be popular and yields many benefits. This strategy is the so-called concept of PCL, which in this thesis is perceived as a SLS of UK ports and intermediaries that are involved with the on-port provision of logistics VAS.

### ***Port infrastructure and terminals***

The second level of the port's structure framework (see Figure 3-3) describes port infrastructure. Infrastructures in general are capital goods that cannot be consumed directly, but support societal functions. Regarding ports, infrastructures are all the tangible assets used for the various processes within the port. Distinction can be made between the core/basic infrastructures (e.g. maritime channels, dredging, quays, breakwaters) and the operational, and other infrastructures (e.g. buildings, cranes) (Baird, 2002; OECD, 2011). Port infrastructures usually require high capital investments for equipment, and are land intensive (Rodrigue et al., 2013a). Depending on the port's administration model, the ownership and management of these infrastructures will vary accordingly.

A port can be divided into multiple terminals. A terminal can be defined as the section of a port that consists of one or more berths and handles a particular cargo type (Stopford, 2009). Different cargo types require different terminals in terms of infrastructure, water depth, quay side cargo equipment, IT system, labour level, environmental impact of the terminal, sea and land side congestion, security level and customs. Three types of terminals are most commonly distinguished based on the different type of cargo they handle. These are container terminals, dry-bulk terminals and tanker terminals (UNCTAD, 2013). Terminals can be owned and operated by the PA, or be dedicated to a shipping company which exclusively operates a particular terminal (Stopford, 2009).

Terminals can be designed to facilitate the requirements of integrated logistics systems (Monios and Bergqvist, 2015). That is important because the competitive edge of a terminal does not always derive from tangible aspects only. Instead intangible elements such as capabilities to provide logistics-VAS can contribute to the competitive edge of a terminal (Notteboom, 2009). Thus, the value created by the terminal must be in alignment with the requirements of the supply chains that pass through this terminal. Consequently, terminals are important elements of the entire supply network (Rodrigue and Notteboom, 2009; Notteboom et al., 2017).

### ***Port Services***

Port services and operations vary widely among different ports or terminals. However, the operations conducted within a port will always be related to ship and cargo (See Figure 3-4). Nowadays ports are not thought to operate in isolation. They are integral parts of SCs and ML systems. Consequently, beyond optimised traditional port services, ports



provide services that reflect the developments of SCM, such as logistics-VAS (Brooks and Cullinane, 2007; Almotairi and Lumsden, 2009; Pettit and Beresford, 2009; Okorie et al., 2016). Consequently, the conceptualisations of port service offerings have changed to include this aspect. For example, the International Association of Ports and Harbours (IAPH) divides port services into three categories: port navigation services, stevedoring services and VAS (Baird, 2002). Many authors encompass the view that VAS are an integral part of the port offering. Among others, Panayides and Song (2008) assert that ports tailor their logistics-VAS offering to the demand of port customers to stimulate SC integration. Carbone and De Martino (2003) highlight that logistics-VAS, and particularly procurement and preassembly, receive increased importance within the port environment. World Bank (2007) summarises the VAS that are considered common offering of container ports (Figure 3-5). They distinguish two broad categories, namely: logistics-VAS, and value-added facilities and highlight that depending on the product type, VAS may vary.

Based on the discussion above it can be seen that the provision of logistics-VAS is considered to be the common offering of ports around the world. However, UK ports did not develop their offering at the same pace as ports in other parts of the world. As it will be discussed in Section 3.3, UK ports initiated the provision of logistics-VAS in the mid-2000s. This research considers this move as a SLS of UK ports and intermediaries and aims to identify what strategies are implemented for the provision of those services, and how those who implement SLS are impacted.

### ***Port users***

A port is a place where freight shippers, shipping lines, private vessels, cruise ships, and other port users meet to use the plethora of provided services. Each of these users need the port for different reasons (OECD, 2011). For this thesis **port users will be considered as all the entities that approach a port to use the port's facilities**. End users can be either passengers using this port to reach their destination, or freight customers that use the products transferred through the port. Brooks et al. (2011) argue that the purchase of port services does not only influence port users. Instead every SC partner is influenced by the effectiveness of the services provided by the port. Thus, port selection is important because it influences the effectiveness and performance of the entire SC. Consequently, ports need to understand the needs of their users and develop strategies that would accommodate these needs to achieve business growth and increased market share.

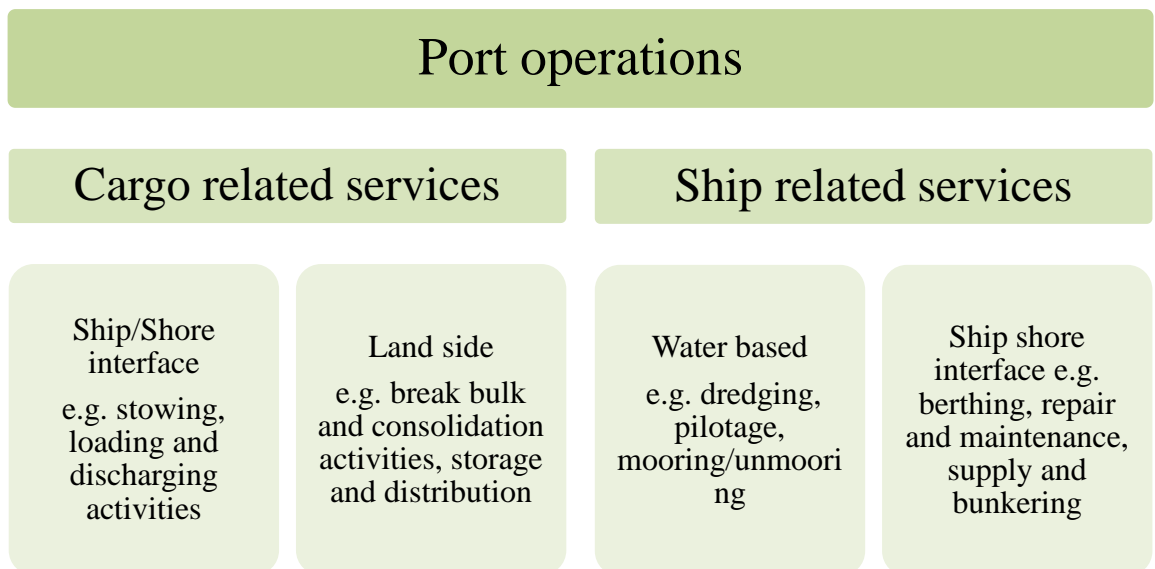


Figure 3-4: Traditional port ship and cargo related operations, adapted from: (Bichou and Gray 2005, OECD 2011, and UNCTAD 1992a)

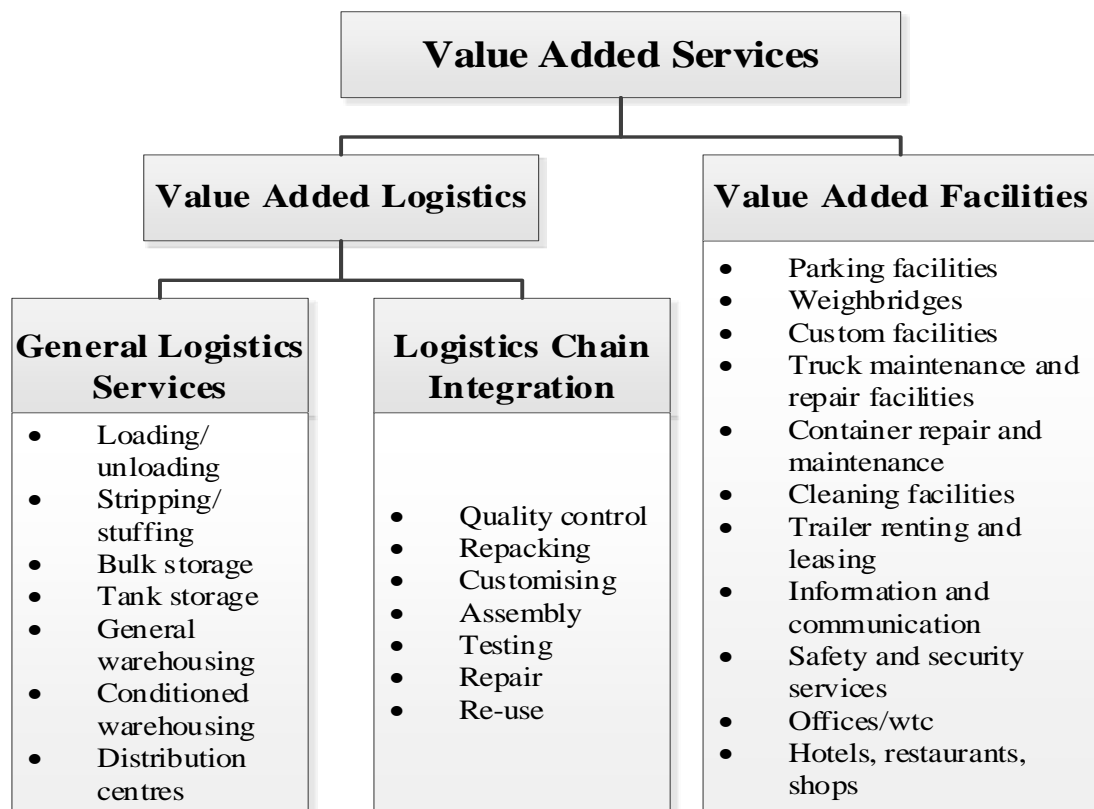


Figure 3-5: Value-Added Services in Ports, source: World-Bank, 2007, p.

Section 3.1.3 presented port structure to enhance the understanding of the entities involved in the port system. The next section provides a thorough discussion about the evolution and development of the ports to meet the requirements of the current logistics environment.

### **3.2 Port evolution and development in the contemporary business environment**

Contemporary ports operate in an environment driven by changing economic systems (Pallis et al., 2011; Okorie et al., 2016; Vonck and Notteboom, 2016), and economies of scope (post-Fordism era), rather than economies of scale (Fordism era). Globalisation, outsourcing, deregulation, and technological innovations are the key determinants of the post-Fordian business environment. In this environment, product life cycles and time to market have decreased, while the demand for greater product variety, availability, quality and reliability have increased (Notteboom and Winkelmanns, 2001; Lee et al., 2012; Okorie et al., 2016).

Furthermore, the logistics environment in which ports operate has changed significantly. Increased vessel sizes, horizontal and vertical integration of shipping lines, development of landside logistics-VAS, containerisation, the changing nature of cargo generating hinterlands, and the rationalisation of hub and spoke systems, are examples of developments that drastically re-shaped supply networks and logistics systems (Pallis et al., 2011; Notteboom and Rodrigue, 2012; Ting et al., 2016; Notteboom et al., 2017).

All the above are characteristics of an uncertain and dynamic environment that affects ports. These force scholars to re-conceptualise ports (Olivier and Slack, 2006; Notteboom et al., 2013a), and generate a need for port managers to identify new strategies. These strategies should enable ports to respond effectively to the dynamics of the market, and encompass reforms in the legislative, institutional and procedural provisions of ports (Juhel, 2001; Notteboom, 2007; Notteboom et al., 2017). As a result the role and governance of PAs and port management teams has evolved.

The need of ports to respond to the changes in the environment made them “*elements in value driven chain systems*”, anticipated to deliver value to their customers but also required to capture value for themselves (Robinson, 2002, p.252). Robinson’s influential study triggered the academic interest in the need for port transformation (Notteboom et al., 2013b). Until that point, ports were perceived as “pawns in the game” (Slack, 1993). This means that ports even though they are required to invest heavily to accommodate their customers do not have control over global commerce.

Contemporary ports are also perceived as important contributors to SC integration because of the inclusion of logistics activities in their operations (Paixão and Marlow, 2003; Pettit and Beresford, 2009; Mason et al., 2015). However, the factors that influence the evolution of a port system are not totally understood (Ducruet et al., 2009).

Wilmsmeier and Monios (2013, p.118) argue that port development can be characterised as path dependent. In terms of past decisions, structures and processes influence future actions, but port system evolution “*is also contingent and open ended as decisions may deviate from an existing development path*”.

The remainder of this section critically evaluates the evolutionary development of ports after WW2 from two perspectives. The first focuses on the ports’ generation model, and the second on the emergence and expansion of global port operators (GPOs). A third view on the evolutionary development of ports, i.e. ports privatisation, was discussed in Section 3.1. This multifaceted review of the development of ports provides a robust understanding of the industry and clearly frames the unique paradigm of UK ports regarding ownership and management mandates.

An additional literature stream related to the evolutionary development of ports also exists. It derives from the field of transport geography, and examines the evolutionary development of ports from spatial and geographical points of view (Bichou, 2009; Monios et al., 2018). This view is based on the “any-port model” of Bird (1980), and on the concept of “port regionalisation” of Notteboom and Rodrigue (2005). However, the present study does not aim to evaluate strategies focusing on the spatial development of ports by the expansion of the boundaries of their captive hinterlands. Instead, this study investigates the impact of the on-port provision of logistics-VAS by UK ports and intermediaries. Consequently, this literature stream is not reviewed further.

### **3.2.1 Ports’ generation model<sup>11</sup>**

The United Nations Conference on Trade and Development (UNCTAD) (1992), in an attempt to frame the functional and institutional development of ports after WW2 developed the three generations’ port model (Verhoeven, 2010; Vonck and Notteboom, 2016). The model has been criticised as unrealistic and inaccurate because it assumes a continuous development of ports, instead of evolutionary development in discrete steps (Beresford et al., 2004; Bichou and Gray, 2005; Pettit and Beresford, 2009; Verhoeven, 2010; Wilmsmeier et al., 2014). Commentators argue that within the same port, elements of different evolution streams might be identified as a result of the composite nature of ports. Additionally, elements of previous generations can still be observed within latter

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<sup>11</sup> The author acknowledges the existence of other models describing the evolutionary development of ports, such as the WORKPORT model, which postulates continuous port evolution in accordance with ecosystem developments (Beresford et al., 2004; Vonck and Notteboom, 2016). However, only UNCTADs model will be discussed in this thesis, because it is the most widely adopted model in relevant literature.

generations. Nevertheless, the UNCTAD (1992) model provides a useful conceptualisation of how the large “multi-purpose-gateway ports” evolved (Verhoeven, 2010). Table 3-4 summarises the key characteristics of the three generations of ports.

	First generation	Second generation	Third generation
<b>Period of development</b>	Before 1960s	After 1960s	After 1980s
<b>Main cargo</b>	Break bulk cargo	Break bulk and dry/liquid bulk cargo	Bulk and unitised cargo
<b>Attitude and strategy of port development</b>	Conservative Changing point of transport mode	Expansionist Transport, industrial and commercial centre	Commercially oriented Integrated transport centre/logistic platform for international trade
<b>Scope of activities</b>	Cargo loading, discharging, storage, navigational service (1) Quay and waterfront area	(1) + Cargo transformation; ship-related industrial and commercial services (2) Enlarged port area	(1,2) + cargo and information distribution; logistics activities Terminal and distribelt towards landside
<b>Organisation characteristics</b>	Independent activities within port Informal relationship between port and port users	Closer relationship between port and port users Loose relationship between activities in port Casual relationship between port and municipality	United port community Integration of port with trade and transport chain Close relationship between port and municipality Enlarged port organisation
<b>Production characteristics</b>	Cargo flow Simple individual service Low value-added	Cargo flow Cargo transformation Combined services Improved value-added	Cargo/information flow Cargo/information distribution Multiple-service package High value-added
<b>Decisive factors</b>	Labour/capital	Capital	Technology/know-how

**Table 3-4: The UNCTAD three generations port model, adapted from: (UNCTAD, 1992; Beresford et al., 2004; Pardali, 2005)**

*1<sup>st</sup> generation ports:* Before the 1960s ports were seen as the connection and transfer point between sea and land transportation modes, where only cargo loading/unloading, and storing activities would take place (UNCTAD, 1992; Pardali, 2005). At that time, ports operated in isolation from transport and trade activities, and did not attempt to meet users’ requirements (Beresford et al., 2004). Monopolistic behaviour, separation from surrounding municipalities, and lack of commercial promotion initiatives were also observed. Further characteristics were low productivity and subsequent slow cargo movements, and the unfamiliarity of port users with the entire entity of the port (UNCTAD, 1992; Beresford et al., 2004).

**2<sup>nd</sup> generation ports, 1960s – 1980s :** The range of activities of second generation ports was broadened and included provision of transport, industrial and commercial services (i.e. services that add value to cargo) (UNCTAD, 1992). These services resulted in the build-up of industrial facilities that extended further into the hinterland of the port (Beresford et al. 2004). Two types of industries were primarily established around ports. These were industries heavily dependant on imported raw materials (e.g. refineries, steel, chemicals, paper mill, and cement), and industries that locate near ports due to their characteristics as consumer markets, (e.g. tobacco, food and clothing industries) (Pardali, 2005). Second generation ports developed closer relationships with their transport and trade partners, and with their surrounding municipalities (Beresford et al., 2004). Hence, it can be asserted that they were no longer isolated from the general transport industry. Moreover, the integration of several port activities resulted in increased speed of cargo throughput. However, this integration was not organised, but spontaneous (UNCTAD 1992b). A final distinction is that second generation ports were more capital intensive in contrast to the labour intensive first generation ports (Bichou, 2009).

**3<sup>rd</sup> generation ports<sup>12</sup>:** During the 1980s the rapid expansion of containerisation necessitated significant structural and infrastructural changes for ports to handle national and international demand. The increased usage of unitised cargo forced ports to invest in intermodal transportation systems to accommodate seamless sea-land (and vice versa) container transfers (Beresford et al., 2004; Parola and Sciomachen, 2005). The development of intermodal transportation<sup>13</sup> systems enabled ports to considerably increase throughput. However, it also resulted in congestion around them, thus, challenging their competitiveness. Consequently, ports were forced to optimise container flows to reach world class productivity levels; which is measured by KPIs such as vessel turnaround time, or container throughput per hour (Thomas, 1989; Parola and Sciomachen, 2005).

Furthermore, during the 1980s ports extensively utilised modern equipment and ICT in their traditional operations, and were considered dynamic nodes within global trade

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<sup>12</sup> Relevant with the 3<sup>rd</sup> generation model is Paixao and Marlow's (2003) conceptualisation of ports as logistics systems, which in contrast to manufacturing units, are bi-directional systems accommodating product and information flows from sea to land and vice versa. However, due to space limitation this conceptualisation is not discussed further.

<sup>13</sup> Intermodal transportation initially influenced North American ports, as regulations in Europe prevented its implementation during early 1980s. European ports implemented intermodal transportation after the deregulations introduced by the EU in the 1990s (Slack, 1993).

networks. This derived from their proactive management which envisioned the development of ports as transport centres and logistics platforms integrated within the global trade networks (Beresford et al., 2004). Additionally, these ports specialised and integrated distribution and logistics-VAS within the traditional port offering that so far comprised only cargo handling services (Bichou and Gray, 2004).

Beyond VAS, third generation ports incorporated ship/vehicle industrial/technical related services (e.g. ship repairing, engineering services) in their offerings, and either provided industrial services themselves, or allowed third parties to provide them in order to generate additional cargo throughput and value-added for the port (UNCTAD, 1992).

Additionally, ports adopted a 7-day operation scheme and due to the extensive use of ICTs achieved high administrative efficiency and increased infra- and superstructure utilisation (UNCTAD, 1992; Beresford et al., 2004). Consequently, third generation ports realised increased profitability triggered by the provision of VAS, reduced custom regulation and various internal and external organisational changes. Moreover, third generation ports adopted environmental protection measures to manage concerns regarding environmental impacts (Beresford et al., 2004).

Bichou (2009, p.44) describes third generation ports as *“the product of the unitisation of sea trade and multimodal cargo packaging which has led to the development of ports as logistics and inter-modal centres offering valued added services, with technology and know-how being the major determining factors”*.

**4<sup>th</sup> generation port:** Since the three-generation port model of UNCTAD technological changes and further developments in working practices and the commercial environment have occurred. As a consequence of these changes, relationships and linkages between service providers, facilitators and end consumers became tighter (Pettit and Beresford, 2009). In 1999, UNCTAD, introduced the concept of the 4<sup>th</sup> generation ports, *“which are physically linked through common operators or through common administration”* (UNCTAD, 1999, p.9). The ports of Copenhagen and Malmö are an example of a joint venture that promotes the competitiveness of the ports under one administrative unit. Increasingly terminals in various places around the world are linked under the common management of a single global port/terminal operator or a shipping line.

UNCTAD’s definition of the fourth generation port is constrained to the spatial evolution of port and does not include other operational and societal changes that have

occurred in port development during the 21<sup>st</sup> century (Verhoeven, 2010). Academics interpreted fourth generation ports differently compared to UNCTAD intentions. Perez-Labajos and Blanco (2004) argue that fourth generation ports should focus on attracting big logistics operators. Paixao and Marlow (2003) argue that fourth generation ports should become proactive rather than reactive to changes in their environment. Thus, port managers should adopt new strategies which encompass the concept of agility. The introduction of agility into the port's SC system enables ports to evolve as transport solution providers rather than just logistics nodes in the SC, as implied by the third-generation port model.

### **3.2.2 Global Port Operators (GPOs)**

Global Port Operators (GPOs) are companies that expand their activities to include international port operations, with the intention to establish worldwide network services (Bichou and Bell, 2007). Three reasons justify the emergence of GPOs. The first two relate to the port evolution and development stages, while the third relates to the vertical integration of shipping lines (Slack and Frémont, 2005; Midoro et al., 2005; Pawlik et al., 2011; Notteboom et al., 2017). The limitations of ports' original scope of operations, and limited internal growth opportunities, triggered many PAs to expand the scale and scope of their operations through horizontal integration (Notteboom and Winkelmanns, 2001). Thus, by means of refining and applying already successful management practices in different countries, these companies managed to increase their profits (Peters, 2001; Slack and Frémont, 2005).

The second reason relates to port privatisation and liberalisation schemes that were implemented in various countries. Many port/terminal operators driven by the incentive of expanding their operational and managerial expertise into new markets acquired terminals/ports and created joint ventures with other port/terminal operators (Slack and Frémont, 2005). The international expansion through organic growth (i.e. M&A or new terminal constructions), represents the first wave of GPOs development (Peters, 2001; De Souza et al., 2003; Notteboom and Rodrigue, 2012). Successes of the first implementers of international expansions strategies triggered the second wave of GPOs development (Notteboom and Rodrigue, 2012). The third reason for the emergence of GPOs relates to the vertical integration activities of shipping lines, which can be summarised as (Slack and Frémont, 2005; Midoro et al., 2005; Parola and Musso, 2007; Notteboom and Rodrigue, 2012; Lam, 2015):



- Unique berthing/volume contractual agreement between a third-party stevedore company and the ocean carrier.
- Acquisition of a minor terminal shareholding by the shipping line.
- Formation of a joint venture among the shipping line and a third-party stevedore company that will be associated with dedicated terminal use.
- Dedicated terminal in which the shipping line or a terminal operating sister company owns at least 51% of its shares.

By implementation of such activities shipping lines achieved economies of scope, internalisation of terminal handling costs, and extended downstream SC control. The vertical integration activities of container shipping lines shaped the third wave of GPOs development (Notteboom and Rodrigue, 2012).

Slack and Fermont (2005), Bichou and Bell (2007), Olivier et al. (2007) and Parola and Musso (2007), also discuss the emergence and development of GPOs. Each study provides a taxonomy or classification of the different types of GPOs. However, the GPOs classification of Notteboom and Rodrigue (2012) will be used in this thesis for any reference to POCs. That is because this is one of the most recent classifications incorporating the private equity schemes as operators of ports/terminals. According to this classification, GPOs are *Stevedores*, *Maritime Shipping Companies*, and *Financial Holdings* (Notteboom and Rodrigue, 2012). The first category refers to terminal operators that expand globally. The second category, the Maritime Shipping Companies, refers to the vertical integration activities of container shipping lines which have already been discussed above. The third category, the Financial Holdings, refers to firms from a versatile background that developed an interest in port/terminal operations due to the revenue generation potential of the sector. These firms are regarded as Private Equity Funds and represent the fourth wave of GPOs expansion (Pawlik et al., 2011). Financial Holdings have adopted two managerial regimes towards their port/terminal operations; the indirect management approach, where the parent company acquires an asset stake while the current operator still “runs” the port/terminal, and the direct, where the parent company owns and operates the port/terminal (Notteboom and Rodrigue, 2012).

Table 3-5 shows the top ten GPOs according to the “Global Container Terminal Operators Annual Review and Forecast” of Drewry (2013). Only two of them have operations in the UK; HPH owns and operates the Ports of Felixstowe and Thamesport,

and DP World owns and operates London Gateway, and operates the container terminal in Southampton.

Ranking	Operator	Million TEU	% share of world throughput	Characterisation according to Notteboom and Rodrigue, 2012	Presence in the UK
1	PSA International	50.9	8.2%	Stevedores	No
2	Hutchison Port Holdings (HPH)	44.8	7.2%	Stevedores	Yes
3	APM Terminals	33.7	5.4%	Maritime Shipping Company	No
4	DP World	33.4	5.4%	Financial Holding	Yes
5	COSCO Group	17.0	2.7%	Maritime Shipping Company	No
6	Terminal Investment Limited (TIL)	13.5	2.2%	Maritime Shipping Company	No
7	China Shipping Terminal Development	8.6	1.4%	Maritime Shipping Company	No
8	Hanjin	7.8	1.3%	Maritime Shipping Company	No
9	Evergreen	7.5	1.2%	Maritime Shipping Company	No
10	Eurogate	6.5	1.0%	Stevedores	No

**Table 3-5: Top 10 global/international terminal operator's equity based throughput, 2012, adapted from: (Drewry, 2013), \*: future development**

### 3.3 Port Centric Logistics

The critical review of the evolutionary development of ports revealed that ports in the majority of the world incorporate logistics-VAS in their core offering ever since the emergence of containerisation (Brooks and Cullinane, 2007; Lee et al., 2012; Okorie et al., 2016). However, due to port privatisation schemes (1981 and 1991) and the national dock labour scheme (late 1940s), UK container ports focused solely on the provision of cargo and ship handling services (Baird, 1995; Suykens and Van De Voorde, 1998; Asteris and Collins, 2009; Chen et al., 2017). Therefore, UK container ports did not develop at the same pace as ports in other parts of the world (Pettit and Beresford, 2009). However, during the early 2000s, UK port operators realised that increased benefits could be derived by the on-site provision of warehousing and logistics-VAS, in addition to their core offerings. Mangan et al. (2008) define this strategic shift of ports as Port Centric Logistics (PCL).

This section partially addresses RO1 by critically evaluating the concept of PCL. Based on the outcomes of a comprehensive literature review on PCL several papers were identified. The content of these papers was initially analysed with respect to the contribution of each paper to empirical research on PCL. This analysis, reinforces the

argument of Mason et al. (2015) that although the term PCL has been adopted by scholars, most of conclusions and suggestions are made without empirical support. Furthermore, the PCL literature was analysed under the lens of the four themes (financial, strategic, marketing and environmental impact of SLS) identified in Chapter 2. The analysis of PCL literature under a SLS-impact lens enables the development of the data collection and analysis protocols of this thesis, which underpin the research aim of this thesis.

### **3.3.1. Conceptual aspect of Port Centric Logistics and its functions**

Port Centric Logistics (PCL) is a concept that attracted increasing attention from the maritime, logistics, and SCM scholars over recent years. Based on the papers of Falkner (2006), Wall (2007) and Analytiqa (2007), Mangan et al. (2008, p.36) define PCL as "*the provision of distribution and other value-adding logistics services at ports*". The interest on PCL is justified by the increasing import volumes of goods from the Far East to the UK, the growing use of containers in the transportation of commodities such as agricultural products and the realisation that UK ports could be used as hubs for logistics operations (Falkner, 2006; Rodrigue et al., 2013b; Mason et al., 2015).

“Pure” port centric is defined as the practice of destuffing imported containers at the premises of the port, where cargo is held in warehouses until onwards direct inland transportation to the final destination (Mason et al., 2015; Okorie et al., 2016). This practice contradicts the UK paradigm by which containers are transported inland to be destuffed at centrally located DCs and then transferred back empty to the port to be loaded onto vessels (Wall, 2007; Monios and Wilmsmeier, 2014). Additionally, PCL represents a step back from global contemporary port development paradigms (i.e. port regionalisation through the advancement of intermodal rail systems and dry ports (Rodrigue and Notteboom, 2012)), as it is based on the notion that the port is the main point at which goods are imported, stored, and distributed inland (Mason et al., 2015; Okorie et al., 2016). Consequently, PCL challenges traditional SC models, as it enables entire segments of the SC to be removed, and reduces the congestion between the port and the logistics hubs (Pettit and Beresford, 2009; Mason et al., 2015). This practice results in increased efficiency and visibility, reduced demurrage and inventory levels, and decreased response time to delays in vessel arrivals (Falkner, 2006; Monios et al., 2018).

Furthermore, PCL results in reduced empty-runs (Mangan et al., 2008), and improved turnaround time of empty containers (Monios and Wilmsmeier, 2012b). The fact that containers no longer travel on-road means that UK road transportation weight

restrictions are not applied and the full weight capacity of containers can be utilised on the maritime legs of the consignment (Mangan et al., 2008; Falkner, 2009; Landon, 2013).

The studies of McKinnon (2013; 2014) verify the increased container loads of imported containers and additionally identify that exporters can also realise the same benefits as importers if a PCL model is adopted for exports. For example, 1.5 tonnes extra load per container would result in a 6% reduction in vehicle-kilometres and CO<sub>2</sub> emissions (McKinnon and Woolford, 2011).

Furthermore, PCL enable retailers and logistics service providers (LSPs) to optimise distribution networks by balancing cost and time between primary and secondary distribution (Monios et al., 2018). In this sense, heavy containers can be kept off the road network and the direct store distribution could be made by trailers instead of containers (Monios and Wilmsmeier, 2012b).

### **3.2.2 Criticism of PCL and its importance for the UK ports and distribution system**

According to Pettit and Beresford (2009), Monios and Wilmsmeier (2012b), and Mason et al. (2015), the Mangan et al. (2008) definition of PCL does not describe anything different than the common practice of warehousing services at ports. Such practices have been witnessed for many years in the so called “Distriparks” and “Districentres” in the ports of Rotterdam and Singapore respectively (Okorie et al., 2016). Recent empirical findings confirm this view among port managers, who relate PCL to the concepts of Distriparks and Free trade zones (Demirbas et al., 2014). Additionally, Allen (2008) asserts that PCL is the continuation of a practice that has been implemented for many years in mainland Europe; whilst, Rodrigue and Notteboom (2012) argue that PCL is a term only used within the UK, as similar practices have been in existence for several years in mainland Europe and North America.

However, according to Coronado Mondragon et al. (2012), and Demirbas et al. (2014) PCL is a relatively new strategy for UK ports. This is because UK ports were solely focused on the provision of cargo and ship handling services, while neglecting entirely the provision of warehousing and logistics-VAS (Pettit and Beresford, 2009). Mainland European ports developed such functions in the 1980s, and have become logistics platforms (UNCTAD, 1992; Bichou and Gray, 2004; Okorie et al., 2016). Consequently, UK ports fell behind mainland European ports, which experienced high container throughput volumes. Indicative of this situation is the fact that the ports in the Hamburg – Le Havre range handle more than the 48% of the European container throughput (Rodrigue and Notteboom, 2010).

The importance of PCL in the UK is highlighted also by Monios and Wilmsmeier (2012b) and De Langen et al. (2012). They argue that the UK distribution network was developed when most of the products were sourced locally, which led to the development of the “golden triangle of logistics”<sup>14</sup>. However, the shift of manufacturing towards the developing countries of East Asia, changed UK sourcing patterns (Mangan et al., 2008; McKinnon, 2009). Imports through ports have increased, thus the centralised distribution model developed in the 1980s is no longer efficient.

Consequently, a new model needs to be developed in accordance with the notion that maritime freight is passing through ports (Pettit and Beresford, 2009; Mason et al., 2015; Okorie et al., 2016). PCL is a vital aspect of this new design, as it is involved with the relocation of inland DCs towards the ports, so that cargo owners can take advantage of the fact that products are imported to the UK through ports (Coronado Mondragon et al., 2012). This shift is caused by the influences of inland transportation, which can help ports to become more integrated with the supply chain (Monios and Wilmsmeier, 2012a; Monios et al., 2018).

Moreover, Wilmsmeier and Monios (2013) argue that PCL is relevant to the UK as PCL can support the changing logistics paradigm and facilitate the shift of UK’s gateway ports to become transshipment hubs. Additionally, PCL is viewed as a differentiation strategy of regional secondary UK ports, which allows them to compete with larger ports in the South, and lock-in customers (Monios and Wilmsmeier, 2014). PCL can also facilitate Scotland to overcome its double peripherality (geographical and institutional), by either enhancing the PCL capabilities of its ports in order to attract feeder services, or by developing an offshore-PCL model<sup>15</sup> (Monios and Wilmsmeier, 2012b).

Furthermore, large scale investments occurring in UK ports and the response of retailers (e.g. UK's top three retailers, which set up warehouses at Teesport and Felixstowe) to this trend are also reasons supporting the importance of PCL for the UK. New ports and terminals were constructed based on the PCL concept (e.g. London Gateway, Teesport, Liverpool2), while other existing major ports altered their strategies to implement PCL (e.g. Felixstowe, Grangemouth, Port of Tilbury) (Wall, 2007; Analytiqa, 2007; Mangan et al., 2008; Baker and Sleeman, 2011; Clark, 2013; Monios and Wilmsmeier, 2014; Mason et al., 2015).

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<sup>14</sup> The golden triangle refers to the area around the East and West Midlands, which is considered as the optimal location for national distribution centres in the UK.

<sup>15</sup> Off-shore PCL involve the use of warehouses located at ports in mainland Europe and the utilisation of the existing Ro-Ro connections between Scotland and mainland Europe

### 3.3.3 Disadvantages of Port Centric Logistics

Several disadvantages associated with the implementation of PCL have been identified in the relevant academic literature (See Table 3-6).

	Source	Potential Disadvantages
Disadvantages identified in academic literature	Holter et al. (2010)	Increased transit time of international freight transport up to one week, and hence, negative effect on cash to cash cycle of cargo owners.
	(Monios and Wilmsmeier, 2012b)	Undermining the advantages of intermodal transport, because the container will break into smaller loads at the port. Negative effect on inland container availability
	(Ng et al., 2013).	Port storage facilities can interrupt the seamless flow of cargo between ports and dry ports
	(Monios and Wilmsmeier, 2013).	PCL at regional UK ports can limit the shipping line options of cargo owners and thus make them vulnerable to potential increased maritime transport prices.
	(Monios and Wilmsmeier, 2014)	Insufficient hinterland infrastructure, the location of secondary ports, and the need to reposition empty containers might result in increased logistics costs for cargo owners, and reduce the attractiveness of PCL in such ports.
Disadvantages identified in practitioner literature	(Joyce et al., 2013)	The suggested use of multiuser warehouses poses risks for cargo owner unless reflected in contractual agreements. Potential negative effects on SC performance, caused by loss of control of its compartments by cargo owners.
	(Hearn, 2012)	Road congestion in case of inadequate port rail connection. Financial risks associated with the relocation of warehouses.
	(Tindall, 2009)	Cost savings from the elimination of inland journeys might not balance out the cost of port land. PCL at North UK ports might face the unwillingness of shipping lines to deviate from existing sea routes.

**Table 3-6: Potential disadvantages of PCL, source: author**

The concerns discussed in Table 3-6 are not supported by empirical research. An exception is the study of Demirbas et al. (2014), who identified certain disadvantages and constraints of PCL. They argue that the adoption of a PCL strategy assumes land availability. However, this obstacle can be tackled with the provision of logistics-VAS in the near proximity of the port. Nevertheless, in this situation the port needs to assure the same quality of service provision in those premises. Failure to do so can lead to customer and reputation loss. Additionally, Demirbas et al. (2014) assert that PCL might increase both the complexity of port operations and the responsibilities, as the port needs to sort imported goods to orders and notify the responsible bodies for their collection. Additionally, the requirement to work with the different ICT systems of the various cargo owners results in increased complexity of port operations (Demirbas et al., 2014). However, this can be tackled by using an Intelligent Transport System (ITS) (Coronado Mondragon et al., 2012).

### **3.3.4 Adaptation of PCL literature to the financial, strategic, marketing and environmental impact of SLS<sup>16</sup>**

In this section the SLS literature is combined with the PCL literature to set the foundations for the development of the ROs and the data collection and analysis protocol of this thesis, and to create the initial link between the two literature streams. The manufacturer-centred SLS impact classification developed in Chapter 2 is used as the basis of a comprehensive review and analysis of the existing academic literature on PCL. Each of the attributes identified in Chapter 2 is adopted to PCL literature. From this process the nine attributes that comprise the data collection and analysis protocols are created.

To identify relevant PCL papers, a systematic literature review<sup>17</sup> has been conducted using major business management databases such as Elsevier, Emerald, Business Source Premier, and library services as EBSCO. The keyword search for “Port Centric Logistics” resulted in 83 publications during the period 2006-2018. 38 peer reviewed academic papers, 6 government reports, 6 conference papers, 28 periodical publications and 3 white papers have been identified. As the scope of this thesis is limited to peer reviewed academic papers, written in English, only 38 papers published in 18 peer-reviewed academic journals were included in further analysis.

After the content of the papers was studied in detail 19 papers are excluded from further analysis. The reasons for exclusion were the lack of relevance to PCL, or the fact that they could not be assigned to the SLS impact classification. Additionally, some papers are excluded as they only use PCL as a term without any further discussion on the concept. The remaining papers are analysed according to their content, and are discussed in the remainder of this section.

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<sup>16</sup> The adaptation of PCL literature to the SLS impact has been presented in the following conferences:

Valantasis-Kanellos, N., Piecyk, M.I. and Caldwell, N. (2014) 'Port Centric Logistics: An operations strategy for UK ports in the era of servitisation', in 19th International Symposium on Logistics, Ho Chi Minh City, Vietnam, 6-9 July 2014.

Valantasis-Kanellos, N., Caldwell, N. and Piecyk, M.I. (2014) 'Contemporary operations strategies of UK container ports in the era of servitisation: A Conceptual framework', in 7th International EurOMA Service Operations Management Forum, Tilburg, The Netherlands, 21-23 September 2014.

Valantasis-Kanellos, N., Caldwell, N. and Piecyk, M.I. (2014) 'Contemporary competitive strategies for UK container ports in the era of servitisation: A Conceptual framework', in 3rd International Conference on Business Servitisation, Bilbao, Spain, 13-14 November 2014.

<sup>17</sup> A more detailed discussion of the methodology followed for this systematic literature review can be found in: Valantasis-Kanellos, N., Piecyk, M.I. and Song, D.-W. (2013) 'The Port Centric Logistics concept: A systematic literature review', in 18th Annual Logistics Research Network Conference, Birmingham, UK, 4-6 September 2013.

### ***Financial impact***

Monios et al. (2018), and Mangan et al. (2008) argue that the provision of non-core services can result into new revenue streams, and higher profit margins for ports. By definition PCL strategy enables a port to experience increased revenue derived from warehousing and logistics-VAS. This assertion is in alignment with the argument that manufacturers experience additional and more stable revenue streams by the provision of VAS compared to the provision of goods (Wise and Baumgartner, 1999; Smith et al., 2014; Baines et al., 2017). Logistics-VAS are considered as non-core services of UK ports<sup>18</sup>, thus although ports are service providers the provision of logistics-VAS is considered as an enhanced service offering. Monios and Wilmsmeier (2012b) also support the argument of Mangan et al. (2008); however, they highlight the need for land availability and hinterland connectivity for successful facilitation of PCL. Furthermore, Demirbas et al. (2014) argue that PCL enables ports to utilise their land bank in ways that result in increased revenue for the ports. Additionally, cargo owners (e.g. retailers) are anticipated to experience reduced costs because of SC rationalisations and decreased cost per unit associated with PCL (Coronado Mondragon et al., 2012; Mason et al., 2015; Monios et al., 2018).

The analysis of the PCL papers did not result in any arguments that could support that VAS can be perceived as a stable source of revenue *per se*. Arguments concerning the stability of the revenue that derives from logistics-VAS can be based on the assertions that PCL lock-in cargo owners and secure cargo throughput (Monios and Wilmsmeier, 2014; Monios et al., 2018). Thus, the revenue of ports that implement PCL will be more secure. Additionally, this research encompasses the view that services can be perceived as intangible resources; and that intangible resources are not weakened by use. On the contrary they can be improved by repetition and yield benefits for longer period (Molloy et al., 2011). Therefore, it is anticipated that logistics-VAS are regarded a stable source of revenue for ports.

### ***Strategic impact***

Manufacturer-centred SLS enable the firm to achieve CA by the addition of value-adding capabilities (Adrodegari and Sacconi, 2017; Gebauer et al., 2017). Feng et al. (2012) and Monios et al. (2018) argue that retailers can be incentivised to relocate import operations

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<sup>18</sup> The author acknowledges that logistics-VAS are considered as common offering of third or fourth generation ports. However, from the literature review of this thesis it was identified that UK ports had not incorporated logistics-VAS in their offering prior to the commencement of PCL. Therefore, logistics-VAS can be considered as non-core services of UK ports.



to a port that invests in PCL. Particularly, they argue that the provision of warehousing and other logistics-VAS can increase a port's competitiveness and confer CA. The view that VAS can enhance the competitiveness of ports is also supported by Okorie et al. (2016). According to Grant (1991; 2005) the bundle of resources that work together and determine what firms can achieve are defined as capabilities. Furthermore, Hoopes et al. (2003) argue that capabilities can confer CA to firms and can create value on their own, or can add value to a certain resource. Consequently, the provision of logistics-VAS can be regarded as enhanced capabilities of ports, which according to Feng et al. (2012) and Okorie et al. (2016) have the potential for CA for the port.

Furthermore, manufacturer-centred SLS can confer SCA based on inimitability of resources (Gebauer et al., 2006; Matthyssens and Vandenbempt, 2010; Adrodegari and Saccani, 2017). Provision of logistics-VAS enables ports to satisfy complex customers demand, due to inherent advanced offering of PCL. Additionally, it sets the base for the realisation of SCA (Mangan et al., 2008; Nam and Song, 2011; Woo et al., 2013). This argument can be further supported with literature that resides beyond the narrow field of PCL. Resources can be considered as a bundle of potential services. This premonition assumes that resources are those tangible elements that a firm purchase, leases or creates for internal use and human capital employed to effectively incorporate them within the firm. Consequently, services can be perceived as outcomes of these resources upon a firm's productive operations (Penrose, 1959; Spring and Araujo, 2013). Extending this notion to PCL means that all tangible assets owned by ports represent resources upon which services are delivered. However, the way the human capital of the port will work to provide these services is a determining factor upon the level of service provision. Slack and Lewis (2008) argue that the provision of services could be characterised as one of the intangible resources of firms which are a combination of formal and informal procedures that take place within firms. Herrman (2005) argues that intangible resources, due to the fact that are not easily measurable can create CA. Furthermore, according to Molloy (2011) intangible resources are untradeable, a fact that raises the level of heterogeneity of those resources even among the same industry. According to Barney (1991) inimitability of resources is a factor that can create the basis for SCA. Thus, it can be asserted that PCL can confer SCA by the provision of logistics-VAS.

Additionally, a manufacturer-centred SLS enables firms to achieve CA based on differentiation. That is because differentiation based on product innovation is not sustained. However, addition of services can enhance the customisation of the offering,

and act as source of CA (Gebauer et al., 2006; Fischer et al., 2010; Adrodegari and Saccani, 2017; Bustinza et al., 2017). Mangan et al. (2008) argue that PCL can be considered a strategic choice for ports that want to utilise their space to accommodate the differentiated warehousing needs of SCs that follow one of the three strategies (i.e. lean, agile, leagile) suggested by Christopher et al. (2006), and enhance their core offering with the capability to provide VAS. Woo et al. (2013), and van Asperen and Dekker (2013), with a particular focus on lean and leagile strategies, and Okorie et al. (2016) also support the argument proposed by Mangan et al. (2008).

Pettit and Beresford (2009) build on Mangan's et al. (2008) taxonomy regarding the port related warehousing needs of various SC strategies, and propose that *Distriparks* incorporate the full spectrum of logistics-VAS similar to the PCL concept, while *Districentres* are analogous but on a smaller scale. Additionally, Demirbas et al. (2014) argue that PCL enable ports to utilise their land in a way that will result in increased revenue streams. In this sense PCL can be viewed as a strategy that enables a port to diversify utilisation of its assets to create value for customers. The value for customers results from the development of capabilities that enable the port to differentiate its offering by the provision of logistics-VAS. Consequently, it can be asserted that PCL is a strategy that has the potential to confer CA to a port, based on diversified land utilisation and differentiation of its offering.

Furthermore, Monios and Wilmsmeier (2012b; 2013; 2014) argue that PCL is a strategy implemented by medium sized UK-ports as a way to compete with larger Southern UK-ports. In this sense PCL could be perceived as a differentiation strategy of medium sized ports. However, larger UK-ports such as Tilbury and Felixstowe implement PCL as well. Therefore, further investigation is required concerning the specific offering of ports that have implemented a PCL strategy to identify differences among their offering.

### ***Marketing impact***

Chapter 2 presented arguments that manufacturer-centred SLS can be perceived as responses to increased demand for services (Gebauer et al., 2006; Ostrom et al., 2010; Bustinza et al., 2017). In PCL literature, Chhetri et al. (2014), and Okorie et al. (2016) argue that the growth of global trade increases the requirements for provision of logistics-VAS at port-centric locations. Thus, the development of logistics hubs, which will be able to handle the demanded “*volume of activity, scope of work and capabilities*” (Chhetri et al. 2014, p.235) is crucial. De Langen et al. (2012) argue that the development of PCL in

the Humber area can be perceived as a response to the need for logistics services at the points of entry of imported goods to the UK. Mangan et al. (2008) and Coronado Mondragon et al. (2012) also argue that the implementation of port centric warehousing and distribution models is designed to meet the increased requirements for logistics services at the points of import. Consequently, it can be asserted that PCL is a response to the increased demand for logistics and VAS at the points of import.

From the review of manufacturing centred SLS it was argued that the provision of enhanced service offering is perceived as the provision of tailored solutions to customers (Davies et al., 2007; Cusumano et al., 2015). PCL enables ports to enhance their portfolio of services to customers. Particularly the logistics-VAS inherent in a PCL strategy can be regarded as response of ports to meet the increased complexity of customer demand. Additionally, it can be also regarded as a tool that diversifies ports' offerings to reflect the needs dictated by the strategies of the SCs that pass through them (Mangan et al., 2008; Woo et al., 2013).

Pallis et al. (2011) argue that the operating environment of ports, which is highly influenced by developments in logistics, has triggered the notion that ports should be viewed as elements in value driven SCs. Therefore, ports should adjust their offering to provide value to shippers and third-party service providers. Thus, it can be asserted that logistics-VAS can be perceived as tailored solutions to the needs of cargo owners.

Furthermore, in Chapter 2 it was argued that SLS enable transactions to be developed into long term relationships based on customer loyalty and supplier dependency (Davies, 2003; Neely et al., 2011; Bertoni et al., 2016; Kowalkowski et al., 2017). In regard to PCL literature, Wilmsmeier and Monios (2013), and Monios and Wilmsmeier (2014) argue that the provision of logistics-VAS has the potential to lock-in customers into the use of one particular port. Customer loyalty and supplier dependency are inherent within these practices. However, they highlight that a high level of risk is inherent in such practices, because cargo owners will be dependent on the shipping lines calling at that port. Consequently, cargo owners will have limited options if the shipping lines alter their pricing strategies. However, it should be mentioned that their argument is focused on the provision of logistics-VAS at regional ports. As it was already discussed logistics-VAS are offered by large ports in the UK as well, where more shipping lines include these ports in their network. Thus, it could be argued that the provision of logistics-VAS has the potential for the development of transactions into long term relationships based on customer loyalty and supplier dependency, which for a regional

port might be considered as a risk for the shipper. The potential of PCL to result in high customer retention is also supported by Okorie et al. (2016).

### ***Environmental impact***

Most of the discussion regarding the environmental benefits associated with an increase in services offered derives from the notion that the service industry is considered less environmentally harmful in comparison with other industries (Goedkoop et al., 1999; Mont, 2002; Reim et al., 2015; Qu et al., 2016). Additionally, a service-based offering is anticipated to result in reduced environmental output because customers will purchase the use of the asset rather than the asset *per se* (Baines et al., 2007; Qu et al., 2016; Bertoni et al., 2016; Gebauer et al., 2017).

Concerning PCL literature, McKinnon (2014) argues that PCL can trigger up to 6% of CO<sub>2</sub> emissions reduction if they choose to ship their containers between ports that implement PCL. That is, because within port bounded land containers can be loaded up to their actual capacity, instead of the capacity implied by the road transport weight restrictions. This argument gives an environmental dimension to the financially and operationally beneficial practice of loading containers up to their actual capacity that was already supported by Mangan et al. (2008). Additionally, Piecyk and McKinnon (2010) argue that the extensive use of the hub and spoke system, which add links in the SCs, increases road miles. Thus, an increase of tonne-kilometres is expected. The elimination of SC parts after the implementation of PCL should result in fewer tonne-kilometres and lower environmental impact (Piecyk and McKinnon, 2010).

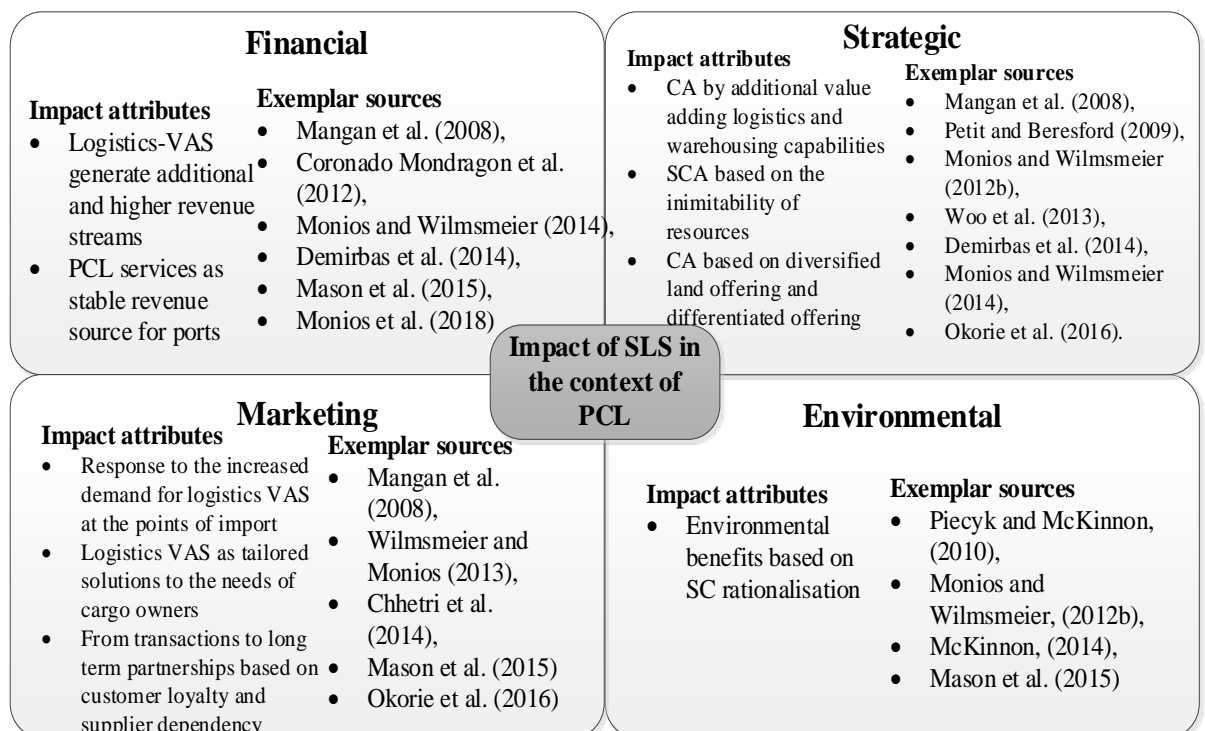
Furthermore, Monios and Wilmsmeier (2012b) and Mason et al. (2015) also suggest environmental benefits derived by the implementation of PCL. Monios and Wilmsmeier (2012b) further argue that ports can leverage these anticipated environmental benefits to seek government support for the development of their infrastructures to accommodate PCL activities. The CO<sub>2</sub> emission reductions suggested by the discussion above are not in alignment with the environmental benefits supported by the SLS literature. However, sufficient arguments are presented to assert that PCL enables the realisation of environmental benefits based on SC rationalisation.

### ***Section Summary***

From the discussion above several attributes regarding the anticipated impact of a SLS in the context of PCL are identified (Figure 3-6). These attributes are the input for the data collection protocol of this study. Additionally, they will also serve the purpose of a-priority

codes that are used in the subsequent template analysis of the collected data. The identification of these attributes allows RQ2 of RO2 (i.e. How do SLS impact UK ports and intermediaries?) to be partially addressed.

Furthermore from the discussion above it can be asserted that many papers rely for their arguments on the paper of Mangan et al. (2008), demonstrating that empirical research on PCL is limited, reinforcing the argument of Mason et al. (2015). This observation is also in line with the argument of Monios and Wilmsmeier (2012b, p.208) that PCL has been “*used rather loosely as a concept over the last decades [and] has not been given sufficient theoretical grounding*”. They suggest that PCL could be grounded by the industrial location theories of Weber and Christaller. However, their paper does not offer such an approach. Instead they explain PCL as “*an attempt to create temporary spatial fixes for global container flows, as a proxy for global flows of capital*”. In alignment with this fact is the observation that many papers that are identified by the keyword search of PCL do not contribute to the discussion on PCL. The authors use the term but do not discuss it further, or do not provide empirical research relevant to the term. Some exceptions to this phenomenon are the papers of Demirbas et al. (2014) and McKinnon (2014), Okorie et al. (2016), and Monios et al. (2018).

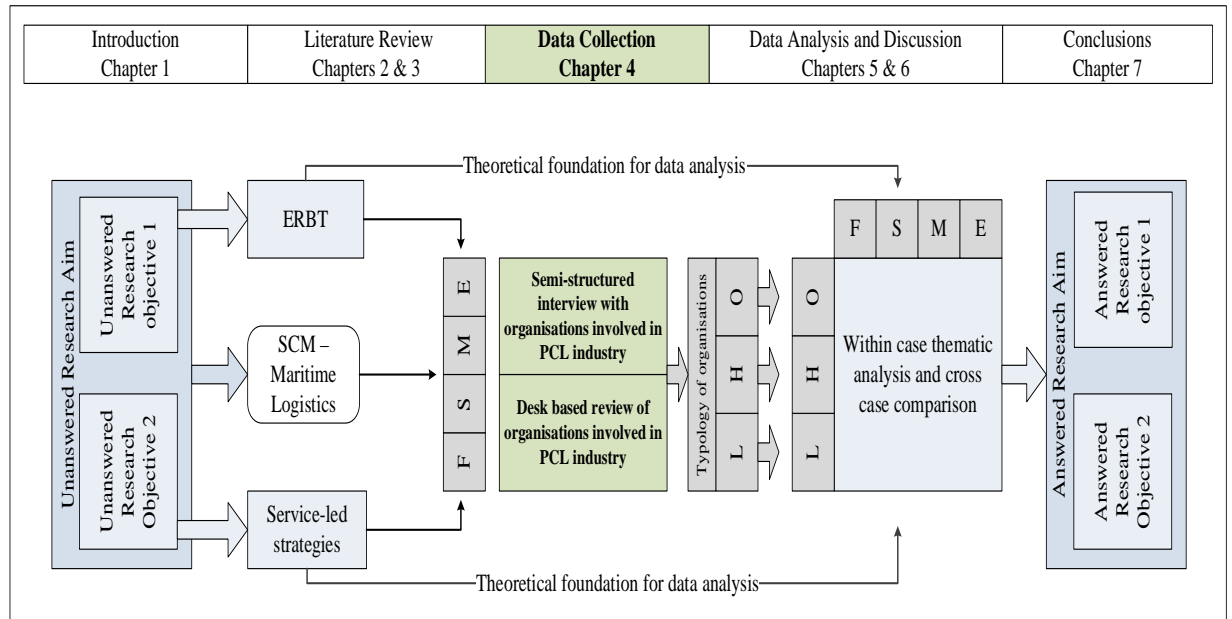


**Figure 3-6: The impact of SLS in the PCL context, source: author's own**

## **Chapter Summary**

This chapter provided a critical literature review on the context of this research. Initially, the scoping of this thesis on unitised MT was justified and the key components of ML systems were identified. Since the focus of this thesis is the identification of the impact of SLS in a PCL context, an extensive review of port literature was conducted. Various characteristics of ports were defined for clarity, and the development and evolution of ports from three perspectives were critically reviewed. Additionally, the current state of the industry was outlined and the main forces causing ports to change their strategies to regain their power in the SC were presented. Following the development of the governance models of ports, the unique case of UK ports concerning their ownership and management mandates was highlighted. As such the focus of the rest of the chapter was on the strategic development of UK ports. The concept that has been mostly prevalent over the last decade in port strategies in the UK is PCL. This concept has been reviewed in the last part of the chapter. The view that PCL is SLS of UK ports and intermediaries was adopted. The framework that was developed in Chapter 2 was used as lens to conduct a comprehensive review on PCL literature to develop the attributes of the data collection protocol and provide a base for the analysis of the empirical findings of this research.

## Chapter 4 : Research Philosophy and Methodology



**Figure 4-1: Thesis outline and focus of Chapter 4**

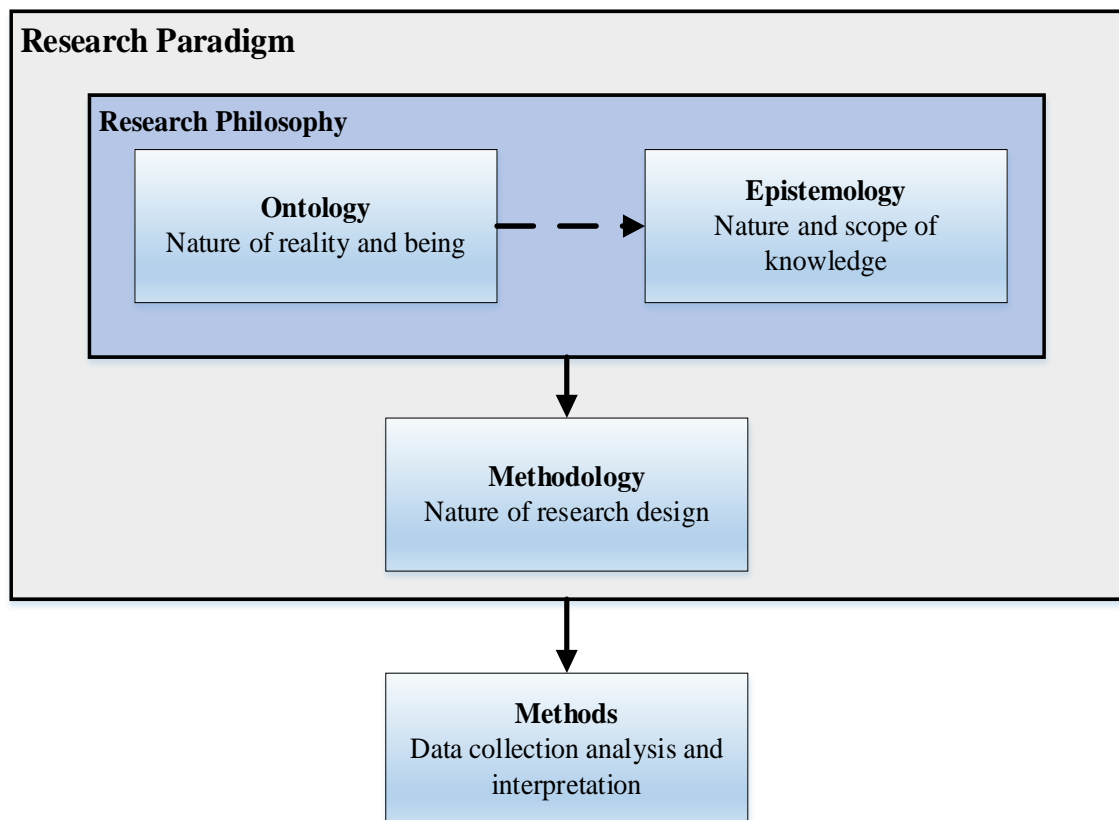
Chapter 4 presents the philosophical and methodological approaches adopted for inquiry in this thesis. Business management research, and social sciences research, are influenced by diverging worldviews, methodologies and methods, which derive from a variety of disciplines. Each of these worldviews, methodologies, and methods imposes different techniques and results in different type of data (Thorpe and Holt, 2008). Hence, it is important to clarify the philosophical and methodological perspectives that inform the research, and justify the selection of the methods used for data collection, analysis and interpretation. The chapter is divided into 7 sections. The first discusses the philosophical perspectives that shape the perceptions of the researcher. Thereafter, the case for the abductive reasoning of this thesis is made (Section 4.2), and the qualitative nature of the study is justified (Section 4.3). Section 4.4 presents the case study strategy selected for this thesis, whilst Section 4.5 outlines the robust case study design. Thereafter, Section 4.6 presents in a detailed way the data collection method employed in this thesis, and Section 4.7 describes the analytical techniques used.

### 4.1 Philosophical considerations of social science research

This thesis is grounded in the disciplines of operations and supply chain management (O&SMC), with an interest in the fields of logistics and port operations, and utilises strategic management theories to underpin generated knowledge. Thus, it is positioned within the social sciences. As such it is influenced by the world-views and knowledge-views of the researcher and the broader scientific discipline that this research belongs to

(Bryman and Bell, 2011). World views are associated with ontological assumptions and knowledge views are associated with epistemological assumptions (Solem, 2003). In turn, ontological and epistemological assumptions represent the philosophical considerations of research (Crotty, 1998; Sarantakos, 2013).

Clear understanding of philosophical stance enables the researcher to clarify methodological considerations, and thus identify which research design is most appropriate for addressing the research questions (Frankel et al., 2005; Easterby-Smith et al., 2012; Golicic and Davis, 2012). Subsequently, the identification of an appropriate methodology enables the researcher to identify what type of data need to be collected, and how they will be collected, analysed and interpreted (Easterby-Smith et al., 2012). The philosophical and methodological considerations of the study form its research paradigm and methods that will be used (Guba, 1990). As such, philosophical considerations are important in identifying the way theories are created and tested and in influencing the shape and form of the generated knowledge (Adamides et al., 2012). The influence of philosophical considerations on methodologies and methods is depicted in Figure 4-2.



**Figure 4-2: Theoretical perspectives of research, adapted from: (Guba, 1990; Bryman and Bell, 2011; Easterby-Smith et al., 2012; Sarantakos, 2013)**



### 4.1.1 Ontology

Ontology is involved with philosophical assumptions that explain the nature of reality and existence; put differently the worldview of the researcher (Solem, 2003; Easterby-Smith et al., 2012). The worldview of researchers acts as the starting point of their research. Consequently, the worldview of the researcher influences the methods of the research (Solem, 2003). In natural sciences researchers are more convergent with regard to ontological considerations (Easterby-Smith et al., 2012); however, in social sciences researchers diverge along the objectivism (or realism (Easterby-Smith et al., 2012; Sarantakos, 2013)) and subjectivism/nominalism continuum (Bryman and Bell, 2011).

**Objectivism** is an ontological stance which implies that social phenomena and their connotations are independent and external to the researcher and the researcher's consciousness and experience of them (Crotty, 1998; Bryman and Bell, 2011). That is, objectivism adopts a realist stance that asserts that a single objective reality exists, it is external to the researcher and has the same meaning for all actors (Easterby-Smith et al., 2012; Sarantakos, 2013). Conversely, **subjectivism/nominalism** is an ontological stance which asserts that a single truth does not exist, and that social phenomena and their connotations are "socially constructed" by the perceptions, cognition and social actions of researchers (Morgan and Smircich, 1980; Solem, 2003). Additionally, subjectivism asserts that social phenomena are continuously revised through the process of social interaction between the phenomena and the researcher (Saunders et al., 2009).

Between the objectivism-subjectivism continuum other stances exist. One position is the **transcendental realism** which asserts that "*ultimate objects of scientific enquiry exist and act quite independently of scientists and their activity*" (Bhaskar, 2010, p.12). Another stance is **internal realism**, which accepts the existence of a single obscure reality; therefore, researchers will never directly access this reality. However, once the scientific laws are discovered; they are "*absolute and independent of further observations*" (Easterby-Smith et al., 2012, p. 19). Furthermore, another ontological stance is that of **relativism**. Relativism bridges the opposing views of objectivism and subjectivism and asserts that scientific laws are created by people and that there is no single truth that waits to be discovered. The acceptance of a truth depends on the viewpoint of the observer and will be reached through a dialogue between the main protagonists. Consequently, the meaning of truth can vary among protagonists, places and time (Easterby-Smith et al., 2012).

### 4.1.2 Epistemology

Epistemology is involved with the nature and scope of knowledge, and addresses the questions of how is knowledge acquired (Meredith, 2001; Rotaru et al., 2014), and what should be considered as acceptable knowledge in a discipline (Bryman and Bell, 2011). An important note is that epistemological assumptions cannot be addressed independently from ontological assumptions (Meredith, 2001), because the different worldviews along the objectivism-subjectivism continuum “*imply different grounds of knowledge for the social world*” (Morgan and Smircich, 1980, p.493). The epistemological debates of social scientist are focused around two main contrasting views, namely positivism and interpretivism (Easterby-Smith et al., 2012).

**Positivism** relates to ontological assumptions of objectivism that view the world as concrete structure. The epistemological assumptions of this worldview need to facilitate the understanding of the nature of relationships among the elements that shape this concrete social world (Morgan and Smircich, 1980). Therefore, similar to natural sciences, knowledge under positivism assumptions is based on facts (i.e. it is real) measured by objective methods in a social world external to the researcher, is tangible, predictable based on regularities, and suitable for law like generalisations (Morgan and Smircich, 1980; Näslund, 2002; Bryman and Bell, 2011).

On the other hand, **interpretivism** relates to the ontological assumptions of subjectivism that view reality as socially constructed based on individual perceptions. The epistemological assumptions of a socially constructed world need to facilitate the understanding of the process used by individuals to “*concretise their relationship to their world*” (Morgan and Smircich, 1980, p.493). Therefore, knowledge under interpretivism assumptions is soft, based on the differentiated perceptions of those involved in the inquired phenomena rather than based on external causes and fundamental laws (Näslund, 2002; Solem, 2003; Denzin and Lincoln, 2011; Easterby-Smith et al., 2012)

The combination of the different ontological and epistemological assumptions creates the distinct research paradigms of positivism and interpretivism. These, and the relatively recent paradigm of critical realism are discussed in the following section.

### 4.1.3 Research paradigms of social science

In a research context, paradigms are defined as the set of beliefs “*that guide disciplined inquiry*” (Guba, 1990, p.18). This means the cluster of beliefs that inform researchers, regardless of discipline, what they should study, how they should conduct research, and how they should interpret it (Bryman, 1998).

Paradigms are characterised by the way that their proponents respond to three fundamental questions; namely ontological (what is the nature of reality?), epistemological (what is the nature of knowledge?), and methodological (how should knowledge be obtained and investigated) (Guba, 1990). These questions constitute an integrated interdependent whole (Kuhn, 1970; Arlbjørn et al., 2008), and are the starting point that dictates the type of inquiry and how it should be most appropriately addressed (Guba, 1990). However, it should be mentioned that “*even if a researcher identifies within a particular paradigm, it does not necessarily mean that the research must use one particular research method*” (Frankel et al., 2005, p.186).

Two paradigms are dominant in business management and social sciences. These are positivism and interpretivism<sup>19</sup>. However, the turn of social sciences towards more interpretative, postmodern and critical practices and theorising, as well as the well-established legitimacy of postpositivist and postmodern paradigms (Lincoln et al., 2011) dictate the consideration of more research paradigms in this study.

### ***Positivism***

Positivism as a paradigm dominated business management research when researchers applied practices of engineering and natural sciences research on business management and social sciences research towards the end of the 19<sup>th</sup> century (Mangan et al., 2004; Clegg, 2008). Positivism has roots in the work of Auguste Comte (1853, p.3) who argues that “*...there can be no real knowledge but that which is based on observed facts*”. Positivism assumes *ontologically* an external and objective reality that does not affect the researchers and remains unaffected by them. *Epistemologically* positivism supports that knowledge will be significant only if it is based on unequivocal observations of this external reality rather than from subjective inference conducted through sensation, reflection and intuition (Bryman and Bell, 2011; Easterby-Smith et al., 2012).

Therefore, positivism aims to create true and objective knowledge in the form of causal laws, which are free from value and time, and independent from research context (Mentzer and Kahn, 1995). Knowledge growth under positivism is a cumulative process (Näslund, 2002). Researchers create hypotheses based on existing theories. Then they empirically verify or falsify these hypotheses for the creation of new knowledge (Guba

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<sup>19</sup> The author acknowledges that each of those two paradigms has a magnitude of alternative names in literature. Positivism can be encountered as: Quantitative, Objectivists, Scientific, Experimentalists, Traditionalist, Hypothetico-deductive, while interpretivism can be encountered as: qualitative, subjectivist, humanistic, hermeneutic, inductive, or phenomenological paradigm (Mangan et al. 2004).

and Lincoln, 1994; Frankel et al., 2005). Therefore, positivism is associated with deductive approach and theory testing research (Easterby-Smith et al., 2012). Mangan et al. (2004, p.568) argue that positivism can be regarded as a “*top-down*” and “*outside-in research*” approach; which for decision making research, such as O&SCM, would be useful in “*getting an overview and considering the broad structure of decisions*”.

The ontological and epistemological assumptions of positivism pose this research paradigm to utilise procedures of natural sciences, and to be identical to quantitative methodology (Näslund, 2002; Sarantakos, 2013). Under a positivism paradigm, methods such as surveys and experiments are used, to statistically measure, analyse and generalise causal relationships between variables (Benbasat et al., 1987; Näslund, 2002). The assumptions of positivism can be summarised (Guba and Lincoln, 1994) as follows:

1. *Existence of a single tangible reality capable of being divided and independently studied in subunits (reductionism).*
2. *Researchers are external to this reality, do not affect it or get affected by it, and the observations are free from temporal, geographical and contextual characteristics and idiosyncrasies.*
3. *Reality is characterised by linear causality in the sense that every effect has its causes, and each cause has an effect.*
4. *Use of robust methodologies that will result in value and bias free findings.*

The above assumptions are difficult to maintain in social systems, such as business environments, because the realisation of these assumptions in such systems is extremely problematic (Guba and Lincoln, 1994). Näslund (2002) argues that the methodologies and methods imposed by a positivistic paradigm can prove to be problematic due to: i) potential misinterpretations of statistical analysis, ii) incomplete or corrupted datasets, and iii) alternative connotations of variables. Furthermore, he argues that research under a positivistic paradigm tends to be past oriented and focused on empirical tests of theory with “snapshots” of human activity. Additionally, the tendency to oversimplify the complexity encountered in the real world can lead to partial and superficial views of social phenomena and can compromise the practical impact of the research (Näslund, 2002).

Another point of criticism is that positivism incorporates beliefs and methodologies of natural sciences, which deal with objects; whereas social sciences deal with actions and behaviours generated by human minds and phenomena, where the investigator and the inquired phenomenon are occasionally inseparable (Mangan et al., 2004). Furthermore, the isolation of variables for investigation in natural sciences can be conducted with relative easiness in the controlled environment of a laboratory, whereas in a real business world setting such isolation of variables is difficult (Sarantakos, 2013).

## ***Interpretivism***

The development of the paradigm of interpretivism (constructionism or constructivism (Burgoyne, 2008)) has been a reaction of philosophers to the problematic application of positivism in social sciences (Easterby-Smith et al., 2012). Following a subjective-nominalism ontology and interpretivism epistemology, this paradigm assumes that:

- i) *there is no ultimate and objective truth,*
- ii) *reality is socially constructed, and that*
- iii) *its meaning derives from peoples' interpretations about social phenomena, thus, is not determined by external and objective factors.* (Morgan and Smircich 1980; Mir and Watson 2001; Solem 2003; Easterby-Smith et al. 2012)

Put differently, interpretivism assumes that “*meanings do not exist before a mind engages them*”. Therefore, under an interpretivism paradigm physical elements, such as trees, mountains and rivers, exist but their meaning is not fixed; it is emergent from the interaction of people with them (Sarantakos, 2013, p.37).

Researchers following an interpretivism paradigm should neither be concerned about gathering facts and measuring frequency of pattern occurrence, nor about identifying external causes and laws that explain behaviour (Erkälren/Explaining). The focus of interpretivists should be on understanding the individual and collective connotations and constructions of people about social phenomena based on peoples' and researchers' previous experiences (Verstehen/understanding) (Sarantakos, 2013). Consequently, under an interpretivist paradigm it is expected that different researchers will notice different things and will provide differing interpretations (Mir and Watson, 2001). Furthermore, interpretivists should emphasise the way people communicate with each other in a verbal and non-verbal manner and how people make sense of and act on different situations (Crotty, 1998; Easterby-Smith et al., 2012).

The assumptions of interpretivism that the world must be understood from the inside and from the point of view of the individuals who are directly involved in the inquired phenomenon (Denzin and Lincoln, 2011) dictates the use qualitative methodologies and methods (Frankel et al., 2005). However, according to the views of positivists/quantitative researchers, qualitative methodologies and methods result in time specific, idiographic, and contextually rich findings that cannot express causality (Mentzer and Kahn, 1995; Näslund, 2002).

In general, interpretivism could be characterised as the “bottom-up” and “inside-out” approach of social research (Mangan et al., 2004). It produces subjective findings, and theories that are generated from researchers' interpretation rather than formalisations of

underlying reality (Mir and Watson, 2001). Table 4-1 presents the assumptions and methods of interpretivism in a direct comparison to those of positivism.

<b>Assumptions</b>	<b>Positivism</b>	<b>Interpretivism (Social Constructionism)</b>
<b>The observer</b>	Independent	Part of what is observed
<b>Human interests</b>	Irrelevant	Main drivers of science
<b>Explanations</b>	Must demonstrate causality	Aim to increase general understanding of the phenomenon
<b>Research progress through</b>	Hypotheses and deductions	Rich data from which ideas are induced
<b>Concepts</b>	Precise definitions allowing measurement	Should incorporate stakeholder perspectives
<b>Units of analysis</b>	Reduced to simple terms	Holistic view of phenomenon's complexity
<b>Generalisation through</b>	Statistical probability	Theoretical abstraction
<b>Sampling requires</b>	Large scale selected randomly	Small number of cases chosen purposively

**Table 4-1: Contrasting assumptions and methods of positivism and interpretivism, adapted from: (Easterby-Smith et al. 2012)**

### ***Critical Realism***

Critical Realism (CR) was introduced by Roy Bhaskar (1978) as an anti-positivist movement of social sciences (Denzin and Lincoln, 2011); however, various scholars contributed to the construction and refinement of this paradigm by adjusting it to individuals' philosophical assumptions and school of thoughts (Sarantakos, 2013). The application of CR in management researcher has risen over the recent decades, because CR is considered as a "*compromise position*" among the extremes of positivism and interpretivism (Burgoyne, 2008; Easterby-Smith et al., 2012).

CR assumes the existence of a stratified and complex reality and aims to challenge the assumptions of the positivism paradigm by the implementation of qualitative and multifaceted research methodologies through the employment of an abductive mode of inference (Adamides et al., 2012). CR is associated with a transcendental realism ontology, that several social conditions exist and have consequences regardless of whether they are observed and comprehended or not. However, the occurrence of these conditions is not guaranteed, it varies with situation and context (Burgoyne, 2008; Denzin and Lincoln, 2011; Easterby-Smith et al., 2012).

Additionally, CR views the world as an open system with emergent properties, thus, it is in contrast to the positivistic view of the world as a closed deterministic system with

stable properties, and the interpretivist view that the world has no meaning, only the meaning individually or collectively given to it (Burgoyne, 2008).

The most prominent distinction of CR is the application of a “structured ontology” in three interdependent levels, namely the real, the actual, and the empirical. The structured ontology is autonomous from human thinking but still identifiable to a certain degree. Therefore, CR assumes “*that the world cannot be accessed directly but only indirectly and intellectually*” (Sarantakos, 2013, p.33). In particular:

- The **real domain** reflects everything that exists in a natural or social sense, regardless if it is empirical for the observer or adequately understood (Sayer, 2002). Additionally, the real domain assumes that each object of natural or social existence comprises generative mechanisms and causal structures generated by these mechanisms. These generative mechanisms and causal structures exist independently from their activation and direct observation from the researcher (Aastrup and Halldórsson, 2008). However, the activation of these mechanisms triggers sets of events and behaviours (Bhaskar, 1978; Rotaru et al., 2014), and thus impacts on people and society (Easterby-Smith et al., 2012).
- The **actual domain** comprises the events and behaviours that can potentially be triggered by the activation of the generative mechanisms and causal structures of the real domain (i.e. what happens if they are activated) (Sayer, 2002; Aastrup and Halldórsson, 2008; Rotaru et al., 2014). The research will not be able to detect and observe the entirety of these events and behaviours (Bhaskar, 1978; Aastrup and Halldórsson, 2008; Easterby-Smith et al., 2012)
- The **empirical domain** comprises the events and behaviours that are actually experienced and observed by the researcher (Bhaskar, 1978; Rotaru et al., 2014).

The implication of the stratified ontology of CR is the recognition of the assumption that unexercised causal powers exist, thus “*the nature of the real objects present at a given time constrains and enables what can happen, but does not predetermine what will happen*” (Sayer, 2002, p.12) According to Easterby-Smith et al. (2012) the three domains correspond to the three different ontological assumptions of CR; namely relativism, internal realism, and realism respectively.

Beyond the multi-structured ontology, CR has two additional distinct features. The first is that CR assumes causality as a potential, thus it differentiates from positivism where causality is assumed as an automatic correlation of events. The second feature is associated with critical theory. In particular, CR assumes that the underlying mechanisms of causality “*do not work in the interests of ordinary people and employees*”; therefore it seeks to enhance the awareness and understanding of such underlying mechanisms to accordingly enhance the potential of actors to emancipate from their effects (Aastrup and Halldórsson, 2008; Easterby-Smith et al., 2012).

CR rejects objectivist and subjectivist ontologies and assumes that daily life transforms the world (Bhaskar, 2010; Sarantakos, 2013). Consequently, CR does not adhere to the positivistic rules and standards of quantification, measurement and prediction. However, it asserts that qualitative methods are more appropriate for inquiry into the social world (Sarantakos, 2013). Additionally, CR seeks objectivity in the research process, similar to the positivism paradigm. However, a key differentiator between the two paradigms is that CR does not consider researcher neutrality as fully achievable; because CR acknowledges that the findings can be biased by researchers’ value and beliefs. Therefore, various techniques need to be applied to mitigate the effect of such biases (Benton and Craib, 2010). The techniques and tests applied in the present research to avoid such biases are discussed in subsection 4.4.3.

Saunders et al. (2009) and Burgoyne (2008) highlight the relevance of CR in business management research. They argue that because CR assumes that the social world is dynamic and seeks to understand the mechanisms that result in these changes, it is therefore more suitable for business management research usually associated with the understanding of the underlying mechanism of phenomena prior to recommendations for change. Under a CR paradigm, management research is best considered as understanding what stimuli triggered what processes, and how the context affects these processes to outcomes. Therefore, CR generates knowledge that can provide helpful rather than definitive advice to managers. However, this is not a drawback of CR, because managerial decisions and actions do not take place in the exact same contexts and under the same managerial actions that can be taken simultaneously. Therefore, managers can benefit from research that underpins the understanding of what mechanisms exist and how they can impact outcomes in specific contexts (Burgoyne, 2008). Table 4-2 summarises the key features of CR.



<b>Features of Critical Realism</b>
Stands between positivism and postmodernism and rejects objectivist and subjectivist ontologies
Assumes existence of a real world
Is based on the belief that reality is independent of people's perception of it, but accessible to scientific study.
Denies the view that it is possible to access reality by means of sensory experience.
Presumes that the social world is produced and transformed in daily life.
Perceives social world as mediated and subjective
Proposes that the existence of constructive mechanisms can be proven through their effects
Suggests that the purpose of social research is to seek the outcomes of these mechanisms through hypothesis testing
Finds qualitative methods as appropriate to study the social world.

**Table 4-2: Features of Critical Realism, source: (Sarantakos 2013, p. 33)**

#### **4.1.4 Paradigmatic stance of this thesis**

As discussed in Chapter 3, UK ports and intermediaries, due to mandates and other political and societal factors, followed a unique developmental path in comparison to similar organisations in other parts of the world. Therefore, a study that aims to understand the motivations (RQ3 of RO1) of these entities cannot neglect temporal, geographical and contextual characteristics of the main actors. Additionally, as discussed in Chapter 3, PCL is a subsystem of a wider ML system, which in turn is a subsystem of a wider logistics system, which is also a subsystem of a wider SC structure. A quantitative, positivistic investigation of such complex structure would require an oversimplification of the complexity encountered in the ecosystem of these organisations, and could lead to oversights of the actions and behaviours of the main actors (i.e. managers and directors) of those systems (Näslund, 2002). Consequently, a purely positivistic paradigm is not appropriate for this research.

Furthermore, the need to enrich the understanding of a phenomenon which has received limited attention requires an “*inside-out view*” of this phenomenon through the connotations and constructions of its key actors. This can be achieved by adopting methodologies imposed by an interpretivist research paradigm. However, qualitative methods produce findings which are subjective and can be interpreted differently by different researchers. Additionally, as discussed above, the context of this research is a complex business phenomenon which exists in a multilayer network of organisational divisions and functions. Therefore, several elements and constants influencing decisions related to this phenomenon have to be acknowledged as universal truths without the

necessity to add meaning to them via the cognitive process of the actors. Consequently, a purely interpretivist paradigm is not appropriate for this research.

Recognising the shortcomings of the positivistic paradigm, which traditionally dominated logistics and SCM research (Näslund, 2002; Aastrup and Halldórsson, 2008), and trying to avoid the critique of interpretivist paradigms, this research adopts the CR paradigm; which stands as a “*compromise position*” among the extremes of positivism and interpretivism (Burgoyne, 2008; Lewis et al., 2010; Easterby-Smith et al., 2012).

However, the employment of a CR paradigm poses a challenge to the researcher. This challenge is the use of triangulation (i.e. use of data from multiple sources, and/or multiple data collection methods to evaluate if they will come to the same or closely aligned conclusions (Patton, 1990; Worley and Doolen, 2006)), to compensate for the incomplete appreciation of reality of those involved in research and to avoid the oversimplification of the findings (Solem, 2003; Aastrup and Halldórsson, 2008; Lewis et al., 2010; Easterby-Smith et al., 2012). The achievement of triangulation in CR research by the use of interviews, observations and document analysis has been employed by Lewis et al. (2010) as a means of achieving triangulation under a CR paradigm. The present research employs the same three methods on a plethora of actors within the PCL industry, as it will be discussed in the subsequent sections of this chapter.

## **4.2 Research Approach**

According to Mantere and Ketokivi (2013, p. 71) one of the main “chores” of researchers is to “*bridge premises with conclusions and to defend claims made in these conclusions*” by the use of sound reasoning principles. These reasoning principles are the inductive, deductive, and abductive approaches.

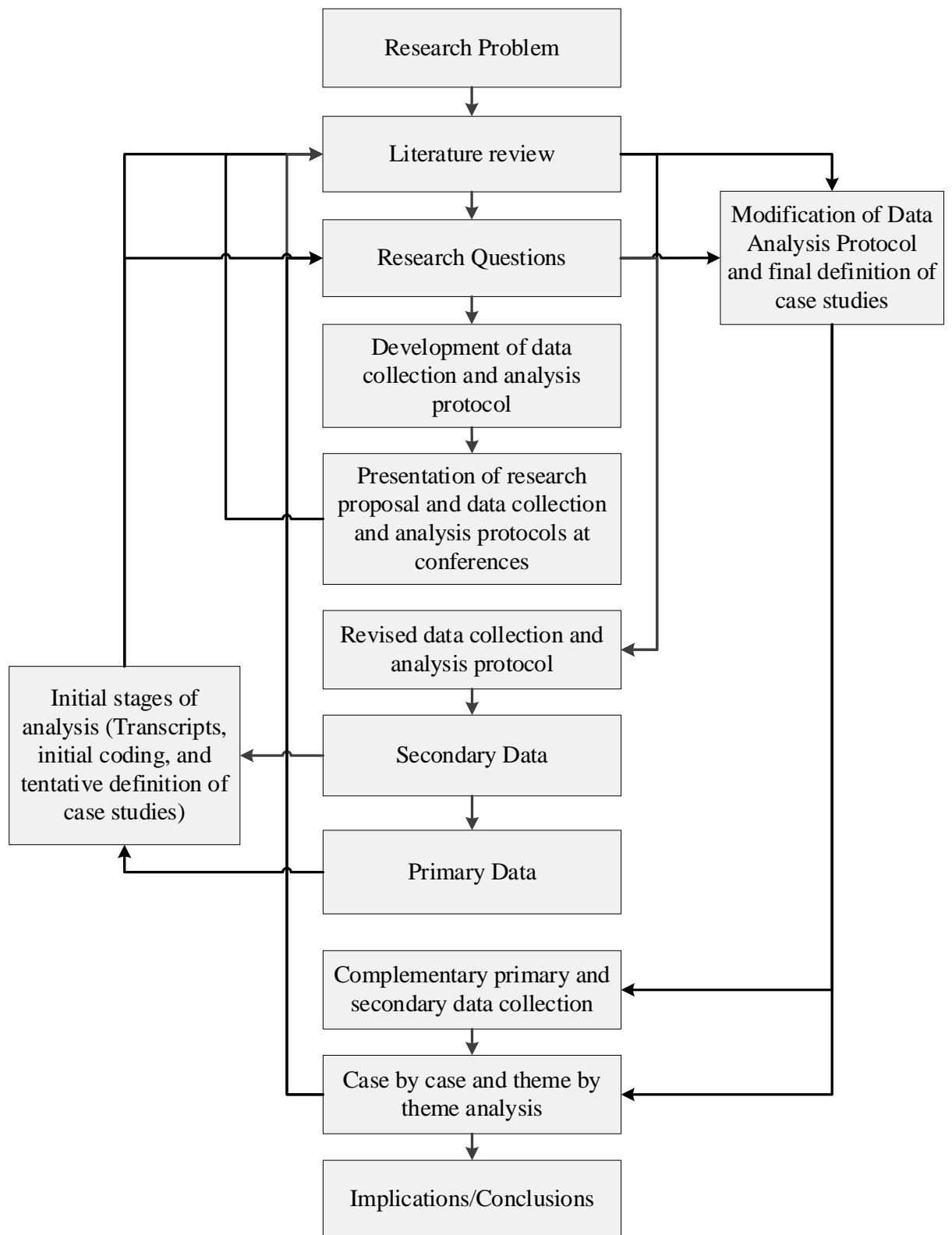
In particular, the *inductive* approach is considered as a theory building process that starts with the observation of a particular phenomenon and tries to infer generalisations about the inquired phenomenon. An inductive approach follows a relativist paradigm and is associated with qualitative research (Hyde, 2000). Thus, it tries to advance the understanding and connotation of the inquired phenomenon (Kovács and Spens, 2005).

On the other hand, the *deductive* approach is a theory testing process that begins with an established theory or generalisation, and tries to test if that theory applies to the research context. Additionally, a deductive approach follows a positivist paradigm and is mostly associated with quantitative research (Hyde, 2000). Thus, a deductive approach is an inference to a particular case (Mantere and Ketokivi, 2013).

In many instances the dynamic nature of the research process prevents the implementation of a clear inductive or deductive approach (Dubois and Gadde, 2002). Kovács and Spens (2005) argue that major accomplishments in science are not results of pure deductive or pure inductive approaches. There are instances where the development of the theoretical framework of the research, data collection, and analysis evolve simultaneously. Such an approach is defined as “systematic combining” or *abductive* approach (Dubois and Gadde, 2002). According to Mantere and Ketokivi (2013, p. 72) abduction is “*an inference to an observation*”. Such an approach is extremely relevant in the development of theories (Dubois and Gadde, 2002) or the elaboration of theories because it “*involves modifying of the general theory in order to reconcile it with contextual idiosyncrasies*” (Ketokivi and Choi, 2014, p.236).

Furthermore, Ketokivi and Choi (2014) argue that inductive and deductive approaches are forms of computational reasoning; in that they follow an inter-subjective routine through formalised, and established rules and procedures. On the other hand, the abductive approach follows a line that is shaped by the individuality of the researcher, thus is less formalised. Consequently, the abductive approach is not a form of computational reasoning but a form of cognitive reasoning (Ketokivi and Choi, 2014).

The scope of the present research is to investigate a particular context with insights from general theories. Consequently, a deductive approach can be eliminated, because the aim of the thesis is not to test a theory in a particular context. Furthermore, an inductive approach can be also eliminated, because a general theoretical framework has been identified prior to the data collection. Figure 4-3 illustrates the iterative nature of the research process that has been followed in the present research. Based on the research process and the two remarks presented above it can be argued that the most appropriate approach for this research is abductive reasoning. Furthermore, it should be noted that the approaches discussed above are not mutually exclusive. Therefore, attempts to classify individual research projects to one of those approaches can be considered misleading (Ketokivi and Choi, 2014). Consequently, different stages of the present research contain elements of deductive and inductive reasoning.



**Figure 4-3: The iterative nature of the research process, source: (author's own)**

### 4.3 Research Method<sup>20</sup>

The quantitative and qualitative methods antinomy, even though it has been characterised as “not necessarily the most productive” or even “false”, it can still be considered as a useful means for the classification of the plethora of business research methods (Dubois and Araujo, 2007; Bryman and Bell, 2011). That is because each research model rests on contrasting world-views and utilises different methods and purposes (Sarantakos, 2013). *Quantitative research* is understood as the research that investigates large samples and seeks statistical inference or mathematical and stochastic modelling (Ketokivi and Choi, 2014), examines a given phenomenon in terms of amount, intensity or frequency, and is grounded on natural scientific models, and the positivist paradigm (Denzin and Lincoln, 2011). Additionally, quantitative research examines from a perspective of distance, because it isolates variables (Thorpe and Holt, 2008).

Conversely, *qualitative research* is utilised in the investigation of in-depth relationships between multiple variables in their natural setting (Worley and Doolen, 2006); as such it is used for examining phenomena holistically, without the imposition of conditions and limitations that result in the disfiguration of their nature (Gummesson, 2006). Therefore, qualitative methods are most appropriate in addressing complex managerial situations (Gummesson, 2006). The relationships between the variables imposed in the examining of such complex phenomena cannot be easily captured by data collection tools (e.g. surveys) utilised in quantitative studies (Worley and Doolen, 2006). On the contrary, qualitative research utilises rich descriptions to report the messiness and differences that exist in the natural setting of those phenomena (Thorpe and Holt, 2008). Additionally, qualitative research is well suited in research that aims to explore well known concepts in new context; that is because a qualitative research context is intrinsic to the inquired phenomenon (Golicic and Davis, 2012).

Furthermore, qualitative research is associated with subjectivist ontology and interpretivist epistemology. It assumes that reality is experienced from the inside and exists in the perceptions of those that construct it (Sarantakos, 2013). Qualitative researchers involve themselves with informants in a form of dialogue. The dialogue can be cursorial, distant (e.g. telephone interviews), or participatory (Thorpe and Holt, 2008).

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<sup>20</sup> The researcher acknowledges the existence of mixed research methods, which can be defined as research that combines both qualitative and quantitative research methods within a single study that stands on its own, or is part of a larger research project and is associated with critical realist (Golicic and Davis 2012). Each of the approaches within a mixed method project will remain the same as if this project was a single method study (Sarantakos 2013). However, due to the time and resource intensive nature of mixed method, particularly in a SCM related topic (Golicic and Davis 2012), mixed methods are not utilised in this thesis.

Additionally, qualitative inquiry can lead to serendipitous findings that can assist researchers to reconceptualise their initial frameworks (Miles and Huberman, 1994). Table 4-3 summarises the nature of quantitative and qualitative research.

	<b>Quantitative Research</b>	<b>Qualitative Research</b>
<b>Researchers</b>	Distant from reality	Close to reality
<b>Inquires reality</b>	From the outside	From the inside
<b>Data collection methods</b>	Closed	Open
<b>Research design</b>	Fixed	Flexible
<b>World depiction</b>	Still	Active
<b>Methods</b>	Statistical/scientific and predetermined	Naturalistic, predetermined and flexible
<b>Data analysis</b>	Sequential to data collection	Parallel to data collection

**Table 4-3: The nature of quantitative and qualitative research, adapted from: (Sarantakos, 2013)**

The aim of this research is to enhance understanding concerning the reasons why ports and intermediaries are involved in the provision of logistics-VAS, how these services are developed, through which mechanisms these services are provided, and how the provision of these services affects the competitiveness of ports. Consequently, since the aim of this research is to investigate a dynamic and complex phenomenon in-depth, and to provide a clarification concerning the actors and mechanisms that create an augmented offering within a dynamic environment, qualitative research methods will be adopted. As discussed above qualitative research is most appropriate in addressing complex, dynamic or new managerial phenomena, because it will result in detailed data that will enhance the understanding in regard to the inquired phenomena (Gummesson, 2006; Golicic and Davis, 2012).

Worley and Doolen (2006), stress that qualitative studies can be subject to research bias and the bias that is created by over-reliance on a single source. According to the same authors, to avoid such biases the researcher needs to conduct each step of the data collection process in a systematic and well documented way. In this way, other researchers will be able to evaluate potential bias. A common way to increase the robustness of a research study is the use of triangulation, which occurs when the researcher uses data from multiple sources and multiple data collection methods to evaluate if they come to the same or closely aligned conclusions (Patton, 1990; Worley and Doolen, 2006). The use of triangulation in the present research is discussed in the following sections.

#### 4.4 Research Strategy

Research strategy is the plan that sets the guidelines for the undertaking of the systematic investigation of the inquired phenomenon. It can be understood as a series of decisions that the researcher makes to determine the most appropriate approach for addressing research objectives and questions (Marshall and Rossman, 1995). According to Yin (2003), the selection of the appropriate research strategy depends on three conditions; namely: i) the type of research question (i.e. exploratory, descriptive, explanatory or predictive), ii) researcher's control upon behavioural events, and iii) the emphasis upon contemporary or historical phenomena. Table 4-4 summarises the three conditions presented above and demonstrates how they are related to the potential research strategies. Furthermore, Table 4-5 provides Marshall's and Rossman's (1995) research strategy framework. This framework considers the purpose of the study and its research questions in the decision of the most appropriate research strategy and data collection techniques.

Strategy	Type of research questions	Control over behavioural events	Emphasis on contemporary or historical events
<b>Experiment</b>	How, Why?	Yes	Contemporary
<b>Survey</b>	Who, What, Where, How many, How much?	No	Contemporary
<b>Archival Analysis</b>	Who, What, Where, How many, How much?	No	Contemporary/ Historical
<b>History</b>	How, Why?	No	Historical
<b>Case study</b>	How, Why?	No	Contemporary

**Table 4-4: Relevant situations for different research strategies, source: (Yin, 2003, p.5)**

The research aim of this thesis suggests an exploratory and descriptive study to investigate the little known phenomena of SLS in a PCL context. Consequently, the selected research strategy should allow the researcher to capture the type of relationships that are developed within the business networks created around UK ports, and the role of each actor within those networks. Additionally, direct access to each of the actors involved in the provision of logistics-VAS should be permitted by the selected research strategy. Furthermore, the research aim of this study does not require the researcher to have control of behavioural events; it rather suggests that the researcher should follow a research strategy that would enable the rich and accurate description and understanding of the inquired phenomenon. Moreover, the inquired phenomenon (i.e. provision of logistics-VAS within the environment of UK container ports) is a contemporary dynamic phenomenon, as indicated by the recent research interest on the topic (see Wilmsmeier and Monios (2013), Demirbas et al. (2014), Yip (2016), Monios et al. (2018)).

Considering the discussion above, and Table 4-4 and 4-5, it can be argued that the case study strategy is the most appropriate for this study.

<b>Study purpose and associated research questions</b>	<b>Suggested Research Strategy</b>	<b>Examples of Data Collection Techniques</b>
<i>Exploratory:</i> investigation of little understood phenomena, identification of important variables	Case Study, Field Study	Participatory observation, in-depth interviewing, Elite interviewing
<i>Explanatory:</i> identification and explanation of causal relationships that shape the phenomenon	Multisite case study, history, field study, ethnography, experiments	Participatory observation, in-depth interviewing, survey questionnaire, document analysis
<i>Descriptive:</i> In-depth documentation and description of events, persons and situations involved with the inquired phenomenon	Field study, case study, ethnography, surveys	Participatory observation, in-depth interviewing document analysis, unobtrusive measures, survey questionnaire
<i>Predictive:</i> Prediction of outcomes of the inquired phenomenon, forecasting of the resulting effects and behaviours	Experiments, quasi-experiments	Large scales survey questionnaire, kinesics/proxemics, content analysis

**Table 4-5: Determinants of research strategy, adapted from: (Marshall and Rossman, 1995, p. 41)**

#### **4.4.1 Case study research strategy**

A case study can be defined as empirical research that investigates a contemporary phenomenon (i.e. industries, single or multiple organisations, locations or individuals) in-depth over a period of time, by the collection of contextually rich data, gathered from real world settings (Barratt et al., 2011; Bryman and Bell, 2011; Easterby-Smith et al., 2012). Case study data can be quantitative or qualitative, and can be collected from various sources (Benbasat et al., 1987; Ellram, 1996; Meredith, 1998; Yin, 2003; Kovács, 2008). For example, a qualitative case study can utilise primary data that derive from interviews and observations, as well as secondary data derived from the analysis of corporate documents and archive records (Meredith, 1998; Barratt et al., 2011). Use of multiple data sources in case study research is encouraged, because such practice results in triangulation of findings and more grounded theoretical implications (Eisenhardt, 1989).

The collection of rich data within the natural setting of the inquired phenomenon allows the researcher to consider a plethora of variables and relationships that result in a fuller depiction of the complexity and fuzziness encountered in real life (Flyvbjerg, 2006; Gummesson, 2008). Conversely, research strategies associated with quantitative methods (e.g. survey) require reduced levels of ambiguity and complexity, thus are inadequate for



in-depth understanding of complex phenomena (Gummesson, 2008). Consequently, qualitative case studies are exceptionally well fitted when the research aim is the exploration or further understanding of little known phenomena, because they produce context dependent knowledge and facilitate the understanding of dynamics within single settings (Eisenhardt, 1989; Ellram, 1996; Meredith, 1998; Dubois and Gadde, 2002; Voss et al., 2002; Flyvbjerg, 2006; Kovács, 2008).

Due to the suitability of case research in exploratory research and their inquiry within natural settings, authors such as Eisenhardt (1989), Dubois and Gadde (2002), Barrat et al. (2011), and Ketokivi and Choi (2014) argue that case studies are preferred for the development of new theories, or further elaboration/extension of existing theories. The purpose of case studies is not to generate statistical generalisations (i.e. how many/much/often) but to enable the understanding of underlying mechanisms in managerial processes and decisions. This practice is known as analytical generalisation and answers “identification” (what) and “explanation” (how) questions but most importantly “understanding” questions (why) (Benbasat et al., 1987; Gummesson, 2008).

Concerning the use of case study in the discipline of this research, Barratt et al. (2011) argue that case studies are an appealing research strategy in disciplines which are comprised of many emerging research areas, such as the OM discipline. That is because qualitative case studies are well suited for building and extending theories and for the thorough naturalistic investigation of emerging contemporary phenomena. Furthermore, Pallis et al. (2011) reviewed 400 port related publications, and argue that port research, particularly studies concerned with spatial developments of ports, is “dominated” by the case study approach.

In summary, it can be argued that case studies are chosen as an appropriate research method when the contextual factors are considered, but also when they set limits to the extent of the analysis (Eisenhardt, 1989; Voss et al., 2002; Seuring, 2008). In the present research, cases studies were chosen for the investigation of the impact of SLS on the competitiveness of organisations in the context of PCL in the UK.

Case studies are mostly preferred because they are a flexible, or even opportunistic, research strategy. However, their exact nature can be one of their major weaknesses if the research process is not well documented (Seuring, 2008). This and other limitations of case study research are discussed in the following subsection.

#### 4.4.2 Criticism of case study research

Case studies have not always been considered as “*proper scientific methods*” (Dubois and Gadde, 2002), even though their applicability in examining real-world situations and addressing important research questions is high (Yin, 2011). The opponents of case study research are concerned that the result of such studies do not suffice for scientific generalisations, because case studies are content specific (Dubois and Gadde, 2002; Flyvbjerg, 2006). However, such views are influenced by positivistic research streams which evaluate the external validity of research by the level of generalisability of the findings in regard to persons, settings, and time (Aastrup and Halldórsson, 2008). Qualitative studies do not rely on statistical generalisations; they rely on analytical generalisations. Analytical generalisation is the identification of “*causal relationships within cases rather than by selecting, measuring and comparing a number of attributes on each site*” (Dubois and Araujo, 2007, p.177).

A common suggestion to overcome the generalisability issue is to conduct multiple case studies rather than a single case study, because case studies are similar to experiments, and scientific facts are based on multiple experiments that replicate the same phenomenon under different conditions (Eisenhardt, 1989; Yin, 2003). However, cross case comparison does not rely upon statistical logic, because the number of cases does not represent a random and representative sample of a pre-specified population. In a comparative case study design, each case has its idiosyncratic characteristics, and is theoretically relevant (Dubois and Araujo, 2007). Additionally, a multiple case study design might be selected to allow within and cross industry comparisons (Kovács, 2008).

A second critique is that case studies are mostly appropriate in the hypothesis generation phase of a research study, due to their highly exploratory nature (Flyvbjerg, 2006). However, a sequential view of conducting research is outdated, because each of the other research strategies (i.e. experiments, surveys etc.) have their own exploratory modes (Yin, 2011). Furthermore, recent publications that develop frameworks which facilitate the rigorous and robust design of theory testing (Barratt et al., 2011) and theory elaboration (Ketokivi and Choi, 2014) using case studies, show that the conception of the research world towards the exploratory nature of case studies is overly dogmatic.

A third critique of case study research regards the potential researcher’s bias and subjectivity. Such bias and lack of subjectivity can result in lack of rigor and validity (Seuring, 2008; Yin, 2011). Several actions have been proposed by various authors to overcome this issue. Seuring (2008) argues that case research should follow four steps;

namely: case selection, data collection, validity and reliability. Yin (2003) argues that observer's bias and subjectivity can be avoided if the researcher utilises multiple sources of evidence and constantly checks the consistency of the findings from those sources (Yin, 2011). This way the outcomes will be robust and triangulation of data will be achieved (Patton, 2002; Bryman and Bell, 2011). Additionally, Yin (2003) argues that the researcher should develop a chain of evidence. The purpose of which is to demonstrate the process that has been followed by the researcher from the development of the research questions until the final conclusions (Yin, 2003). Thirdly, Yin (2003) argues that the researcher should allow key informants to review draft case study reports.

From the discussion above it can be argued that a systematic process needs to be conducted and reported by the researcher to overcome the weaknesses of case study research. In the following sections the constructs of the design of the present research are discussed to underpin the rigor and robustness of the research. However, even though the research process is presented as a sequential process, the reality is different. As argued earlier, this research adopts an abductive reasoning. As such the actual research process is an iterative process that requires the repetition of various stages of the research.

#### **4.4.3 Quality of Case study research**

The design of a research study represents a logical set of statements. Therefore, the quality of the research design can be evaluated by a set of logical tests (Yin, 2003). The most common logical tests in social science research are construct validity, internal validity, external validity, and reliability (Yin, 2003). **Construct validity** is involved with the identification of the right operational measures for the inquired phenomenon (Yin, 2003); or in simple terms construct validity is relevant to the question "Do researchers see what they think they see?" (Sarantakos, 2013, p.102). **Internal validity** is mostly associated with explanatory case studies and is involved with the identification of the correct causes that result in a particular outcome. **External validity** refers to generalisability of the findings of the research beyond the case study. As argued above, the generalisability of a case based research study concerns analytical generalisation. As such the external validity of case study research is involved with the generalisations of the findings of the case based research within a broader theory (Yin, 2003). **Reliability** refers to the capacity of the research design to produce consistent results if another investigator conducted the exact same research process (Sarantakos, 2013). The aim of the reliability test is to minimise potential errors and biases in the case study that could result in favourable or accidental conclusions (Yin, 2003). Therefore, the researcher has to ensure structured and

transparent data collection and analysis (Seuring, 2008). Table 4-6 summarises the tests discussed above and their application in this study. As the concern of each one of these tests is to attribute rigor and robustness, by enabling the researcher to follow consistent and visible procedures during data collection and analysis, it can be asserted that the design of this research and the subsequent findings are valid and reliable.

Tests	Case study tactic	Research phase in which tactic occurs	Operationalisation
<b>Construct validity</b>	<ul style="list-style-type: none"> <li>• Use multiple sources of evidence</li> </ul>	Data collection	Secondary data support the assertions of key informants. (Section 4.5.3) Whenever possible multiple informants from the same organisation to verify assertions. (Section 4.6)
	<ul style="list-style-type: none"> <li>• Establish chain of evidence</li> </ul>	Data collection	Citation of informants and secondary sources. (Data Analysis)
	<ul style="list-style-type: none"> <li>• Have key informants review draft case study report</li> </ul>	Composition	Whenever possible a summary of the interview was sent to the informant for the verification of its contents.
<b>Internal validity</b>	<ul style="list-style-type: none"> <li>• Do pattern matching</li> </ul>	Data analysis	Not applicable to this study due to its exploratory and descriptive nature
	<ul style="list-style-type: none"> <li>• Do explanation-building</li> </ul>	Data analysis	
	<ul style="list-style-type: none"> <li>• Address rival explanations</li> </ul>	Data analysis	
	<ul style="list-style-type: none"> <li>• Use logic models</li> </ul>	Data analysis	
<b>External validity</b>	<ul style="list-style-type: none"> <li>• Use theory in single-case studies</li> </ul>	Research design	Inference of findings of data analysis to three different literature streams to achieve analytical generalisability
	<ul style="list-style-type: none"> <li>• Use replication logic in multiple-case studies</li> </ul>	Research design	Imposition of company selection criteria
<b>Reliability</b>	<ul style="list-style-type: none"> <li>• Use case study protocol</li> </ul>	Data collection	Development of data collection protocol to ensure reliability among the data collection and analysis phases (Section 4.5.3)
	<ul style="list-style-type: none"> <li>• Develop case study database</li> </ul>	Data collection	Case study database contains: Digital recordings of interviews with the consent of the informant. Electronic copies of transcripts, notes made during interviews with informants that did not wish to be recorded, and field notes Electronic copies of secondary data

**Table 4-6: Quality of case study research design, adapted from: (Yin, 2003, p.34)**

## 4.5 Case study design

This section describes the research design developed for this thesis to provide a transparent guide to the decisions made during the data collection and analysis processes.

### 4.5.1 Single or multiple case studies

The first decision to be made in case study research is between single or multiple case study design. Each design serves different purposes, and has its own advantages and disadvantages. Single case study would be an appropriate research design under five circumstances covering the possibility that the case is *critical* to test a well formulated theory, *extreme/unique* (i.e. rare case worth researching for), *representative/typical* (i.e. the research aims to identify conditions and circumstances of a common phenomenon), *revelatory* (i.e. researching a previously inaccessible phenomenon) and/or *longitudinal* (i.e. studying the same case in different timeframes) (Ellram, 1996; Yin, 2003).

This research aims to investigate the impact of SLS on ports and intermediaries involved with PCL. A single case study design could not capture all the facets of this industry, because it would not enable the allocation of organisations in different SLS depending on their role concerning the provision of logistics-VAS. Therefore, a multiple case study design is considered as the most appropriate design for this research. The exploratory nature of this research dictates the selection of companies that differ in size, location, core functions, and governance. That is because a diverse sample of organisations provides an extensive coverage of the inquired phenomenon and allows the identification of patterns of differences and similarities among these organisations (Matos and Hall, 2007). Diversity within the case studies sample should be attempted, because such diversity contributes to the research objectives in comparison to attempts for randomness (Stuart et al., 2002). In other words, each case serves a “*different purpose within the overall scope of the inquiry*” (Yin, 2003, p. 47).

Furthermore, a multiple case study design augments the external validity of the research and reduces the potential researcher’s bias (Voss et al., 2002; Barratt et al., 2011). Multiple case studies can result in more robust and testable theories in comparison to the conclusions of a single case study (Eisenhardt, 1989; Barratt et al., 2011), because they can be considered analogous to multiple experiments, which follow a replication logic (Ellram, 1996; Yin, 2003). However, it should be highlighted that the cases selected in this thesis are not intended to result in *literal replication* (i.e. confirmation among the cases), but to achieve *theoretical replication* (i.e. multiple cases to cover different conditions) (Yin, 2011).

#### 4.5.2 Unit of analysis and number of cases

The unit of analysis and the number of cases are the most important elements of multiple case study research. The unit of analysis is “*the entity that forms the basis of any sample*” (Easterby-Smith et al., 2012, p.65). The sample can be single or multiple countries, industrial sectors, organisations etc. In case study research the unit of analysis is the case (Miles and Huberman, 1994). Yin (2003) defines a case as a “bounded entity”, and highlights that the boundaries between the case *per se* and its contextual condition in geographical and temporal magnitudes will not always be clear (Yin, 2011).

In regard to the number of cases Voss et al. (2002, p. 201) argue that “*for a given set of resources, the fewer the case studies, the greater the opportunity for depth of observation*”. This argument is important for a research project conducted by a single researcher with a limited time frame and limited funding, such as this one. Eisenhardt (1989) suggests that any number between four and ten cases suffices, because less than four cases may not capture the complexity of the real world, and more than ten will become difficult for the cognitive processing of the collected data. However, Stuart et al. (2002) counter-argue that successful multiple case study research can be conducted with three cases studies.

Dubois and Araujo (2007) suggest that case study research should not follow approaches influenced by positivism, but should actively pursue and encourage the flexibility that case study research imposes. They assert that cases should evolve “*as patterned configurations in interaction with processes taking place in the empirical world and what happens to the researcher’s theoretical notions and assumptions during the course of the research*” (p.178). This process is defined as “casing” (Ragin, 1992). Casing is a methodological step that can occur at any stage of the research process and can be the primary finding of the investigation. The boundaries of the case study can be flexible until the analysis of the data is finished (Ragin, 1992; Dubois and Araujo, 2007).

The “casing” approach in defining the case studies of a research study, and subsequently the number of cases of the research, allows a dynamic interaction between theory and data during the stages of research (Dubois and Gadde, 2002; Dubois and Araujo, 2007; Spring and Santos, 2015) and is aligned with the abductive reasoning employed in this research. As such, the exact definition and number of cases of this research were not predetermined at the initiation of the data collection. The number of cases and their definition emerged during data collection and analysis, and particularly at the point that the data collection reached theoretical saturation. Theoretical saturation

indicates a particular point in the research process at which any new data do not yield new insights to the study (Sarantakos 2013).

However, prior to the initiation of data collection several company selection criteria were set, as dictated by the research aim and scope . As such, the selected companies need to fulfil the following criteria:

- *All selected companies need to operate in the UK*
- *All selected companies need to be associated with the port and logistics industry*
- *All selected companies need to be associated with PCL or to advertise their intension to implement PCL and/or provide logistics-VAS.*
- *All selected companies need to be willing to share data and information with the researcher and allow the use of these data and information for research purposes.*

According to Miles and Huberman (1994) imposition of criteria in sampling is useful for quality assurance of the research design. The company selection and data collection processes followed in this research are discussed in Section 4.6.

#### **4.5.3 Data collection (case study) protocol**

Case study researchers need to develop a case study protocol, which serves the purpose of a measurement instrument that captures the data for analysis and enhances the reliability of the research (Stuart et al., 2002; Yin, 2003). A case study protocol is not an interview guide, it should be considered as the “map” that guides the researcher to the appropriate focus for forthcoming field visits and interviews, and provides a specific structure to the trail of evidence (Stuart et al., 2002).

A case study protocol should be directed to a single company/informant within the company and should i) provide an overview of the study, ii) frame field procedures, iii) contain the interview questions, and iv) provide guidance for reporting the case (Yin, 2003). The “casing” approach utilised in the present research imposes that case studies are defined during the data collection and analysis processes of the study (Ragin, 1992; Dubois and Araujo, 2007). Consequently a case study protocol as suggested by Yin (2003) cannot be developed. Instead, to ensure reliability in the data collection process, a data collection protocol has been developed in accordance with the guidelines of Yin’s (2003) case study protocol. Table 4-7 is an example of the data collection protocol, section 1 presents an overview of the research, section 2 frames the interview/site visit procedures, section 3 provides the profile of the informant and the company, presents the interview questions, links them with secondary data whenever possible, and provides guidance towards the analysis of the data.

<b>1. Overview of the project</b>				
<b>Title of the Project:</b> Services led strategies: The case of PCL in UK ports				
<b>Founded by:</b> Heriot Watt University			<b>Supervised by:</b> Dr. M. Piecyk, Dr. N. Caldwell	
<b>2. Field / Interview Procedures</b>				
<b>Name and core function of the company:</b>	██████, POC/PA	<b>Interview mean and recording device:</b>	Telephone interview recorded over telephone line with digital recording device	
<b>Place and date of the interview:</b>	Interviewer: Edinburgh Interviewee: NW England	<b>Duration of the interview/site visit:</b>	58 minutes	
<b>3. Interview questions and links with data analysis</b>				
<b>A. Interviewee Profile</b>				
<b>Participant's Name and Jon title:</b>	██████, Sales and Logistics Development Manager	<b>Number of years in present role/industry</b>	2 / 10 years	
<b>B. General Questions</b>				
<b>Questions</b>	<b>Probing questions and explanations</b>	<b>Supported by secondary data</b>	<b>Source</b>	<b>Codes and link to data analysis</b>
B1. Why did your company consider the provision of PCL services?	-	N		Company description, Case study definition, Strategic impact
B2. What is the % of port's annual throughput is PCL oriented	-	N		Company description
B3. What new services are introduced as a result of the implementation of PCL strategy?	How are these services designed? Are these services demand driven or speculative?	Y	W2	Company description, Case study definition
B4. What is the main cargo type that you provide PCL services for?	i) Containerised/non-containerised, ii) import, export based	Y	W1, W2	Company description
B5. What resources did your company acquire in order to provide these services?	i) physical capital, ii) human capital, iii) proprietorship	Y	M1, R1	Company description, Strategic benefits
B6. Are you the sole provider of PCL services at your port?	If not what other type of companies offer PCL services?	Y	W26	Company description, Case study determinant
B7. Do you carry out all PCL services yourself or do you outsource some of them?	Depending on the answer consider: i) type of services outsourced, ii) criteria for selection of partner, iii) extend of involvement in the SC	N		Company description, Case study determinant



<b>C. Benefits and Challenges of PCL</b>				
<b>Questions</b>	<b>Probing questions and explanations</b>	<b>Supported by secondary data</b>	<b>Source</b>	<b>Codes and link to data analysis</b>
C1. Has the company experienced higher and more stable revenue streams due to the provision of PCL services?	What % of the port's annual throughput is attributed to PCL services?	Y	F1	Financial benefits: Additional and higher revenue streams, Stability of revenue streams.
C2. Do you think PCL has impacted your long term competitiveness?	How do you ensure that the competitive edge is sustained?	Y	M2,N2	Strategic benefits: CA based on additional VAC, Sustainability of CA
C3. Do you think that the provision of PCL services has helped you to achieve differentiation from your competitors?	-	Y	W2,M2,N2	Strategic benefits: Differentiation based CA
C4. Has your company experienced increased customer loyalty as a result of being able to offer tailored PCL services?	-	Y	N1, N9, N10	Marketing benefits: Response to the increased demand for PCL services at the point of import
C5. How closely do you collaborate with your PCL customers?	Have the relationships with customers got stronger than they used to be?	Y	N1, N9, N10	Marketing benefits: Long term partnerships as a result of the provision of tailored solutions
C6. Are there any environmental benefits your company has experienced as a result of PCL?	Examples to keep in mind i) improved container load utilisation, ii) reduced CO2 emissions	Y	M2,M3,N2	Environmental benefits
<b>D. Closing up questions</b>				
<b>Questions</b>	<b>Probing questions and explanations</b>	<b>Supported by secondary data</b>		<b>Codes and link to data analysis</b>
D1. What are the main benefits of PCL?	Ask for a summary in 3 key bullet points	Y	W2	Supplementary data for major themes
D2. What are the main challenges you experienced in the provision of PCL?	Ask for a summary in 3 key bullet points	N		Strategic benefits: Implementation barriers

D3. Have you experienced the benefits/results that you anticipated since the implementation of PCL strategy?	-	N		Supplementary data for marketing benefits
D4. Does your company have any plans to expand its PCL operations?	if yes: i) other port locations, ii) type of operations, iii) level of involvement in the provision of PCL services, iv) time framework	Y	M1	Company description
D5. Are there any other managers in your company you could refer me to for future interviews?	if yes: i) name, ii) contact details, iii) permission to refer to you as a reference. If no: ask if there is any of their customers that could be willing to participate.	N/A		N/A
<b>E. Background information for the company</b>				
<b>Location:</b>	NW England	<b>EBITDA or other financial figure:</b>	159,600 (Group)	
<b>Container Throughput:</b>	623,000 TEU in total (378,000 Lo-Lo, 245,000 Ro-Ro)	<b>Number of employees:</b>	2,754 (Group)	
<b>List of supporting material:</b>	See Appendix B	<b>Capacity in which the company is considered in the present study</b>	Port operating company and provider of PCL services at the Northwest of England	

Table 4-7: Example of data collection protocol from the interview with participant Port1E, source: (author's own)

## **4.6 Data Collection**

Three categories of data sources are most commonly utilised in case studies; these are interviews, observations (e.g. site visits, shadowing, attendance at corporate meetings etc.), and archival sources (e.g. historical records, annual reports, newsletters etc.) (Barratt et al., 2011). As argued, multiple data sources increase the reliability of the research by the achievement of data triangulation (Benbasat et al., 1987; Eisenhardt, 1989; Yin, 2003; Barratt et al., 2011). For this reason, even though the main instrument for data collection of this research is interviews, other data sources, such as company documents (e.g. annual reports, newsletters, etc.), notes and observations made during site visits have been used. Combining of such data sources is common in case study research in logistics & O&SCM research (see Meredith, 1998; Voss et al., 2002; Seuring, 2008; Kovács, 2008; Lewis et al., 2010; Barratt et al., 2011; Ketokivi and Choi, 2014).

### **4.6.1 Identification of potential informants**

The identification of potential informants commenced in June 2014 with an extensive desk-based project. In accordance with Mangan's et al. (2008) definition of PCL, the first stage required the identification of the largest container ports of the UK. Wilmsmeier and Monios (2013) created a taxonomy of the 15 top UK container ports for the period 2005-2010 based on data from the Department of Transport in the annual UK Port Freight Statistics report. For the purpose of this thesis the annual Port Statistics Report by DfT (2013) has been used to expand this taxonomy and identify the top 20 UK container ports during the period 2000-2012 (See Appendix D).

Once the busiest container ports were identified, a thorough desk-based investigation (i.e. brochures, annual reports, and port webpages) for each port was conducted, the purpose of which was to identify if logistics-VAS are offered at these ports, and which entity provides them. This resulted in the identification of 13 major UK ports. In March 2013, one container port commenced operations in SE England. Therefore, this port was not included in DfT's (2013) dataset. However, it was included in the initial sample of this study due to the extensive promotion of its logistics park and the widespread coverage of its involvement in PCL in logistics oriented trade publications (see Whitten, 2012; Hearn, 2012; Helms, 2014). Table 4-8 shows the results of the preliminary data collection stages of this study.

<b>Ports</b>	<b>POC/PA and PCL provider</b>	<b>Logistics-VAS by a third party</b>
<b>Belfast Harbour</b>		●
<b>Clyde port</b>	●	
<b>London Gateway</b>		●
<b>Port of Bristol</b>		●
<b>Port of Felixstowe</b>	●	●
<b>Port of Grangemouth</b>	●	
<b>Port of Hull</b>		●
<b>Port of Immingham</b>		●
<b>Port of Liverpool</b>	●	●
<b>Port of Southampton</b>		●
<b>Port of Tilbury</b>		●
<b>Port of Tyne</b>	●	●
<b>Tees and Hartlepool</b>	●	
<b>Thamesport</b>	●	●

**Table 4-8: Initial sample of ports, adapted from: (Valantasis-Kanellos and Song, 2015)**

Based on Table 4-8 in four instances the provider of logistics-VAS co-exists with the POC/PA. In seven instances logistics-VAS are offered only by third parties, while in four instances the logistics-VAS are offered by the POC/PA and third parties. To the best of the author’s knowledge such classification has not been previously considered in any academic publication. Therefore, the findings of this preliminary stage of this study were considered as a useful way to frame the PCL industry. Additionally, the proposed classification guided the initial decision about the number of case studies in this research. As such it was decided that three cases studies should be developed. The first case study should regard the POC/PAs that are not involved in the provision of logistics-VAS. The second case study would include the instances that logistics-VAS are provided by the POC/PA or by third parties only. The third case study would include the instances that logistics-VAS are offered both by the POC/PA and third parties. The “data-emerging” design and definition of the three case studies is aligned with the process of “casing” (Ragin, 1992; Dubois and Araujo, 2007) that was discussed earlier in this chapter.

Once the targeted ports were identified the third stage of the participant selection processes started. This stage involved further desk based research. The aim of which was the identification of the counterparties that are involved with the provision of logistics-VAS at the eleven ports where such services are offered either by third parties only, or by

the POC/PA of the port and third parties. This stage involved further review of annual reports and newsletters of ports, review of various publications in practitioner magazines and generic web searches. This process continued until a sufficient number of companies was identified for each port. Thereafter, an extensive search within the organisation charts, as published on the annual reports and webpages, of these companies has been conducted for the identification of potential informants. LinkedIn has been used as an additional tool in the identification of potential informants. Potential informants were also approached through networking in conferences (e.g. TOC London, CILT events).

The stage of identification of potential informants was conducted in parallel with the data collection (August 2014 – January 2015). Once a potential participant was identified a request for participation in a research interview was sent (See Appendix A1). During this process an extensive database containing correspondence information (i.e. date of request, reminders, notes after the reminder, sharing of interview questions etc.) with each potential participant was created (See Figure 4-4).

A	B	C	D	E	F	G	H	I	J	K	L
1	Name	Position	Company	E-mail Address	Company Type	Locatio	Notes	Reminder	Notes after Reminded		
2					16/03/2014						
3	1	Commercial Director - Logistics			POC		No reply 25/09/2016 Received reply from company's Commercial Assistant on 02/10/2014 (Contact details: [redacted] I asked her if she could send the interview guide to other managers/directors for an interview.	02/10/2014 - interview guide	no reply 14/02/2014 -- reminder again on 24/11/2014 -- no reply		
4	2	Business Development Director			POC			No reply until 03/11/2014			
5	3	Head of Commercial Strategy and Planning			POC		Agreed for a telephone interview, waiting confirmation of date	29/09/2014 - interview questions	Reminder again 24/11/2014 -- interview scheduled for 05/01/2015		
6	4	Managing Director			POC		e-mail address invalid				
7	5	Development Director Portcentris			POC		e-mail address invalid -- new request attempted at the current e-mail on 03.11. It is possible that she is no longer employed by [redacted]				
8											
33					02/10/2014						
34	31	Finance Director			POC		Replyed that he is not the best suited person to participate in the interview. He forwarded my request to someone else who will contact me if willing to participate.				
35	32	Operations Director			POC						
36	33	Property Director			POC			reminder on 09/12	no reply		
37	34	Commercial Manager			POC			Agreed to participate after the second reminder send dates and questions	Interview arranged for 22/12/2014		
38	35	Property Manager			POC			reminder on 09/12	no reply		
39	36	Business Development Manager			POC			reminder on 09/12	no reply		
40	37	Company Director			3PL			reminder on 09/12			
41	38	Managing Director			3PL			reminder 16/12/2014			
102											
103					02/12/2014						
104	119	Commercial Director			3PL		Interview arranged for the 13th of January. Asked me to send him a reminder a day in advance				
105	120	Warehouse Manager			3PL						
106	121	Systems Project Analyst			3PL		asked for the questions. Send out on 03/12/2014 plus availability until 19/12 - interview contacted 19/12				
107	122	Senior Manager - Research			3PL		Responded that [redacted] can assist me with the questions				
108	123	Operations Director			3PL			Reminder 05/01/2015			
109	124	Senior Supply Chain Solution Manager			3PL			Reminder 05/01/2015			
232											
233					30/10/2015						
234	198	Commercial Director			POC		Agreed on an interview, asked her PA to arrange it. I have send her my availability and the questions. Interview arranged for 10/02/2015				
235	199	Head of Supply Chain			Retailer		Contact from [redacted] Agreed for a Skipe interview on 10/02/2015				
236											

Figure 4-4: Extract of interview invitations database, source: (author's own)

In total 223 potential informants from 71 companies were identified and contacted. Multiple informants from each organisation were sought to enable cross-checking of responses and identification of inconsistent or conflicting opinions. Such practices limit subjectivity and participant's bias (Eisenhardt and Graebner, 2007; Smith et al., 2014). The potential participants represented different hierarchical levels within the companies and had significant work experience as suggested by Kowalkowski et al. (2015).

The process described above regards the non-probability purposive sampling procedure that has been utilised in this study. Purposive sampling is defined as the process where the subjects of the sample are chosen according to their suitability for the project, based on the judgement of the researcher (Patton, 1990; Sarantakos, 2013). Furthermore, the suitability of the subjects is determined by their knowledge and expertise regarding the inquiry.

As described above participants were chosen after a thorough investigation of the PCL industry and all were employed by companies associated with this industry. Purposive sampling is a type of non-probability sampling that is well suited for qualitative and exploratory studies (Miles and Huberman, 1994; Sarantakos, 2013). Additionally, non-probability sampling is mostly utilised in case study research, because it is not concerned with representativeness and statistical generalisability to predefined populations, but in the selection of subjects due to specific reasons (Barratt et al., 2011; Sarantakos, 2013).

In addition to purposive sampling, snowball sampling has been used in this research. Sarantakos (2013) defines snowball sampling as the approach where the researcher asks participants to recommend other potential participants that would meet the criteria of the research within their organisations or from a wider circle. Interviewees were prompted to suggest potential participants for future interviews during interviews (see Appendix A2). This question was asked towards the end of the interview because at that point the interviewee would be familiar with the nature of the questions and could judge if a colleague or a member from a collaborating organisation could further contribute to the research. In some cases, participants were not willing to give further names but suggested companies that could be included in the research. In other cases, interviewees provided contact details of potential participants who according to their judgement would be relevant and willing to contribute to the research<sup>21</sup>. A list of all the companies that comprise the sample of this study and the characteristics of the interviewees from each company are presented in Table 4-9, at the end of the following subsection.

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<sup>21</sup> e.g. the Director of a LSP3 suggested the General Manager of Port2 as a good fit for this research. This person was then contacted and the reference of the person that suggested him was used. An interview with the General Manager of Port2 was scheduled; during this interview further potential participants were suggested. This process was repeated on several other occasions.

#### **4.6.2 Semi-structured interviews**

Interviews are common sources of primary data in case studies for the collection of information about motives, actions, behaviour and experiences, and the shaping of a comprehensive understanding of the issues relevant to the research objectives in a cost efficient way (Foddy, 1994; Gillham, 2000; Yin, 2003). Interviews can be structured, unstructured or semi-structured depending on their formality, the use of a-priori constructs, and the freedom allowed in the responses of interviewees (Marshall and Rossman, 1995; Sarantakos, 2013).

*Structured interviews* utilise questionnaires verbally presented to informants. Every interview is conducted in the same manner and adheres to the sequence and wording of questions (Sarantakos, 2013). However, the present study, even though it uses a set of predetermined constructs, requires a tool that allows the interpretation of the inquired phenomenon from the viewpoint of the interviewee. Additionally, the data collection tool should allow flexibility in the order of questions and permit the omission or addition of questions depending on their relevance with each organisation. Furthermore, the data collection tool should allow freedom to investigate in greater depth emerging themes from the interview. Therefore, structured interviews are inappropriate for this research.

*Unstructured interviews* imply the development of a guide that reminds to the interviewer the range of topics that should be covered (Bryman and Bell, 2011). Unstructured interviews may contain a set of open ended questions which can be reworded depending on the occasion. The interviewer has the flexibility to change the sequence of the questions or to follow new strands of emerging narrative (Sarantakos, 2013). Patton (1990) characterises unstructured interviews as informal conversations, while Yin (2003) argues that in unstructured interviews the researcher can ask interviewees to propose their insights into certain occurrences. However, in the present research a set of predetermined questions has been created according to the insights of the three literature streams that were reviewed. Additionally, the exploratory nature of this research and the different type of organisations that comprise the sample require a certain degree of flexibility in the data collection tool. Therefore, a tool that utilises a-priori constructs whilst allowing for flexibility in the interview questions is required.

*Semi-structured interviews* contain elements of both structured and unstructured interviews; in that they allow the interviewer to develop an interview guide which groups and lists systematically all the relevant topics in advance. However, the interviewer has the flexibility to reorder questions or to reflect on the narrative of the interviewee and ask

questions not included in the interview guide to follow an emerging thread (Ellram, 1996; Yin, 2003). Additionally, semi-structured interviews give a great leeway to interviewees in regard to their answer (Bryman and Bell, 2011). In spite of flexibility, semi-structured interviews ensure coverage of all relevant topics and the exact or similar wording of questions (Sarantakos, 2013). Additionally, the structure imposed using the interview guide also ensures that the interview will focus on the defined research area and will avoid the deviation of the interview in less important topics.

Complying with the semi-structured interview rules an interview guide was developed for this research (See Appendix A2). The questions in the interview guide are based on the theoretical constructs that emerged from the literature review, and are divided into four sections. The first one regards descriptive characteristics of interviewees. The second section illustrates the role of companies in PCL, identifies the type of resources acquired by companies for the provision of logistics-VAS, and identifies how companies develop their PCL offering. Section C addresses the impact of SLS. Questions included in this section are linked to the SLS and PCL literature streams, and are “wrapped” around the four drivers of SLS. These drivers guide the subsequent data analysis. Finally, the closing-up section contains “summary questions”; these questions enable the interviewee to reflect on the entire discussion and aim to validate the data provided in the main body of the interview, by reducing ambiguity and linking answers (Collis and Hussey, 2009). Additionally, in this section the interviewees were asked about potential contacts for further interviews in accordance with the snowball sampling used in this research.

The semi-structured approach of the interviews implies that the order in which questions were asked between interviews can differ, and that additional questions can be asked depending on the responses of the interviewees. For example, when the answers of the informants were not detailed or when new threads of narrative emerged prompting questions were used, as suggested by Martin and Eisenhardt (2010). Additionally, depending on the core function of each company (i.e. POC, LSP, Retailer etc.) the interview guide was adjusted respectively. The interview guide was sent to participants before the interview for three reasons:

- a) To ensure their appropriateness in answering the questions,*
- b) To increase their awareness about the inquired topics, and*
- c) To be sure that informants answer the question that they are supposed to answer and avoid the creation of assumption as to what is answered (Easterby-Smith et al., 2012)*



Furthermore, to avoid bias the interview guide was reviewed by the academic supervisors to ensure that questions were not leading. Additionally, all interviewees were asked for permission to be recorded to allow the researcher to transcribe the interviews, analyse them in great detail using the original terms given by interviewees, and further avoid researcher bias (Voss et al., 2002; Bryman and Bell, 2011).

### ***Pilot interviews***

Pilots are “*an opportunity for adjustments and fine-tuning before the real work begins*” (Sarantakos, 2013, p.267). In case study research, normally the pilot would be a pilot case. However, this research follows the process of casing. Consequently, a pilot case study could not be conducted because of the emerging nature of the case studies in parallel with data collection. To evaluate the construct validity of the data collection technique and the interview guide, two pilot interviews were conducted in October 2014. These were one telephone interview and one face-to-face interview with the Business Development Manager of LSP1 and the Director of LSP2 respectively. The informants’ availability, and their similarities in terms of core function, guided the selection of those two companies. Both companies are LSPs operating within the boundaries of container ports and provide logistics-VAS for containerised products. Additionally, both companies could be assigned to the same case study with the tentative definition “logistics-VAS provided only by the POC/PA, or third parties”. These pilot interviews aimed to test the four following aspects of qualitative research, as outlined by Sarantakos (2013):

- a) ***Accessibility of respondents.*** The two interviewees were contacted on their business e-mail address directly, which were identified by the process described in Section 4.6.1. The inviting e-mail included a cover letter that explained the research aim, time and data requirements, and potential use of data generated during the research. Upon a positive reply by the interviewees, and identification of mutually convenient times, the interview guide was sent. This process was proven sufficient to build the level of rapport required between the interviewer and the interviewees concerning the demands of the scheduled interview. Therefore, no additional efforts such as promotion of the research in practitioner journals, or professional organisations (e.g. CILT UK) were required to access respondents.
- b) ***Convenience of site.*** The differing nature of the two interviews enabled the evaluation of both interview types. Concerning the telephone interview, it was identified that the researcher’s office provided sufficient technological equipment

for the interview (e.g. recording facilities for telephone interviews). However, even though the office provided the calmness necessary for concentration during the interview, external distractions disturbed the process. Therefore, it was decided that during future interviews a sign informing the conduction of research interview had to be hung outside the office door to avoid disturbance. The setting of the face-to-face interview appeared to be problematic in terms of noise levels. That is because the room used for the interview faced the yard of the facility, where numerous vehicles loaded and unloaded containers, resulting in several interruptions of the interview until the noise returned to tolerable levels. Thus, it was decided that an additional request for a quiet room should be made when the interviewee agreed for a face-to-face interview.

*c) Relevance of information generated by the data collection technique.* Each pilot interview was transcribed verbatim, with the assistance of transcription software, and analysed according to the theoretical premises of the study. The analysis of the data from these two interviews clearly demonstrated that the data collection technique could provide data that would sufficiently address the ROs. The interview questions enabled the identification of the SLS followed by each company, and the reasoning why they decided to implement such a strategy. Additionally, the data collection technique enabled the evaluation of the financial, strategic, marketing, and environmental impacts of a SLS. Moreover, the questions enabled comments to be made, about the level of collaboration between the firm and its business partners. Thus, sufficient data were generated to enable the comparison with the theoretical constructs of this research and evaluate the competitiveness of the firm. The semi-structured element of the interview resulted in some unexpected findings that could not be captured by the data analysis protocol (template). Therefore, the data collection had to be revised to capture the emerging threads of narrative.

*d) Research plan evaluation and identification of necessitated adjustments.* The results of the pilot demonstrated that the data collection technique was appropriate for the requirements of this study and no changes had to be made to the interview guide. Therefore, the data collected during this stage of the research were incorporated with the data from the main research. Nevertheless, the pilot interviews showed that amendments needed to be made in the data analysis protocol to incorporate any relevant emerging threads. Furthermore, the pilot

showed that the digital recorder provided a very clear recording of the interviewee in both cases. However, it also showed that attention needed to be paid for the mitigation of external disturbances to avoid fuzzy recordings. Additionally, the pilot attributed the necessary experience to the researcher to handle situations that interviewees deviated from relevant topics. Furthermore, the pilot interviews also enabled the researcher to develop his probing and prompting skills whenever the answers were not clear and further elaboration was needed to avoid ambiguity and assumptions during data analysis.

### ***Number of Interviews and Observations***

A total of 25 interviews and 4 site visits among 18 organisations were conducted during October 2014 – February 2015. The interviews lasted between 40 to 160 minutes, while site visits lasted between 60 to 90 minutes. Table 4-9 summarises the participating companies and the number of interviewees per company. Additionally, it shows the mean, date, and duration of each interview, and the number of years of experience of each interviewee. Selection of interviewees with extensive experience is crucial in purposive sampling, because the knowledge of the interviewees will be used in the formation of the final conclusions of the study. For this reason, interviews with high ranking interviewees have been conducted (Eisenhardt and Graebner, 2007; Martin and Eisenhardt, 2010).

Additionally, selection of highly knowledgeable informants in combination with open ended questions focused on recent events reduces the informant's bias, because it avoids recall bias (Martin and Eisenhardt, 2010). Table 4-9 shows that all informants are highly ranked within their organisations. However, depending on the size and type of the company different job titles exist. The most common job titles amongst the interviewees were Commercial-Marketing Manager/Director (32%) and Supply Chain Managers/Directors (24%). Additionally, the nature of the questions was open ended and even though few focused on the reasoning of the decision to implement such strategy; most them focused on the identification of the contemporary impact of this strategy on the organisations. This approach limited the informant's bias.

Another tactic that reduces informant's bias is the anonymity of companies and informants to achieve candour based on the premise that informant's responses will not compromise their jobs (Martin and Eisenhardt, 2010). As it can be noticed in Table 4-9 the names of the companies have been replaced with pseudonyms and informants are referred to by job title and not their name, to ensure anonymity wherever possible.

With regard to the final sample of the study it should be mentioned that it contains a port not identified during the desk based project described in Section 4.6.1. This is Port3. The reason for not being considered in the initial sample of this research is that Port3 is small public port, while the DfT's (2013) dataset, used at the initial stage of the research, considers major UK ports<sup>22</sup>, so Port3 was not included in it. However, since 2005 Port3 has been aiming to enter the PCL market. Therefore it was considered as an interesting case to enhance the diversity of the sample and to increase the chances for the identification of patterns of differences and similarities among diverse organisations (Matos and Hall, 2007).

In some instances, follow up correspondence via e-mail was conducted with the interviewees (Table 4-9). The aim of these e-mails was either to clarify uncertain responses once the transcription of the interview was finished, or to ask for supporting information (e.g. financial statements, cargo throughput etc.). In two cases (LSP7, LSP8) the interviewees initiated the follow up to forward supporting material that they thought would be of relevance to the research.

Additionally, in four instances the interviews were combined with site visits that allowed the observation of the natural setting of the activities of the organisations. The researcher visited four ports (Port1, Port3, Port4S, Port4T<sup>23</sup>) and two warehousing facilities (LSP2, LSP8<sup>24</sup>). The interviewee in each of these cases offered a tour of the facilities. During the visits, the researcher had the opportunity to witness the provision of logistics-VAS and to visualise the resources required for their provision. Moreover, these site-visits sharpened the understanding of the researcher concerning the size and structure of the organisations involved in the provision of logistics-VAS. The combination of observations with interviews allows the researcher to visualise and sharpen his understanding in regard to the meanings people hold in their everyday activities (Marshall and Rossman, 1995). Additionally, observational data can further enhance the findings from the analysis of interview and secondary data (Stuart et al., 2002; Barratt et al., 2011; Ketokivi and Choi, 2014).

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<sup>22</sup> *“Major ports: Ports handling over one million tonnes per year, and a small number of other key ports, accounting for over 98% of UK port traffic”* (DfT 2013, p.20).

<sup>23</sup> The researcher visited Port4T during the visit at LSP2, who is located on dockside of the port.

<sup>24</sup> The researcher visited the flagship facility of the LSP, which is located in the Midlands because at the time of the visit the port centric facility of LSP8 was under construction. However, the design of the facility will be an exact replica of the Midlands facility concerning the structure of the building and the services offered.

Company	Type	Position of the Interviewee(s)	Years in present role	Years in respective industry	Interview mean	Follow up e-mails	Interview duration	Interview Date
<b>Port1</b>	POC/PA	a) Head of Commercial Strategy	5	20	Telephone		50	05/01/2015
		b) CEO	5	33	Face-to-face		45	21/01/2015
		c) Port Director	2	20	Face-to-face		40	21/01/2015
		d) Senior Manager Bulk Operations	5	20	Face-to-face	Yes	100	21/01/2015
		e) Sales and Logistics Development Manager	2	10	Telephone		43	08/12/2014
<b>Port2</b>	POC/PA	a) Commercial Director	1	23	Telephone	Yes	45	22/01/2015
		b) Supply Chain Marketing Manager	14	28	Telephone		63	27/11/2014
<b>Port3</b>	POC/PA	Business Development Manager	10	12	Face-to-face	Yes	160	19/01/2015
<b>Port4T</b>	POC/PA	Head of Commercial	2.5	12	Telephone		40	12/02/2015
<b>Port4S</b>	POC/PA	Divisional Director	5	25	Telephone		40	26/11/2014
<b>Port5</b>	POC/PA	Commercial Manager	11	17	Telephone		44	22/12/2014
<b>LSP1</b>	LSP	Business Development Manager	4	44	Telephone	Yes	50	15/10/2014
<b>LSP2</b>	LSP	Director	4	30	Face-to-face	Yes	55	16/10/2014
<b>LSP3</b>	LSP	Managing Director - Logistics Manager	17	17	Telephone	Yes	52	03/11/2014
<b>LSP4</b>	LSP	Business Development Manager	1	16	Telephone		65	28/11/2014
<b>LSP5</b>	LSP	Group Sales Director	7	31	Telephone		48	07/11/2015
<b>LSP6</b>	LSP	a) Systems Project Analyst	5	15	Telephone		50	11/12/2015
		b) Commercial Director	13	40	Telephone		56	13/01/2015
<b>LSP7</b>	LSP	Commercial Manager	2	43	Telephone	Yes	42	05/01/2015
<b>LSP8</b>	LSP	a) Sales and Marketing Director	6	10	Face-to-face	Yes	140	28/01/2015
		b) Supply Chain Director	8	18	Telephone	Yes	48	15/01/2015
<b>LSP9</b>	LSP	Managing Director	6	20	Telephone	Yes	45	30/01/2015
<b>Retailer1</b>	Retailer	Head of Supply Chain	2	25	Telephone		46	12/02/2015
<b>Retailer2</b>	Retailer	Partner and Technical Director	2	22	Telephone	Yes	48	04/02/2015
<b>FM1</b>	Food Manufacturer	Buyer Supply Chain Manager	5	16	Skype		40	13/01/2015

**Table 4-9: Participating companies and interviewees, source: (author's own)**

### 4.6.3 Documents

Secondary data in the form of documents can corroborate and augment data collected by other sources (Yin 2003), and allow a historical perspective to enrich the narrative of the study (Easterby-Smith et al., 2012). In logistics and O&SCM research the analysis of corporate documents and websites is the second most preferred data collection method (Seuring, 2008).

Secondary data were used for the creation of the profile for each participating company. This procedure allowed the researcher to familiarise himself with each company and develop common references with interviewees. Additionally, secondary data were used to support arguments made by interviewees and to verify their assertions. The references for secondary data of this research can be found in Appendix E. However, to protect, wherever possible, the anonymity of the companies and the informants, the secondary data have not been cited within the data presentation and analysis. An example of how secondary sources were used to support data from other sources is provided at the data collection protocol (Table 4-7).

Yin (2003) highlights the danger of over-reliance on documents because these documents have been produced for purposes different than those of the research project. Therefore, the researcher should be aware of the potential bias included in these documents by acknowledging the audience that these documents were produced for. The classification of documents in various categories, as presented in Appendix E, serves also the purpose to remind the researcher of the initial objective of any document used in this research. For example, marketing brochures are produced to increase the awareness of potential customers for the services provided by the firm. Therefore, these documents have been used only for the descriptive characteristics they contain and not for the justification of the decisions of managers.

Another way that documents can prove to be useful is to verify the correct spelling of organisations or persons mentioned during the interview (Yin, 2003). This aspect has been very useful as on many occasions the interviewees mentioned customers' names or names of colleagues. The verification of those names in organisation documents enabled the identification of potential new participants for the study, or provided an avenue to look for further evidence to support the arguments made during the interviews. Table 4-10 shows the number of documents used for each company.

Document Type	Annual Reports	Financial Statements	Internal Documents	Marketing Brochures	Newsletters	Presentations	Reports and Journals	Webpages	TOTAL
Company Pseudonym									
Port1		1		5	4	1	3	2	16
Port2	1	4		1	3		1	1	11
Port3			3						3
Port4S		2		1	2	1		2	8
Port4T	2	1		2			2	1	8
Port5	1							2	3
LSP1		2			1			6	9
LSP2		1						4	5
LSP3		2						4	6
LSP4		3		1	1	2			7
LSP5		2					1	2	5
LSP6		2						2	4
LSP7		2					1	1	4
LSP8		8				1		18	27
LSP9		1						1	2
FM1		2			2				4
Retailer1		2		1		1	1	1	6
Retailer2		2	2			1			5

Table 4-10: Number and type of documents used for each company, source: (author's own)

#### 4.6.4 Overview of the participating organisations

This section introduces the participating companies of this study. In particular, 25 semi-structured interviews with managers and directors from five<sup>25</sup> port operating companies, nine LSPs, two retailers and one food manufacturer were conducted between October 2014 and February 2015. Table 4-11 presents the core function, the location of PCL facilities, annual cargo throughput, key financial information, and number of employees of all participating organisations.

<sup>25</sup> Port4 has presence in multiple locations in the UK. However, its role in those locations is not the same; for example in location *S* the company acts as the PA, the POC, and the operator of logistics-VAS. In location *T* the company acts as the POC and is not involved in the provision of logistics-VAS *per se*. the PA for location *T* is an independent entity which controls many ports in SE England. The divergent function of the company in those locations and the fact that different managers were interviewed for each particular location allow Port4 to be included in this study as two companies, Port4S and Port4T respectively.

<b>Pseudonym: Port1</b>			
<b>Type: POC/PA</b>	<b>Est.: 1920</b>	<b>Location: NW England</b>	<b>Core function and capacity in present research:</b> Owner and operator of 5 ports in England and Scotland. Operator of 2 container terminals in the Republic of Ireland and Northern Ireland. However, the primary and secondary data of this study focus only on the offering at the NWE port. Consequently, Port1 will be considered here in its capacity as the POC/PA of the NWE port. As such Port1's core function is the accommodation of cargo in the following operational areas: automotive, containers, dry and liquid bulks, energy products, forest products, metals, project cargo, Ro-Ro and cruises and ferries.
<b>Annual throughput:</b> 623,000 TEU			
<b>Number of employees:</b> 2,754 (Group)			
<b>Financial Information:</b> EBITDA (2013) in thousands: £159,600 (Group)			
<b>Ownership:</b> Owned by a leading UK infrastructure, transport, and real estate investment organisation group. The group's business activities span into: Real Estate, Leisure, Media, Retail, Energy & Environment, and Transport.			
<b>Pseudonym: Port2</b>			
<b>Type: POC/PA</b>	<b>Annual throughput:</b> 3,4mill TEU		<b>Core function and capacity in present research:</b> Operation of the port and its associated services. Port2 is a major container port that provides state of art connections to its customers on sea and landsides by continuously investing in the development of its infrastructure.  Port2 has an in-house logistics company, which will be referred to as "Port2 logistics". The key functions of the Port2 logistics cover the following operational areas: ocean freight forwarding, port and park services and inland intermodal networks.
<b>Location: East Anglia</b>	<b>Est.: 1875, acquired by GPO in 1991</b>		
<b>Number of employees:</b> 2,518 (for the POC)			
<b>Financial Information:</b> EBITDA (2013) in thousands: £81,799			
<b>Ownership:</b> Owned and operated by a GPO with a network of 52 ports in 26 countries, accommodating 78.3 million TEUs (2013) annually. The GPO is owned by an investment holding company involved in: Ports, Property and hotels, Retail, Infrastructure, Energy, and Telecommunications.			
<b>Pseudonym: Port3</b>			
<b>Type: POC/PA</b>	<b>Est.: 1840</b>	<b>Location: NW England</b>	<b>Core function and capacity in present research:</b> Public POC/PA that employs its own stevedores, runs its own marine section and offers boat services and pilotage. Container handling and its surrounding business is only an integral part of that broader basket of Port3's business. Port3 handles a whole host of cargo types in dry bulks, break bulks, liquid bulks, project cargo, and specialist heavy lift work. Port3 also supports an off-shore wind farm of a European energy provider by hosting their operations and merging centre from this base.
<b>Annual throughput:</b> 5,801 TEU, (approx. 250,000 tons of cargo)			
<b>Number of employees:</b> 20			
<b>Financial Information:</b> Operating revenue (2014): £1,689,738			
<b>Ownership:</b> Public-municipal port, owned by a County Council since 1975, previously owned by a manufacturer in the steel industry.			



<b>Pseudonym: Port4S</b>			<b>Core function and capacity in present research:</b> A freehold port owner and operator of 7 Scottish and 1 SE England ports. The present study focuses only on one Scottish port. The interview used here is focused on the offering of the company at this port only. Consequently, Port4S is considered in its capacity as the POC and PA for Scotland's largest container port which specialises in short-sea feeder operations, and links Scotland to European deep-sea ports. Core functions: landlord, provision of utilities, stevedoring services and warehousing. Main commodities traded: Containers, Vehicles/wheeled cargoes, Dry bulks, Refrigerated products, Hazardous cargoes, Forest Products, Oil/Petroleum, Other liquid Bulk, General cargo and Project cargo.
<b>Type:</b> POC/PA	<b>Est.:</b> 1967	<b>Location:</b> Scotland	
<b>Annual throughput:</b> 261,000 TEU			
<b>Number of employees:</b> 400+ (Scottish operations)			
<b>Financial Information:</b> EBITDA (2013) thousands: £104,100 (Group)			
<b>Ownership:</b> Private limited with shared capital company owned since 2011 by an independent fund specialised in infrastructure management. Parent company's investments are focused in Europe and are involved in: toll road operation, rolling stock leasing, communication tower ownership, transport and logistics solutions and port ownership & management.			
<b>Pseudonym: Port4T</b>			<b>Core function and capacity in present research:</b> Port4T is a multipurpose large-scale port that provides port services to a wide range of products and industries, combining deep sea and European short sea trade routes at the same facility. Its operational areas of cargo handling activities are: container terminal, conventional cargo (timber, cars, general cargo, ro-ro and ferries), grain/ dry bulk terminal (aggregates, animal feed), imported paper products warehousing and handling facilities, Cruise Terminal. Beyond port services Port4T aims to make connections, join supply chains; work with shipping lines through to retailers; bring together logistics providers with their own customers' network and ultimately connecting to PCL within the port and the logistics park.
<b>Type:</b> POC	<b>Location:</b> SE England		
<b>Est.:</b> port opened 1886, acquired by POC in 2012			
<b>Annual throughput:</b> 945,000 TEU			
<b>Number of employees:</b> 466			
<b>Financial Information:</b> EBITDA (2013) in thousands: £78,575			
<b>Ownership:</b> Private limited with shared capital company owned by a private port operating group which in turn is owned by a private equity investment fund.			
<b>Pseudonym: Port5</b>			<b>Core function and capacity in present research:</b> Port5 is a principal maritime gateway and logistics hub of Northern Ireland and the Republic of Ireland. The raison d' être of Port5 is the operation, maintenance and capacity development of the Harbour and its Estate to support the
<b>Type:</b> PA	<b>Est.:</b> 1613	<b>Location:</b> Northern Ireland	
<b>Annual container throughput:</b> 205,000 TEU			
<b>Number of employees:</b>			
<b>Financial Information:</b> Turnover thousands (2013) £50,328			

<b>Ownership:</b> Trust port governed by Statute			regional economy. Operational areas of cargo handling activities: conventional cargo (timber, cars, ro-ro and ferry terminal), grain/dry bulk (aggregates, animal feed, fertilisers, cement, scrap), liquid bulk (petroleum and oil products), and containers.
<b>Pseudonym:</b> LSP1			
<b>Type:</b> asset based LSP	<b>Est.:</b> 1991	<b>Location:</b> South England	<b>Core function and capacity in present research:</b> Provision of innovative logistics services on terms contracts to clients supplying the retail sector with imported goods. LSP1 works with clients to continually improve the efficiency of their end to end SC.
<b>Annual throughput:</b> 5,200 TEU			
<b>Number of employees:</b> 75			
<b>Financial Information:</b> EBITDA (2013) thousands: £2,202			
<b>Ownership:</b> Privately owned limited company			
<b>Pseudonym:</b> LSP2			
<b>Type:</b> asset based LSP	<b>Est.:</b> 2010	<b>Location:</b> SE England	<b>Core function and capacity in present research:</b> Complete warehousing, handling and distribution solutions across the UK for importers, exporters, traders and manufacturers. LSP2 is linked with two other companies owned and managed by the same directors. The first is a haulage provider. LSP2 utilises the fleet of this haulage company for medium distance cargo distribution to/from its port centric facility. The second company is an online haulage exchange platform. LSP2 utilises this platform to accommodate the customers that wish to distribute their cargo from port to long distance inland locations by shipping their cargo in backloads of other hauliers.
<b>Annual container throughput:</b> 12,000 TEU			
<b>Number of employees:</b> 25			
<b>Financial Information:</b> Networth (2014) thousand: £461,962			
<b>Ownership:</b> Limited Liability Partnership			
<b>Pseudonym:</b> LSP3			
<b>Type:</b> asset based LSP	<b>Est.:</b> 1997	<b>Location:</b> East Anglia	<b>Core function and capacity in present research:</b> Outsourced logistics provider specialised in the nursery industry. LSP3's principal activity is the provision of contract led warehousing and storage facilities. LSP3 collaborates with local hauliers and parcel carriers for inland store distribution customer orders. LSP3 also runs customer service centres for and is responsible for the re-engineering and after sale service of its returned or faulty products.
<b>Annual throughput:</b> 13,000 TEU			
<b>Number of employees:</b> 141			
<b>Financial Information:</b> EBITDA (2013) thousands: £448.553			
<b>Ownership:</b> Private limited with share capital			

<b>Pseudonym:</b> LSP4			<b>Core function and capacity in present research:</b> Global LSP offering end to end SC solutions; including storage, sea-air-land cargo transport, SC tracking, accreditation, and consignment documentation. LSP4 also offers contract logistics in terms of deconsolidation warehousing and distribution from port locations. LSP4 is also involved in product merchandising and manages via reverse logistics return and re-engineering of faulty products. LSP4 owns warehousing various warehousing facilities near airports and seaports in the UK and Ireland; however, the all data used here are focused only on the company's operations at Port2 and Port4T. In this study, LSP4 is considered as the provider of PCL services in these ports only.
<b>Type of organisation:</b> asset based LSP			
<b>Founded:</b> 1984	<b>Location:</b> East Anglia and SE England		
<b>Annual throughput:</b> 250,000 TEU			
<b>Number of employees:</b> 312 (Group)			
<b>Financial Information:</b> EBITDA in thousands GBP: £5,979			
<b>Ownership:</b> Private limited with shared capital. LSP4 is owned by LSP4 holdings			
<b>Pseudonym:</b> LSP5			<b>Core function and capacity in present research:</b> Global SC solution provider, who maintains global presence by the formation of strategic partnerships with Pan-European LSPs. LSP5's operations include: national pallet network services, warehousing and deconsolidation capabilities, national roadside recovery network, supply chain consultancy, and provision of international medical services. LSP5's services are offered for the following industries: agricultural, construction, truck crane services, commercial recovery, chemical, and retail. In the UK, LSP5 owns 12 warehousing facilities. This study is focused on a single facility located in the proximity of Port2 in East Anglia.
<b>Type:</b> asset based LSP	<b>Est.:</b> 1988	<b>Location:</b> East Anglia	
<b>Annual throughput:</b> 250,000 pallets			
<b>Number of employees:</b> 1,195 (Group)			
<b>Financial Information:</b> EBITDA (2013) in thousands: £10,496			
<b>Ownership:</b> Privately owned limited company			
<b>Pseudonym:</b> LSP6			<b>Core function and capacity in present research:</b> Provision of transport, storage and product handling services. LSP6 established operations in Essex in 1978. In the 1990s LSP6 collaborated with a POC and expanded its warehousing facilities to widen product cover range. During the same decade LSP6 collaborated with retailers for imports' handling, warehousing and distribution. In the second half of the 1990s
<b>Type:</b> asset based LSP	<b>Est.:</b> 1991	<b>Location:</b> East Anglia	
<b>Annual throughput:</b> 20,000 TEU			
<b>Number of employees:</b> 128			
<b>Financial Information:</b> EBITDA (2013) in thousands: £924			
<b>Ownership:</b> Private limited with shared capital			

			LSP6 created a primary consolidation centre for a major UK retailer and later on introduced a wet bonded facility for alcoholic products. In the early 2000s LSP6 relocated from Essex to Port2. This study focuses on the operations and services provided after this relocation.
<b>Pseudonym:</b> LSP7			
<b>Type:</b> asset based LSP	<b>Est.:</b> 2003	<b>Location:</b> NW England	<b>Core function and capacity in present research:</b> Cargo handling and logistics services for forest products from multiple ports across UK and Ireland. LSP7's provides shipping, warehousing, and distribution services, and operates a labour agency for port services. LSP7's facilities are equipped with state of the art inventory and WMS that offer product level visibility throughout the supply chain. LSP7 operates on a JIT basis to meet the customers' schedule. This research focuses on the warehousing facility, located at Port1.
<b>Annual container throughput:</b> 500,000 tons of forest products			
<b>Number of employees:</b> 145 (Group)			
<b>Financial Information:</b> EBITDA (2013) in thousands: £2,183 (Group)			
<b>Ownership:</b> Privately owned			
<b>Pseudonym:</b> LSP8			
<b>Type:</b> asset based LSP	<b>Est.:</b> 1979	<b>Location:</b> SE England	<b>Core function and capacity in present research:</b> SC solutions that incorporate primary and secondary temperature controlled transport, VAS, and warehousing services to major food retailers and manufacturers. LSP8 owns 7 warehouses in the UK and handles approx.130,000 pallets per week through its network. LSP8 also operates a web based platform capable of allocating its subcontractor requirements to a network of 2,500 vehicles Europe-wide. LSP8 currently develops a port centric facility in Port4T. The planed operations at this location are the focus of this thesis. LSP8 is considered in the capacity of the operator of a port centric facility for temperature controlled products at the Port4T. All data are focused on this facility.
<b>Annual throughput:</b> 270,000 TEU			
<b>Number of employees:</b> 1,974 (Group)			
<b>Financial Information:</b> EBITDA (2014) in thousands: £9,800 (Group)			
<b>Ownership:</b> Private limited company owned by a private equity since 2014. The parent company's clients and investor base includes institutional investors, funds, corporates and family offices. The investments opportunities of the parent company are focused in markets in Asia, U.S. and UK.			
<b>Pseudonym:</b> LSP9			
<b>Type:</b> non-asset based LSP	<b>Est.:</b> 2009	<b>Location:</b> West Midlands	<b>Core function and capacity in present research:</b> Non-asset based LSP that provides freight forwarding, logistics and SC solutions on a global scale from the gate of the factory until the end customer for a
<b>Annual throughput:</b> 6,000 TEU			
<b>Number of employees:</b> 17			
<b>Financial Information:</b> Networth (2014) in thousands: £5,214			

<b>Ownership:</b> Private limited company			wide range of industries. LSP9 collaborates with many UK ports. However, this thesis focuses on the relationship of LSP9 with Port3.
<b>Pseudonym:</b> FM1			
<b>Type:</b> Food Manufacturer	<b>Est.:</b> 1903	<b>Location:</b> NW England	<b>Core function and capacity in present research:</b> Blending, packing, sales and marketing of tea and coffee. FM1 imports tea beans from Africa, India and China. The beans are then blended according to their recipe and are distributed in major retailers. FM1 contracted with Port1 for the purchase of PCL service and the redirection of its imports to Port1. In this thesis FM1 is considered only in its capacity as a customer of Port1 for PCL services.
<b>Annual throughput:</b> 2,000 TEU			
<b>Number of employees:</b> 253			
<b>Financial Information:</b> EBITDA in thousands (2014): £6,406			
<b>Ownership:</b> Private limited with capital share			
<b>Pseudonym:</b> Retailer1			
<b>Type:</b> Retailer	<b>Est.:</b> 1949	<b>Location:</b> North Yorkshire	<b>Core function and capacity in present research:</b> Retailing of food, clothing, general merchandise products, and services throughout the UK and online. However, in the present study Retailer1 will be considered only in its capacity as the operator of a warehousing facility located at the North Yorkshire port.
<b>Annual throughput:</b> 18,200 TEU for general merchandise			
<b>Number of employees:</b> 177, 410 (Group), 230 (PCL facility)			
<b>Financial Information:</b> EBITDA in millions (2013): £1,400 (Group)			
<b>Ownership:</b> Retailer1 is a private limited with shared capital company, owned by a US multinational retailer group, who retains more than 11,000 stores in 27 countries, under 71 brands.			
<b>Pseudonym of the organisation:</b> Retailer2			
<b>Type:</b> Retailer	<b>Est.:</b> 1919	<b>Location:</b> North Yorkshire	<b>Core function and capacity in present research:</b> Major multichannel UK retailer with presence in 12 countries, operating also in banking, ICT, and hospitality. Retailer2 key function is the purchase of products and services from suppliers, their transportation through the company network and their merchandise in stores. This study focuses only on the DC operated by Retailer2 at North Yorkshire Port.
<b>Annual throughput:</b> Total UK imports 75,000 TEU – 37% in North Yorkshire			
<b>Number of employees:</b> 391,868 (Group)			
<b>Financial Information:</b> EBITDA in million (2014): £5,040 (Group)			
<b>Ownership:</b> Public limited with share capital			

Table 4-11: Descriptive characteristics and core function of participating companies, source: (authors own based on primary and secondary data)

## 4.7 Qualitative Data Analysis

The organization and analysis of the large amount of data generated by qualitative research in a sensible way is of key concern for researchers (Cassell et al., 2005). The main tension among qualitative researchers exists between the “*urge*” to keep an open mind for emerging themes, and the “*urge*” to follow a highly structured analytical process. The tendency to keep an open mind can lead to a chaotic and incoherent outcome, while a highly structured approach can lead researchers to an outcome presenting the limitations of quantitative research but without any of its advantages (King and Brooks, 2016). Furthermore, an open mind in data analysis is linked with inductive research approaches, while highly structured data analysis is linked with deductive approaches (Miles and Huberman, 1994). This thesis follows an abductive research approach. Therefore the data analysis technique should impose a concurrently “*tight and evolving framework*” (Dubois and Gadde, 2002, p.558). The data analysis framework should be tight because the “*tightness reflects the degree to which the researcher has articulated the preconceptions*” (p. 558). On the other hand the evolving nature of the framework allows empirical observation to affect the view of theory and vice versa (Dubois and Gadde, 2002). Therefore, it is crucial to choose a technique that balances both sides.

### 4.7.1 Template Analysis

Template analysis was developed by Crabtree and Miller (1992) and has been expanded in business management studies by Nigel King (Cassell, 2008). Template analysis is a group of techniques which enable the thematic organisation for the analysis of textual data based on a set of codes (King and Brooks, 2016). The codes-set represents the data analysis template (Cassell et al., 2001). A code in qualitative research is the label attached to a passage to index it as relevant to a specific theme according to the researcher’s interpretation. Codes can vary from simply descriptive to complex. The former require limited or no analysis of what the interviewee means, while the latter are more interpretative thus their definition is more complicated (King and Brooks, 2016).

In template analysis codes can be developed “*a-priory*”, based on the research framework (Smart et al., 2010) or the interview guide (Cassell et al., 2001). However, template analysis allows the researcher to redefine and adjust the codes during the analysis and interpretation of the interview transcripts (King and Brooks, 2016). This coding process allows the accommodation of themes that were not pre-considered in earlier research stages (Cassell, 2008). Furthermore, codes in template analysis can be

presented in hierarchical order allowing for analysis at multiple levels of specificity (Easterby-Smith et al., 2012). Broad higher level codes provide a general overview of the data, while detailed lower level codes enable the within and cross case identification of similarities and differences (King and Brooks, 2016).

Its flexibility sets this data analysis method in the middle-ground between content analysis<sup>26</sup> and grounded theory<sup>27</sup> (Easterby-Smith et al., 2012). Additionally, the main strength of template analysis is that it provides researchers with a clear guide for data organisation and analysis (Cassell, 2008). Consequently, it can be argued that template analysis is consistent with the abductive research approach of this thesis. That is, because it allows a certain degree of tightness in the data analysis using a-priori codes but also allows codes to be developed during the analysis of the transcripts.

Furthermore, template analysis is suitable for a variety of epistemological stances; except from extreme constructivist approaches focused on the analysis of discourse (Cassell, 2008). That is because template analysis reduces data to coded segments. A practice that opposes the epistemological assumption that a part of text can have multiple meanings and interpretations (King and Brooks, 2016). Additionally, template analysis is not appropriate for mixed method studies, because it allows parallel coding (i.e. multiple codes attributed to a particular passage of the data (Easterby-Smith et al., 2012)). Therefore, the assertion that the frequency of a code within a text is an indicator of salience of this code, as in quantitative content analysis, cannot be made (King and Brooks, 2016). Considering that this thesis follows a critical realism paradigm and a qualitative approach it can be argued that template analysis is an appropriate data analysis technique. Additionally, template analysis is well suited for samples between 20 and 30 participants and when the aim of the research is the comparison of contextually bounded different groups or entities (King, 2004; Khan and Creazza, 2009; King and Brooks, 2016). Considering that the aim of this research is to identify the impact of different SLS on UK ports and intermediaries, and that the final sample of this research was 25 interviews, template analysis can be deemed as appropriate data analysis technique.

In general, template analysis is a tool for the organisation of qualitative data in a manageable way, but is not the final step of the analysis. Once the final template is

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<sup>26</sup> Content analysis is a deductive data analysis technique for the objective, systematic and quantitative description of data (Berelson 1952). In content analysis, codes are developed a-priori and are systematically used to structure data (Easterby-Smith et al. 2012).

<sup>27</sup> Grounded theory is an inductive open approach for data analysis, with no a-priori defined codes, developed by Glaser and Strauss (1967). Grounded theory utilises theoretical sampling to draw emerging concepts and ideas from the data for the development new theory (Easterby Smith et al. 2012).

constructed the researcher should further interpret the data to generate the research findings (Cassell, 2008). Different authors, such as, Milles and Huberman (1994), Robson (2002) and Dey (2003), propose similar data analysis techniques without the use of the word template in the description of their method (Cassell, 2008). Additionally, in the fields of Logistics & O&SCM research various authors, such as Khan and Creazza (2009), and Stuart et al. (2010), use the term template analysis interchangeably with the terms “thematic analysis<sup>28</sup>” or “thematic coding”. However, in this thesis template analysis is considered as a flexible tool that allows the “a-priori” and “in vivo” development of codes for the structure of the data and should not be confused with other forms of analysis.

#### **4.7.2 Application of Template Analysis and within case analysis**

This section describes the implementation of template analysis according to King and Brooks (2016). In accordance to the first step of the template analysis an initial set of “a-priori” themes and codes was developed based on the interview guide and the research question of the study (Cassell et al., 2001; King and Brooks, 2016). The structure of the interview guide (see Appendix A2) and the research questions of the thesis impose two distinct themes. The first regards the codes necessary for the development of the definitions of this thesis’s cases studies (Section B of the interview guide). The second broad theme regards the impact of the SLS on UK ports and intermediaries (Section C of the interview guide). The second theme is divided into four subthemes; namely, the financial, strategic, marketing, and environmental impact of SLS.

The second step of the template analysis regards interview transcription (King and Brooks, 2016). Each interview was transcribed verbatim, with the assistance of a transcription software. The transcription of the interviews was deemed necessary to:

- i) limit intuitive interpretations and enhance the memory of what have been discussed during the interview,*
- ii) permit thorough and repetitive examination of informants’ narrative,*
- iii) allow other researchers to access and evaluate the data analysis, thus limit researcher’s bias, and*
- iv) allow data to be inquired from a different theoretical or methodological perspective (Bryman and Bell, 2011; Heritage, 2013).*

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<sup>28</sup> Thematic analysis is an inductive qualitative data analysis technique where the analysis is focused on themes emergent from the data and occurs concurrently with the data collection process (Sarantakos 2013).



The third step regards the initial coding of a subset of the dataset (King and Brooks, 2016). Each passage that matched any of the “*a-priori*” themes was attached to a specific code. During this process it was identified that some of the passages could not be matched with any of the “*a-priori*” codes. For example, the interview guide did not include any questions concerning the availability of land for the development of port-centric facilities. However, many interviewees expressed concerns concerning the potential threat to their competitiveness imposed by the limited port land for expansion of their facilities. Therefore, it was considered that an additional code named “land availability” would be developed. After the initial coding of a subset of transcripts the initial template was developed. The development of the initial template represents the fourth step of template analysis (King and Brooks, 2016).

The next step involves the “application” of the template on the entire dataset (King and Brooks, 2016). Throughout this stage the initial template was redefined numerous times to capture emerging concepts. Once the template was applied to the entire dataset, the final template was developed (King and Brooks, 2016). It should also be mentioned that after the coding, transcripts have been maintained in their original form to allow the possibility to revert to individual data sources and maintain the wholeness of the data, as suggested by Cassell (2008). Figure 4-5 shows the final template used for the categorisation of data into themes and codes. A distinction is made between the “*a-priori*” and “*emergent*” codes and themes, as indicated by the figure index. It should be noted that the template itself, although it is considered as part of data reduction and analysis, does not provide any interpretation of the data (Nadin and Cassell, 2004). Once the final template was developed and applied in the entirety of the data-set, the interpretation and write-up of the findings of the research commenced (King and Brooks, 2016).

The template (See Figure 4-5) is divided in two main sections. Each section is further subdivided by subthemes in hierarchical levels. The section named “Case study definition” assisted the organisation of data in such way that companies would be aggregated into groups according to their common characteristics concerning their role in PCL industry. This categorisation created a taxonomy of SLS and allowed the subsequent development of the three case studies of this research. The section named “Impact of SLS” allowed transcripts to be thematically organised in accordance to four main impact areas of SLS. These procedures are described in detail in Chapters 5 and 6 respectively.

Chapter 6 represents what is referred to in case study literature as within-case analysis, the purpose of which is to familiarise the researcher and the reader with each

case as an entity on its own (Barratt et al., 2011). Within-case analysis allows unique patterns of each case to be revealed (Eisenhardt, 1989; Voss et al., 2002). For the composition of the case study write-ups, beyond secondary data, a plethora of short and long direct quotes from the primary was used. The short quotes enhance the perception of the interpretation of specific points (i.e. clarification of differences of themes), while the use of extensive passages allows the reader to get a “flavour” of original documents (King and Brooks, 2016). Additionally, matrices and charts were utilised to organise, summarise and present the findings of each case study.

The findings of each case study were then contrasted with theories from the literature. Use of theories in case study research increases the research quality (Barratt et al., 2011) and allows for analytical generalisability (Dubois and Araujo, 2007). The theoretical framework of this study was developed a-priori by the literature review that preceded data collection; but in accordance to the abductive nature of the study, the theoretical framework was revised during data collection and analysis to capture all emerging threats of narrative (Dubois and Gadde, 2002). The final step regarded the development of summary matrices that present the key findings of each case study and the contribution of each case study to respective literature streams. Usually, the within-case analysis is followed by a cross-case analysis phase. Cross-case analysis is used for the identification of similarities and differences between the cases write ups by the use of pattern matching (Barratt et al., 2011). However, the research objectives of the present study do not impose the conduction of cross-case analysis. That is because this study aims to identify the impact of SLS on each type of organisation separately and is not concerned with the generalisation of the findings for the entire industry.

## **Chapter Summary**

This chapter presented the arguments for the philosophical and methodological stances of this research. Philosophical paradigms were discussed and the case for the selection of a critical realism philosophy was made. Additionally, the research approach and strategy were justified and criticism of case study research has been addressed. The chapter also described in detail the data collection process, namely semi-structured interview, secondary data sources and observations, and the stages involved in the analysis of the data of this thesis. Furthermore, the chapter addressed the issues of construct validity, external validity and reliability that impact on the quality of the research. The following chapter presents the development of the case studies of the present research.

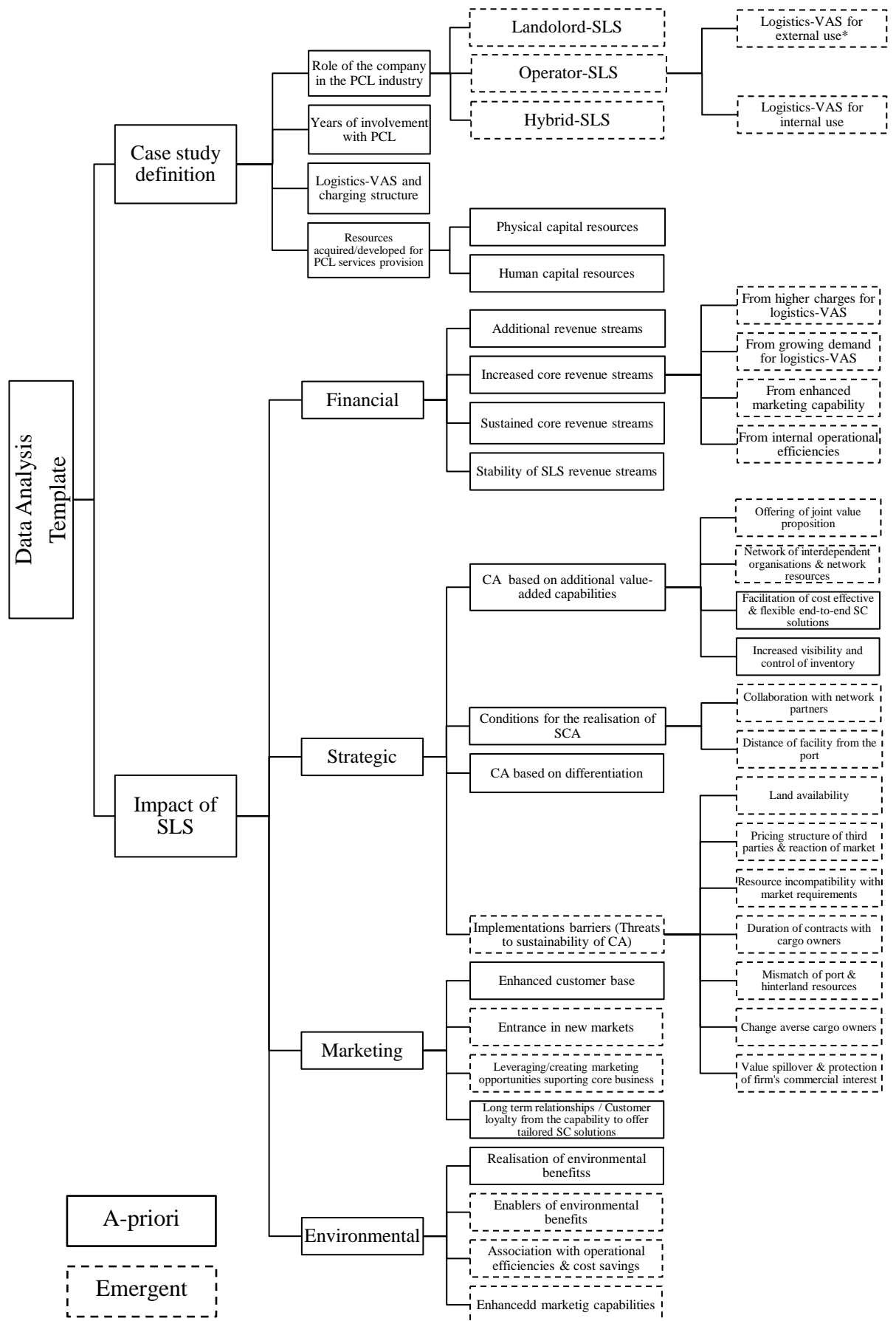
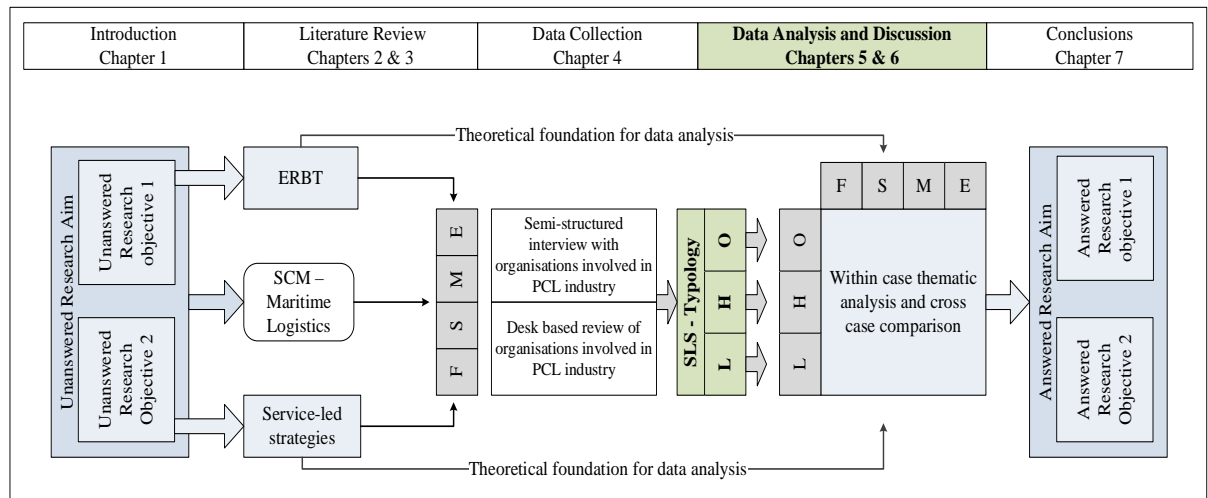


Figure 4-5: Data Analysis Template, source: (author's own)

## Chapter 5 : Toward a typology of SLS in the context of PCL – Case study presentation<sup>29</sup>



**Figure 5-1: Thesis outline and focus of Chapter 5**

Chapter 5 addresses RO1 by presenting the three emerging case studies of this research, which were developed following the method of casing (Ragin, 1992; Spring and Santos, 2015). As such, the unit of analysis was not predetermined, instead, it emerged from the analysis of data. During the initial stages of data analysis, it was decided that the core function of each participating company did not suffice for the allocation of companies to cases. Conversely, similarities concerning:

- i) *the role of each company within the PCL industry, and*
- ii) *their revenue source from their SLS,*

were deemed as more appropriate company allocation criteria. Based on these criteria the analysis of the data allows the identification of three distinct SLS of UK ports and intermediaries; namely the landlord-SLS, operator-SLS, and hybrid SLS (RQ2 of RO1). For the purposes of this research each SLS is perceived as a different case study. Additionally, for each case study the motivation of each company to invest in logistics-VAS is identified (RQ3 of RO1). Furthermore, the spectrum of logistics-VAS provided, and the physical and human capital resource investments are outlined.

<sup>29</sup> The typology of SLS in a PCL context has been presented in the 7<sup>th</sup> ITRN conference: Valantasis Kanellos, N., Caldwell, N., and Piecyk, M.I. (2016) 'A typology of multidirectional and multifaceted service led strategies of UK ports and intermediaries', in 7th Irish Transport Research Network, Dublin, Ireland, 1-2 September 2016

## 5.1 Landlord-SLS

Data analysis revealed two organisations with similar SLS in the PCL industry. These are Port4T and Port5. Both organisations do not actively provide logistics-VAS *per se*, but act as enablers for the provision of those services.

### 5.1.1 Role in the PCL industry

The Head of Commercial of Port4T describes their PCL involvement as:

*“We own the land, we also own the land outside of the port which is the distribution park. We can be the leaseholder for that land or we can go into a JV. [...] The port can be involved in the funding of the facility, but its management is down to the experts who know what they are doing [...]. The port will also help with the marketing, the encouragement of specific refer trades through the terminal and into the facility.”*

Similarly, the Commercial Manager of Port5 describes their PCL involvement as:

*“We provide turnkey purpose build facilities for LSPs and companies providing logistics-VAS. [...] So, our involvement would be to build facilities tailored to their specific requirements and then lease them to those counterparties under traditionally property leases generally known as full-repair and insuring leases”.*

Consequently, it can be inferred that none of these ports is involved with the management of port centric facilities nor the provision of logistics-VAS. Additionally, it can be asserted that their SLS revenue derives from leasing land and/or facilities to intermediaries.

Further, the Commercial Manager of Port5 advocates that the port has an interest in the success of its tenants; *“because the port centric operators influence cargo volume passing through the port”*. On the same notion, Port4T is a port operating company, thus, its main revenue yields from port charges on imported and exported cargo. Port4T can secure and increase its main revenue source by the existence of intermediaries in its proximity. Thus, landlord-SLS complements the main revenue source of the port, and creates a new revenue stream associated with leasing land and/or warehousing facilities.

Additionally, the Commercial Manager of Port5 maintains:

*“We help them to grow their business. For example, if we get a requirement that we know our existing warehouse customer base could fulfil and we don’t want to fulfil directly with a new build warehouse, we would pass the leads to a number of them”.*

Therefore, it can be argued that occasionally the port *“directs”* cargo owners to tenants (i.e. intermediaries) providing logistics-VAS. Thus, facilitating the development of the customer base of those intermediaries.

### 5.1.2 Years of involvement with PCL<sup>30</sup>

According to the Head of Commercial, Port4T has been involved with PCL for more than 130 years since its establishment. She argues: *“Port centric is bit of an overused word for us, it is just being a port with the infrastructure to service the local area. [...] Our current state is part of the port’s natural development along the development of our container terminal and Ro-Ro facility”*.

Conversely, the Commercial Manager of Port5 argues that their first warehouses were built in the late 1990s, and ever since the port warehousing capacity has grown on a demand driven basis. It should be mentioned that Port5 used to be involved in the provision of logistics-VAS. They offered *“a full-service package of receipt, stevedoring, storage, picking to transport and managing all that, but the mass part was provided by a third party subcontracted by ourselves”*. However, due to loss of human resources and the high risk of operating the facilities, they decided to lease the warehouses to experts. The Commercial Director of Port5 argues: *“we have a substantial land bank and it’s better that we exploit it with building good product on it rather than letting someone else fill that space in the market”*.

### 5.1.3 Resources for the provision of logistics-VAS

To implement a landlord-SLS both ports are required to invest in resources. Table 5-1 summarises these resources as identified from the data of the two companies that populate the case study of the landlord-SLS. It should be mentioned that depending on the landlord – tenant contract the requirements for these resources may vary.

Resource Type	Investments for landlord-SLS
Physical capital	Land, purpose built facility, equipment for the facility
Human capital	Relationships with property management companies, managerial insight for the marketing of the facility, relationships with tenants

Table 5-1: Investments in resources for landlord-SLS, source: author’s own

### 5.1.4 Definition of landlord-SLS

Based on the analysis above, the SLS, of Port4T, and Port5 can be termed *“landlord-SLS”*, because none of these ports manages port-centric facilities, or provides logistics-VAS. Their role is limited to leasing land and/or warehousing facilities to intermediaries that wish to provide on-port logistics-VAS. The leased land and facilities can be either within the premises of the port, or on logistics parks adjacent to- and owned by the port.

<sup>30</sup> Please see Appendix G, for current facilities, cargo type, and future developments of the companies allocated in the case study Landlord-SLS.

The simplest form of landlord-SLS is limited to leasing land to the tenant. An advanced landlord-SLS imposes the construction of warehousing facilities by the port according to customer requirements, or the co-finance of facilities in joint ventures (JV). However, in no circumstance will the port be actively involved with the provision of logistics-VAS. Therefore, it can be asserted that the SLS revenue of landlord-SLS yields from leasing land and/or facilities to third parties.

Implementation of landlord-SLS is either path dependent, as it is inherited from traditional functions of ports prior to containerisation, or is a “*risk averse*” approach in meeting the demand of the market. That is because leasing land and/or facilities is considered less risk intense function in comparison to managing and operating the facilities.

Furthermore, ports that implement a landlord-SLS can be involved in the marketing of facilities, to ensure tenants’ success. Such practice supports the core functions of ports in two ways. On one hand the success of tenants’ operations results in increased container throughput. On the other hand, successful operations lock-in tenants for longer leases. Table 5-2 summarises the key characteristic of landlord-SLS.

<b>Landlord-SLS</b>	
<b>Involvement</b>	- Leasing of land and/or warehousing facilities to third parties for the provision of logistics-VAS. - Marketing of port-centric facilities.
<b>Motivation</b>	Path dependency and/or outsourcing of non-core activities whilst meeting market’s demand.
<b>Physical capital resources</b>	Land, purpose build facility, equipment for the facility
<b>Human capital resources</b>	Relationships with the property management companies, managerial insight for the marketing of the facility, relationships with tenants.

**Table 5-2: Landlord-SLS, source: author’s own**

## **5.2 Operator-SLS**

Data analysis revealed twelve organisations (Port4S, LSP1-9, Retailer1 and Retailer2), which actively provide on-port logistics-VAS, either as providers of logistics-VAS (revenue from the charges for logistics-VAS), or as providers and consumers of logistics-VAS (internal use of logistics-VAS). Additionally, those organisations might be organisers of logistics-VAS (i.e. the port/intermediary is the trading entity but subcontracts part or the entirety of the offering to counterparties). The following sections present the role of each of these companies within PCL industry, the number of years involved with PCL, and their resource investments. Thereafter, the emergent definition of an operator-SLS is provided.

### **5.2.1 Role in the PCL industry**

This section presents the role of each firm that implements an operator-SLS within the PCL industry and the type of relationship with the respective port. However, due to the large number of companies assigned to the case study of operator-SLS and word limitations of this thesis, the role of each company and the relationships of each company with the port are summarised in Table 5-3.



	<b>Role in the PCL industry, and PCL Offering</b>	<b>Relationship with the port</b>
<b>Port4S</b>	In-house provision of a bundle of on-port logistics-VAS. Enabling collaborations among customers through a collaborative initiative, that aims to reduce SC cost by promoting inland transportation synergies.	N/A
<b>LSP1</b>	Provision of B2B and B2C end-to-end SC solutions through a mix of in-house and subcontracted services. <b>Subcontracted services:</b> consolidation of orders abroad through a network of collaborating freight forwarders, shunting of containers from/to container terminal, and inland transportation of customer orders. <b>In-house services:</b> entire spectrum of logistics-VAS from the point where the container is presented at the warehouse gate, until customer order is dispatched.	Purely transactional and limited to the role of the tenant for one facility that is located at the container terminal.
<b>LSP2</b>	Provision of on-port warehousing and other logistics-VAS for imported and exported cargo from its leased warehouses from Port4T. Provision of inland road distribution through subcontractors, and through their subsidiary haulier company, and e-platform for haulage exchange.	Purely transactional relationship with Port4T, who acts as the landlord for the facilities leased to LSP2 and provides stevedoring, and container storage and shunting services.
<b>LSP3</b>	Receipt of custom cleared containers, storage of products, preparation of customer orders, and arrangement for delivery to customers from the company facilities that are located 45 miles from Port2. Nevertheless, they are still marketed as port centric <sup>31</sup> .	Beyond its collaboration with freight forwarders and distribution companies located at the port, LSP3 is not involved in any formal relationship with Port2; it leverages its relative proximity for marketing purposes.
<b>LSP4</b>	Use of PCL facilities at Port4T and Port2 as e-fulfilment, cross dock and product re-processing centres. In-house offering of end-to-end SC solutions, with exemption of a small percentage of inland distribution. The Port2 facility allows entrance into wine bottling market.	Landlord-tenant relationship with POCs. Close relationships facilitating the prioritisation of urgencies, and seamless experience for the customer

<sup>31</sup> “I class myself partly as port centric because I am one of the nearest contract-led LSPs to [Port2]. It hasn’t worked against us, for the last years the majority of the business we win is because of our proximity to the port. [...] So we are pushing it and trying to advertise our location being near the port. Although ultimately we are not that close to the port but if you are in America and look at a map we are close enough to the port. We are trying to get a facility nearer the port to make us even more port centric than what we are [...]”. (Managing Director of LSP3)

<b>LSP5</b>	<p>Use of its East Anglia warehousing facility as a transportation hub and bonded cross-docking facility for of logistics-VAS to e-commerce customers.</p> <p>LSP5 collects containers from Port2, handles products into customer orders and delivers to customers' DCs any order greater than pallet size.</p>	<p><i>“Our relationship with the port is truly as a transport business. We inform the port that we’d like to pick up these containers, on these days, and they just allow us to enter the port and pick up the containers and move them wherever we are moving them to, it’s not really collaboration”</i></p>
<b>LSP6</b>	<p>Provision of on-port logistics-VAS associated with receipt of imported containers, storage of products, reprocessing into customer orders, and delivery to customers' DCs. LSP6 also provides logistics-VAS for exports and arranges for the deconsolidation of full container loads to customer orders at destination. LSP6 also runs a primary consolidation centre on-port for a large UK retailer. During peak periods LSP6 implements an origin pick model to facilitate the flow of products through its premises. In-house services with the exemption of parts of inland distribution and container shunting that is subcontracted to the port or third parties.</p>	<p>More than a simple tenant-landlord relationship as it involved collaboration with the port for the development of new processes/services.</p>
<b>LSP7</b>	<p>In-house receipt, store and delivery services for paper products in its warehousing facility that is leased from Port1.</p>	<p>Purely transactional tenant-landlord relationship.</p>
<b>LSP8</b>	<p>Development of a port centric facility on a JV agreement with Port4T with the vision to achieve end-to-end SCM and to match demographic trends whilst exploiting efficiency over miss-located facilities. The port centric facility is part of the service “productization plan” of LSP8 where the logistics-VAS will be perceived as an add-on to the core service offering of the company. Logistics-VAS on an “in-house” basis with the exemption of stevedoring and shipping services.</p>	<p>JV with Port4T for the development of the facility. The port will be co-responsible for the marketing of the facility and the attraction of more shippers, while LSP8 will be responsible for the management and operation of the facility.</p>
<b>LSP9</b>	<p>LSP9 provides end to end SC solutions on a subcontractor basis, including: receipt of containers, on port warehousing and distribution of orders as well as collection of LCL loads from manufacturers, consolidation of those in full container loads and export.</p>	<p>Transactional relationship with other LSPs and ports. In the case of Port3 they have formulated a joint working agreement to utilise the Port3’s PCL facilities for consolidation of orders for export and deconsolidation of imported orders for inland distribution.</p>
<b>Retailer1</b>	<p>Operator of an imports DC at North Yorkshire port for company purposes. The spectrum of services involves devanning of containers, product storage and</p>	<p>Transactional relationship with the port for the shunting of the containers from/to the container terminal and the</p>

reprocessing into cages prior to onward inland distribution to the NDC or several RDCs of the retailer. All activities included from the point that the container is presented to the retailer warehouse until its ready for inland transportation are kept in-house. Container movements from/to port and inland distribution are outsourced to the POC and a LSP respectively. Retailer1 does not have income from logistics-VAS, because they are not selling them to third parties.

facility. Landlord-tenant relationship for the land where Retailer1 developed the facility.

**Retailer2** Operator of an imports DC for the company's own purposes at North Yorkshire port. The role of the DC in Retailer2's SC is like that of Retailer1. However, for the onward inland transportation of products, Retailer2 utilises the multimodal capabilities of the port by using both rail and road transportation.  
Retailer2 does not have any income from logistics-VAS, because they are not selling them to third parties.

Transactional relationship with the port. However, within the company the premonition that relationships should be collaborative exists: *"It should be collaboration because there is a benefit for the retailer as well as a benefit for the port, but I haven't seen that. It usually stays as a very transactional like the containers are here; you can come and pick them up. However, the interesting bit is that the port has talked about it for longer term, and they've done it because it's a competitive advantage for them, so they actively market PCL into the North of the country"*

**Table 5-3: Role of firms that implement an operator-SLS within the PCL industry, and type of relationship with the port, source: (author's own)**

### 5.2.2 Years of involvement with PCL<sup>32</sup>

Concerning the numbers of years of involvement with PCL the Divisional Director of Port4S argues:

*“There are two schemes of thought here, most people think that PCL is about containers and warehousing, but others think that PCL is for any commodity that goes through a port. It goes to that port because it is better to be in that location and that in essence is PCL at its heart. If anything, we’ve been doing PCL for hundreds of years”*

Therefore, it can be argued that PCL for containerised products for Port4S is a continuation of the notion that imported cargo should be handled at port. Furthermore, LSP1 is involved with PCL for a decade, whilst LSP2 commenced its PCL operations in 2011. The Company Director of LSP2 describes their development with the following quote:

*“4 years ago, we decided to open this port centric operation. We started from scratch effectively, but because of my [haulage] business, we could approach many customers who would be interested. That’s really what started us off. My business partner used to work for [a timber provider] so he had connections in the industry. So, we immediately made it off to a profitable start after the first three months of operation and ever since we’ve basically doubled our turnover every year, it just got busier and busier”.*

LSP3 established operations in East Anglia in 2010, and ever since promotes its vicinity to Port2 to attract customers that want to store products there. LSP4 established its port centric facility at Port4T almost two decades ago, according to the Business Development Manager:

*“it’s nothing new for us [...] We entered the contract logistics market with port centric in mind not coming at it from a traditional hub and spoke background we are not a traditional LSP. We started as freight forwarders, so we did not have any assets from the start. We used to outsource all those activities to somebody else, but we acquired warehousing when there was need wherever possible freehold. So, we missed that step, our focus is on port centricity”.*

Furthermore, LSP4 acquired the land to develop a new warehousing facility at Port2 in 2009. However, due to outstanding planning permission, constructions commenced in the second quarter of 2014. The Port2 facility is operational since the end of 2015.

LSP5 established port centric operations in 2012 when they purchased their East Anglia facility. The Group Sales Director justifies this decision in the following quote:

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<sup>32</sup> Please see Appendix G, for current facilities, cargo type, and future developments of the companies allocated in the case study Operator-SLS.

*“We needed a bonded facility to offer an enhanced service to our customers and the site had bonded accreditation. It was also apparent to us that the amount of work generated by [Port2] was underserved both from the amount of warehousing but also from the number of companies able to offer genuine port centric solution. So, we felt that there is an opportunity for us. Also, the facility would allow us to offer services to some e-commerce customers that wanted to keep imported products close to port to avoid the cost involved in getting the product from port to their central distribution centres”.*

Therefore, it can be argued that LSP5 invested in PCL to expand its customer base by entering the e-commerce market, servicing the demand for warehousing in East Anglia, and to enhance the service level to existing customers by offering bonded warehousing

LSP6 commenced its PCL operations in 2002 when they leased their first warehouse from Port2 to import, de-man and prepare for onwards transportation overweight containers that are not allowed to be transported by road. The Commercial Director of LSP6 argues that PCL is not a viable option for the entire product range of someone’s SC. However, he emphasises that a very interesting aspect for PCL is e-commerce:

*“because there is more and more sort of the Ali-Baba type stuff that comes through, [...] if the customer is buying directly from the Far East, then PCL is right because there is no point in moving anywhere else to be honest, because you don't know where it's going to go in the country”.*

LSP7 commenced PCL operations at Port1 in 2011. They utilise their port centric facility as a hub for operations in Northwest England. LSP7 operates similar facilities in other UK and Irish ports. However, the establishment of the Northwest England facility allowed them to enter the container transport industry, as according to the Commercial Manager of LSP7, *“prior to investing in this facility we were handling bulk cargo only”.*

At the time of the data collection LSP8 had not yet commenced PCL operations. However, they were developing, under a JV agreement with Port4T, a 225,000sq. ft. facility for the storage of imported and locally sourced temperature control food products, due to commence operations in March 2016. The Supply Chain Director of the company maintains that the Port4T facility will enable them to enter the market of fresh fruits, *“that’s a market that we until today haven’t really got involved in and that’s the new opportunity that PCL lends itself to”.*

LSP9 collaborates with various ports and LSPs since 2009, but formed a joint working agreement with Port3 in 2013. LSP9 does not own any assets, the company contracts with various LSPs and ports to provide end-to-end SC solutions to its customers,

who mainly are small retail companies that do not require full container loads. Therefore, LSP9 organises the consolidation of these loads into a full container load.

Retailer1 is involved with PCL industry since 2006. The Head of SC argues that the company decided to establish an imports' DC at North Yorkshire port to *“be able to access our containers very quickly after arrival and hold inventory close to the point of arrival and then distribute direct to our regional DCs”*. Additionally, he argues that this DC would enable them to avoid the congested UK southern ports, and optimise their inland distribution network because they would consolidate in a single in-house DC operations previously outsourced to *“randomly dotted around the country”* third party warehouses.

Retailer2 established its PCL facility at the North Yorkshire port in 2009. The main reasons for selecting this location was that the port already had an extensive development plant, planning consent for high bay warehouses and offered multimodal capabilities for inland transportation. Additionally, the port could deliver the site within the retailer's required timeline. The main reasoning for Retailer2's PCL investment is that at the time the retailer was growing rapidly and needed extra storage capacity. Additionally, the retailer wanted to keep imported products at the point of import until their destination was known to remove distribution legs and reduce costs. Furthermore, the Partner and Technical Director of the company argues:

*“For the port this was very appealing, the port looks at it mainly as a revenue driver for the containers because once you are committed to a certain port, you've got a very strong case of bringing your containers into that port so it's a guaranteed future income stream”*.

### **5.2.3 Logistics-VAS and Resources for the provision of logistics VAS**

This section presents the logistics-VAS and charging structure of the firms that implement an operator-SLS as identified by the analysis of the primary and secondary data. Additionally, this section presents the investments in physical and human capital resources made by the firms that implement an operator-SLS, to provide logistics-VAS, as they were identified by the analysis of the primary and secondary data of this research. However, due to space limitations the logistics VAS and the investments in resources are summarised in Table 5-4, and Table 5-5 respectively. It should be mentioned that the table presents only the new investments in physical and human capital resources. Empty cells do not necessarily indicate that the company does not possess the respective resource.

	Stevedoring services	Hanging, tagging, & bagging of garments	Bottling of alcoholic beverages	Consignment redirection between fast and slow distribution networks	Inlands Distribution	Parcel deliveries	Container shunting to/from the warehouses located out the premises of the port	Consignment consolidation	Freight Forwarding	Return process	E-commerce	Quality control	Customer services	Cross-docking	Container stuffing cargo rigging and lashing	Origin pick	General reworking services including co-packing and mixing	Gift packing	Labelling	Stock control and management	Pick and Pack services	Storage	Palletising	Transhipment	Compliance checking	V.A.T. Deferment	Customs clearance	Container devanning
Port4S								•																				
LSP1					*	*	*	*	*																			
LSP2							*																					
LSP3					*								•															
LSP4																												
LSP5																*												
LSP6																												
LSP7																												
LSP8																												
LSP9						*	*	*	*						*	*	*	*	*	*	*	*	*				*	
Retailer1																												*
Retailer2																												*

\*: subcontracted, •: in-house

Table 5-4: Logistics-VAS per company, source: (author's own)

	Port4S	LSP1	LSP2	LSP3	LSP4	LSP5	LSP6	LSP7	LSP8	LSP9	Retailer1	Retailer2
<b>Physical Capital Resources</b>												
Development of on-port/near-port warehousing facility/ies	•	•		•	•				•		•	•
Leasing of on-port/near-port warehousing facility/ies		•	•		•	•	•	•				
Improved IT system and planning equipment	•	•	•	•		•		•				
Product/Pallet storage <sup>33</sup> and handling <sup>34</sup> equipment	•	•	•		•	•	•	•	•		•	•
Container/Pallet/Cage handling equipment <sup>35</sup>		•	•			•		•				
Road vehicles, skeletal trailers			•					•				
Manufacturing line					•							
<b>Human Capital Resources</b>												
Warehouse workers		•	•		•	•		•	•		•	•
Forklift and Truck drivers		•	•					•				
Stock planners		•										
Skilled engineers					•							
Staff training and development			•				•					
Managerial level staff						•						
Temporary staff							•				•	
Relationships with ports and LSPs										•		

**Table 5-5: Investments in new physical and human capital resources for the provision of logistics-VAS, source: (author's own)**

<sup>33</sup> e.g.: aisle racking systems

<sup>34</sup> e.g.: scanning and picking machines, wrapping devices

<sup>35</sup> e.g.: Forklifts trucks, side loaders, articulated units, offloading ramps, dock levellers and clamp trucks etc.



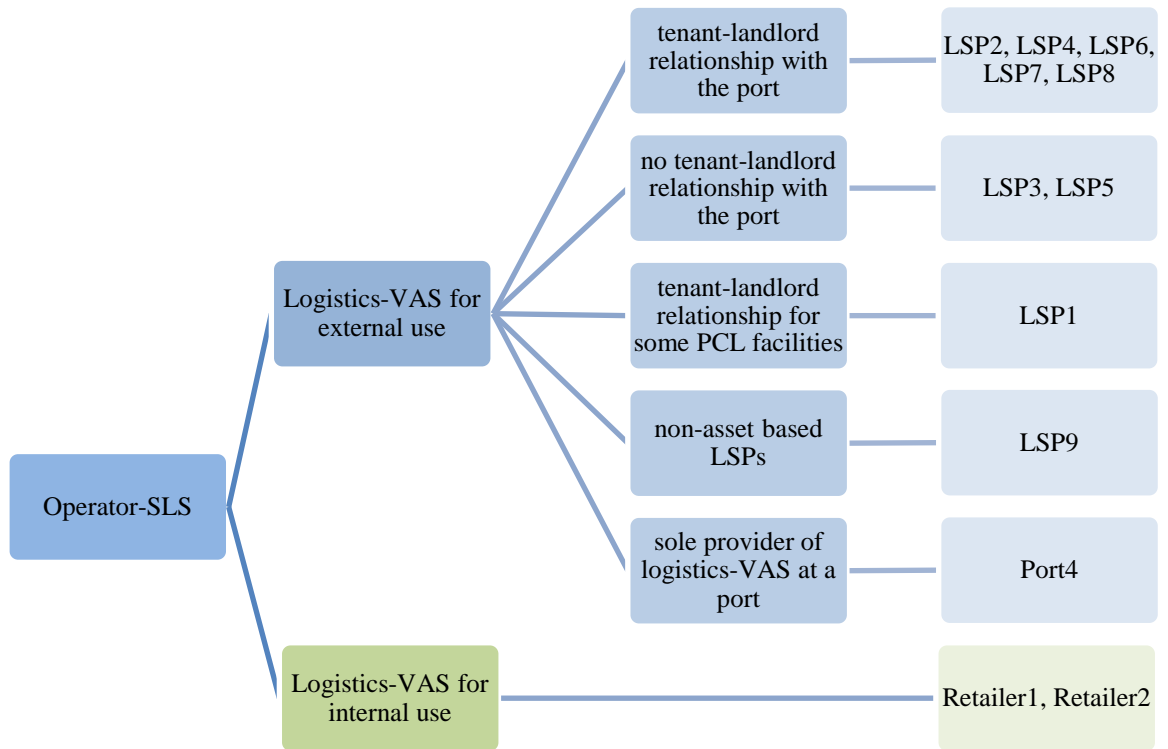
#### 5.2.4 Definition of operator-SLS

The SLS, of Port4S, LSP1-9, Retailer1 and Retailer2 can be termed “*operator-SLS*” because it implies direct involvement in the provision of logistics-VAS for external or internal use. Additionally, an “*operator-SLS*” might coordinate the organisation of logistics-VAS. In that, the firm that implements an operator-SLS will be the trading entity, but service provision will be partially or fully subcontracted to counterparties.

External use of logistics-VAS refers to organisations engaged with provision of logistics-VAS as their core offering, or part of their offering to customers. Therefore, those organisations earn revenue from logistics-VAS. Based on the ownership of the facility, five subcategories of firms implementing an operator-SLS for external use of logistics-VAS are identified.

- i. LSPs (LSP2, LSP4, LSP6, LSP7) leasing warehouses from the port (therefore, have a tenant-landlord relationship with the port) or form JV with the port (LSP8).
- ii. LSPs located in the proximity of a container port, marketing themselves as port centric and providing similar services as with LSPs located on port, but are not engaged in tenant-landlord relationships with the port (LSP3, LSP5).
- iii. LSPS engaged in a tenant-landlord relationship with the port but also own facilities in near proximity of the port that are marketed as port centric and are operated in the same way (LSP1).
- iv. Ports that are the sole provider of logistics-VAS in that port (Port4S). Therefore, they earn revenue from the provision of those services and are the landlord of the facility. However, they do not earn revenue from leasing warehousing facilities as they are the sole operator for these services. Thus, they do not have a dual source of income from PCL.
- v. Non-asset based LSPs offering logistics-VAS for external use on a subcontractor basis (LSP9).

Figure 5-2 depicts the various types of firms that implement an operator-SLS for external use of logistics-VAS.



**Figure 5-2: Types of operator-SLS, source: (authors own)**

Internal use of logistics-VAS aims to improve internal operations, which are defined as the “unseen” supportive processes for an organisation’s visible functions (Davis, 1991). The internal use of logistics-VAS is identified in two retailers (Retailer1, Retailer2) in the sample. These organisations invested in port-centric facilities to optimise their internal logistics functions for imported products by reducing costs and lead-time. Therefore, logistics-VAS are used internally to support core operations. In this case firms do not earn revenue from logistics-VAS but are still considered eligible even if they partially meet the inclusion criteria for this case study.

The implementation of an operator-SLS can be considered as a response to market requirements, which in this context is demand from cargo owners for logistics-VAS at points of import. For example, LSP6 transferred its warehousing operations from Essex to Port2 to exploit operational efficiencies that can be achieved if containers are not transported by road. Another example is LSP5’s involvement in PCL as response to the need of customers for bonded warehousing and an opportunity to service underserved demand for logistics-VAS in proximity of Port2.

Furthermore, organisations implemented an operator-SLS to enter new markets. A distinct example is LSP8 that aims to enter the fresh fruit market and frozen foods market, segments that were not previously handled by the organisation. Similar examples are

LSP4, who entered the wine bottling market, and LSP5, who entered the e-commerce market. Another reason for implementing an operator-SLS is the capability to extend control over the SC by incorporating another SC segment. This reasoning was provided by organisations with already established national distribution networks. Their investment in PCL enables them to extend SC control by capturing imported products at the point of import. LSP8, Retailer1 and Retailer2 are distinct examples that invested in port centricity for this reason.

Finally, implementation of operator-SLS can be path dependent. One example would be Port4S where the involvement in logistics services for containerised products is inherited from traditional functions prior to containerisation. Similarly, LSP4 developed from a freight forwarder to an asset based LSP. Table 5-6 summarises the key characteristic of operators-SLS.

<b>Operator-SLS</b>	
<b>Involvement</b>	Provision of logistics-VAS for external or internal use
<b>Motivation</b>	Response to market requirements, path dependency, entrance in new markets, part of end-to-end SC, optimisation of internal functions.
<b>Logistics-VAS</b>	<p><b>Within the port/warehouse premises:</b> container devanning, container shunting to on-port warehouses, customs clearance, transloading, cross-docking, palletising, barcoding, compliance checking, storage, stock control management and handling, order picking, VAT deferment, pre-retailing services such as product labelling, gift packing and co-packing, packing, customer services, e-commerce, return products re-processing and re-sale, and consolidation of LCL to full container load and container stuffing for exports.</p> <p>Services specialised on particular product types such as hanging, tagging and bagging for garments and bottling for alcoholic beverages. Services on containers such as rigging and lashing and stevedoring services.</p> <p><b>Outside the port/warehouse premises:</b> freight forwarding and agency services, container shunting to/from the port warehouses, inland distribution on pallet or parcel carriers, consignment consolidation, origin pick and consignment redirection between fast and slow distribution networks.</p>
<b>Physical capital resources related with:</b>	the development and operation of modern warehousing facilities, cargo handling equipment and installation of specialised production units within the warehouses. Additional investments in IT systems with stock and space planning, e-commerce and bonded warehouse capabilities.
<b>Human capital resources to:</b>	operate and manage the warehouses, monitor inventory, operate specialised production units and provide inland distribution; partner with experts for the provision of specialised services; develop and manage relationships with ports, other LSPs, labour agencies and customers; train

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new staff and supervise staff continuous improvement; and market the facilities.

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**Table 5-6: Operator-SLS, source: (author's own)**

### **5.3 Hybrid-SLS**

The data analysis reveals three organisations which actively provide logistics-VAS (revenue from the charges for logistics-VAS for external use), and act as the landlords for the provision of those services (revenue from leasing facilities to intermediaries). These are Port1, Port2 and Port3. In the following sections the role of each of these companies, the number of years involved with PCL, the services provided and their investments in resources are described. Thereafter, the emergent definition of a hybrid-SLS is provided.

#### **5.3.1 Role in the PCL industry**

Port1 “exploits” PCL to increase cargo volume by “locking-in” customers, following a hybrid approach, described by the CEO of Port1 as follows:

*“I didn’t take any comfort when I said that we have a hybrid model, because hybrid model can very easily sound like we don’t know what we are doing, it has to be one or the other. There is a natural blend between being a traditional landlord and being an operator in its pure sense”.*

The Head of Commercial Strategy of Port1 describes the operator role of Port1 in the following quote:

*“Our model is different to those where the port is the landlord and a LSP is the lead tenant and then goes out and run as it has their own business. We ourselves are the trading entity of the warehouse but we will use third party companies to support us where they have specialists’ skills they want to use”.*

From a transactional point of view, the customers work with Port1. However, not all the logistics-VAS are provided by Port1. The port is in partnership with various LSPs that provide specialist services. The responsibility of Port1 ends when the product leaves the warehouse. However, Port1 organises the transportation for certain web based smaller customers who trade in the UK and do not manage their transportation. Port1 will be actively involved in onward inland transport only through the operation of a barge on the ship canal. Port1 used to be involved with haulage in the past, but they withdrew. Their CEO reasons this decision as follows:

*“We decided that haulage services are something that completes the value chain that we did offer and we essentially rather than acquire the expertise to deliver that we tried to build the expertise, and I personally feel that this have been an expensive learning curve. We are not hauliers. That’s a different business”.*

He further claims that the current operator role of Port1 might change in the future. He explains that the ultimate long-term vision for Port1 is the establishment of a large team responsible for the management of the logistics-VAS. This team would be focusing on the optimisation of value extraction from PCL contracts and will be focusing on increasing cargo volumes rather than delivering logistics-VAS. He comments: *“But it's a big step; it's a leap of faith moving away from having the ability to totally control something”*.

Furthermore, beyond its role as an operator of logistics-VAS Port1 act also as the landlord for some LSPs who operate on port's estate. The Port Director of Port1 describes this function as follows:

*“We are not the sole provider of PCL, there is a number of LSPs on a leased base on the port's estate who provide those solutions [N: so, what is the main decision behind renting a facility to a LSP, or using it by yourself?] It's really down to two things. One is what yield could be maximised so are we better financially to operate it or a third party. Secondly, where does the skill set sits, who has the specialists' skills, ourselves or a LSP”*.

The second company assigned to the case study of hybrid-SLS is Port2. The Commercial Director of Port2 describes the role of the port as threefold.

*“[...] we are offering three main types of services, we offer a logistics park as we recently have done, facility management would also be another one and we have a small in-house logistics company, which offers port centric services for some companies. These could be for example retailers that might want to use these services, so we will offer them the services they want, but it is mostly smaller customers because the big retailers have their own contracts in most of the cases with other logistics providers”*.

Therefore, Port2 leases land and facilities for the provision of logistics-VAS. However, Port2 also actively provides logistics-VAS for smaller customers that do not contract with other LSPs, through their subsidiary logistics company.

According to the Supply Chain Marketing Manager, Port2 was the sole operator for the on-port warehouses for the first three years of involvement with PCL. However, they decided that these functions needed to be outsourced to LSPs. He argues:

*“a number of things played towards that, one is the return on that particular service was not in keep in with normal port's rate of return. Also, you had an obligation to provide WMS and we actually finished up with seven, because individual customers would want you to use their systems. That affected the labour mobility because [...]. Also, once you unload containers you immediately pick up product liability. There is still a liability of moving containers around but ports very rarely damage containers”*.

The third company assigned to the case study of hybrid-SLS is Port3. By formulating an association partnership with LSP9, Port3 offers a whole bundle of services to customers on a single invoice. LSP9 arranges end-to-end solutions for cargo owners and utilises facilities of Port3 to consolidate LCL into FCL for export, or deconsolidates imported products and arranges for distribution in the UK. The business development manager of the port describes the relationship between Port3 and LSP9 as follows:

*“LSP9 will work with the port authority, they will buy services from us, we're obviously a fully-fledged port, so we can administer shipping, we also have our own in-house stevedoring, so we can offer all the cargo handling, all the storage, the warehousing if it's required we can devan containers, we can stuff containers with our own employed staff”.*

Based on the above quote Port3 can be considered as an operator of logistics-VAS. However, beyond the agreement with LSP9, Port3 has long-term contracts with other operators that lease warehousing facilities on the port premises and are involved with PCL:

*“We host and support a number of tenants on site, but we let them get on with what they are experts in, we don't interfere in their business. There is a very clear policy inhered in being municipally owned, in that none of the port estate will be placed for sale there are various leases that exist, and that's the model in which we associated with partners. So, the County Council retains the ownership of the asset under any circumstance. We have many leases and are not averse to striking long term arrangements in that regard. [...] When you have a predictable income stream, it allows you to maybe take a slightly different view on more risky opportunities”.*

Therefore, it can be argued that Port3 implements a hybrid-SLS because it earns revenue from the in-house provision of logistics-VAS to the customers of LSP9, but also leases facilities to third parties. Port3 is not involved in the marketing of facilities leased to intermediaries, nor has any direct contact with cargo owners. The trading entity in these occasions is LSP9.

### **5.3.2 Years of involvement with PCL<sup>36</sup>**

Port1 launched its offering of in-house port centric warehousing services in 2010. According to the group's CEO:

*“that was bit of an adversity really, [...] a major customer on site had a large warehousing facility here, importing plastic patio furniture, ultimately ended up to us, they went bust. At time the business was still in the depths of recession, so the management asked how we will actually utilise this warehouse. We didn't have any big customers knocking on our door at that time, but we have lots of smaller*

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<sup>36</sup> Please see Appendix G, for current facilities, cargo type, and future developments of implementers of a Hybrid-SLS.

customers asking for warehousing space and distribution, none of them big enough to take this. So, we set up our multiuser warehouse at that point and before we knew it, we sort of set it up at the adversity really, but it became quite a compelling story”.

Port2 is engaged with the provision of PCL for more than a decade, the Supply Chain Marketing Manager argues:

*“It all started back in 1999. We didn’t call it PCL then. We started a project called Sea-Change, but it wasn’t really working for us as it wasn’t descriptive enough, so a colleague of mine said why don’t we call it what it is. It’s port centric and that’s how it all started. The project’s aim was to leverage the port’s assets and hinterland for the benefit of the cargo owner rather than what the port had previously seen as its customers being the shipping lines. [...] So, we wanted to create something of additional value within the port community that meant that irrespective of the shipping line they would continue to ship containers through in the future. In 1999, the port had 23 warehouses covering 1,250,000sq. ft. previously used for storing forest products. That business moved to a niche port, so the port had the warehouses at its disposal to use for whatever it chose. My research showed that the port needed to offer those warehouses in some way to support containerised movements”.*

Port3 has been involved with the role of the operator of logistics-VAS upon commence of the partnership with LSP9 in late 2013. However, Port3 has been a landlord for PCL since 2005 when it diversified its strategy because its major clients from the pharmaceutical industry ceased operations. The Business Development Manager of the port argues:

*“That was the launch of our journey towards PCL it was about diversifying and starting to develop the offer understanding more about customer needs by networking and associating with quality partners that could give us the scope of service without the port authority necessarily having to provide all services directly”.*

### 5.3.3 Logistics-VAS and charging structure

This section presents the logistics-VAS provided by the organisation implementing a hybrid-SLS on an own account or on a managed service basis, as identified by the analysis of the primary and secondary data (See Table 5-7).

	Port1	Port2	Port3 <sup>37</sup>
Container devanning	●	●	●
Container shunting to/from the warehouses located within and outside the premises of the port (logistics parks)	●/*	●/*	●/*

<sup>37</sup> Port3 currently has no sea based container services. Therefore the containers are presented to them either by road or rail.

Customs clearance	●	●	●
VAT deferment		●	
Compliance checking	●	●	●
Re-boxing and palletising and shrink wrapping	●	●	●
Storage	●	●	●
Pick and pack services	●	*	
Labelling or Re-labelling	●	●	
General reworking services including co-packing and mixing	●	●	
Stock control and VMI fulfilment		●	
Inland road distribution	●	●	
Parcel deliveries	●		
Inland barge transportation	●		
Development of new services in collaboration with customers upon request <sup>38</sup>	●		
Origin pick		●	
Freight forwarding		●	
Container tracking		●	
Consignment re-direction between fast and slow distribution network		●	
Consignment consolidation into LCL for exports			●

**Table 5-7: Logistics-VAS per company (\*: refers only to services where the company is the trading entity), source: (author's own)**

### 5.3.4 Resources for the provision of logistics-VAS

For the implementation of a hybrid-SLS investments in physical and human capital resources were made. The investments in physical capital resources of Port1 related to the upgrade of port's existing warehousing stock to accommodate containerised products, and to provide the services listed in Table 5-7. The Head of Commercial strategy argues:

*“We are not spending an awful lot. I wouldn't say we are doing anything new or revolutionary to the warehousing marketplace. What we are doing that is new is bringing lots of supply chain skills and attributes to a port environment. We can do that because of our proximity to market. Many of the internet retailers in the UK are not based in the Midlands they are based in the Northwest because of geographic proximity to market rather than population proximity to market. That's the ability to get up in to Scotland on a next day basis. So, we have an opportunity that we can exploit by bringing decent logistics process to our port estate that may not exist for other port environments because they are geographically remote”.*

Additionally, regarding the human capital investments, the CEO of the group argues:

<sup>38</sup> *“It's all collaboration and our approach is very much driven by that. Quite often customers spark the ideas, they might say this is our problem and maybe say in a way they don't think that the port can offer a solution. So when we talk to cargo owners we behave more like a LSP and less like a port. That enables us to see if we can have solutions” (Head of Commercial Strategy).*



*“Our executive board has a very healthy balance of skills across our team, people from infrastructure, services, supply chain, manufacturing. So, we have a natural advantage in that. Again, one of the things that I am very keen to do, is to make sure that we have an influx of new talent, we don't preclude the traditional industry that would be naive [...]. Often, it's too easy to just look at technology or even changing market dynamics but people change market dynamics. So, having the right skills is important”.*

Therefore, it can be inferred that the resource investments made from Port1 are also focused on the enhancement of the unique characteristics of the port in terms of location and proximity to market and the strengthening of the managerial capabilities of the company.

Port2 has not invested recently in PCL facilities *per se* beyond the development of the new logistics park. The new logistics park is a response of the port to the increased demand for port centric and on-dock logistics. On the contrary, Port2 invests in physical capital resources that will enhance the efficiency of cargo accommodation. Those investments include IT systems for improved container management, and expansion of berths and quays and operating systems to accommodate the largest container vessels.

Additionally, the port invests in its rail connectivity so that all the containers will be handled as efficiently as possible, even if they are not destined for a warehouse in its proximity but for warehouses located further inland. The port markets its increased connectivity as an advantage for those willing to invest in facilities in the park.

Furthermore, for the provision of logistics-VAS Port3 invested in container handling equipment. The Business Development Manager of the port comments:

*“We invested in the facility, to create a fit for purpose port again, not to create anything new, just putting in the investment that one would have hoped the steel industry had done the prior years”.*

Regarding the human capital resources required for logistics-VAS Port3 utilises its own work force. However, concerning the commercial side of the services the port utilises its own business development function and the human capital resources of its business partner. The business development function of the company is responsible *“to understand what the market demands are, and we needed to understand how well we could reflect the requirements of customers”*. The sales team of LSP9 will then tailor a SC solution for those cargo owners.

Additionally, the port preserved and developed its rail connections with the mainline to offer full facilities. The Business Development Manager of Port3 argues: *“Crucial part*

*of the multimodal mix is being able to support rail traffic, we are not and will never be rail operators, but we partner with all the main operators in the country”.*

Based on the above, Table 5-8 summarises investments in physical and human capital resources required for the implementation of a hybrid-SLS. Depending on the SC involvement of each company, the cargo type and volume and the size of each port, requirements for these resources can vary.

Type of resources	Investments for hybrid-SLS
<b>Physical capital</b>	<ul style="list-style-type: none"> <li>- Investments in racking, barcoding equipment and scanners, product handling equipment such as forklifts and trucking trailers, and in various production lines for the re-processing of products.</li> <li>- WMS to enable reduced labour cost, space optimisation, and fine picking for internet fulfilment capabilities.</li> <li>- IT investments for optimised container management and for vessel traceability providing the capability to plan their warehousing capacity</li> <li>- New multipurpose warehouses and logistics parks.</li> <li>- Investments in the rail connectivity of the port.</li> <li>- Investments in container handling equipment, berths and quays to be able to accommodate container ships.</li> </ul>
<b>Human capital</b>	<ul style="list-style-type: none"> <li>- Staff to operate the warehouses</li> <li>- Managerial insight from different perspectives to develop the company</li> <li>- Partnerships with LSPs to provide specialist services and support non-core activities.</li> <li>- Partnership with rail operators</li> <li>- Relationships with property management companies</li> <li>- Relationships with tenants</li> </ul>

**Table 5-8: Investments in resources for hybrid-SLS, source: (author’s own)**

### **5.3.5 Definition of hybrid-SLS**

The SLS, of Port1, Port2, and Port3, can be termed “*hybrid-SLS*” because the term imposes a duality of roles. Ports that implement a hybrid-SLS lease land and/or warehouses to specialists (predominantly LSPs), to provide logistics-VAS. In this capacity, ports adopt the role of the landlord. Consequently, they yield revenue from leasing facilities to intermediaries. Additionally, those who implement a hybrid-SLS act also as operators, in that they actively provide logistics-VAS. Consequently, they yield revenue from the marketing of logistics-VAS for external use. Concerning the operator role three distinct business models can be observed. In its simplest form, the port will be the trading entity and the sole provider of logistics-VAS. However, in other occasions, like Port3, the LSP will be the trading entity with the cargo owner but the LSP will buy logistics-VAS from the port. However, the exact opposite might also happen. In that the

port will be the trading entity with cargo owners and will provide some of the services, but will also outsource the most specialised aspects of the offering to a LSP (see Port1).

An interesting observation is that all three organisations pursued a landlord-SLS prior to a hybrid-SLS. This strategic shift is justified by various reasons such as, sudden availability of warehousing stock, desire to strengthen cargo volumes over the quay, and strategic shift to obtain the capability to handle containerised cargo.

The analysis of the data also reveals that, in the long-term, ports tend to reduce their operator role by engaging in collaboration with LSPs. This is noticeable in the cases of Port1 and Port2. Port2 acted as the sole provider of logistics-VAS for three years. Since 2002 it outsourced most of the logistics-VAS to a LSP and has been providing only a limited amount of logistics-VAS to smaller clients. Similarly, Port1 in the long-term aims to withdraw from the provision of logistics-VAS and acquire the role of the coordinator of those services. Table 5-9 summarises the case study of hybrid-SLS.

<b>Hybrids</b>	
<b>Involvement in PCL</b>	<p><b>Operator role:</b> Provision of logistics-VAS either at the front-end by engaging with customers directly and outsourcing the most specialised services to experts, or at the back-end by selling logistics-VAS to LSPs.</p> <p><b>Landlord role:</b> Leasing of land and/or warehousing facilities to third parties to provide logistics-VAS and the marketing of these facilities.</p>
<b>Motivation</b>	<p><b>Operator role:</b> availability of warehousing stock, strengthening cargo volumes over the quay, and strategic shift to obtain the capability to handle containerised cargo.</p> <p><b>Landlord role:</b> Outsourcing of non-core activities, securing steady influx of revenue</p>
<b>Logistics-VAS</b>	<p><b>Within the port's premises:</b> Container devanning, on/off port shunting, re-boxing, palletising and latching products for transshipment into other transportation modes, quality assurance and compliance, customs clearance and VAT deferment, on-port storage, picking and packing, product co-packing, relabelling and reprocessing, shrink wrapping, merchandising, VMI fulfilment and orders consolidation, and consolidation of LCL into full container load.</p> <p><b>Outside the port's premises:</b> origin pick, freight forwarding, container tracking and container management, consignment redirection between fast and slow-moving channels, and organisation and/or provision of inland multimodal distribution.</p>
<b>Investments in resources</b>	<p><i>Investments in physical capital resources related with:</i> the development and operation of the warehousing facilities and cargo</p>

handling equipment. Additional investments in IT systems with stock and space planning capabilities.

*Investments in human capital resources to:* operate and manage the warehouses; partner with experts for the provision of specialised services; develop and manage relationships with tenants, labour agencies, property management organisations and customers; and market the facilities.

**Table 5-9: Hybrid-SLS, source: (author’s own)**

## Chapter Summary

Prior to any conclusions, it should be mentioned that one of the interviewed companies, FM1, could not be embodied in any case study, because they are the buyer of logistics-VAS from Port1 (i.e. in addition to port services, they purchase from Port1 warehousing and inland transportation services). Therefore, they cannot be assigned to any of the cases defined above because they cannot be considered as enablers or providers of logistics-VAS. Thus, FM1 is excluded from further analysis. Consequently, the final sample of this research is 17 companies.

Table 5-10 presents the distribution of the 17 organisations that comprise the final sample of this study among the three cases, and Figure 5-3 illustrates the three cases of this research. Figure 5-3 is based on Kotler’s (2003) concentric circles figure of the three levels of product. The initial purpose of Kotler’s figure is to present product augmentation. However, in this study the layout of the concentric circles is used to simply illustrate the three cases of the research, and does not imply any relationship between them like the original purpose of the figure.

	<b>Operator-SLS</b>	<b>Hybrid-SLS</b>	<b>Landlord-SLS</b>
<b>Definition</b>	Operation of PCL facilities for internal or external use of logistics-VAS.	Operation of PCL facilities and leasing of port land or warehousing facilities to intermediaries.	Leasing land or warehousing facilities for the provision of logistics-VAS but do not provide the services.
<b>POC/PA</b>	Port4T	Port1, Port2, Port3	Port4S, Port5
<b>LSP</b>	LSP1, LSP2, LSP3, LSP4, LSP5, LSP6, LSP7, LSP8, LSP9	-	-
<b>Retailer</b>	Retailer1, Retailer2	-	-

**Table 5-10: Distribution of organisations to each case study, source: (author’s own)**

Table 5-10 and Figure 5-3 demonstrate three distinct SLS implemented by ports and intermediaries involved in the PCL industry. Ports that implement a “*landlord-SLS*” provide land and/or facilities to third parties wishing to establish operations to provide

logistics-VAS within the premises of a port. Consequently, the SLS related revenue derives from the leasing of these facilities. Furthermore, ports and intermediaries who implement an “*operator-SLS*” provide logistics-VAS for external use (SLS related revenue derived from the provision of services) or operate of PCL facilities for the internal use of logistics-VAS (no SLS related revenue, use of logistics-VAS for optimisation of internal functions). The last SLS combines the characteristics of the previous two. Ports who implement a “*hybrid-SLS*” actively provide logistics-VAS for external use, and lease land and/or facilities to third parties. Therefore, the SLS related revenue of those organisations derives from the provision of logistics-VAS to third parties, and from the leasing of facilities and/or land to third parties.

The three case studies, presented in this chapter, allow the creation of a typology of SLS of ports and intermediaries involved in the PCL industry. A valid typology is important in theory development, because it considers multiple variables and provides a general set of principles for the objective classification of “things” and “events” in order to evaluate complex phenomena in a straightforward way (Mills and Margulies, 1980). In this research, the development of a typology serves several purposes.

Methodologically, the typology allows data reduction into a manageable manner (Mills and Margulies, 1980). It framed the 18 participating organisations in three groups (case studies) based on common characteristics within an industry. These groups form a “platform” to identify the impact of each SLS on UK ports and intermediaries (RO2 – Chapter 6).

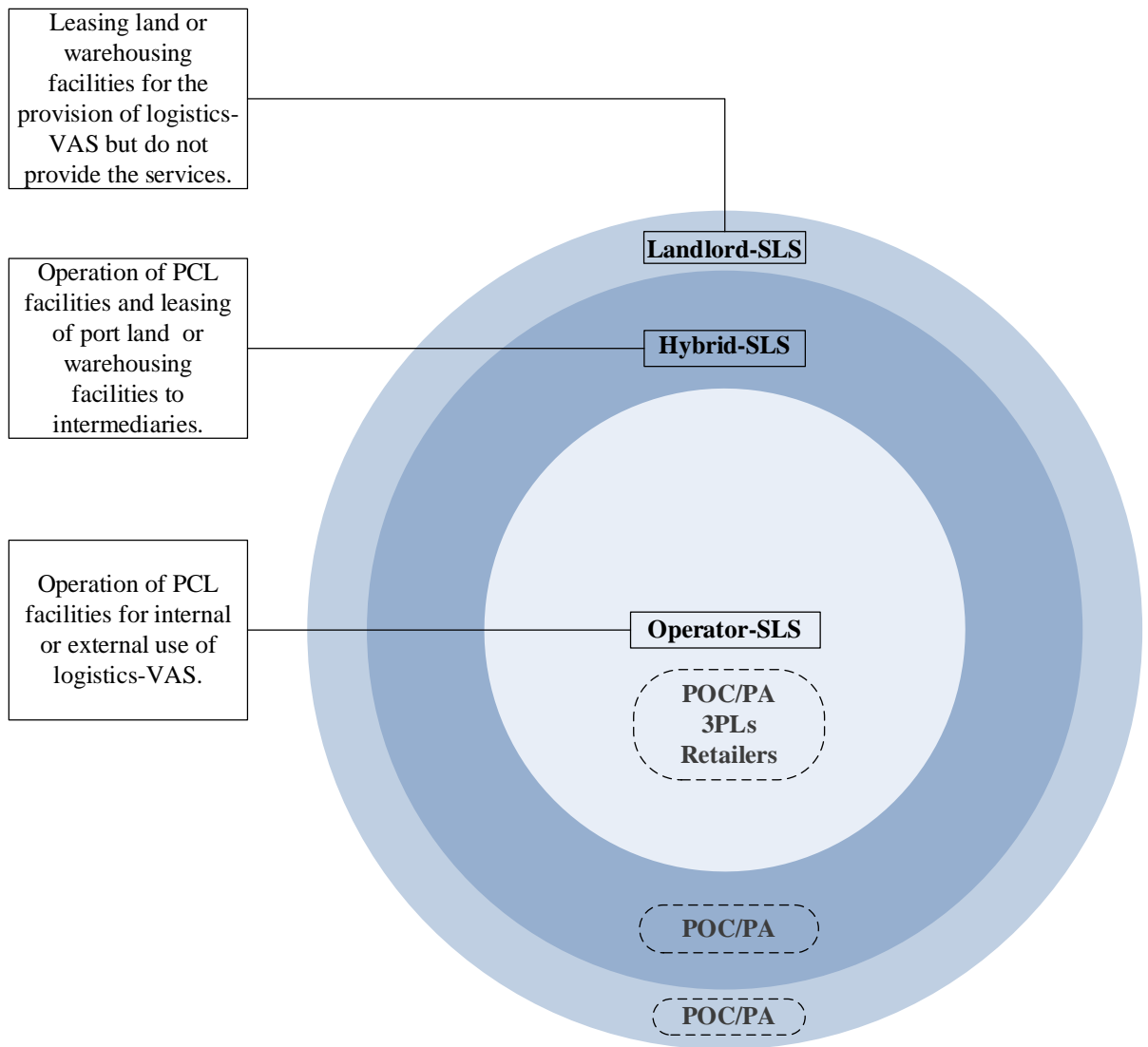
The proposed typology implies a different role and level of resource commitment for firms within the PCL market. It suggests that intermediaries, in a UK context, can only be directly involved with the provision of logistics-VAS, in contrast to ports that follow direct (in-house development and operation of warehousing facilities) or indirect (leasing of land and/or warehousing facilities to intermediaries) paths. Furthermore, the analysis of the data reveals that ports implement SLS to outsource non-core activities, meet market demands, and secure a long-term more stable influx of revenue; whilst intermediaries implement SLS to enter new markets, offer end-to-end SC solutions, and optimise internal functions.

Additionally, the proposed typology, to the best of the author’s knowledge, has not been provided so far in PCL literature. Thus, this typology is a valuable contribution of this study to the PCL literature, because it provides a comprehensive guide to ports and intermediaries regarding the resource investments required for the provision of on-port

logistics services depending on their role in the industry. The proposed typology reinforces the findings of Okorie et al. (2016) that LSPs are actively involved in the provision of logistics-VAS within port estates, and that their involvement in the provision of those services will continue to increase. In particular, a tendency of ports to withdraw from the active provision of logistics-VAS has been identified in the cases of Port5, and Port2, and has been mentioned as a future prospect for Port1.

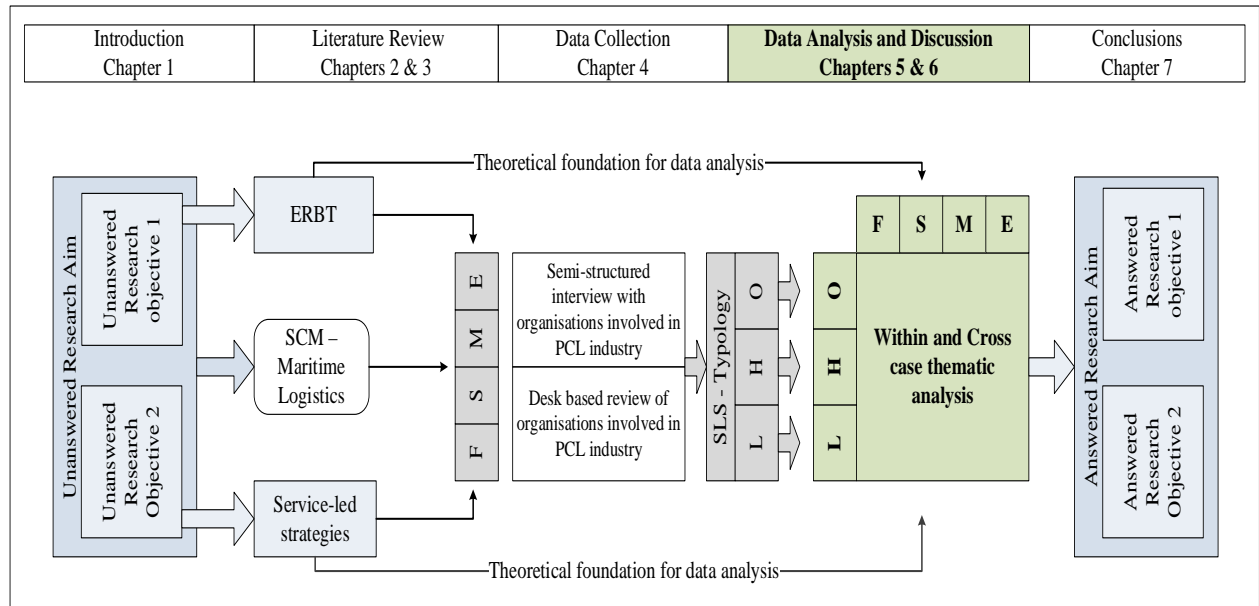
Moreover, the identification of multidirectional and multifaceted SLS of UK ports and intermediaries has a twofold contribution to the SLS literature. While it addressed the call of Kowalkowski et al (2017) for research beyond the transition of manufacturers, it also confirms the existence of different trajectories of organisations adopting SLS, and different service levels in accordance with customer demand in line with Kowalkowski et al (2015).

Furthermore, the identification of the resources utilised in the provision of logistics-VAS, and the way those who implement SLS interact and share resources (relationships) with business network partners for the provision logistics-VAS is of importance for this study. That is because the theoretical underpinning of this thesis assumes that organisations form business networks in which they share network resources to achieve SCA (Gulati et al., 2000; Lavie, 2006; Lewis et al., 2010; Xu et al., 2014; Prajogo et al., 2016). Therefore, this typology contributes empirically to the ERBT literature stream.



**Figure 5-3: Graphic illustration of the three case studies, source: (author's own)**

## Chapter 6 : Analysis and Discussion



**Figure 6-1: Thesis Outline and focus of the chapter**

Chapter 6 addresses RO2 by presenting the within case analysis of the emergent case studies (See Figure 6-1). Once the companies were assigned to cases studies, a template analysis of the primary and secondary data has been conducted (See Template in Figure 4-5). The themes upon which the interviews have been analysed derive from the SLS literature review (Section 2.3.4)<sup>39</sup>. The arguments emerging from the analysis of the data are then contrasted with SLS and PCL literature, to identify convergence or divergence between literature and practice. Also, due to the abductive reasoning of the research design, the emerging arguments are elaborated with the ERBT perspective adopted in this thesis to theoretically underpin the empirical findings and to reconcile and modify the general theory with contextual idiosyncrasies (Ketokivi and Choi, 2014).

<sup>39</sup> Factors affecting the implementation of a SLS have been also identified. However, due to word limitations the presentation and analysis of those factors are provided in Appendix D.



## 6.1 Financial impact

The next three sections, present the responses of the participants concerning the financial impact of their SLS, and a critical comparison of the empirical findings with extant literature.

### 6.1.1 Landlord-SLS

The analysis of the primary data of this research reveals that a landlord-SLS may positively affect the financial performance of ports implementing it. The positive financial impact is expressed in additional revenue streams (i.e. revenue derived from leasing land and/or facilities), and in increased and secured revenue from the provision of core services. Additionally, it is also identified that a landlord-SLS results in “safer” revenue streams in comparison to the traditional revenue streams of the port, because it derives from landlord-tenant contractual agreements of the port and its tenants.

#### Additional revenue streams and sustained revenue from core services

The Head of Commercial of Port4T claims that the port’s involvement with PCL yields increased revenue, “*yes, of course, I mean that's part of our EBITDA we can see that growth quite clearly in different streams*”. One of those streams is the revenue associated with the leasing of warehousing facilities to intermediaries that have established operations at the port. The presence of those intermediaries at the port attracts more customers for the port. She further claims: “*[LSP8] being here and having a facility like that can only benefit the throughput across the quay [this results in] more importers*”. Subsequently, the landlord SLS implicitly secures cargo owners for the core services of the port (i.e. port services). The increased number of cargo owners enhances the revenue derived from core services in addition to the revenue derived from the leasing of land and/or facilities. Similarly, the Commercial Manager of Port5 argues that the port increases and diversifies its revenue streams by the provision of “*turnkey purpose build facilities*” to LSPs. However, none of the participants could comment on the higher profit margin and the contribution of those revenue streams to port annual revenue. Therefore, conclusions regarding the contribution of those port revenue streams to total annual port revenue cannot be made.

From the analysis above, it can be argued that a landlord SLS enables ports to utilise their assets (land) in ways that increase and diversify revenue streams, and increase and sustain core revenue. This argument contradicts the findings from PCL literature; in that ports will realise increased revenue from the provision of logistics-VAS (Mangan et al., 2008; Monios and Wilmsmeier, 2012b; Demirbas et al., 2014; Monios et al., 2018).

However, this case study demonstrated that ports realise higher revenue streams by the leasing of land and/or facilities, and by the subsequent increased and secured cargo throughput.

Similarly, the SLS literature suggests that increased revenue opportunities exist downstream in the SC. The higher revenue can derive from greater profit margin of VAS, in comparison to profit margins of core products, and because VAS are not asset based (Wise and Baumgartner, 1999; Malleret, 2006; Baines et al., 2009b; Neely, 2008; Cusumano, 2008; Smith et al., 2014; Cusumano et al., 2015; Baines et al., 2017). However, a landlord SLS results in increased revenue streams by the leasing of land and/or facilities and the increased and secured cargo throughput.

Concerning the higher revenue that derives from increased demand for core services of the port, it can be argued that the port leverages its own idiosyncratic resources (port land) by accessing the complementary assets of its tenant. In this case complementary assets are regarded as the tangible and intangible resources of the tenant that are necessary for the innovation in question (i.e. logistics-VAS). According to Lavie (2006) and Moxham and Kaupi (2014), if the firm leverages the value of its proprietary resources (i.e. port land, financial resources for development of the building and marketing capabilities), by accessing its partner's complementary assets, then the firm realises internal rent. Figure 6-2 depicts the creation of internal rent for Port4T and for LSP8. The figure is based on Lavie's (2006) figure of rents extracted by the firm in an alliance.

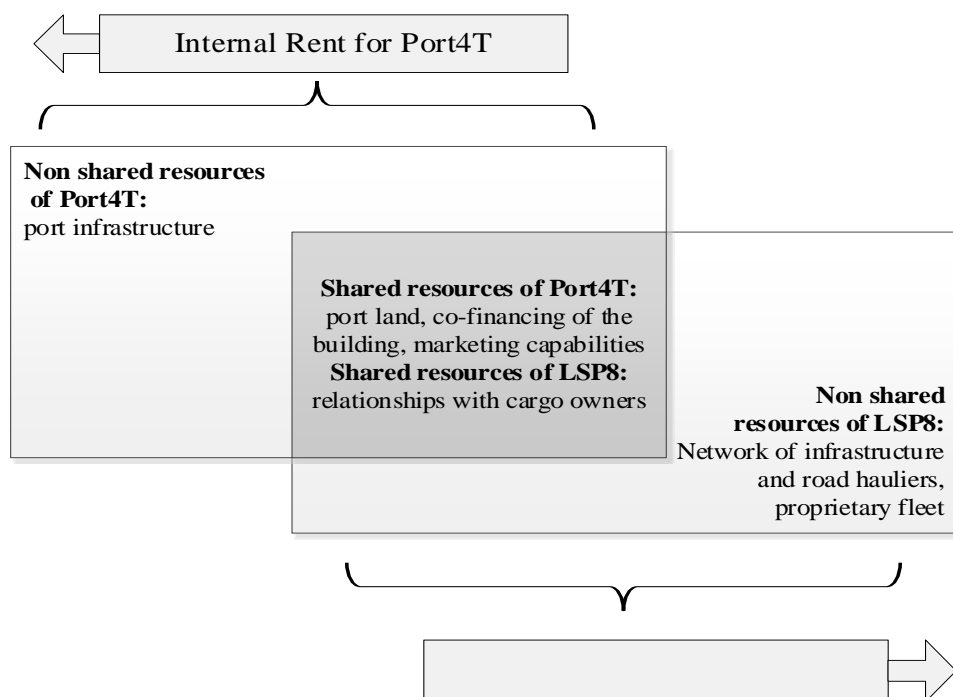


Figure 6-2: Creation of internal rent for the landlord, adapted from: (Lavie, 2006)

### Stabilised revenue streams

The Commercial Manager of Port5 argues that leasing the warehouse facilities yields more secure revenue, in comparison with traditional revenue streams of the port:

*“...a guaranteed rental is more secure than some pure shipping that may rise and fall with markets and the economy, even though, like more ports, we tend to have a minimum guarantee on many of our major facilities to mitigate such risks”.*

Consequently, it can be asserted that a landlord SLS can result in increased and secured revenue from the leasing of land and/or facilities to third parties, and will enhance the core revenue streams of the organisation (i.e. port services), by attracting new shippers and locking-in customers.

This argument complements the SLS literature in that the provision of VAS can result in more stabilised revenue sources in comparison to traditional revenue streams of the firm, due to the existence of contractual arrangement between buyers and suppliers of those services (Malleret, 2006; Baines et al., 2009b; Zahir et al., 2013; Baines et al., 2017). However, from the findings of this research it can be argued that the port can realise stabilised additional revenue streams even if it acts as the enabler of VAS, rather than the provider. This finding complements also the arguments of Monios and Wilmsmeier (2014), and Monios et al. (2018) by clarifying that ports realise more stable revenue because of the long-term contractual agreements between ports and tenants, which implicitly lock-in cargo owners.

### Key findings of the landlord SLS case study

- *A landlord-SLS has positive financial impact for the port.*
- *The positive financial impact is expressed in additional revenue streams (i.e. revenue derived from leasing land and/or facilities), and in increased and secured revenue from the provision of core services.*
- *A landlord-SLS results in more secure revenue streams in comparison with the traditional revenue streams. The stability of the revenue streams is reflected in the landlord-tenant contractual agreements between the port and its tenants.*

Table 6-1 summarises the key findings of the case study of landlord-SLS, and its contributions to literature.

Key findings	Contribution to the SLS and PCL literature	Contribution to the ERBT literature
<p>1) A landlord-SLS positively impacts the finances of the port. This impact is expressed in:</p> <ul style="list-style-type: none"> <li>i) additional revenue streams from leasing land and/or facilities to LSPs,</li> <li>ii) increased revenue from core functions that derives from the cargo volume that is attracted by the existence of LSPs at a port (Internal rent).</li> </ul> <p>2) A landlord-SLS results in safer revenue streams in comparison to traditional revenue streams. The stability of the revenue streams derives from the landlord-tenant contractual agreements between the port and its tenants.</p>	<p><b>SLS literature:</b></p> <p>The findings of this case study <i>contradict</i> the SLS literature; in that a landlord-SLS results in additional and higher revenue streams for the firm because it enables the provision of logistics VAS; and not by their actual provision.</p> <p>The findings of this case study <i>complement</i> the SLS literature; in that, enabling the provision of VAS results in more secure additional revenue streams in comparison with the traditional revenue streams of the firm.</p> <p><b>PCL literature:</b></p> <p>The findings of this case study <i>contradict</i> the PCL literature; in that a landlord-SLS results in additional and higher revenue streams for the port because it enables the provision of logistics VAS, and not by their actual provision.</p> <p>The findings of this case study <i>complement</i> the PCL literature; in that the revenue derived by a landlord-SLS is stable because of the long-term contractual agreement between ports and tenants, which implicitly locks-in cargo owners.</p>	<p>The findings of this case study confirm the ERBT literature; in that the port leverages the value of its proprietary resources (i.e. port land, monetary resources for the development of the facilities, and marketing capabilities) by accessing the organisational resources of its business partner (i.e. relationships with cargo owners).</p>

**Table 6-1: Key findings financial impact of landlord-SLS, source: (author's own)**

### 6.1.2 Operator-SLS

All twelve companies assigned to the case study of operator-SLS reported positive financial impact. To investigate this further the financial impact can be broken down into two components. The *first component* regards the increased revenue opportunities of ports and intermediaries that implement an operator-SLS and market logistics-VAS. Such ports and intermediaries realise increased revenue from:

- i. *higher charges for logistics-VAS,*
- ii. *increased demand for logistics-VAS, and enhanced marketing capability.*

However, an additional revenue stream is identified for ports that are the sole provider of logistics-VAS at a location. That is because the revenue derived from the logistics-VAS is not a traditional port revenue stream (Van der Lugt et al., 2013).

Additionally, it was identified that ports and intermediaries can appropriate internal rent if they leverage the value of their resources by accessing the idiosyncratic resources of their business partner. However, ports and intermediaries can appropriate relational rent if the SLS revenue derives from resources shared between them and their business partners. Moreover, another finding was that increased revenue can be realised from intermediaries that are not located on port, but leverage the marketing power of the term “port-centric-logistics”.

Furthermore, concerning intermediaries who utilise logistics-VAS internally, the increased revenue derives from:

- i. reduced storage costs,
- ii. rationalised inbound and outbound cargo flows,
- iii. enhanced cash flow from optimised inventory cost.

The *second component* of the positive financial impact regards the stability of the revenue derived from an operator-SLS. This revenue can be regarded as a relative stable revenue stream due to the loyalty of cargo owners to the “port-centric” benefits, and the length of contracts between cargo owners, and ports and intermediaries. However, the seasonality of innovative products can challenge the stability of such revenue. Nevertheless, close collaboration with cargo owners, and the implementation of agile solutions for innovative products can assist the stability of such revenue.

#### *Increased revenue from higher charges of logistics-VAS*

The positive financial impact of an operator-SLS can be perceived in most of the companies as increased revenue. The Group Sales Director of LSP5 argues that the charges of the company within the port-centric environment tend to be higher than the

charges of the company for general warehousing. He explains that the higher charges are justified by the nature of the logistics-VAS, which are specialist services:

*“For instance, in our [West Midlands] operation our average cost of storage for a pallet is probably around £1.30 per pallet per week, but in [East Anglia] we tend to charge on average £1.60 per pallet per week, purely because of the nature of the site, which is a bonded site”*

Similarly, the Sales and Marketing Director of LSP8 uses an example from a recent contractual agreement with a customer to explain the anticipated higher revenues from their port-centric offering. He explains that this customer imports fresh fruits from various UK ports, and distributes them to numerous third-party warehouses. Therefore, the importer pays for the transportation of the cargo from the ports to these warehouses, and then from the warehouses to the manufacturing plant. LSP8 demonstrated by SC-modelling annual savings of £1,500,000 if Port4T was used for import and storage of the products. Consequently, the Sales and Marketing Director of LSP8 claims, that:

*“we don’t have to be cheap as chips, because we don’t have to compete with current warehousing providers. [...] This is a £25,000,000 state of the art investment, it’s not a cheap facility, [...] there will be so many efficiency gains, that paying a little more for storage to be in such a facility is still going to be a far better solution. So, what I am saying is that the commercial will hopefully stack up, even if we are not as cheap as his current providers”.*

Therefore, it can be argued that the higher charges for logistics-VAS will increase the revenue of those who implement an operator-SLS. The higher charges are justified by the nature of the services, which are specialist services. Additionally, higher charges can be also justified because a PCL solution can rationalise the SC of cargo owners, and reduce inland distribution costs.

This argument complements the PCL and SLS literature, in that an operator-SLS strategy will increase the revenue of ports and intermediaries due to the higher charges for specialist services. It should be mentioned that the intermediary does not have to be located within a port. For example, LSP5 is located 25 miles west of Port2. On the other hand, the PCL facility of LSP8 is located on the container terminal of Port4T. Therefore, the benefits of an operator-SLS strategy can be realised in a wider geographical area. This remark refines the definition of PCL provided by Mangan et al. (2008, p.36), who define PCL *“as the provision of logistics and other VAS at ports”*. However, from the analysis above it can be argued that intermediaries that market themselves as PCL, and are not located in a port, can realise the same benefits as intermediaries located in a port.

Concerning the increased revenue derived from the higher charges for logistics-VAS it can be argued that intermediaries realise internal rent (see Figure 6-2). LSP8 leverages its own idiosyncratic resources by accessing the shared resources of Port4T (port land). The idiosyncratic non-shared resources of LSP8 in this case are all the tangible and intangible assets of the company required for the provision of logistics-VAS and optimised SC solutions.

*Increased revenue from growing demand for logistics-VAS, and enhanced marketing capability.*

Another reason that an operator-SLS results in increased revenue is the heightened interest of cargo owners in logistics-VAS. The Director of LSP2 argues that the operator-SLS gradually increased their revenue. He explains that the gradual growth of revenue is associated with the increasing number of services included in their offering until they became “*a one stop shop for these importers and manufacturers*”. He further explains:

*“we found a growing demand for such services as it reduces cost for all our clients who in the past would have moved containers from every port in the UK to an inland RDC prior to the material being distributed to their depot’s or to an end user”.*

Similarly, the Business Development Manager of LSP1 argues that over the last two years a growing number of clients expressed interest to purchase service packages incorporated in their PCL offering. He claims that this happened because now “*people understand it, and are looking to try and use it*”. Therefore, the increased revenue of LSP1 derives from the enhanced marketing capability of the company, and the increased demand of cargo owners for logistics-VAS.

Furthermore, the Group Sales Director of LSP5 argues that:

*“the new services have obviously attracted new opportunities and new clients and allowed us to expand on some other services that we offer to some of our existing customers which in turn led to more revenue”.*

Similarly, the MD of the non-asset based LSP9 argues that the working agreement of the company with Port3 has increased their revenue by approximately £1million p.a. This increase derives from LSP9’s capability to approach new customers and demonstrate that they can:

*“...improve their supply chain and take costs out for them. Because it does take cost out having cargo coming to a local port, so you reduce the distribution cost and on the other side reduce the delivery time. So, it will all the time increase our revenue throughput”.*

Similarly, the Systems Project Analyst of LSP6 argues that “*revenue grew as we moved on to the port and ever since it’s been a steady increase*”. Further, he claims that the steady increase of revenue allows the company to expand its offering to other types of operations such as export oriented logistics-VAS, and consequently sign contracts with more customers. He explains that 25% of the company’s current revenue derives from the new services and the new customers.

Additionally, the Managing Director of LSP3 argues that the company secured new contracts with customers because of their relative proximity to Port2. He explains that these customers want to contract with an LSP in the proximity of the port to reduce containers shunting costs. Therefore, the strategy of the company to market themselves as port-centric positively affected the revenue of the company by the increased number of customers.

The data presented above show that an operator-SLS increases revenue because of the capability to provide logistics-VAS to cargo owners who progressively become aware of the benefits of logistics-VAS, and increasingly demand them. This capability enables ports and intermediaries that implement an operator-SLS to contract with new clients and increase revenue streams.

The argument presented above confirms the marketing aspects of the SLS literature (See Section 6.4); in that the firm leverages marketing opportunities by providing VAS (i.e. logistics-VAS in this context) (Gebauer et al., 2006; Bustinza et al., 2017), and that the provision of tailored solutions influences the purchasing decisions of customers (i.e. cargo owners in this context) (Mathieu, 2001; Bustinza et al., 2017). Furthermore, the arguments presented above also confirm the PCL literature; in that the provision of logistics-VAS enables the ports and intermediaries to meet the demand of cargo owners for logistics VAS at the point of import (Chhetri et al., 2014). However, it also complements it; in that the provision of logistics-VAS enables the provision of customised offerings (Mangan et al., 2008; Woo et al., 2013), with the difference that the customised offerings can be provided either by a port or an intermediary. This nuance reinforces the findings of Okorie et al. (2016), that logistics-VAS on port environments are not always delivered by ports.

Additionally, it should be mentioned that the joint working agreement of LSP9 with Port3 establishes the potentials for the creation of relational rent. The combination of both partners’ shared resources is responsible for the creation of rent that would not have been created by either firm in isolation (Dyer and Singh, 1998; Dyer and Nobeoka, 2000;



Lavie, 2006; Xu et al., 2014; Hitt et al., 2016). The contribution of each partner's shared resources is discussed in the hybrids case study (Section 6.1.3 – see Figure 6-4).

#### *Increased revenue from internal operational efficiencies*

The two retailers in the sample reported positive financial impact from an operator-SLS. The Head of SC of Retailer1 argues, “*obviously the cost of storage was lower in our own facility than in commercial facilities*”. He further comments that the cost of importing containers through the North Yorkshire port was higher because of the use of feeder services, rather than services on main trade routes. However, their port-centric facility enabled them to remove previously used satellite facilities, and therefore eliminate inbound movements of containers from the port to satellite facilities. Additionally, the implementation of an operator-SLS that incorporates the internal use of logistics-VAS enabled Retailer1 to rationalise the outbound flow of products from its port centric warehouse. The Head of SC argues:

*“[North Yorkshire port] enabled us to have a joined-up system, an operating process that meant that we could flow high velocity stuff straight through to the RDCs and on to stores so we basically took out a transport leg and we took out one level of handling within the DC network”.*

He further argues that the rationalised flow of inbound containers and outbound distribution enabled the company to reduce SC lead-time. Consequently, they incorporated the reduced lead-time in order calculations and delayed order placement. This positively affected the cash flow of the company, as well as its inventory holding.

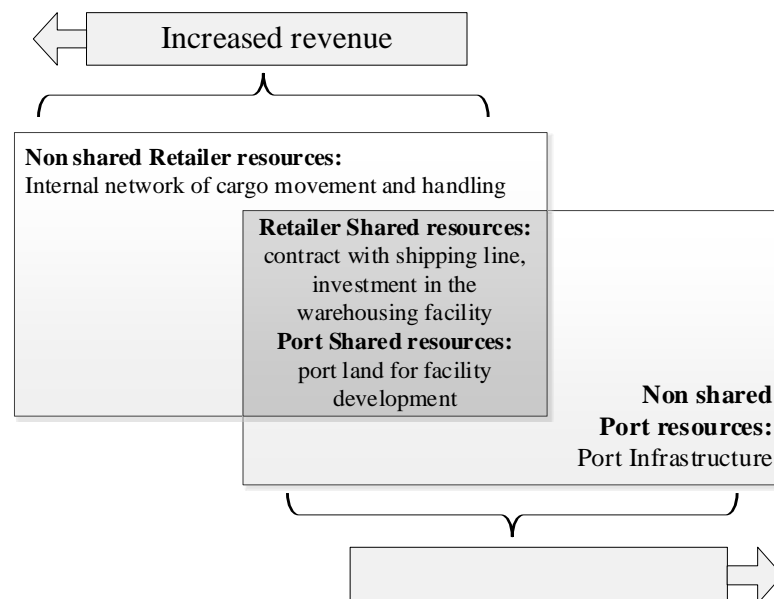
Similarly, the Technical Director of Retailer2 argues that:

*“There is a substantial cost benefit of being in a port-centric location [...] the difference between running a port-centric SC versus a SC that is centre of the country, basically it's the transport cost benefits”*

Therefore, it can be argued that an operator-SLS incorporating internal use of logistics-VAS enables retailers to enhance their financial performance by reducing storage costs, rationalising inbound and outbound cargo flows, and to enhance cash flow by optimising inventory costs. This argument complements both SLS and PCL literature streams by extending the financial impact of VAS beyond buyer-supplier relationships. According to the SLS literature opportunities for additional revenue exist in the downstream SC (Wise and Baumgartner, 1999; Malleret, 2006; Baines et al., 2009b; Neely, 2008; Cusumano, 2008; Smith et al., 2014; Cusumano et al., 2015; Baines et al., 2017). These opportunities derive from the provision of VAS services in addition to the core offering of the organisation. However, an operator-SLS in the context of PCL,

particularly when the logistics-VAS are used for the improvement of internal operations, does not result in the marketing of those services. On the contrary, the use of these services results in rationalised operations for the retailer. These rationalised operations are reflected in the revenue of the organisation in the form of cost savings. Figure 6-3 depicts this positive impact on the retailer's revenue.

Additionally, it should be mentioned that the port where the retailer is located will realise internal rent from the partnership with the retailer, as discussed earlier.



**Figure 6-3: Internal rent realised from an operator-SLS, adapted from: (Lavie, 2006)**

Similarly, the finding above clarifies the argument of earlier PCL literature, which supports that increased revenue can be realised by the provision of non-core logistics-VAS (Mangan et al., 2008; Monios and Wilmsmeier, 2012b; Demirbas et al., 2014). Additionally, it reinforces the argument of more recent PCL research which supports that retailers which establish warehouses within ports will realise improved financial performance (Mason et al. 2015; Monios et al. 2018).

### Stability of SLS revenue streams

Divergent views regarding the stability of the revenue streams deriving from an operator-SLS have been reported. The Commercial Director of LSP6 argues that the company was able to secure revenue streams by its operator-SLS regardless of the cargo or customer type. He asserts:

*“We offer something unique. So once someone is used to having that advantage, then he is less willing to give it away. That creates a more stable environment. [...]*

*I am not saying we are going to keep that forever but with what we have built here, people come to us with confidence of knowing that we can deliver a service that will save them money. That's where that sort of stability comes in".*

Therefore, it can be argued that the revenue stability of an operator-SLS is based on the loyalty of customers on the cost saving benefits, which are achieved by the removal of "touch-points" and unnecessary cargo movements from the customers' SCs.

Similarly, the Commercial Manager of LSP7 argues that their SLS yields stabilised revenue streams. However, she distinctively argues that even though stable, the revenues derived from the provision of logistics-VAS are "*marginally higher in some instances*", compared to the normal rate of return of the company. She highlights that the marginal increase of revenue is caused by the high port charges.

Therefore, it can be argued that even though an operator-SLS can yield stable revenue sources, profit margins are influenced by extrinsic factors. These factors can be for example the charges of ports for the port services. However, this paradox can only be realised when customers are issued with a single invoice (i.e. single charge for port and warehousing charges).

Additionally, the Supply Chain Director of LSP8 comments that the contracts for logistics-VAS will form long-term operating partnerships. Therefore, the increased revenue will be sustained in the long-term. Similarly, the Divisional Director of Port4S argues that their operator-SLS results in stable revenue streams for the port compared to other revenue streams. However, comments on the contribution of the PCL related revenue on the total annual revenue of the port have not been made, even though logistics-VAS are charged independently from port services.

Conversely, the Group Sales Director of LSP5 argues that an operator-SLS does not provide stabilised revenue streams for the company. He argues:

*"...if anything, I'd say it's less stable because a lot port-centric solutions are very seasonal because of the nature of the products. You get large peaks and troughs in the volume coming through the business. It tends to get very quiet during summer months, and then builds up in September as Christmas products start to arrive and people are looking to store them. It dies off again in January for a little bit until it builds up again for the Easter period. So, it's very difficult to plot, it's certainly not a stable revenue source. Stable is not a good word for it".*

According to the quote above, and considering that the pricing strategy of the company for logistics-VAS is volume and resource dependant, it can be asserted that an operator-SLS does not result in stabilised revenue sources due to the seasonality of the demand for these services. This argument diverges from the SLS literature; in that in the

SLS literature the stability of the service-led revenue is not affected by seasonality. The provision of VAS, as argued in the SLS literature, is reflected in buyer-supplier contractual agreements. Therefore, VAS are anticipated to mitigate the fluctuations in the demand caused by the nature of product's sales (Sawhney et al., 2004; Slack, 2005; Malleret, 2006; Baines et al., 2009b; Zahir et al., 2013). However, as argued earlier, the nature of VAS of manufacturing-centred SLS differs from VAS in a PCL context. VAS in a manufacturing environment are bound to the entire life cycle of the product, while logistics-VAS are designed to facilitate the movement of products through the SC. Therefore, the provision of logistics-VAS is bound with the demand fluctuation of the product.

However, other organisations have reported stability of operator-SLS revenue. These divergent opinions create a paradox. Therefore, other factors need to be considered prior to any final argument. These factors can be the nature of the products and the type of services offered. Table 6-2 aggregates the cargo handled by each company assigned to the case study of operator-SLS. The cargo has been then categorised according to the functional/innovative product categorisation of Fisher (1997).

From Table 6-2 it can be asserted that most of the organisations that reported stable revenue streams, handle functional products. According to Fisher (1997), the demand of functional products is predictable. Therefore, the demand for logistics-VAS is also predictable throughout the year. Moreover, LSP6 and LSP5 handle similar cargo types (i.e. both functional and innovative products). However, the former reported steady revenue regarding their operator-SLS, while the later reported the opposite, due to the seasonality of demand for logistics-VAS

For example, LSP6 implements an innovative service with their key customer. This service is called origin-pick; in that, they prepare products ready for merchandise from the origin. These services are designed to handle seasonal products (e.g. Christmas decoration), or promotions (e.g. Back-to-school). Therefore, once these products arrive in the UK, they are not stored in LSP6's premises. Instead, they are directed, soon after arrival, directly to stores. Consequently, any peaks throughout the year are mitigated, and do not cause turbulence in the demand for logistics-VAS for products with more predictable demand. Therefore, it can be argued that close collaboration with customers, and the implementation of agile solutions for innovative products can assist the stability of revenue derived from provision of logistics-VAS.

This case study argument contradicts the PCL literature which argues that logistics-VAS result in stable revenue due to locking-in customers (Monios and Wilmsmeier, 2014; Monios et al. 2018), by identifying that the stability of revenue derived by logistics-VAS can be affected by the seasonality of innovative products.

Operator	Products	Product type	Cargo Orientation	Stability of revenue	
<b>LSP1</b>	Three product groups: toys and gifts, sport and leisure, and electronics	Innovative	Imports/ Exports	<i>relevant comment made</i>	<i>not</i>
<b>LSP2</b>	75% Building products, 25% food and forest products	Functional	Imports/ Exports	Steady increase of revenue	
<b>LSP3</b>	80% nursery products, 20% forest products, toys and garments.	Predominantly functional, limited innovative	Imports	<i>relevant comment made</i>	<i>not</i>
<b>LSP4</b>	Drinks, ambient and frozen food products, garments, electronics and pharmaceuticals.	Mixture of functional and innovative	Imports	<i>relevant comment made</i>	<i>not</i>
<b>LSP5</b>	50% home furnishing products, 50% drinks, food, garden and forest products, and car engines.	Predominantly innovative and some functional	Imports	Unstable due to seasonal demand of logistics-VAS.	
<b>LSP6</b>	Ambient food, house furnishing and forest products, kitchen equipment, seasonal products, water, stone, machinery for the building industry, cars.	Mixture of functional and innovative	Imports/ Exports	Stable revenue due to the customers' loyalty.	
<b>LSP7</b>	Forest products	Functional	Imports/ Exports	Stable but marginally higher.	
<b>LSP8</b>	Temperature controlled and ambient food products	Functional	Imports	Stable due to long term partnerships with customers.	
<b>LSP9</b>	Food, chemical products, garments, electronics, and cars.	Predominantly functional, some innovative	Imports/ Exports	<i>relevant comment made</i>	<i>not</i>
<b>Retailer1</b>	Toys, electronics, garments, and home furnishing products and equipment.	Innovative	Imports	<i>relevant comment made</i>	<i>not</i>

<b>Retailer2</b>	Garments and electronics.	Innovative	Imports	<i>relevant comment made</i>	<i>not</i>
<b>Port4T</b>	Iron, steel and forest products, machinery, and drinks.	Mostly functional	Imports/ Exports	More stable in comparison with other revenue streams	

**Table 6-2: Cargo type handled by operators, source: (authors own)**

Key findings of the operator-SLS case study

- Ports and intermediaries who market logistics-VAS realise increased revenue from: i) the advanced charges for these services, and ii) increased demand for logistics-VAS, and enhanced marketing capability that results in contracts with new cargo owners. However, for *ports* the increased revenue derives also from the addition of a revenue stream. This revenue stream is associated with revenue derived from the provision of logistics-VAS, which is not considered a traditional port revenue.
- Ports/intermediaries can appropriate internal rent if they leverage the value of their resources by accessing the idiosyncratic resources of their business partner. However, they can appropriate relational rent if their SLS revenue derives from resources shared between them and their business partners.
- Increased revenue can be realised from LSPs that are not located at port, but leverage the marketing power of PCL. Furthermore, concerning companies that utilise logistics-VAS internally (i.e. retailers), an operator-SLS enhances their financial performance by reducing storage costs, rationalising inbound and outbound cargo flows, and enhances cash flow through optimisation of inventory cost.
- The SLS revenue of the ports/intermediaries can be regarded as a relative stable revenue stream due to the loyalty of cargo owners to the “port-centric” benefits, and the length of contracts. However, the seasonality of innovative products challenges the stability of such revenue. Nevertheless, close collaboration with cargo owners for the implementation of agile solutions for innovative products can stabilise such revenue.

Table 6-3 summarises the key findings of the case study of operator-SLS, and the contributions of this case study to literature.

Key findings	Contribution to the SLS and PCL literature	Contribution to the ERBT literature
<p>1) An operator-SLS has positive financial impact for ports and intermediaries. This impact can be divided in two components:</p> <p>A. <i>Increased revenue</i> that derives from:</p> <ul style="list-style-type: none"> <li>i) higher charges for <b>logistics-VAS</b>,</li> <li>ii) increased demand for <b>logistics-VAS</b>, and enhanced marketing capability that results in contracts with new cargo owners.</li> </ul> <p><b>Ports only</b> – An operator-SLS can result in additional revenue stream. This revenue stream is associated with revenue from the provision of logistics-VAS, which are not considered as core port services.</p> <p><b>Retailers that use internally logistics-VAS:</b> an operator-SLS enables enhanced financial performance by reducing storage costs, rationalising inbound and outbound cargo flows, and enhance cash flow by optimising inventory costs.</p> <p>B. <i>Stable revenue</i> due to the loyalty of cargo owners to the benefits <sup>40</sup>that are realised, and the length of the contractual agreements between ports/intermediaries and cargo owners. However, the seasonality of innovative products can challenge the stability of the revenue of an operator-SLS. The findings of this research suggest that close collaboration with the cargo owner and implementation of agile solutions for</p>	<p><b>SLS literature:</b></p> <p>The findings of this case study <i>confirm</i> the SLS literature; in that</p> <ul style="list-style-type: none"> <li>i) an operator-SLS allows the firm to leverage marketing opportunities by the provision of VAS</li> <li>ii) the provision of VAS influences the purchasing decision of cargo owners.</li> </ul> <p>The findings of this case study <i>complement</i> the SLS literature; in that</p> <ul style="list-style-type: none"> <li>i) in the context of PCL, the provision of logistics-VAS results in increased revenue for ports/intermediaries due to the higher prices of those services.</li> <li>ii) an operator-SLS that implies the internal utilisation of logistics-VAS results in positive financial impact beyond the buyer-supplier relationship.</li> </ul> <p>The findings of this case study <i>contradict</i> the SLS literature; in that the stability of the service led revenue, in the context of PCL, can be affected by the seasonality of innovative products.</p>	<p>The findings of this case study confirm the ERBT literature; in that</p> <ul style="list-style-type: none"> <li>i) Intermediaries leverage the value of their proprietary resources (i.e. tangible and intangible resources required for the provision of logistics-VAS and optimised SC solutions) by accessing the shared resources of ports (i.e. port land), and consequently appropriates internal rent.</li> <li>ii) if the intermediary and the port share resources that result in the creation of a rent that cannot be realised by either firm in isolation, then conditions for the appropriation of relational rent are created. In this case the intermediary shares intangible human capital resources (i.e. relationships with customers) and accesses the shared physical capital (i.e. warehouses, cargo handling equipment, and rail connectivity) and human capital (i.e. labour required for the provision of the logistics-VAS) resources of the port.</li> </ul>

<sup>40</sup> the benefits of cargo owners that procure logistics-VAS, according to the primary data of this research, are associated with the cost saving opportunities that derive from the elimination of additional/unnecessary transportation segments and removal of touch points.

<p>those products can assist in the stability of such revenue streams.</p> <p>2) An intermediary that is not located on port's land but markets itself as port centric can realise the same type of financial benefits in comparison to an intermediary that is located on port's land.</p> <p>3) Ports/intermediaries can appropriate <i>internal rent</i> if they leverage the value of their resources by accessing the idiosyncratic resources of their business partner. However, ports/intermediaries can appropriate <i>relational rent</i> if the service led revenue derives from resources shared between them and their business partners.</p>	<p><b><i>PCL literature:</i></b></p> <p>The findings of this case study <b><i>confirm</i></b> the PCL literature; in that the provision of logistics VAS at the points of imports is a response to market demand.</p> <p>The findings of this case study <b><i>complement</i></b> the PCL literature; in that:</p> <ul style="list-style-type: none"> <li>i) the provision of logistics VAS results in increased revenue due to the higher prices of those services.</li> <li>ii) an intermediary not located on port's land but marketing itself as port centric, can realise the same type of financial benefits in comparison to an intermediary located on port's land.</li> <li>iii) the internal utilisation of logistics-VAS results in positive financial impact beyond the buyer-supplier relationship.</li> <li>iv) the provision of logistics-VAS enables ports/intermediaries to tailor their offering to market demand.</li> </ul>	
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**Table 6-3: Key findings financial impact of operator-SLS, source: (author's own)**



### 6.1.3 Hybrid-SLS

All ports that implement a hybrid-SLS reported positive financial impact from both roles. The positive financial impact can be categorised into additional revenue streams, enhanced core revenue, and stabilised revenue sources.

It is identified that both roles yield additional revenue sources. Additionally, both roles enable increase in core revenue streams. Further, it was identified that the SLS revenue can be considered as stable revenue when it derives from the landlord function of a hybrid-SLS. Conversely, when it derives from the operator function it can be regarded as higher but less stable revenue.

#### Additional revenue streams

Port1's CEO asserts that their hybrid-SLS results in increased revenue, and enables them to grow disproportionately to other port groups. He explicitly argues:

*“If you compare the financial performance of our peer group, and ours, even though our model is probably quite unique, the results will tell an interesting story. [...] We measure our business performance ultimately on EBITDA and in 2010, we put down £118 million. This year we are very close to £200, and, we spend very little in new capital investment, so it's working, it's working well”.*

Furthermore, the Port Director of Port1 argues that the operator role of their hybrid-SLS yields an additional revenue of £4million per annum to the port. Similarly, the Commercial Director of Port2 asserts that the hybrid-SLS increases the revenue of the port. However, he highlights that the exact percentage of revenue yielded by the SLS of the port cannot be calculated because of the ambiguity of PCL as a concept<sup>41</sup>. He argues that:

*“...it's not always easy for the port to know whether a container is destined to a port centric facility or not, [because] various LSPs located in multiple distances around the port use the terms PCL”.*

Additionally, positive financial impact by both roles of a hybrid-SLS is reported by the Business Development manager of Port3. Concerning the operator role, he claims that the port realises additional revenue streams, which derive from the joint working agreement of the port with LSP9. The joint working agreement implies that LSP9

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<sup>41</sup> The ambiguity of the concept is supported by the findings of this research. In particular, LSP3, and LSP5, market themselves as PCL providers, but LSP3's warehousing facilities are located 50 miles away from Port2, while LSP5's warehousing facility is located 25 miles west of Port2. However, both companies are marketed as PCL providers, and contract with customers that want to store their products in the “proximity” of the port.

contracts with cargo owners for the provision of end-to-end SC solutions. However, LSP9 purchases logistics-VAS from Port3.

Additionally, concerning the landlord's role as a hybrid-SLS, the Business Development Manager of Port3 argues that leasing land to third parties provides a stable and predictable income. Further, he claims that the presence of these tenants enhances the port's revenue from general port charges.

From the discussion above, it can be argued that a hybrid-SLS results in additional revenue streams. The additional revenue streams can be divided into two categories. The first category regards the revenue from the landlord role. As discussed in the case study of landlord-SLS this argument diverges from the SLS literature; because the role of the landlord facilitates rather than provides logistics-VAS. However, in the case of hybrid-SLS, the SLS revenue derives also from the vertical integration of ports into the SC. This revenue is consistent with the revenue opportunities discussed in SLS literature (Wise and Baumgartner, 1999; Malleret, 2006; Baines et al., 2009b; Neely, 2008; Cusumano, 2008; Smith et al., 2014; Cusumano et al., 2015; Baines et al., 2017).

Furthermore, the PCL literature suggests that ports are anticipated to realise increased revenue by the provision of logistics-VAS, and the utilisation of their land banks in more profitable ways (Mangan et al., 2008; Monios and Wilmsmeier, 2012b; Demirbas et al., 2014). Considering the dual revenue streams of a hybrid-SLS, as presented above, these arguments can be confirmed.

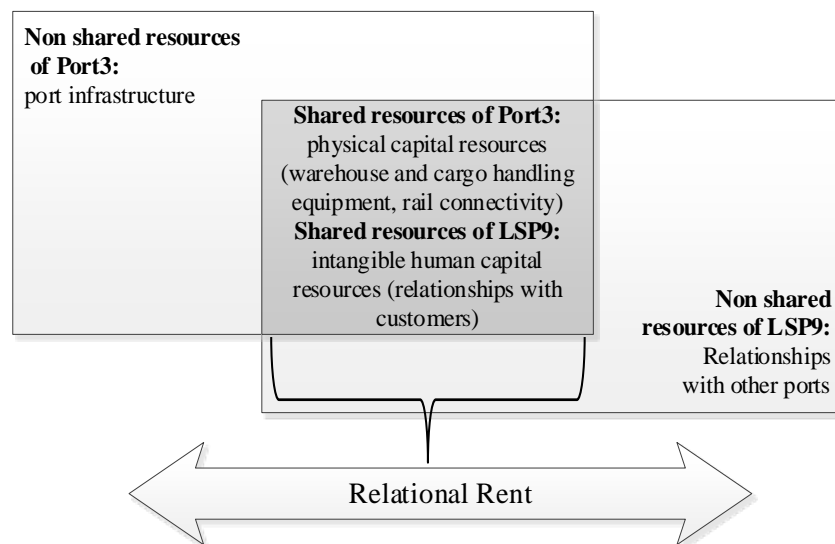
However, three caveats have to be made. The first caveat regards the nature of the VAS offered by servitised manufacturers, and the VAS in the context of PCL. The VAS of servitised manufacturers are services bound to the entire product life cycle of the product (e.g.: maintenance and repair). However, the VAS in a PCL context are logistics services not bound to the entire life cycle of the product, but designed to facilitate the movement of a product within the SC.

The second caveat regards the argument of the SLS literature that the revenue streams of service-led organisations are anticipated to have greater profit margins. The higher profit margins are justified by the fact that the provision of services is not as asset intensive as some of the core processes of organisations. However, due to commercial sensitivities none of the interviewees could comment on that.

The third caveat regards the additional revenue stream that derives from the operator role of Port3. As was argued above the operator's role of a hybrid SLS enables the port to increase its revenue streams by the provision of logistics-VAS. In the cases of Port1

and Port2, the port contracts directly with cargo owners for the provision of those services. However, Port3 does not contract directly with cargo owners. Instead, it contracts with a non-asset based LSP (LSP9), who then sells the logistics-VAS to cargo owners. Even in this case the revenue that derives from the logistics-VAS is considered as an additional revenue stream for the port because it derives from the provision of logistics-VAS, and not the core services.

Furthermore, for Port3, it can be argued that the additional revenue stream is created by the contribution of the idiosyncratic resources of two partners. Port3’s idiosyncratic resources are the tangible physical and human capital resources required for the provision of the logistics-VAS. On the other hand, LSP9’s idiosyncratic resources are its relationships with cargo owners, which are intangible human capital resources (Barney, 1991). Relational or quasi rent is defined as “*supernormal profit jointly generated in an exchange relationship that cannot be generated by either firm in isolation and can only be created through joint idiosyncratic contributions of the specific alliance partners*” (Dyer and Singh, 1998, p.662). Therefore, if the service offering is based on the shared resources of both partners, then conditions for the appropriation of relational rent for both partners are created. This argument confirms the ERBT literature. Figure 6-4 depicts the creation of relational rent between Port3 and LSP9.



**Figure 6-4: Relational rent between Port3 and LSP9, adapted from: (Lavie, 2006)**

Increased core revenue streams

Considering the operator role of a hybrid-SLS, the Head of Commercial Strategy of Port1 asserts that the revenue growth of the port, regarding the provision of logistics-VAS, is equivalent to the growth of the port’s warehousing space. He argues: “*you’ve seen the growth in space from nothing in 2010, to 100,000sq. ft. when we opened in 2011, to*

600,000sq. ft. now, so our revenue growth is broadly like that”. However, he highlights that the port has an ulterior motive concerning its involvement in the provision of logistics-VAS. He claims the main reason that Port1 actively provides logistics-VAS is *“the influence on the routing of the cargo. So as a port our principal objective is cargo over the quay. So, PCL helped us secure existing volumes and increase volumes over our quay side”*. The Sales and Logistics Development Manager of Port1 supports this, arguing that the provision of logistics-VAS *“is driving volume over the quay”*, which results in increased revenue streams from core services. Furthermore, the Port Director of Port1 argues:

*“Although we have penetrated new customers, we find that the longevity of a customer staying with us is because of the value-added services. So, we are becoming more and more part of the decision-making process. It’s not just a choice based on where is the lowest cost of entry in the UK, but is it closer to my market, does the port offer port-centric solutions”*.

He further argues that the negative impact of the European economic recession also contributed to the success of the hybrid-SLS of Port1. He maintains that cargo owners wanted to find more viable and sustainable solutions for their SCs. Therefore, Port1’s capability to offer cost efficient SC solutions to cargo owners acted as a determinant factor in their decision-making process.

Concerning the port’s landlord’s role, the Business Development Manager of Port3 argues that leasing land to third parties provides the port with a stable and predictable income. He comments that the presence of these tenants enhances the port’s revenue from general port charges. Regarding the port’s lease agreement with a major electricity provider, the Business Development Manager of Port3 comments that *“it ties them into the port authority supporting them in their marine service, so it’s a quite powerful relationship. To get a tenant of that quality over that term is significant”*.

From the quotes above it can be inferred that a hybrid-SLS enables ports to enhance and sustain core revenue streams. This argument can be partitioned into the respective roles of a hybrid SLS. Concerning the operator role, it can be argued that the provision of logistics-VAS facilitates the enhancement of core revenue streams. That is, because new customers (i.e. cargo owners) contract with the port due to its service-led offering, but these customers will also contract with the same port for traditional port services.

Additionally, concerning the landlord role of the port the leasing of land to tenants locks-in those tenants for the length of their contract. However, these tenants purchase also port services in addition to the lease. Consequently, the demand for port services is

increased. Therefore, the landlord role of a hybrid-SLS generates additional revenue sources (i.e. income from leasing agreements), and increases the core revenue.

The arguments presented above complement the PCL literature; in that, the provision of logistics-VAS will secure cargo throughput for the port (Mangan et al., 2008; Demirbas et al., 2014). Moreover, the PCL literature is further confirmed (quote of Port Director of Port1); in that, port users will benefit from the cost efficient SC solutions offered by ports (Coronado Mondragon et al., 2012).

Additionally, the argument that both roles of a hybrid-SLS enhance and sustain the core revenue stream, complements the SLS literature; in that, the provision of VAS increases the sources of income of the firm (Sawhney et al., 2004; Zahir et al., 2013; Baines et al., 2017). However, in the context of PCL it was identified that the provision of logistics-VAS or the enabling of their provision enhances also the core revenue streams.

#### Stabilised revenue streams

The interviewees of the companies that implement a hybrid-SLS report stabilised revenue streams from the hybrid-SLS. The Sales and Logistics Manager of Port1 asserts that the SLS revenue of the port is a stable source of revenue. However, she distinguishes between levels of stability associated with the dual role of the port. She claims: *“a lease is guaranteed revenue for an X number of years regardless if there was anything in that warehouse or not”*. On the other hand, the port’s own managed warehouses are multiuser warehouses. Therefore, the port’s revenue is derived from multiple customers. Thus, she argues: *“...there is some stability there, we’ve also got more say if we are operating the warehouse, but there is more risk that we might not be making as much revenue from that warehouse compared to if we just leased it to somebody else”*.

However, according to the Port Director of Port1, the fact that the customer portfolio of the port’s multiuser warehouses is so diverse creates a balance of demand for warehousing space throughout the year. Consequently, the revenue derived from the operator role is relatively stable throughout the year. Therefore, it can be argued that the revenue derived from the landlord function can be considered as a more stable source of revenue. However, the Sales and Logistics Development Manager further argues:

*“Once we’ve had a decent amount of stock in our own managed warehouses we make as much if not more as if we were to lease it. So as long as there is new business over the quay and we factor in the additional revenue we made there then it does make more money for the business to run the warehouse”*.

Therefore, it can be counter-argued that the operator function results in higher but less stable income, while the landlord function results in stable but lower income.

The Business Development Manager of Port3 also supports the argument that revenue streams derived from leasing of land/and or facilities are more stable in comparison to revenue derived from other SLS related operations. He argues that leasing land to intermediaries provides a stable and predictable income stream over a long period. For example, the port's lease with an energy provider is a 25 years contract extendable for another period of 25 years. He emphasizes, that such stable and predictable income: *"...allows you to take a slightly different view on more risky opportunities. You can factor that fact that you've got predictable income into future potential opportunities that may carry a little bit more risk"*. Therefore, it can be argued that a hybrid-SLS results in increased revenue streams which are sustained because of the long-term lease agreements of the port in its landlord's role. Additionally, the sustained income that derives from a leasing period acts as a safety net that counterbalances risky operations.

Furthermore, the Supply Chain Marketing Manager of Port2 argues that the involvement of Port2 in the provision of logistics-VAS increases its revenue. However, the revenue from those operations is *"not as lucrative as general port operations, because the returns from warehousing operations are not in keep with normal port's rate of return"*. Additionally, he claims that *"if you manage the warehouse yourself the overheads come along"*. Therefore, the port leases most of the warehouses to third parties to stabilise revenue earned from its SLS, *"following a less risk involved approach"*. However, Port2 retains the provision of logistics-VAS to smaller customers through a subsidiary company. The Commercial Director argues that even though Port2 decided to withdraw from the active provision of logistics-VAS, the company is part of a global group of ports. Thus, by keeping in-house some of these operations the port offers single invoicing for end-to-end solutions to many smaller customers that do not have contracts with LSPs.

Therefore, it can be asserted that the landlord related revenue source is guaranteed for the entire length of the lease and it is a less risky approach. However, contracting with smaller cargo owners also provides a stability of income to the port, because those organisations have limited bargaining power when they tender for contracts with large LSPs. Nonetheless, port operators engaged with a hybrid-SLS will be interested in those cargo owners, because they would lock them in, and secure cargo throughput for their core services.

From the analysis of the data above it can be argued that the additional revenue generated by a hybrid-SLS can be regarded as stable when it derives from the landlord function of the hybrid-SLS. Additionally, it can be argued that the additional revenue that is generated by the operator function of a hybrid-SLS, even though higher, is less stable in comparison to the revenue generated by the landlord function. The argument presented above complements the SLS literature; in that the provision of VAS is anticipated to generate a more stable source of revenue, in comparison with its core revenue streams (Sawhney et al., 2004; Zahir et al., 2013). However, in the context of this research it was identified that the additional revenue stream of a SLS is more stable when the firm enables the provision of VAS rather than providing them. Furthermore, the claim that the return on logistics-VAS is not as lucrative as general port operations, confirms the servitisation paradox that has been identified in mainstream SLS literature (Brax 2005; Benedettini et al. 2015). Additionally, this case study reinforces the argument of Monios and Wilmsmeier (2014), and Monios et al. (2018), that revenue from logistics-VAS is stable because such services lock-in customers. However, this case study complements this argument by identifying that the revenue of ports is more stable when ports facilitate the provision of logistics-VAS, rather than providing them.

*Key findings of the hybrid's case study*

- A hybrid-SLS results in additional revenue streams. In its **landlord role** the additional revenue stream derives from the leasing agreements of the ports with LSPs for leasing land and/or facilities. In its **operator function** the additional revenue derives from the vertical SC integration of the port.
- If the service offering is based on the shared resources of both partners, then conditions for the appropriation of relational rent for both partners are created.
- A hybrid-SLS enhances and sustains the core revenue streams of ports. In its **landlord function** the increased core revenue stream derives from port services purchased by the tenants of the port, or by port services purchased by the customers of the tenants of the port. In its **operator function**, the increased core revenue derives from port services purchased by the new customers (i.e. cargo owners) of the port.
- A hybrid-SLS results in stabilised additional revenue sources when the additional revenue derives from the **landlord** function of the hybrid SLS. Conversely, a hybrid-SLS results in higher but less stable additional revenue streams when the additional revenue derives from the **operator** function of the hybrid-SLS.

Table 6-4 summarises the key findings and contribution of this case study to literature.

Key findings	Contribution to the SLS and PCL literature	Contribution to the ERBT literature
<p>The financial impact of a hybrid-SLS is threefold:</p> <p>1) A hybrid-SLS results in additional revenue streams</p> <p style="padding-left: 20px;">a) <b>Landlord role:</b> additional revenue stream from leasing agreements of the port with LSPs (i.e. port enables the provision of logistics-VAS)</p> <p style="padding-left: 20px;">b) <b>Operator role:</b> additional revenue from the vertical SC integration of the port (i.e. port provides logistics-VAS).</p> <p style="padding-left: 20px;">c) If the service offering of the port is based on shared resources of both partners, then conditions for the appropriation of relational rent for both partners are created.</p> <p>2) A hybrid-SLS enhances and sustains the core revenue streams of the port</p> <p style="padding-left: 20px;">a) <b>Landlord role:</b> the tenants beyond paying lease to the port, also purchase port services to accommodate their needs, or the needs of cargo owners.</p> <p style="padding-left: 20px;">b) <b>Operator function:</b> new customers (i.e. cargo owners) contract with the port due to its logistics-VAS offering, and inevitably for traditional port services.</p> <p>3) A hybrid-SLS results in stabilised additional revenue sources when the additional revenue derives from the <b>landlord</b> function. Conversely, a hybrid-SLS results in higher but less stable additional revenue streams when the additional revenue derives from the <b>operator</b> function.</p>	<p><b>SLS literature:</b></p> <p>The findings of this case study <b>confirm</b> the SLS literature; in that, the firm realises additional revenue streams from the provision of VAS in its operator role.</p> <p>The findings of this case study <b>contradict</b> the SLS literature; in that, the firm realises additional and higher revenue from enabling the provision of logistics VAS.</p> <p>The findings of this case study <b>complement</b> the SLS literature; in that:</p> <p>i) providing or enabling the provision of VAS enhances core revenue streams.</p> <p>ii) the additional revenue streams will be more stable when the firm enables the provision of VAS.</p> <p><b>PCL literature:</b></p> <p>The findings of this case study <b>confirm</b> the PCL literature; in that:</p> <p>i) the duality of the roles of a hybrid-SLS increase the port's revenue from the provision of logistics-VAS and from the more profitable utilisation of its land bank.</p> <p>ii) cargo owners are benefited by the capability of the port to offer cost efficient SC solutions.</p> <p>The findings of this case study <b>complement</b> the PCL literature; in that the provision of logistics-VAS will explicitly increase the core revenue streams of the port. However, similar increase of core revenue streams is enabled also by the leasing of land and/or facilities to intermediaries. Additionally, logistics-VAS lock-in customers, but ports realise more stable revenue when they facilitate such services rather than providing them.</p>	<p>The findings of this case study <b>confirm</b> the ERBT literature; in that if the service offering of the firm is based on the shared resources of both partners, then conditions for the appropriation of relational rent for both partners are created.</p>

**Table 6-4: Key findings financial impact of hybrid-SLS, source: (author's own)**



#### **6.1.4 Cross case comparison of financial impact**

In all three cases the investigated organisations reported a positive financial impact from increased and stabilised revenue streams because of the implemented SLS. Concerning the increased revenue, landlord-SLS and hybrid-SLS generate extra revenue with new revenue streams, which are associated with leasing of land and/or facilities to intermediaries. Hybrid-SLSs also result in additional revenue from the vertical SC integration of the port implementing it.

With regard to an operator-SLS, a new revenue stream can be realised only if the operator-SLS is implemented by a port that is the sole provider of logistics-VAS. The absence of new revenue streams for the other subcategories of firms implementing an operator-SLS relates to the nature of their core business, which is the provision of logistics services. Similarly, absence of new revenue streams is realised for the internal utilisation of logistics-VAS.

Furthermore, all three SLS enhance core revenue. Regarding the landlord-SLS, the existence of LSPs (i.e. tenants) attracts more cargo owners to the port. These cargo owners purchase logistics-VAS from LSPs, but also purchase port services. Therefore, ports increase their “core-customer base” (realisation of internal rent). For operator-SLS, increased revenue is realised from premium charges for logistics-VAS. Premium charges are justified either because they are specialist services (e.g. VAT-deferment), or because PCL solutions enable customers to reduce costs from SC rationalisation (realisation of internal rent). Furthermore, an operator-SLS increases revenue due to increased demand for on-port logistics-VAS, and the capability of those who implement it to market themselves as providers of those services. Regarding the use of logistics-VAS for the improvement of internal operations, as identified for the two Retailers in the sample, increased revenue is realised in the form of reduced transportation, warehousing and inventory costs (realisation of internal rent).

Hybrid-SLS, like landlord-SLS, also result in internal rents by leveraging excess cargo throughput that is created by the existence of LSPs at a port. However, core revenue streams are also enhanced by excess cargo which results from the vertical SC integration of the firms implementing a hybrid-SLS (i.e. direct contract with cargo owners for logistics-VAS). Therefore, compared to the other two SLS, hybrid-SLS, have a dual impact on core revenue streams. Additionally, increased revenue in the form of relational rent can be realised by the horizontal collaboration of network partners. The relational rent derives from the shared resources of the two partners.

The second positive financial impact is stability of SLS revenue streams. However, even though stabilised SLS revenue has been reported in each case study, the stability of revenue is justified on different grounds. A landlord-SLS, and the landlord role of a hybrid-SLS suggest stabilised revenue streams based on the longevity of leasing agreements; in that, ports receive the agreed rent for the duration of the leasing agreement regardless of whether tenants utilise the facility to full capacity or not. Thus, the revenue from the landlord role of hybrid-SLS is more stable compared to revenue from the operator role. However, the fact that hybrids contract with multiple smaller cargo owners for the provision of logistics-VAS also provides a relative stability for this SLS derived revenue. The relative stability is associated with the limited bargaining power of small cargo owners, and the fact that demand profiles of a wide range of products create a balanced demand for logistics-VAS throughout the year. An operator-SLS also results in stabilised revenue streams due to the offering of sustainable and cost-efficient SC solutions to cargo owners. However, seasonality of demand for logistics-VAS often creates an unstable environment. Nonetheless, collaboration with customers, and agile solutions can help to overcome these turbulences.

Unequal demand for logistics-VAS caused by seasonality has been perceived differently by those who implement an operator-SLS compared to those who implement a hybrid-SLS. Ports/intermediaries that implement an operator-SLS perceive seasonality negatively, even though additional measures can help to mitigate this. Conversely, ports that implement a hybrid-SLS perceive that as an opportunity. In that, they aim to contract with customers that have divergent product portfolios. The divergent product portfolios create variable demand for warehousing space for each of these products. Consequently, excess in warehousing capacity caused by limited demand for certain products can be utilised for storing products with high demand.

The varying demand of products throughout the year, and their subsequent need for warehousing space, can be reflected in fluctuating demand for port services throughout the year. Therefore, the possibility to contract with multiple customers and leverage the seasonal profiles of product to an advantage, allows hybrid-SLS to create a relative stable demand for core services throughout the year. Consequently, the relative stability of new revenue stream of hybrid-SLS can equally complement core revenue streams throughout the year. Therefore, it can be maintained that a hybrid-SLS can be the most profitable SLS in a PCL context.

## 6.2 Strategic impact

The following three sections, present the responses of the participants concerning the strategic impact of their SLS, and a critical comparison of the empirical findings with literature.

### 6.2.1 Landlord-SLS

The data analysis revealed three key findings for the strategic impact of a landlord-SLS. Firstly, it is identified that a landlord-SLS gives the capability to offer a joint value proposition (i.e. bundle of port services and logistics VAS), which can confer CA. Secondly, it was found that a landlord-SLS enables the development of a network of interdependent organisations, within which the creation of network resources is enabled. These network resources are the bundles of services that comprise the joint value proposition of the port, and its network partners. The combination of those elements creates the conditions for the realisation of SCA.

Thirdly, it is revealed that a landlord-SLS cannot confer CA based on differentiation *per se*; it is the combination of the capabilities derived from the landlord-SLS, and other intrinsic strategies that enable the ports that implement a landlord-SLS to differentiate. These strategies are related to the selection of specific market segments that ports compete in, and the subsequent selection of respective network partners that underpin demand for core services in those markets.

#### CA and potential SCA based on valued-adding capabilities

The Head of Commercial of Port4T argues that the landlord-SLS positively affects their competitiveness. That is because it enables the offering of a joint value proposition to cargo owners; she asserts:

*“...it's a sort of integrated proposition, when I am with one of our warehousing partners or JV partners and I am talking to their customers, then it's very much a joint proposition. I don't just stand there and say well look you can put your containers through us and they will go out again. I talk them through the SC and the other benefits they have from coming into the port”.*

Further, she highlights that the joint value proposition is dependent on the individual requirements of cargo owners, and the characteristics of the cargo itself. Similarly, the Commercial Manager of Port5 argues “...it definitely has enhanced the competitiveness of the port in the sense that the end to end product of [Port5] it's so much better with the fact that these facilities are in the port and the companies that use them are able to drive efficiencies”.

Consequently, it can be asserted that a landlord-SLS gives the capability to offer a joint value proposition. This joint value proposition is a bundle of core services (offered by the port), and logistics-VAS (offered by the port's tenants), which positively affect the competitiveness of the ports that implement a landlord-SLS.

The argument above complements the SLS literature; in that, according to Baines et al. (2009b), Gebauer et al., (2017), and Adrodegari and Saccani, (2017), the provision of VAS gives the firm additional value-added capabilities. These additional value-added capabilities can confer CA. However, in the case of landlord-SLS the logistics-VAS (components of the joint value proposition) are provided by their network partners (i.e. LSPs). The joint proposition of Port4T with its tenants is the outcome of the combination of the port's idiosyncratic resources (port land, and physical and human capital resources responsible for the accommodation of cargo from/to sea), and the organisational capabilities of the port's tenants (derived from the idiosyncratic resources of the tenant that enables them to offer logistics-VAS). Consequently, the argument above confirms the theoretical views of ERBT, in that value generating resources reside beyond the boundaries of the firm (Gulati et al., 2000; Lavie, 2006; Spring and Araujo, 2013; Prajogo et al., 2016).

Furthermore, services are intangible resources of the firm (Slack and Lewis, 2008). Consequently, it can be asserted that the joint proposition of the port with its tenants is an intangible resource residing within the port's network. However, considering the theoretical foundations of ERBT, the resources that are emergent from inter-firm networks that firms belong to, are network resources (Gulati, 1999; Gulati et al., 2000; Gulati, 2007). It can be argued that a landlord-SLS enables the establishment of a network around the firm; and within this network the development of network resources. According to Gulati et al. (2000) and Arya and Lyn (2007) the combination of the network that a firm belongs to, and the network resources, can lead to the realisation of SCA. That is, because networks are considered idiosyncratic to the firm, are relatively inimitable and non-substitutable, and their development is path dependent (Gulati et al., 2000).

The argument that those who implement a landlord-SLS potentially realise SCA further complements the SLS literature. In particular, Oliva and Kallenberg (2003) and Adrodegari and Saccani, (2017) argue that SLSs can confer SCA, because the offering of the firm will be based on a bundle of products and services. That is, because services are considered less imitable, due to their relative ambiguity and increased labour intensity. In the context of this research, the joint offering is a combination of the core services offered

by each network member, and the capabilities realised by the combination of the resources of network partners. Therefore, it can be argued that SCA can be realised from the bundle of services offered within the network.

Also, the concept of value co-creation is relevant here. In particular, the process that combines the resources of two or more business network partners to achieve something that cannot be achieved by each of these partners in isolation, is defined as value co-creation (Hartmann et al., 2014).

The argument that a landlord-SLS enhances the creation of network resources, which lead to a joint offering, and the realisation of SCA, complements the PCL literature. Feng et al. (2012), and Monios et al. (2018) argue that the on-port relocation of retailers increases the competitiveness of the port, and leads to CA. The empirical findings of this research confirm and further expand the argument of Feng et al. (2012), and Monios et al. (2018); in that, CA will be realised by the capability of the port and its tenants to offer joint value propositions. Mangan et al. (2008), and Woo et al. (2013), argue that the port can achieve SCA by the provision of logistics-VAS; in that, the advanced offering of the port satisfies customer demand. The findings of the present research confirm and further expand this argument. The joint proposition of the port with its tenants will offer a bundle of port and logistics-VAS that will meet the demand of cargo owners.

#### Differentiation based CA

According to the literature a SLS enables organisations to differentiate and subsequently achieve CA (Brax, 2005; Gebauer and Friedli, 2005; Baines et al., 2009b; Fischer et al., 2010; Bustinza et al., 2017). To explain how Port4T differentiates from competitors, the Head of Commercial comments that recently a new container port commenced operations in SE-England. The new port competes in the container trade with Port4T, Port2 and South England port. However, the Head of Commercial of Port4T distinguishes that the existence of a new container port “*it's not necessarily bringing in any more containers in the UK container market*”. Therefore, to safeguard its revenue, Port4T diversifies its focus. The Head of Commercial argues, “*...where we safeguard our revenues is through the fact that we are able to be quite diverse, is not just containers for us it's about what's in the container, and how it flows through the port*”.

She further argues that the port diversifies itself from the direct competition on container trades by focusing on major bulk trades, and the development of Ro-Ro, feeder, and shortsea shipping services. She argues: “*We have quite a diverse nature in the*

*container terminal, that's because we don't want to be at the behest of the East West trade that's suddenly just gets taken away”.*

Additionally, she argues that the port further safeguards its competitive edge by focusing on a niche container trade market. She claims that their port-centric offering targets specific market segments:

*“Construction, waste and renewables and perishables, those three strands basically are what we are. We are not just doing sort of wholesales spread port centric; we are doing a niche market. We also like to lock in, either the importer or the end customer, or the distributor, or the LSP. We like to lock them in so that they are obviously reducing their SC cost, but it also forces them to put their bill of lading at [Port4T]”*

Consequently, it can be argued that a landlord-SLS does not confer CA based on differentiation for the port *per se*; it is the combination of the capabilities derived from the landlord-SLS, and other intrinsic strategies that enable the port to differentiate. These strategies enable the port to focus on specific market segments, and develop networks, both for maritime and land transportation. These networks create differentiation.

Subsequently, the port selects business partners, who enhance its differentiation. This argument contradicts the SLS literature. That is because differentiation is not achieved by competition in a different value chain. It is the market segments that the port deliberately chooses to operate in, that differentiate it from competitors; and subsequently the selection of business partners that underpin the demand for core services in those respective markets. It can be argued that the landlord-SLS is only a fragment of a broader strategy that enables differentiation of the port. This argument complements the PCL literature (Mangan et al., 2008; van Asperen and Dekker, 2013; Demirbas et al., 2014; Okorie et al., 2016); in that the decision of the port to lease land to intermediaries does not confer CA based on differentiation. The port can differentiate if it chooses to compete in specific market segments, and select appropriate business partners to enhance competitiveness in these segments.

It should be noted that even though a landlord-SLS does not solely differentiate the port, it assists differentiation due to the utilisation of the organisational capabilities of business partners. This argument complements the ERBT literature (Lavie, 2006; Lewis et al., 2010; Xu et al., 2014; Prajogo et al., 2016); in that the organisational capabilities of network partners assist the differentiation strategy of the port.

*Key findings of the landlord-SLS case study*

The analysis of the primary data reveals that:

- a landlord-SLS enables a joint value proposition (i.e. bundle of core services and logistics-VAS), which facilitates the opportunity for CA.
- The ports that implement a landlord-SLS can develop a network of interdependent organisations; within this network the creation of network resources is enabled. These network resources are the bundles of services that comprise the joint value proposition of the network partners. Thus, the ports that implement a landlord-SLS can realise SCA by the combination of those two elements.
- The ports that implement a landlord-SLS cannot realise differentiation based CA from the landlord-SLS per se; it is the combination of the capabilities derived from the landlord-SLS and other intrinsic strategies that result in differentiation. These strategies are related to the selection of specific market segments that the ports compete in, and the subsequent selection of respective network partners that underpin the demand for core services in those markets.

Table 6-5 summarises the key findings of the case study of landlord-SLS, and its contributions to literature.

Key findings	Contribution to the SLS and PCL literature	Contribution to the ERBT literature
<p>1) A landlord-SLS gives to the ports that implement it the capability to offer a joint value proposition (i.e. bundle of core services, and logistics-VAS), which positively affects their competitiveness.</p> <p>2) A landlord-SLS enables the development of a network of interdependent organisations, and the creation of network resources. These network resources are bundles of services that comprise the joint value proposition of the port and its network partners. The combination of those elements creates the conditions for the realisation of SCA.</p> <p>3) A landlord-SLS does not confer CA based on differentiation for the port <i>per se</i>; it is the combination of the capabilities derived from the landlord-SLS and other intrinsic strategies that create differentiation. These strategies are related to the selection of specific market segments that the port competes in, and the subsequent selection of respective network partners that will underpin the demand for core services.</p>	<p><u>SLS literature:</u></p> <p>The findings of this case study <b>complement</b> the SLS literature in that:</p> <ul style="list-style-type: none"> <li>- The logistics-VAS that confer CA to the port are provided by network partners.</li> <li>- The conditions for the realisation of SCA are created by the service bundles offered within the network of the port rather than by a single port.</li> <li>- The differentiation based CA of the port is not solely dependent upon its landlord-SLS. Other intrinsic strategies contribute to that CA as well.</li> </ul> <p><u>PCL literature:</u></p> <p>The findings of this case study <b>complement</b> the PCL literature; in that:</p> <ul style="list-style-type: none"> <li>- A landlord-SLS enables ports to realise CA, potentially SCA based on the joint value proposition with network partners.</li> <li>- A landlord-SLS is only a fragment of a wider strategy that enables ports to achieve CA based on differentiation. Other intrinsic strategies determine the differentiator of the port.</li> </ul>	<p>The findings of this case study <b>confirm</b> the ERBT literature; in that:</p> <ul style="list-style-type: none"> <li>- Value generating resources can reside beyond the boundaries of the port. In this case the value generating resources are the idiosyncratic resources and capabilities of the port's network partners that are responsible for the provision of logistics-VAS.</li> </ul> <p>The findings of this case study <b>complement</b> the ERBT literature; in that:</p> <ul style="list-style-type: none"> <li>- the organisational capabilities of network partners can assist the differentiation strategy of the port.</li> </ul>

**Table 6-5: Key findings strategic impact landlord-SLS, source: (author's own)**



## 6.2.2 Operator-SLS

The data analysis reveals a positive strategic impact for firms that implement an operator-SLS. Prior to presenting the findings of the operator-SLS case study **a remark needs to be made regarding the repetition of arguments due to the structure of the case study.**

The case study is divided into two main subsections. Each subsection discusses one of the two components that comprise the strategic impact of an operator-SLS.

The **first component concerns all the companies populating the case study**, and regards the CA or SCA that can be achieved by value-added capabilities that are attributed from an operator-SLS. **However, the discussion is divided into two further subsections. The first subsection involves intermediaries (i.e. LSPs and Retailers) as tenants of a port, while the second part involves the only port included in the case study.** The key findings of this subsection are that an operator-SLS gives value-added organisational capabilities, which can confer CA. This CA is dependent upon two non-exhaustive factors; the location of the firm implementing an operator-SLS, and the collaboration level with the port. The theoretical foundations of this thesis further support this argument; in that if a tenant collaborates with the port, then its offering is based on network resources rather than proprietary resources. Consequently, the attained CA can be sustained in the long term.

The **second component regards the CA conferred by differentiation. In this subsection the discussion excludes the two retailers of the sample** because they do not compete in the market of logistics-VAS. Additionally, the remaining companies, LSPs and Ports, are discussed separately because they compete in different markets. The key findings of this subsection are that the competitiveness of LSPs can be further enhanced if the company achieves two levels of differentiation. However, ports cannot achieve CA based on differentiation *per se*.

### CA based on value-added capabilities

The data analysis revealed that intermediaries that implement an operator-SLS amass value-added organisational capabilities, which can confer CA. These capabilities are associated with the underlying efficiencies of the port-centric warehousing and distribution model that is incorporated in an operator-SLS. The Director of LSP2 argues:

*“We are extremely competitive by the way that we do things here. You can’t be more competitive in the distribution market because we are at the port and because of the lack of double handling and because predominately we use back-loader vehicles for our distribution. There is no way that just a haulier can compete with us because of the way that we do things”.*

Similarly, the Commercial Manager of LSP7 argues that an operator-SLS enables them to become more competitive by eliminating non-value-added distribution segments. Furthermore, the Sales and Marketing Director of LSP8 argues that the operator-SLS enables the company *“to facilitate an end-to-end supply chain using a facility for goods coming in the SE of England”*.

Moreover, he argues that the operator-SLS further enhances competitiveness by attributing the capability to handle products faster, which is important because: *“we are dealing with perishable goods, [where] hours actually matter”*. Therefore, customers are very persistent in keeping tight time schedules in the transportation of such products. He emphasises that even if the port-centric facility is geographically distant in comparison with legacy options located in the Midlands, this is not a disadvantage, he comments:

*“...a retailer might say, it will take you longer to get the product from [Port4T] into Scotland, that's a disadvantage for me. I would counteract that by saying actually, the product is being made available to you to be able to order faster because it doesn't have to travel 4 hours to get into the warehouse, it's immediately available and there are obviously advantages in the destinations where we are closer to the RDCs”*.

Similarly, the Commercial Director of LSP6 argues that the ability to handle products at *“the first point of landing”* increases visibility and control of cargo owner's pipeline inventory levels. That is because they *“have it on their stock system potentially 3 to 5 days earlier rather than if they have to send it in the middle of the country”*. Further, he asserts that the possibility to handle products at *“the first point of landing”* gives the value-added capability to offer flexible SC solutions to customers. He comments: *“...with the model we've got here, we can delay containers on quay, we can fast track containers, we can put into holding areas, so we can help manage the flow of work at this point”*.

The Business Development Manager of LSP4 claims that due to the increasing size of container vessels, *“the availability of the cargo once the vessel arrives at the port has become more protracted”*. However, he argues that the ICT-tools and relationships of port-centric operators with the port allow them to *“pull forward those boxes literally as they land”*.

The Business Development Manager of LSP1 asserts that the operator-SLS equals faster and more efficient routes to market. He comments, *“it definitely made us a lot more competitive, it gave us a more recognisable model by retailers and other companies, as the fastest and most efficient route to market”*. He further argues that customers contract with them due to their capability to offer streamlined SC solutions. He comments:

*“[customers] are all looking for competitive advantage, they are all looking for reduction in their cost, they are all looking to be as efficient as possible”.*

Consequently, it can be asserted that an operator-SLS attributes value-added organisational capabilities. These organisational capabilities facilitate the provision of streamlined SC-solutions to cargo owners [or to utilise them internally for the improvement of internal operations] (see Table 6-6).

<b>Value-added capabilities that enhance the competitiveness of intermediaries</b>
Elimination of non-value-added distribution segments
Facilitation of end-to-end SC
Faster route to market based on increased container availability, and products available for handling in shorter time periods
Increased visibility and control of imported inventory
Increased SC flexibility in terms of fast-tracking or delaying containers according to demand

**Table 6-6: Value-added capabilities derived from an operator-SLS, source: (author's own)**

From the data above, it can be argued that two factors affect the streamlined SC solutions. The first is the location of the port-centric facility that allows faster handling of products. The second regards the intrinsic organisational capabilities of each port/intermediary. The Sales and Marketing Director of LSP8 provides an example of this combination of factors. He raises that one of the services included in their SLS-offering is a yoghurt co-packing service. Cargo owners can benefit from economies of scale by importing single flavour loads. LSP8 mixes single flavours in store orders, and transports them either directly to store, or to an RDC, where they are cross-docked with other shipments prior to final transportation. The capability to offer these logistics-VAS allows LSP8 to meet customers’ requirements for customised orders, and the realisation of scale economies in import segments.

The Business Development Manager of LSP4 provides another example. He maintains that their investment in a bottling plant, within their warehousing facility at Port2, increases their competitiveness: *“once built, it will compete with an existing industry to a certain degree. but it will be inside the existing supply chain and the most cost-effective port, rather than taking products on a journey out of their normal supply chain, to only bring them back in again once bottled”.*

The Head of Supply Chain of Retailer1 provides a third example. He highlights the combination of the organisational capabilities of Retailer1’s parent company and the underlying operational efficiencies of an operator-SLS confer CA. He comments:

*“The primary source of CA is the strength of our parent company global logistics system that enables us to do multi-tier ordering system. Having the big building by a port, isn’t particularly clever, anyone could replicate that, and [Retailer2] subsequently did and build one three times as big, to hold three times the inventory. The clever bit is the system. That’s where we get the CA, we can flow our merchandise in a very lean and agile fashion, faster and cheaper to our stores”*

The examples above highlight the CA that can be achieved by the combination of the location of port centric facilities, and the intrinsic processes and capabilities of intermediaries. However, it is important to note that intermediaries located in the relative proximity of a port can also achieve such CA. The Group Sales Director of LSP5 argues:

*“...it’s important that we are able to offer our customers a full spectrum of service and certainly having warehouses that are capable of offering a port centric solution is vital. Not only it allows us to demonstrate our customers that we are forward thinking but also allows them to take advantage of the benefits associated with port centric”.*

However, LSP5’s warehouse is located 20 miles northwest of Port2. Therefore, value-added capabilities can be attributed to intermediaries that are marketed as port-centric, but are not located on port’s land. Further, LSP5 is not engaged in partnership with Port2. Their Group Sales Director claims: *“Our relationship is truly as a transport business, we inform the port that we like to pick-up these containers on these days, and they allow us to enter the port, pick-up the containers, and move them wherever we are moving them to”.*

This argument contradicts the ERBT literature (Lavie, 2006; Lewis et al., 2010; Xu et al., 2014; Prajogo et al., 2016); in that organisations can leverage resources of other organisations without formal collaborative agreements. LSP5 leverages its transactional relationship with Port2. Consequently, it can be argued that the possession of capabilities that are required for the provision of logistics-VAS, and the location of the intermediary are not exhaustive factors for the realisation of CA. An operator-SLS can confer CA even if one of those factors is fulfilled. However, prior to any conclusive arguments the sustainability of such CA needs to be evaluated.

According to Oliva and Kallenberg (2003), and Adrodegari and Saccani (2017) services are less imitable from competitors due to their increased dependency on labour, and their ambiguous nature; thus, conditions for the realisation of SCA can be achieved. However, logistics-VAS do not require highly skilled workers, with the exemption of the offering of very niche services. In this case the complexity of interactions between the tacit knowledge that resides in the human resources, and the assets of the firm will result in increased causal ambiguity (Lippman and Rumelt, 1982; Vicente Lorente, 2001).

Causal ambiguity is a factor that has a positive relationship with the barriers for imitability of a firm's CA (Vicente-Lorente, 2001), and inimitability of resources is one of the factors that contribute towards the sustainability of a firm's CA (Barney, 1991). Consequently, it can be argued that human capital resources can contribute towards the realisation of SCA if their interactions with the assets of the firm are complex, because added complexity will impose higher imitation barriers. This argument complements the SLS literature.

The second attribute in Oliva and Kallenberg (2003) is that services are less imitable due to their ambiguous nature. In the context of PCL the provision of logistics-VAS is based on the bundle of the intermediary's idiosyncratic resources and the resources of network partners<sup>42</sup> or counterparties<sup>43</sup>. According to Arya and Lin (2007), Lewis et al. (2010), Spring and Araujo (2014), Hitt et al. (2016) and Prajogo et al. (2016) the co-existence of internal and external resources leads to CA. Considering the concept of network resources, it can be argued that the combination of the firm's network and the network resources can lead to SCA (Gulati et al., 2000). Thus, intermediaries who engage in collaboration with other network partners have the potential to realise SCA, because the logistics-VAS derive from a bundle of idiosyncratic and network resources and capabilities. Subsequently, the offering of intermediaries that are not located within a port, or do not collaborate with network partners is more imitable. That is because they provide services based only on their idiosyncratic resources, and the exploitation of the marketing power of the PCL model.

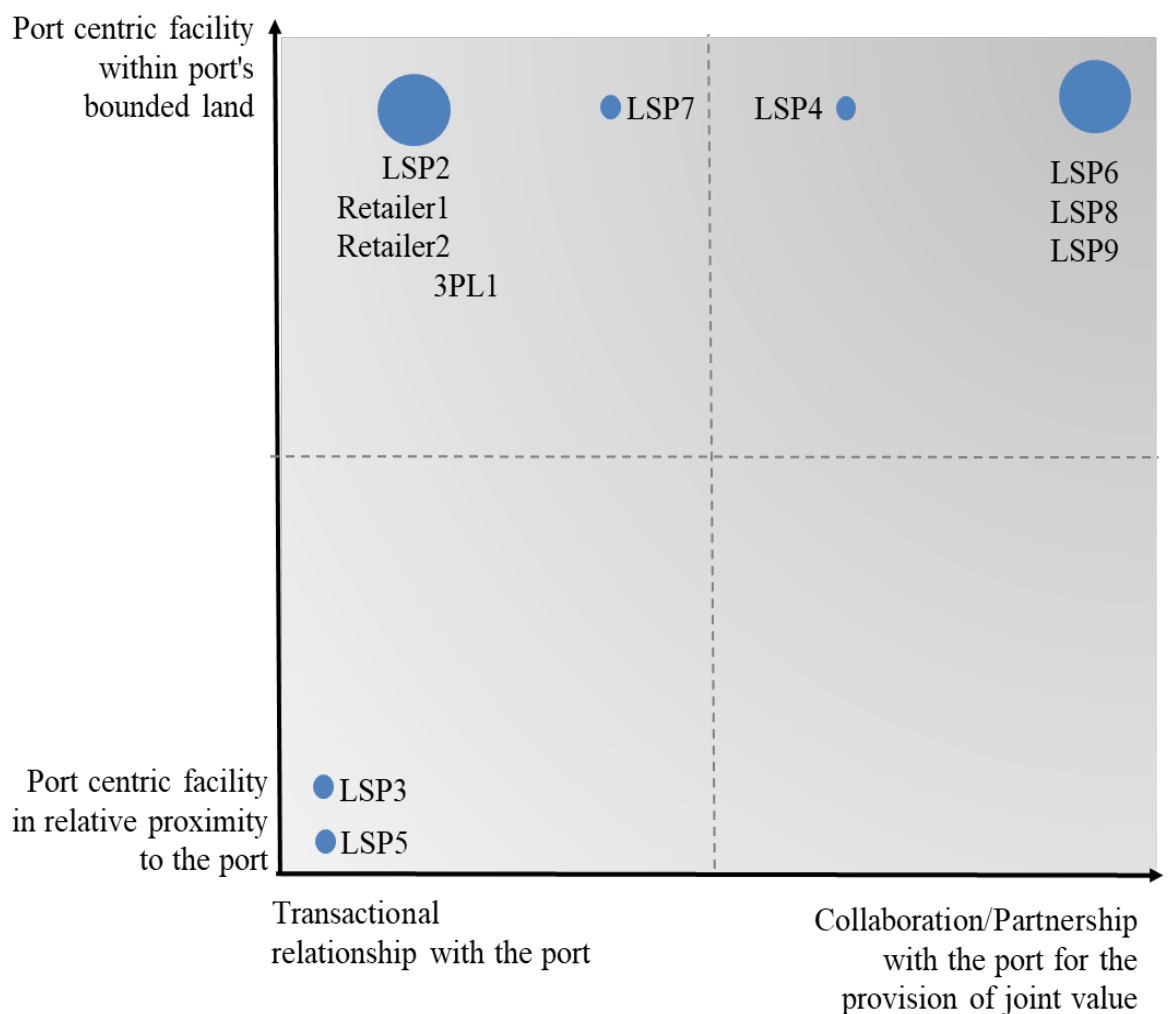
It can be concluded that only intermediaries engaged in formal collaborative relationship with a port can realise SCA because their services are based on the co-existence of their idiosyncratic resources and network resources developed with network partners. The conclusion above complements the argument made earlier that only one of the two factors influencing the capabilities of intermediaries is necessary for CA. If an intermediary is not located within the port's premises nor/ (or does not) collaborate with a port for the provision of logistics-VAS, then its CA is prone to imitation by competitors. Thus, CA can be conferred if one of the two factors is achieved. However, the fulfilment of both factors can lead to the creation of condition required for the realisation of SCA.

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<sup>42</sup> LSPs engaged in tenant-landlord relationship with the port, LSPs engaged in tenant-landlord relationship with the port for some of their PCL facilities, non-asset based LSPs.

<sup>43</sup> LSPs not engaged in tenant-landlord relationship with the port.

In summary, it can be argued that an operator-SLS can confer SCA if the logistics-VAS derive from a bundle of idiosyncratic and network resources. This argument complements SLS (Oliva and Kallenberg, 2003; Adrodegari and Saccani, 2017) and PCL (Mangan et al., 2008; Nam and Song, 2011; Woo et al., 2013) literature streams; in that the conditions for the realisation of SCA are dependent only partially on the idiosyncratic resources of the intermediary. Network resources and/or idiosyncratic resources of the port play a determinant role in the development of the conditions for the realisation of SCA. From the discussion above and considering the relationship of each intermediary with the respective port, and the location of its port centric facility, Figure 6-5 can be created.



**Figure 6-5: Relative positioning of intermediaries that implement an operator-SLS in regard with their proximity and collaboration level with a port, source: (author's own)<sup>44</sup>**

<sup>44</sup> The low right quadrant of Figure 6-5 could not be populated by any of the companies of this research's sample, because none of them has the characteristics required to be positioned in this quadrant.

According to Figure 6-5, an intermediary that implements an operator-SLS and is in a port's relative proximity, but is not engaged in a formal collaborative agreement with the port can realise relative CA over intermediaries not implementing such strategy. The relative CA is conferred from the value-adding capabilities attributed by an operator-SLS. However, this relative competitive edge cannot be sustained due to imitation risk. This position is presented in the low left quadrant of Figure 6-5. Intermediaries that implement an operator-SLS located within the bounded land of the port will realise CA. Their positioning within the premises of the port enhances the level of value they can offer to cargo owners. These intermediaries are presented in the upper left quadrant of Figure 6-5. Finally, intermediaries located within the ports' premises and collaborating with the port to provide logistics-VAS can realise SCA, because of imitation barriers posed to the development of logistics-VAS based on idiosyncratic and network resources. These intermediaries are positioned in the upper right quadrant of Figure 6-5.

Port4S has not been considered in the discussion so far. That is because the arguments used so far concerns the value-adding capabilities that can be conferred to intermediaries from their establishment within a port's boundaries, and by the level of collaboration they have with the port. Considering those two factors and the nature of Port4S, it is obvious that Port4S must be investigated separately. Port4S's Divisional Director argues that their operator-SLS increased their long-term competitiveness:

*"We certainly see port centric as delivering a long term competitive edge. It's very much in its early stages in development in the Scottish marketplace. It is more prevalent in England now, but some of the key supply chains and routes see this as being more of a long-term commitment to using our facilities because of that port centric added value"*

He further argues that to sustain its competitive edge, the port plans to expand its warehousing offering. Additionally, he argues that the company has developed marketing strategies that focus on locking-in key customers. He highlights that these customers belong to specific market segments associated with the port's direct hinterland (e.g. Scottish whiskey industry) and foreland (e.g. North Sea oil and gas industry).

Consequently, it can be argued that the competitiveness of Port4S derives from its idiosyncratic resources, and market characteristics of its hinterland and foreland. However, other UK ports invest in their multimodal connectivity. Consequently, they can expand their hinterland captivity in the direct hinterland of Port4S. Therefore, the sustainability of the port's competitive edge can be threatened by competitors who offer increased efficiencies to cargo owners. This danger is highlighted also by Monios and

Wilmsmeier (2012b). A potential way to overcome this challenge would be the formation of partnerships with specialised LSPs. Such partnerships can enhance the port's SLS offering by the creation of a joint value proposition based on the port's idiosyncratic resources and capabilities, and the network resources that will be created by network partners. As argued earlier such a proposition can lead to SCA due to increased imitation barriers. The formation of such partnerships will transform the operator-SLS to a hybrid-SLS. This argument complements the SLS literature (Oliva and Kallenberg, 2003; Adrodegari and Saccani, 2017) as asserted earlier. It also complements and expands the PCL literature. Feng et al. (2012) and Monios et al. (2018) argue that the provision of logistics-VAS can increase a port's competitiveness and be a source of CA. However, as it was argued in this thesis, if the CA of a port derives only from its own idiosyncratic resources then it cannot be sustained in the long term. That is, because it is prone to imitation by similar SLS and the hinterland expansion strategies of other ports.

#### CA based on differentiation

According to the SLS literature (e.g. Mathieu, 2001; Baines et al., 2009b; Fischer et al., 2010; Bustinza et al., 2017), manufacturers that implement a SLS can achieve CA based on the differentiation of their offering. Such differentiation is achieved because these organisations provide a customised offering (bundle of products and services), instead of competing only on product innovation. Before analysing the data with regard to the CA achieved by differentiation in a PCL context, some remarks must be made.

Two broad types of ports/intermediaries that implement an operator-SLS are distinguished. The first concerns ports/intermediaries competing in the logistics-VAS market. The second concerns intermediaries (i.e. retailers) that utilise logistics-VAS internally. Concerning the latter type, and considering that these intermediaries do not market logistics-VAS, comments about the achievement of CA based on differentiation of their offering cannot be made. Thus, these intermediaries are excluded from the analysis below. The former type of ports/intermediaries that implement an operator-SLS are divided into five subcategories. One of those subcategories regards only Port4S. Therefore, its ability to achieve CA based on differentiation cannot be discussed in relation to intermediaries, because they compete in different industries.

The Divisional Director of Port4S maintains that their operator-SLS enables them to realise CA based on a differentiated offering on a local level. However, on a wider regional level other ports implement similar strategies. Consequently, it can be argued that an operator-SLS cannot confer CA to Port4S *per se*, because competitors offer similar



services. Trade orientation and competition in specific market segments give Port4S its competitive edge. This argument contradicts the SLS literature; in that even though the offering of a port implementing an operator-SLS can be customised by the provision of logistics-VAS, the differentiation derives from other characteristics such as the cargo types, the port resources, and the nature of demand in the port's hinterland.

Concerning the remaining intermediaries (i.e. LSPs competing in a PCL environment), the analysis of the primary data revealed that differentiation based CA can be realised on two levels. The first level of differentiation regards the capabilities of LSP that implement an operator-SLS in comparison to LSPs that do not implement an operator-SLS. The second level of differentiation can be realised among the LSPs that implement such a strategy. LSP6's Systems Project Analyst claims that the company differentiates from other LSPs that do not implement an operator-SLS. He maintains:

*"Having a port centric operation enables us to reduce some of the haulage charges. For example, for [wine importer], we save around £3,000,000 per year, by having a port centric operation that allows the use tow-liners for delivery of the stock and improves about 19% the efficiency because they use backloads to return".*

Further, the Commercial Director of LSP6 argues that the company also differentiates from other LSPs in the PCL industry because they are located within the port's bounded area, and have a partnership with Port2. He comments:

*"We have an edge being on the port and no other people are physically on the port, they are all technically outside of the port [...] if they are outside of the port boundary, they haven't got the advantage of saving overweight or working closely with the port authority as us".*

Additionally, their relationship with the port and their position allows collaboration with the port in the design of new services: *"We work with them over the years to build up the operation on port. Even though now the processes are in place, when new clients come along with new processes they want to try, we collaborate with the port to make it work".*

The Commercial Director of LSP6 argues that intrinsic characteristics are responsible for their differentiation. He comments:

*"...we try to differentiate ourselves by providing better service quality, so we put a lot of emphasis into our training. We've got to have safety-trained employees who make sure that all the processes and risk assessments are up to date. We pride ourselves being at the top 10% of the logistics operators in this area."*

Consequently, it can be argued that LSPs implementing an operator-SLS can differentiate from competitors not implementing such strategies. Additionally, within the PCL industry, LSPs can further differentiate if they are positioned within the port's

bounded land, and collaborate with the port. The latter argument is significant as it demonstrates a relationship between the capabilities attributed to LSPs that implement an operator-SLS and their physical location in relation to the port.

The argument above can be further enhanced by the comparison of LSP6 with LSP5. The Group Commercial Director of LSP5 argues that they differentiate due to the structural characteristics of their port centric marketed facility. He claims:

*“...there is a lack of decent full grade warehousing; there are a lot of old and poorly maintained warehouses at the port. As a result, many customers feel uncomfortable in such environment. Our warehouse is a modern facility, it looks a part, it’s a clean environment, and it’s well managed. That allows us to attract customers willing to pay a little bit more for the type of environment that reflects on the nuances of their products”.*

Consequently, LSPs that implement an operator-SLS can differentiate based on idiosyncratic physical capital resources. However, further factors need to be considered. The resource enabling LSP5 to differentiate is relatively easy for competitors to imitate. The development of logistics parks by ports negates the entry barriers that could be set by the argument that port land is limited. Additionally, the fact that LSP5 is not located on port land also acts as factor that increases the level of imitability of this resource. It can be argued that even though the possession of a state-of-the-art facility could potentially lead to CA based on differentiation, this CA is not sustainable due to the relative imitability of such resource. Consequently, LSPs that implement an operator-SLS should preferably be located directly by the port and venture to collaborate with the port.

A further example of two level differentiation is reported from the Business Development Manager of LSP4. He asserts that the company can realise CA from the instalment of an alcoholic beverages bottling plant within their Port2 facility. He comments that LSP4 will compete with the UK bottling industry by providing logistics-VAS from a port. Consequently, the SC of the cargo owners will be rationalised; in that non-value-added distribution segments will be eliminated. He distinctively comments:

*“We will be competing for market share with UK bottling which does not now take place at a major international deep-sea port, some of the bottling plants in the UK are very odd places, and they are very expensive places to get to”*

The second differentiator lies among LSPs that implement an operator-SLS. The investment in this resource enables LSP4 to focus on particular market segments, and thus, differentiate from other LSPs that implement an operator-SLS. Consequently, it can be argued that in this case the operator-SLS differentiates the LSP because it enables the LSP to provide product specific logistics-VAS within a port’s environment, and because

the particular investment enables LSP4 to differentiate from competitors in the PCL market. The above argument contradicts the SLS literature (Mathieu, 2001; Baines et al., 2009b; Fischer et al., 2010; Bustinza et al., 2017); in that the provision of VAS alone does not confer CA based on differentiation. In a PCL context differentiation derives from the combination of logistics-VAS with the capabilities attributed from the positioning of the LSP within a port's environment.

A third example of two level differentiation is reported by LSP8. The Sales and Marketing Director of LSP8 claims that the company differentiates from competitors within the PCL industry based on the characteristics of its port-centric facility. He argues: *“When you look at the available facilities, and I am talking about state-of-the-art temperature controlled facilities, there are very few options actually in and around the ports. There are warehouses, but very few temperature controlled warehouses”*. Consequently, it can be asserted that within the PCL industry LSP8 can differentiate due to the characteristics of its port-centric facility. The second level of differentiation derives from the specific market segments that LSP8's competes in (i.e. temperature control warehousing and distribution industry). The Supply Chain Director of LSP8 argues that the company differentiates based on:

*“...a combination of location, modern building design & construction, integration with optimal inbound and outbound transport networks, supported by a network of operating partnerships – deployed as a product to meet our customers exact supply chain requirements far better than legacy solutions”*.

Therefore, it can be argued that the value-adding capabilities attributed to a niche LSP that implements an operator-SLS, enable differentiation within the LSP market, and result in CA.

Additionally, the importance of a two-level differentiation can be highlighted by demonstrating that one level of differentiation cannot be sustained in the long term. The Director of LSP2 argues that an operator-SLS incorporating bonded warehousing enables them to differentiate because: *“[...] VAT is only paid when the material leaves our warehouse, therefore offering customers a distinct cash flow advantage and since goods are not needlessly double handled clients make a further saving on storage and distribution costs”*. He further asserts that the combination of services and capabilities, and the internal process of the company enable them to differentiate from competitors. He maintains: *“We are the company that offers the most diverse port centric operation, we are literally with the three businesses combined a one-stop shop for anything from a parcel to a full artic load, whereas others specialise mainly in one [SC] segment”*.

However, recent developments within its port environment threaten the differentiation of the company. The Director of LSP2 argues:

*“A competitor, who is the biggest UK container haulier operating in multiple port locations, recently started to get into the port-centric market and try to offer the same offering as we do. They were effectively just a container haulier [...] but since we came along they feel their strategy needs to change and they now opened a port-centric operation in [Port4T] and try to do the same in other ports they operate from”.*

The Business Development Manager of LSP1 argues that they are one of the few companies in South England implementing such a strategy for more than a decade. However, he recognises that contemporarily many big LSPs aim to enhance their offering with the capabilities attributed by an operator-SLS. He argues:

*“...there are some big logistics companies, who obviously operate different models including port-centric, some have warehouses in the Midlands but also have other locations near the ports. So some of the very big logistics companies have a mixture of different services and ways of moving the product to market but we've been working it out for a while”.*

Consequently, it can be argued that even though a port centric operation can result in a competitive edge based on differentiation, this edge is not sustained in the long term, due to imitability of the offering. The competitive edge is more sustainable when the differentiation derives from a combination of factors, such as collaboration with the port for the development of services and processes, and/or focus on a niche product market. Figure 6-6 depicts the two levels of differentiation.

#### *Key findings of the operator-SLS case study*

The analysis of the data revealed positive strategic impact from the implementation of an operator-SLS. Prior to the presentation of the key finding of the case study it should be mentioned that the structure of the present case study has an element of repetition of arguments. The case study is divided in two main subsections. Each subsection regards one of the components that constitute the strategic impact of an operator-SLS. The first component regards the CA or SCA that can be achieved by the value-adding capabilities that are attributed to the ports/intermediaries that implement an operator-SLS, and concerns all the companies comprising the operator-SLS case study. However, the discussion is divided in two further parts. The first part involves intermediaries (i.e.LSPs and Retailers) as tenants of a port, while the second part involves the only port of the case study.

The analysis reveals that the firms that implement an operator-SLS develop value-added organisational capabilities that can create CA. This CA is dependent upon two non-exhaustive factors (i.e. location of the intermediary, and collaboration level with the port). The theoretical foundations of this thesis support further this argument; in that if the intermediary that implements an operator-SLS collaborates with the port, then its SLS-offering will be based on network resources rather than proprietary resources. Consequently, CA can be sustained in the long-term only if the SLS offering is based upon a bundle of idiosyncratic and network resources.

The second component regards the differentiation based CA that can be achieved by an operator-SLS. In this subsection the discussion excludes the two retailers of the sample because they do not compete on the provision of logistics-VAS. The remaining companies are discussed separately because they compete in different markets. The key findings of this subsection are that an operator-SLS does not provide differentiation based CA on ports, but can confer advanced competitiveness to LSPs who achieve two levels of differentiation (Figure 6-6). Table 6-7 summarises the key findings of the case study of operator-SLS, and its contributions to literature.

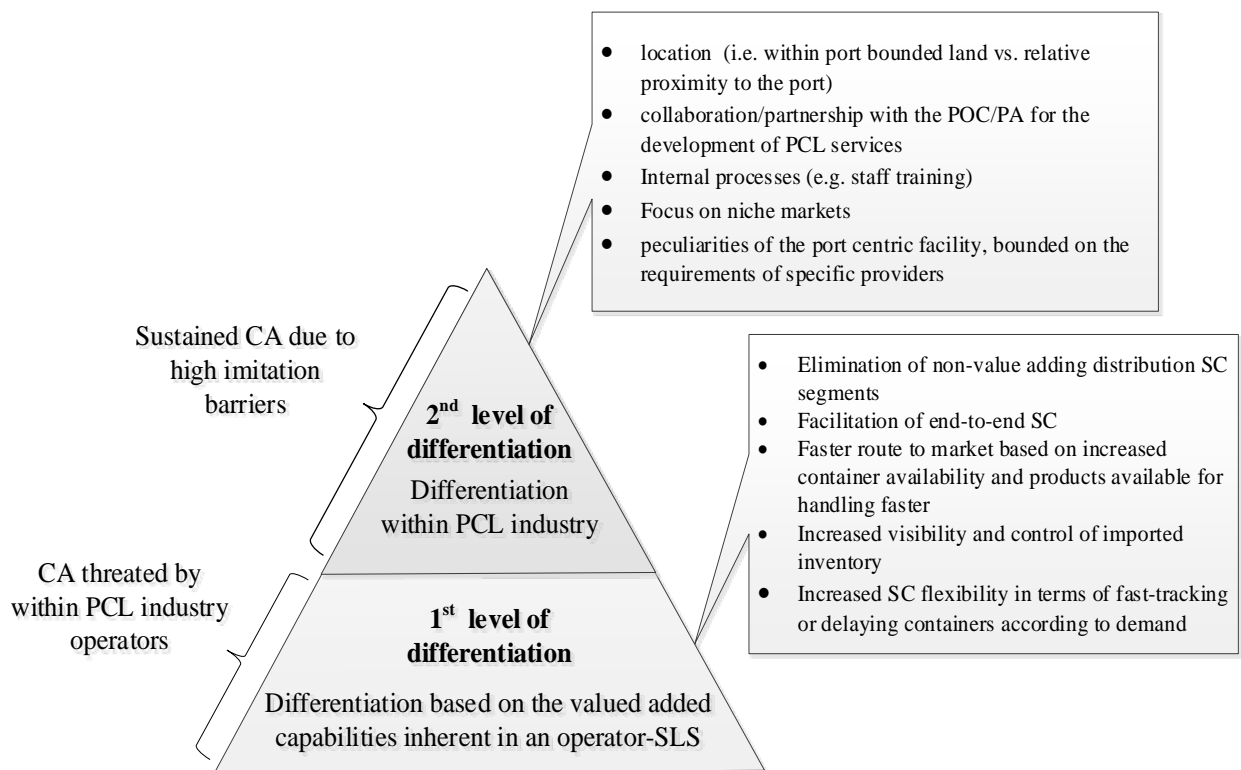


Figure 6-6 : Competitiveness of LSPs in regard with differentiation, source: (author's own)

Key findings	Contribution to SLS and PCL literature	Contribution to ERBT literature
<p>1) Ports/intermediaries that implement an operator-SLS gain value-added organisational capabilities<sup>45</sup> that can confer CA.</p> <p>2) Two non-exhaustive factors influence this CA; the location of the port-centric facility, and the intrinsic processes and capabilities of the ports/intermediaries that implement the operator-SLS.</p> <p>3) Ports/intermediaries that implement an operator-SLS can realise SCA from the human capital involved in logistics-VAS, only if the interaction of human capital with firm assets is complex.</p> <p>4) <b>LSPs and Retailers</b> can realise SCA if located within port's bounded land, and logistics-VAS are based on the co-existence of idiosyncratic and network resources (i.e. collaboration with port).</p> <p>5) <b>LSPs</b> – An operator-SLS can confer CA based on two levels of differentiation:</p> <ul style="list-style-type: none"> <li>i) differentiated capabilities of LSPs implementing an operator SLS compared to LSPs that do not.</li> <li>ii) Differentiation among LSPs in the PCL industry.</li> </ul> <p>6) <b>Ports only:</b></p> <ul style="list-style-type: none"> <li>– An operator-SLS cannot confer SCA on its own. Conditions for the realisation of SCA can be created only if the port collaborates with specialist LSPs.</li> <li>– An operator SLS cannot confer differentiation based CA on its own; trade orientation and competition in specific market segments can enable a port to differentiate and achieve CA.</li> </ul>	<p>The findings of this case study <i>complement</i> the <i>SLS</i> and <i>PCL literature</i>; in that:</p> <ul style="list-style-type: none"> <li>- human capital resources can contribute to the realisation of SCA by the firm only if their interactions with the assets of the firm are complex (i.e. only if the SLS offering incorporates complex and niche services).</li> <li>- conditions for the realisation of SCA are only partially dependent on the idiosyncratic resources of the firm; network resources and/or idiosyncratic resources play a determinant role in the development of the conditions required for the realisation of SCA.</li> </ul> <p><b>Ports only</b> - even though the offering of a port can be customised by the provision of logistics VAS, the differentiation derives from factors extrinsic to the operator-SLS (e.g. nature of products, port's resources, demand peculiarities of the ports hinterland).</p>	<p>The findings of this case study</p> <ul style="list-style-type: none"> <li>1) <i>confirm</i> the ERBT literature; in that the ports/intermediaries that are engaged in collaboration with other entities within the PCL network can potentially realise SCA, because their services are based the outcome of the co-existence of the idiosyncratic resources of the firm with network resources and capabilities.</li> <li>2) <i>contradict</i> the ERBT literature; in that a LSP that implements an operator-SLS can realise CA by leveraging the resources of a port, without those organisations having established a formal collaborative agreement.</li> </ul>

**Table 6-7: Key findings strategic impact operator-SLS, source: (authors own)**

<sup>45</sup> Value-added organisational capabilities: 1) Elimination of non-value-added distribution segments, 2) Facilitation of end-to-end SC, 3) Faster route to market based on increased container availability, and products available for handling in shorter time periods, 4) Increased visibility and control of imported inventory, 5) Increased SC flexibility in terms of fast-tracking or delaying containers according to demand.

### 6.2.3 Hybrid-SLS

The analysis of the data collected for this study revealed two key components of the strategic impact of a hybrid-SLS. The first component regards the strategic benefits that are achieved by the attribution of value-added capabilities to the ports that implement a hybrid-SLS, and the second component regards the differentiation based CA.

Concerning the first component, in its landlord role a hybrid-SLS provides the capability to develop a network of interdependent organisations. From the extant literature it can be argued that this network has the potential to confer CA. That is because within this network the port develops close relationships with its network partners (i.e. LSPs). These relationships lead to secured cargo throughput and the capability to fulfil customer demand without resource commitments. Additionally, the landlord role of a hybrid-SLS enables cost efficient SC solutions. Another finding is that the combination of the network created by the landlord role of a hybrid-SLS, with the existence of network resources creates the condition for the realisation of SCA.

Concerning the operator role of a hybrid-SLS, conditions for the realisation of SCA are created if the SLS offering derives from the combination of proprietary resources of the port and its business partner. Furthermore, the operator role of a hybrid-SLS provides cost efficient SC solutions and the capability to extend customer base. It was also identified that factors that are extrinsic to the hybrid-SLS can contribute towards the realisation of CA or SCA. These are i) the human capital resources comprising the executive board of the port, ii) the physical capital resources (i.e. port's hinterland, ship canal etc.) and iii) the investments in new physical capital resources that augment the value extracted from other resources of the port.

Concerning the second component it is identified that a hybrid-SLS cannot confer differentiation based CA. That is, because most of the container ports in the UK implement similar SLS. However, it is argued that the offering of such logistics-VAS becomes a prerequisite for container ports to remain competitive.

#### CA based on value-added capabilities

The interviewees of the three ports comprising the case study of hybrid-SLS argue that the value-added capabilities that are amassed by the implementation of a hybrid-SLS increase their competitiveness. However, prior to the investigation of these value-added capabilities a remark must be made. By definition, a hybrid-SLS assumes two roles (i.e.

landlord role and operator role). Consequently, the impact of each role on the competitiveness of the firm is investigated separately.

### Landlord role

Concerning the landlord role of a hybrid-SLS, the Commercial Director of Port2 argues that their hybrid-SLS propels the creation of a network of interdependent organisations. He elaborates: *“for us port centricity is the offering of multi-services to keep [cargo owners, hauliers, LSPs and shipping lines] close to us”*. However, he distinguishes that a single company cannot offer all the services; thus, often, Port2 acts *“as the provider of a location for these services”*. Therefore, a network of LSPs is created around the port. Further, he argues that the co-existence of the port the LSPs *“creates demand for each other”*. He explains that the tenants of the port wish to be located in its proximity to receive containers *“within a small amount of time after containers are landed in the UK”*. He further argues: *“the port is also benefited by the existence of such tenants; because the establishment of warehousing operations requires significant contractual commitment”*. Consequently, the existence of such tenants secures cargo throughput for the length of the leasing agreement.

The same notion is shared by the Sales and Logistics Development Manager of Port1. She maintains:

*“I’ve closed business recently with a customer that was handling a specialist’s product that one of the third parties that we lease our warehouse to was handling too. So, I asked them to give a price and said if our price is too expensive, because obviously this is not our speciality, I can put you in touch with this person at this LSP that they handle this product day in day out, because obviously they may have efficiencies there and they can offer a cheaper price”*.

Regarding the landlord role of a hybrids-SLS, it can be argued that a network of interdependent organisations is created around the port implementing a hybrid-SLS. Further, it can be argued that within this network of interdependent organisations close relationships among network partners (i.e. port and LSPs) are created. Such relationships enable the port to secure cargo throughput for its core functions and satisfy the demand of cargo owners without resource commitment<sup>46</sup> from the port’s side. Consequently, the landlord role of a hybrid-SLS, can result in a *“win-win-win”* situation for the port, the tenant, and the cargo owner.

According to Baines et al. (2009b), Gebauer et al., (2017), and Adrodegari and Saccani, (2017), a manufacturing-SLS attributes value-added capabilities to organisations that can confer CA. Additionally, according to Feng et al. (2012) and Monios et al. (2018)

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<sup>46</sup> The resource commitment here refers to the resources required for the provision of logistics-VAS.



ports can realise CA by the provision of logistics-VAS. However, it should be noted that in the landlord role of a hybrid-SLS the logistics-VAS services are a result of the network development capability of the port. Therefore, the empirical arguments presented above confirm the SLS literature, and complement the PCL literature, respectively.

Another value-added capability from the landlord role of a hybrid-SLS is the capability to create cost efficient SC solutions. The Head of Commercial Strategy of Port 1 argues:

*“If somebody’s warehouse is on your port the cost of getting the container from the container terminal to the warehouse is much smaller, and the penalties become so much larger if they move those containers from another container terminal around the UK. So, you create a natural competitiveness on the total supply chain cost by somebody having their warehousing in your port environment”.*

Consequently, leasing of port land and/or warehousing facilities to intermediaries results in reduced SC cost for cargo owners. Therefore, it can be argued that this cost saving capability derives from the co-existence of the idiosyncratic resources of the port and the idiosyncratic resources of its tenants.

Concerning the port, these resources are the land for the development of the facilities, and the physical and human capital resources required for the provision of port services. Concerning the tenant’s resources, these are the physical and human capital resources required for the provision of logistics-VAS. According to Lewis et al. (2010), Hitt et al. (2016), and Prajogo et al. (2016) the co-existence of internal and external resources can lead to the realisation of CA. Consequently, it can be asserted that the bundle of resources imposed by the landlord role of a hybrid-SLS gives the port value-added capabilities; these value-added capabilities have the potentials for the realisation of CA. This argument confirms the ERBT literature; in that value generating resources reside beyond the boundaries of the firm, and that these resources are the base for the creation of CA (Dyer and Singh, 1998; Lavie, 2006; Hitt et al., 2016).

Further, this argument complements the SLS and PCL literature streams; in that in its landlord role a hybrid-SLS confers CA from the value-added capabilities (Baines et al., 2009b; Feng et al., 2012; Gebauer et al., 2017; Monios et al., 2018). However, these capabilities are generated from the co-existence of the port’s idiosyncratic resources and the resources and capabilities of its tenants.

Additionally, the landlord role of a hybrid-SLS enables the development of a network upon which the port that implements the hybrid-SLS can compete. Gulati et al. (2000) argue that the combination of a firm’s network and the development of network

resources can lead to SCA. Consequently, it can be argued that the network created by the landlord role, and the existence of network resources (i.e. combination of idiosyncratic resources of the port, and idiosyncratic resources of network partner for the provision of logistics-VAS and cost saving opportunities to cargo owners) have the potential to confer SCA. This argument complements the SLS literature; in that according to Oliva and Kallenberg (2003), and Adrodegari and Saccani (2017) a SLS can confer SCA to the company due to the ambiguity and labour dependency of services. However, from the primary data it is argued that a SLS can confer SCA from the capability to develop a network and through this network access the resources required for the provision of logistics-VAS.

### Operator role

To discuss the strategic impact of the operator role of a hybrid-SLS a distinction needs to be made regarding the proprietorship of the resources involved in the SLS offering of the ports. For the provision of logistics-VAS Port1 and Port2 rely upon their proprietary idiosyncratic physical and human capital resources. However, Port3 relies upon the human capital resources of LSP9 in addition to its own physical and human capital resources. As presented in Section 5.3, LSP9 is responsible for the commercial facet of the logistics-VAS because LSP9 contracts with cargo owners. Consequently, Port3's SLS offering is based on the collaboration of the port resources, and the resources of its network partner. As argued above, the co-existence of idiosyncratic and network resources has the potential to confer CA on the company (Arya and Lin, 2007; Squire et al., 2009; Lewis et al., 2010; Spring and Araujo, 2014; Prajogo et al., 2016). Therefore, a port can realise CA from the operator role of a hybrid-SLS if the port's SLS offering is based upon the collaboration of its resources and the resources of a partner.

Concerning Port1 and Port2, the operator role of a hybrid-SLS allows them to offer cost efficient SC solutions to cargo owners. This capability derives from the elimination of non-value-added distribution segments inherent in a port centric warehousing and distribution model. The difference between the two roles of a hybrid-SLS is that in its operator role the capability to offer cost efficient SC solutions is attributed from its idiosyncratic resources (i.e. port centric facilities are owned by the port and are operated by its own workforce). The Sales and Logistics Manager of Port1 comments:

*“we've taken the haulage leg out of the journey basically, if they were going to a DC in Northampton or wherever, then there'd still be the haulage leg from the port to the warehouse then consolidation there, and haulage onwards. Also, you've got*

*the issue of returning empty containers back to the port which is quite a substantial hidden cost”*

Consequently, it can be argued that the operator role of a hybrid-SLS gives the capability to offer cost efficient SC solutions based upon idiosyncratic proprietary resources.

The capability to contract directly with cargo owners is another value-adding capability attributed from the operator role of a hybrid-SLS. According to the Port Director of Port1 this capability enables them to: *“spend more time with the cargo owner as opposed to the shipping lines, which we traditionally used to work with”*. The capability to contract with cargo owners helps the port to widen its customer base and increase cargo throughput by locking-in customers. He comments:

*“The added value we provide for our customers makes us more attractive than our competitors. It means that we are seen not just as the port provider, but the port providing added value services. That vertical integration into the supply chain it has really been quite key, it helped bring port volume via our vertical integration into the supply chain”*

He further argues that their SLS has increased their feeder connectivity. He comments: *“we’ve had a big increase into Europe feeder services, so in the 4-year period we’ve gone from two feeders to six”*. Similarly, the Sales and Logistics Development Manager of Port1 comments that the port’s SLS enables them to:

*“...increase the number of customers, rather than our customers only be shipping lines we’ve got a lot more customers now, so we know what’s going on in the supply chain in this area [...] and it has driven much higher volumes over the quay by having these relationships with the shippers rather than just with the freight forwarders or the shipping line”*

She further argues that contracting directly with cargo owners increased visibility of containers’ content. She comments:

*“...it gives us more visibility of what is actually coming over the quay, because containers could have anything in. We don’t really know that much detail unless we get involved in the devanning of the container and understanding a bit more detail about the supply chain. We found that we’ve been able to give better value by understanding [cargo owner’s] supply chain and say look you can speak to these people and we can do this for you or they could do that for you”*

Similarly, the Supply Chain Marketing Manager of Port2 argues that their hybrid-SLS enables them to:

*“leverage the assets of the port and the port hinterland for the benefit of the cargo owner rather than what the port had previously seen as its customers being the shipping lines. Because, if you provide something at the port that creates a degree of attention for that end user he has a good reason to be at that port irrespective*

*of who the shipping line in the future will be. This in a way it supports your core business which is moving containers”*

From the data above, it is asserted that a hybrid-SLS gives the port the capability to widen its customer base and contract directly with cargo owners. This capability combined with the cost saving capabilities inherent in a port centric-model enhance the competitiveness of the port, and increase cargo throughput. This argument confirms the SLS literature; in that according to Baines et al. (2009b), Gebauer et al. (2017), and Adrodegari and Saccani (2017) an SLS can provide value-added capabilities which can confer CA. The emergent argument complements also the PCL literature; in that according to Feng et al. (2012), and Monios et al. (2018) provision of logistics-VAS will confer CA to the port. The primary data of this research expands their argument further; in that the CA will result from the capability of the port to offer cost efficient SC-solutions and the capability to contract directly with cargo owners.

From the discussion, it became apparent that ports that implement a hybrid-SLS can confer CA from additional value-added capabilities. These capabilities are related to the duality of roles of a hybrid-SLS. In its landlord role a hybrid-SLS can confer CA based on the network development capability, and by enabling cost efficient SC-solutions for cargo owners. However, these capabilities derive from the co-existence of the port resources with the resources of its network partners, and from the network of the port. Therefore, conditions for the realisation of SCA are also created.

The operator role of a hybrid-SLS can confer CA based on the capability to provide cost efficient SC solutions, and to contract directly with cargo owners. However, if the port collaborates with a network partner for its SLS offering, conditions for the realisation of SCA are created. The analysis of primary data revealed additional factors that can contribute to the realisation of SCA by a hybrid-SLS.

The CEO of Port1 argues that the sustainability of their CA is based on the actual service offering of the company. He highlights that the offering of the company derives from a network of complementary resources, and the heterogeneity of human capital resources comprising the executive board. Concerning the human capital resources, he comments:

*“...if you look at the make-up of our executive board, there is a very healthy balance of skills across our team. We've got people from infrastructure, people from sort of services background, people from supply chain, people from manufacturing and automotive industry, if I am honest today we have a natural advantage in that, without precluding the traditional [port] industry”*

Consequently, it can be argued that the longevity of a CA can be enhanced by the influx of heterogeneous talent of human capital resources. This is not an exhaustive factor of the hybrid-SLS, but it can be considered as a factor that contributes towards the sustainability of their competitive edge. This argument partially confirms the argument of Oliva and Kallenberg (2003) that a SLS can confer SCA due to the dependency of services on human capital resources, and the ambiguous nature of the services.

The following resources comprise the resource network that shapes Port1's logistics-VAS offering:

- a) The port hinterland: *“Before we start the whole port centric, the first thing we need to ask ourselves is if that addressable market is still there. The answer is yes it clearly is. So are we going to build another terminal and rely on traditional capabilities or are we going to build a new terminal and make it the centre piece of a bigger, longer term picture”* (CEO of Port1).
- b) The new container terminal: *“by delivering the new container terminal we won't have the constraints we currently have”* (CEO of Port1).
- c) The ship canal: *“we've got the ship canal, which becomes an intrinsic part of the jigsaw. So, we are really starting to create the ultimate port centric distribution model but extend that model further away out from here to the centre of Northwest England”* (CEO of Port1).
- d) The warehouses around the canal and the subsequent network of partners: *“What you start to get is a virtuous circle where the investments in the ship canal and people occupying warehouses in the ship canal creates demand for new vessels through the new container terminal”* (Head of Commercial Strategy of Port1).

Consequently, it can be argued that the combination of the port hinterland, the investments in a new container terminal, the ship canal and the extended network of warehouses and warehouse operators are determinant factors upon which the service offering of Port1 is based. Considering the arguments made earlier and those presented here, it can be asserted that a hybrid-SLS can confer CA and potentially SCA (given that the conditions highlighted earlier are met), but factors extrinsic to the SLS can further contribute to the realisation of CA and SCA by the firm. According to the data of this research, these factors are: i) human capital resources on the executive board of the firm, ii) physical capital resources of the firm (i.e. port hinterland, inland waterways etc.) and, iii) investments in new physical capital resources that will augment the value extracted from other resources of the port. The argument above further complements the SLS and PCL literature streams (Baines et al., 2009b; Feng et al., 2012; Gebauer et al., 2017; Monios et al., 2018); in that factors extrinsic to the SLS can further enhance the CA.

### CA based on differentiation

The second component of the strategic benefit of a hybrid-SLS regards the impact of such a strategy on the differentiation of the port. The Head of Commercial Strategy of Port1 asserts that their hybrid-SLS has resulted in a twofold differentiation. He argues:

*“Firstly, having a port centric mentality allowed us to differentiate and attract cargo. Secondly, we also differentiated our port centric offer. It’s different from the traditional come and build a warehouse at our port. Yes, we’ve got that, but the multiuser warehouse activity that we do, where people can take just 1 pallet space to 20 pallet spaces for 2-3-4 weeks. That’s a fundamentally different offer. So, we have differentiated because of port centric, but we also differentiated our port centric offer”.*

He maintains that their differentiated offering enabled them to contract with customers requiring tactical warehousing instead of strategic warehousing. However, he argues that in many cases the realisation of financial and operational benefits from the cargo owner transformed the tactical warehousing offering in strategic warehousing. This change resulted in the transformation of the relationships between the cargo owner and the port from transactional to collaborative and led to a long-term increase in cargo throughput.

Similarly, the CEO of Port1 agrees that their differentiation derives from *“existing assets and doing things differently, for example offering warehousing along the ship canal”*. He elaborates that the differentiation achieved by the port is derived from the hybrid nature of its SLS. He comments *“there is no other port that moves right across the value chain in the way that we do consistently”*.

Both the Commercial Director and the Supply Chain Marketing Manager of Port2 argue that their hybrids-SLS differentiated the use of the warehousing stock of the port. These warehouses have been previously used for the accommodation of Ro-Ro and bulk related traffic. After the implementation of a hybrid-SLS they utilised them for container traffic. Port2 was one of the first movers in the port centric market, but many UK ports have implemented similar strategies ever since. Thus, it can be argued that in its pure sense the hybrid-SLS of Port2 cannot confer CA to the port based on differentiation. Other intrinsic factors such as the maritime network connectivity<sup>47</sup> of the port and rail connectivity investments<sup>48</sup> contribute in the realisation of CA for the port.

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<sup>47</sup> Port2 has more than 90 weekly services to Europe, Asia, Africa, Middle East, and America, from 33 shipping lines. The increased connectivity attributes supreme choice of connections and cargo volume to cargo owners and intermediaries.

<sup>48</sup> Port2 handles 60 rail freight movements in its three open-access, common-user rail terminals.

The Business Development Manager of Port3 asserts that their hybrid-SLS enables them to differentiate the supported cargo type to be less reliant on a limited number of industries, because this approach has proven to be risky. He explains that historically the port was reliant on the iron steel, coal, and chemicals industries. As, those industries either ceased operations or were relocated, the demand for port services in its hinterland disappeared. He argues:

*“We continually try to diversify and build a broader basket for business for the port, because it has fallen victim in the past to be very reliant on a very small number of businesses. So, for us a broader business development strategy also means that we are securing the future of this business”*

Further, he explains that the effort of the port to differentiate its cargo handling base is supported by its business partners. He argues:

*“We are working more closely with [a rail freight provider] to understand how to integrate more unitised business into [Port3]. That’s super market business. That’s a way of diversifying that part of the business that’s container. So, looking to drive a broader basket of business overall for [Port3] even within each area of business, we want various streams of cargo to support”.*

It can be argued that by the implementation of a hybrid-SLS Port3 differentiated its offering to “survive in the industry”, and become less reliant on specific cargo types, rather than achieving CA and outperforming competitors.

From the data presented above it can be argued that a hybrid-SLS cannot confer CA based on differentiation, but it is considered a prerequisite for container ports to remain competitive in the port market. This argument contradicts the SLS literature; in that, various authors, such as Gebauer and Friedli (2005), Fischer et al. (2010), and Bustinza et al. (2017) among others, argue that differentiation can be achieved by the provision of VAS. In the context of PCL, the provision of logistics-VAS can no longer be considered as a factor that can solely confer CA since similar SLS have been implemented by other ports.

The arguments presented above interfere with the PCL literature in multiple ways. Initially, the remark that ports implement SLS in order to diversify the use of their warehousing stocks and to compete in new markets complements the argument of Demirbas et al. (2014), who argue that ports implementing a PCL strategy can diversify the utilisation of their assets in ways that will create value for customers, and increase revenue. This argument is confirmed by quotes from the interviewees in the case study of hybrid-SLS. However, other authors such as Mangan et al. (2008), Pettit and Beresford (2009), and Okorie et al. (2016) among others, argue that PCL is a strategy that enables

ports to differentiate their offering. The primary data of this research revealed that a hybrid-SLS allows ports to diversify their offering and offer bundles of port services and logistics-VAS. The diversified offering does not result in the realisation of CA based on differentiation because most of the container ports in the UK implement strategies that result in similar offerings, and this remark contradicts the PCL literature.

Wilmsmeier and Monios (2013), and Monios and Wilmsmeier (2014) argue that PCL can be considered as a differentiation strategy of medium sized container ports in order to compete with larger UK ports. This remark is confirmed to a certain extent; in that Port1 (a medium sized port, in terms of container traffic) has invested in PCL to regain market share in the container traffic. It can be asserted that investments for the provision of logistics-VAS (regardless of which of the three SLS) are considered as prerequisites for container ports to remain competitive in the UK container traffic market. This argument contradicts the PCL literature.

#### Key findings of the case study

From the analysis of the primary data it can be argued that a hybrid-SLS can confer CA based on the value-added capabilities attributed to the port, but cannot confer CA based on differentiation. It is also argued that this CA can be sustained in the long-term, if several conditions are met. Table 6-8 summarises the key findings of the case study of hybrid-SLS, and summarises the contributions of this case study to literature.



Key finding	Contribution to SLS and PCL literature	Contribution to ERBT literature
<p>1) A hybrid-SLS confers CA based on value-added capabilities. These capabilities are:</p> <ul style="list-style-type: none"> <li>● <b>Landlord role</b></li> <li>- Capability to develop a network of interdependent organisations, which secure cargo throughput and fulfil customer demand without resource commitment.</li> <li>- Capability to enable cost-efficient SC solutions</li> <li>● <b>Operator role</b></li> <li>- Capability to provide cost-efficient SC solutions</li> <li>- Capability to extend the customer base of the port and securing cargo throughput by contracting directly with cargo owners.</li> </ul> <p>2) A hybrid-SLS cannot confer differentiation based CA on its own, it can only enable ports to diversify the use of their assets, and has become a prerequisite for competition in the container market.</p> <p>3) A hybrid-SLS can create the conditions for the realisation of SCA:</p> <ul style="list-style-type: none"> <li>● <b>Landlord role</b></li> <li>- Combination of idiosyncratic and network partner proprietary resources for the development of joint offering</li> <li>● <b>Operator role</b></li> <li>- Only, if the offering of the port is based on a combination of idiosyncratic resources and proprietary resources of a network partners.</li> </ul> <p>However, extrinsic to the hybrid-SLS factors can also sustain the CA. These are: i) human capital resources comprising the executive board of the port, ii) the physical capital resources of the port, and iii) the investments in new physical capital resources that augment the value extracted from other resources of the port.</p>	<p><b>SLS literature: Confirmed:</b> value-added capabilities can confer CA to the firm.</p> <p><b>Complemented:</b></p> <ul style="list-style-type: none"> <li>● <b>Landlord role:</b> - CA by the co-existence of idiosyncratic resources, with proprietary resources and capabilities of the network partner.</li> <li>- SCA by the capability to develop a network of interdependent organisations and access their resources, not by service ambiguity.</li> <li>● <b>Operator role:</b> - SCA if the offering of the port is based on the combination of idiosyncratic and network resources, and by factors extrinsic to the hybrid-SLS.</li> </ul> <p><b>Contradicted:</b> A hybrid-SLS cannot confer differentiation based CA on its own.</p> <p><b>PCL literature: Confirmed:</b> A hybrid-SLS enables ports to diversify the use of assets in ways that will create value for the customer and increase revenue.</p> <p><b>Complemented:</b></p> <ul style="list-style-type: none"> <li>● <b>Landlord role:</b> The provision of logistics-VAS can confer CA. However, the provision of such services is a result from the combination of port resources and resources of its tenants.</li> <li>● <b>Operator role:</b> Ports can realise CA from the capability to offer cost-efficient SC-solutions, and from the capability to contract directly with cargo owners.</li> </ul> <p><b>Contradicted:</b></p> <ul style="list-style-type: none"> <li>- A hybrid-SLS cannot confer differentiation based CA on its own.</li> <li>- The provision of logistics-VAS is not a differentiator for medium sized ports; but a prerequisite for competing in the container traffic market.</li> </ul>	<p>Confirmed, in that:</p> <ul style="list-style-type: none"> <li>- Value generating resources can reside beyond the boundaries of the port.</li> <li>● <b>Landlord role:</b> the value is considered as the possibility for the realisation of CA from the co-existence of the port's idiosyncratic resources with the resources of its network partners.</li> <li>● <b>Operator role:</b> the port can realise CA or create the conditions for the realisation of SCA if its SLS offering derives from the contribution of the idiosyncratic resources of the port and its business partners.</li> </ul>

Table 6-8: Key findings strategic impact hybrid-SLS, source: (author's own)

#### **6.2.4 Cross case comparison**

Based on the findings of the within case analysis, the cross-case comparison for strategic impact of SLS in a PCL context can be conducted. In all three cases adoption of respective SLS resulted in generation of value-added capabilities, which increase competitiveness and can confer CA. In some occasions the CA can be long-term. Concerning the landlord-SLS, and the landlord function of the hybrid-SLS, the value-added capability is the creation of a network of interdependent organisations, which enables a joint value proposition, and development of network resources. Within this network, partners (i.e. ports and LSPs) secure cargo throughput, and fulfil customer demand for end-to-end SC solutions based on reconciliation of their resources with the resources of network partners. As such, these SLSs result in the development of network resources, i.e. bundles of services (port and logistics-VAS, and cost efficient SC-solutions) that comprise the joint value proposition of the port and its network partners. Thus, the competitiveness of the port is positively affected. The relative inimitability of network resources creates conditions for realisation of SCA.

Concerning the operator-SLS, and the operator role of the hybrid-SLS, the value-added capabilities are operational efficiencies associated with the port-centric model<sup>49</sup>; and in the case of the operator function of a hybrid-SLS, the possibility for the port to contract directly with cargo owners, thus extending its customer base. Concerning the operator-SLS, the CA from the value-added organisational capabilities is affected by two non-exhaustive factors; the location of the warehouse, and the intrinsic processes and capabilities of the intermediary that implements the operator-SLS. However, when the interaction of human capital resources with assets of the intermediary is complex, conditions for the realisation of SCA are created. These conditions regard the asset specificity and the technical expertise required for the logistics-VAS. Concerning the ports that implement an operator-SLS, the CA can be sustained in the long-term only if the port collaborates with specialists LSPs (i.e. operating in niche markets).

Further, in the case of operator-SLS, LSPs and retailers, can realise SCA if the warehousing facility is located within the port's bound land, and the logistics-VAS are a result of the co-existence of idiosyncratic and network resources.

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<sup>49</sup> The value-added organisational capabilities referred to here are: elimination of non-value-added distribution segments, facilitation of cost efficient end-to-end SC, faster route to market based on increased container and product availability, increased visibility and control of imported goods, and increased SC flexibility in terms of fast-tracking or delaying containers according to demand.

Concerning the operator role of a hybrid-SLS, the CA can be further sustained from extrinsic factors to the SLS, such as the human capital of the executive board, physical capital resources, and investments in new physical capital resources that augment the value extracted from other resources of the port.

The second element of strategic impact, is potential CA derived from differentiation. However, not all the identified SLS can result in differentiation. A landlord-SLS does not confer CA based on differentiation *per se*; it is the combination of the capabilities attributed from the landlord-SLS and other intrinsic strategies that create differentiation. These strategies are related to the selection of specific market segments, and the subsequent selection of respective network partners that underpin the demand for core services. Similarly, ports implementing an operator-SLS cannot achieve differentiation by the SLS *per se*. Trade orientation and competition in specific markets can create differentiation. However, LSPs implementing an operator-SLS can realise long-term CA if they achieve a two-level differentiation. The first level concerns differentiation among LSPs not implementing an operator-SLS. The second concerns differentiation among LSPs in the PCL industry. Finally, the hybrid-SLS cannot confer differentiation based CA on its own, it can only enable ports to diversify the use of their assets, and has become a prerequisite for competition in the container market.

### **6.3 Marketing impact**

The following sections, present the responses of the participants concerning the marketing impact of their SLS, and a critical comparison of the empirical findings with extant literature.

#### **6.3.1 Landlord-SLS**

Data analysis proves that a port that implements a landlord-SLS can leverage marketing opportunities by enabling on-port logistics-VAS. Leveraging these opportunities yields two marketing benefits. The explicit marketing benefit; in that a landlord-SLS enables ports to directly lease land and/or facilities to LSPs. The implicit marketing benefit; in that the existence of LSPs at port premises enhances the market proposition of the port, which leverages the organisational resources and capabilities of its tenants to promote a bundle of port and logistics-VAS. Additionally, it is argued that the marketing benefits of a landlord-SLS are sustained in the long-term due to the longevity of the port-tenant leasing agreements. Further, it is argued that the longevity of these leasing agreements

has a “knock-on” effect concerning the relationship of the port with cargo owners for port services.

*Explicit and implicit marketing benefits*

Concerning their landlord-SLS the Commercial Manager of Port5 argues “*obviously we were able to attract the customers of the warehouses themselves*”. Further, he maintains: “*we have a track record when we are talking to other firms we can show them the things that we’ve done in that regard*”.

Consequently, it can be argued that a landlord-SLS enables ports to contract with LSPs for the leasing of land and/or warehousing facilities, and attributes the possibility to demonstrate their practice to future potential tenants. The argument made above can be regarded as the explicit marketing impact of a landlord-SLS, which has straight revenue impact for the port, as discussed in Section 6.2.1. The Commercial Manager of Port5 also maintains that the implicit marketing benefit of a landlord-SLS can be:

*“... greater than that. In the sense of our overall offer to the market it really helps our container and ferry service operators, in terms of it locks volume into their routes. The growth of our volumes in [Port5] on [Ro-Ro operator] services has been phenomenal taking a lot of market share from competitors. So, overall if you market in the port, it’s a much better overall proposition”.*

Similarly, the Head of Commercial of Port4T argues their landlord-SLS enables them to offer an “*integrated proposition*”. Consequently, it can be asserted that a landlord-SLS enhances the marketing proposition of a port, even though the port does not actively provide logistics-VAS. The proposition includes the port services that are offered by the port, and the logistics-VAS offered by the respective operator. This enhanced proposition is targeted to cargo owners, who can benefit from the bundle of port services and logistics-VAS inherent in the enhanced marketing proposition of the port. Therefore, ports offering this bundle of services become more attractive to cargo owners.

It can be argued that a landlord-SLS explicitly enables ports to contract with LSPs, and implicitly to secure cargo throughput for core functions. This argument complements the SLS literature; in that according to Ostrom et al. (2010), and Bustinza et al. (2017) the increased demand for VAS affects the demand for products. In the context of this research it can be argued that the demand of cargo owners for logistics-VAS increases the demand for port services. This argument is of importance because it supports that the provision of VAS can enhance the demand for the core service offering. The second part of the argument presented above confirms the assumptions of ERBT; in that value generating resources reside beyond the boundaries of a firm (Lavie, 2006; Spring and Araujo, 2013;

Xu et al., 2014; Prajogo et al., 2016). In this case the port leverages the organisational resources and capabilities of its tenant to offer a value proposition that contains the services of the tenant.

#### Long-term relationships

The Head of Commercial of Port4T argues:

*“We’ve got quite a mix of lease contracts here, and I think the average is about 5 or 6 years, but they can go up to 25 - 30 years, which does lock them in. We haven't got lot of one year, or seasonal deals or anything like that, they are longer term deals that don't necessarily lock the shipping lines in, but lock end customer in to the port centric”.*

Similarly, the Commercial Manager of Port5 argues that long-term contracts and the renewal of the contractual agreements with current tenants are mostly preferable because:

*“In general, a renewal by an existing tenant is better, because you avoid rental voids. So, unless a particular tenant is really bad at paying or something like that then you are more than likely going to be very happy to accept the renewal and renew the lease”.*

Therefore, it can be argued that a landlord-SLS results in the signing of long-term contracts between the port and LSPs. These contracts lock-in operators for an extensive period, so, the implicit marketing benefit of a landlord-SLS can be sustained in the long-term. This argument complements the SLS literature; in that according to Neely et al. (2011), and Kowalkowski et al. (2015) a SLS can transform transactional relationships into long-term partnerships. In the context of PCL, a landlord-SLS results in a long-term partnership between the port and the tenant, but not for the provision of services; instead the partnership concerns the provision of land/and or facilities.

Additionally, these long-term leasing agreements have a “knock-on” effect in the relationships of the port with cargo owners. The “knock-on” effect is that the existence of LSPs at the port, locks-in cargo owners. It can be argued that a landlord-SLS forms long-term partnerships with cargo owners even though the port does not provide logistics-VAS. This argument complements further the SLS literature; in that according to Gebauer et al. (2006), Ostrom et al. (2010), and Bustinza et al. (2017) a firm offers VAS to leverage marketing opportunities. In the context of this research, a landlord-SLS implies that the port leverages marketing opportunities by enabling the provision of logistics-VAS.

The argument that the on-port leasing of land and/or facilities to LSPs will make the port more attractive to cargo owners confirms the PCL literature. Chhetri et al. (2014), and Okorie et al. (2016) argue that the investments for the development of logistics hubs at ports are a response to the increased demand for on-port logistics-VAS. The

development and leasing of facilities (or land) to LSPs, as implied by a landlord-SLS, is a response to the increased demand for logistics-VAS at the points of import.

Further, the remark that the organisational capabilities of the port tenants enhance the market proposition of ports also complements the PCL literature. Woo et al. (2013) and Pallis et al. (2011) argue that ports enhance their service offering with logistics-VAS to meet the complex demand of cargo owners for such services. A landlord-SLS enhances the offering of a port, and the advanced offering derives from the organisational capabilities of its tenants. This argument contributes also to the ERBT literature for the same reasons as discussed above.

Additionally, a third contribution to the PCL literature can be made. Wilmsmeier and Monios (2013), Monios and Wilmsmeier (2014), and Okorie et al. (2016) argue that the provision of logistics-VAS can lock-in customers into the use of one port. From the primary data of this research it was apparent that a landlord-SLS enables ports to lock-in LSPs, who in turn lock-in cargo owners. Consequently, a landlord-SLS implicitly locks-in cargo owners for port services.

#### *Key findings of the landlord's case study*

From the analysis of the interviews with the two ports that populate the case study of landlord-SLS, the following arguments can be made. Ports that implement a landlord-SLS can leverage marketing opportunities by enabling on-port logistic-VAS. The leverage of those marketing opportunities results in an explicit and an implicit marketing benefit. The explicit marketing benefit is that a port can lease land and/or warehousing facilities to LSPs, and earn revenue from this practice. The implicit marketing benefit is that the existence of those tenants increases the attractiveness of the port to cargo owners, due to its enhanced market proposition. It was also argued that the marketing benefit of a landlord-SLS can be sustained in the long-term, due to the nature of the leasing agreements between the port and its tenants. Finally, it is argued that the longevity of the leasing agreements with the tenants has a “knock-on” on the relationship of the port with cargo owners for the provision of port services.

Table 6-9 summarises the key findings of the case study of landlord-SLS and its contributions to literature.

Key finding	Contribution to SLS and PCL literature	Contribution to ERBT literature
<p>1) A landlord-SLS implies that the port will leverage marketing opportunities, by enabling the on-port provision of logistics-VAS.</p> <p>The leverage of marketing opportunities attributes explicit and implicit marketing benefits:</p> <ul style="list-style-type: none"> <li>- Explicit benefit is the revenue earned from the leasing of land and/or facilities.</li> <li>- Implicit benefit is the enhanced market proposition of the port that is based on the organisational resources and capabilities of its tenants.</li> </ul> <p>2) A landlord-SLS enables the port to create long term partnerships with:</p> <ul style="list-style-type: none"> <li>i) LSPs in the form of landlord-tenant agreements</li> <li>ii) cargo owners (knock-on effect from the long-term landlord-tenant agreements)</li> </ul>	<p><b>SLS literature:</b></p> <p>The findings of this case study <i>confirm</i> the SLS literature in that the provision of logistics-VAS enhances the demand for the core services of the port.</p> <p>The findings of this case study <i>complement</i> the SLS literature in that a landlord-SLS allows the leverage of marketing opportunities by enabling provision of VAS, creates long-term landlord-tenant partnerships with LSPs for the provision of land and/or facilities, rather than for the provision of VAS, and creates long-term partnerships between ports and cargo owners based on the organisation capabilities of the tenants.</p> <p><b>PCL literature:</b></p> <p>The findings of this case study <i>complement</i> the PCL literature in that a landlord-SLS allows a port to respond to the increased demand for on-port logistics-VAS, to enhance its market proposition, and lock-in cargo owners, by leveraging the idiosyncratic resources and organisational capabilities of its tenants.</p>	<p>The assumptions of ERBT are confirmed in the context of PCL. A landlord-SLS enables the port to enhance its market proposition. However, the market proposition is enhanced from the services that are provided by the tenants of the port, and not the port itself.</p>

**Table 6-9: Key findings marketing impact landlord-SLS, source: (author's own)**

### 6.3.2 Operator-SLS

From the analysis of the data two key arguments can be made concerning the marketing benefits of an operator-SLS. The first is that an operator-SLS can be considered as a response to the increased demand for on-port logistics-VAS, assisting the port/intermediaries that implement an operator-SLS to enhance their customer base by: i) attracting cargo owners interested in storing products in the proximity of a port, ii) attracting more recognisable cargo owners, iii) quoting to competitor's customers, and iv) allowing them to enter new markets.

The second argument is that an operator-SLS positively affects the customer retention level. That is by attributing the capability to offer tailored SC-solutions to cargo owners; and that the provision of such solutions propels the creation of long-term partnerships with cargo owners. However, intrinsic processes and initiatives of the ports/intermediaries that implement an operator-SLS can positively contribute to the customer retention level.

#### Enhanced customer base and entrance in new markets from meeting cargo owners demand for on-port logistics-VAS

The Systems Project Analyst of LSP6 argues that the operator-SLS enables them to contract with a wide range of cargo owners beyond their major customer. He argues: *“Well our customers have chosen us because we are port centric. It is difficult for me to say that this is the only reason but the very nature of using the port centric operations suggest that this is important to them”*.

Further, he highlights that the company attracted significant market share in the export business since it commenced its port-centric operations in Port2. He asserts that the *“specific way of loading cars and [construction vehicles]”* has been a determinant factor for those cargo owners to contract with them. Distinctively he argues *“it would be impossible, or it would be more expensive and more difficult to do it in a location which is not on a port”*.

Moreover, the Group Sales Director of LSP5 asserts that their operator-SLS enables them to grow their customer base by approaching competitors' customer. He argues:

*“...previously we were unable to speak to our competitors' customers without being able to offer a port centric solution. So, by having this type of warehouse we are able to genuinely respond to other tender opportunities that previously we would not have been able to do”*.

Furthermore, he argues that the operator-SLS enables them to contract with blue chip companies. He asserts:



*“It allows us to attract more blue-chip customers, or customers that have names that are easily recognised within the environment, [...] companies that you want to associate yourself with because everybody knows them”*

Similarly, the Sales and Marketing Director of LSP8 identifies opportunities to enter new markets. He asserts that LSP8 will enter the frozen distribution market, which is a supplementary market to their core market. Additionally, he argues that the combination of the location of the new facility with the organisational capabilities given by the operator-SLS, and the market change to containerised transportation for fresh fruits, will allow LSP8 to enter the market of fresh fruits. He explains that historically the SE of England has been a gateway for the import of fresh fruits. However, facilities for handling fresh fruits are in Kent, which is further away from the market compared to the location of Port4T. The Commercial Director of LSP8 comments:

*“We see that as another opportunity, because why bring a container into [Port4T], road it all the way to Kent and bring the empty container all the way back, why not take away that element of extra cost, and actually do it at the port”.*

Furthermore, the argument that an operator-SLS can result in increased market share is also supported by the Managing Director of LSP3, who asserts:

*“For the last years most of the business we win is because of our proximity to the port. We quote for customers that want to be on [Port2.] Last year we saw the biggest change of companies wanting to sit near a port to reduce cost from shunting the container from the port, because they know that pallet and carton networks is the same price wherever you are in the UK, and that’s where we have won a lot of our business. So, we are pushing it and trying to advertise it more of our location being near the port. Although ultimately we are not that close to the port but if you are sitting in America and looking at a map we are close enough to the port”.*

From the data presented above it can be argued that the marketing capabilities of ports/intermediaries that implement an operator-SLS are positively affected. The logistics-VAS inherent in an operator-SLS enable firms to fulfil the demand of cargo owners for on-port logistics-VAS, and:

- i. enter new markets,*
- ii. attract more recognisable cargo owners,*
- iii. quote to competitors’ customers,*
- iv. and contract with cargo owners that wish to store their products near or at a port.*

Therefore, the argument that an operator-SLS enables ports/intermediaries to leverage marketing opportunities can be made. This argument confirms the SLS literature; in that according to Gebauer et al. (2006), Ostrom et al. (2010), and Bustinza et al. (2017) organisations offer VAS to leverage marketing opportunities. However, a remark must be

made. In a manufacturing context, the SLS offering is the bundle of products and VAS, with VAS complementing the key offering of manufacturers (i.e. the product). Additionally, the VAS are offered throughout to the life cycle of the product (e.g. maintenance, repairs etc.).

However, in a PCL context, the logistics-VAS are designed to facilitate the movement of the product through the SC, and are offered in combination with port services (i.e. bundle of port and logistics-VAS). In the operator-SLS case study, only Port4S provides the combination of those services on its own. The remaining organisations combine the offering of two organisations to provide this bundle of services (i.e. the port and the LSP). The combined offerings can be bilateral (intended) (i.e. formal collaborative agreement between the firm and the port – LSP1, LSP2, LSP4, LSP6, LSP7, LSP8, LSP9, Retailer1, Retailer2) or unilateral (opportunistic) (i.e. LSP exploits its relative proximity to the port – LSP3, LSP5).

The argument that ports/intermediaries that implement an operator-SLS leverage marketing opportunities complements the PCL literature; in that according to Mangan et al. (2008), De Langen et al. (2012), and Coronado Mondragon et al. (2012), the provision of on-port logistics-VAS is a response of ports to the demand for such services. The findings of the present study confirm their argument and extend it further; in that the provision of on-port logistics-VAS is the result of the combination of the idiosyncratic resources of the port, with the idiosyncratic resources of the LSP. This remark also confirms the theoretical assumptions of ERBT that value generating resources exist beyond the boundaries of the firm (Lavie, 2006; Spring and Araujo, 2013; Prajogo et al., 2016). In this case the value generating resources are the idiosyncratic resources of the port that enable intermediaries that implement an operator-SLS to leverage marketing opportunities. However, two remarks need to be made. The first is that in the case of Port4S the provision of logistics-VAS is based solely on the proprietary resources of the port. As a result, it can be argued that when the port is the sole provider of on-port logistics-VAS; then this demand is fulfilled by its idiosyncratic resources, and not by the combination of the resources of the port and its tenants.

The second remark regards the two intermediaries that do not lease land from a port (i.e. LSP3, LSP5). Instead, they advertise themselves as port centric and compete in this market without being involved in a contractually defined collaborative agreement with a port. Consequently, it can be argued that the idiosyncratic resources of a company can

confer value to another company without those two companies being engaged in a partnership. The argument made above complements the ERBT literature.

*Customer [i.e. cargo owners] loyalty created by offering tailored SC solutions*<sup>50</sup>

The companies that populate the case study of operators reported customer loyalty because of their SLS. The Director of LSP2 argues:

*“We found that our customers [i.e. cargo owners] are very loyal as they find that we offer a superb rate of turn both for containers coming into the port and for the loading of trailers from our facility. Our turnaround time on average is 20-30 minutes for the offload of a palletised container and 40 minutes for the loading of a trailer. That’s very convenient for them and it saves them a huge amount of costs. So, we have seen loyalty”*

To demonstrate how the SLS offering results in supplier dependency and increased loyalty from cargo owners, the Director of LSP2 maintains:

*“If you take the [building material retailer] for example, it’s grown from us just starting with much smaller quantity of product for them to a much greater range of products, which is still growing, and since we’ve been taking the actual ships themselves into the berth and combining the timber with all their other materials they are over the moon. It’s so much easier for them. They continue adding new products to their range from this location which is good for them, good for us”.*

Similarly, the Commercial Manager of LSP7 also argues that their operator-SLS has helped in customer retention. She highlights that cargo owners are loyal to LSP7 due to the efficiencies inherent in the SLS offering of the company. She argues that these efficiencies are associated with the ability of the company to “turn around larger quantities of containers within time constraints of demurrage<sup>51</sup> and free quay rental periods on dockside”.

Furthermore, the Business Development Manager of LSP1 asserts that their operator-SLS results in the provision of tailored solutions to cargo owners, which in turn create high levels of customer loyalty. He argues:

*“A lot of our customers see the advantage and we are really interested in having long term relationships with them. We work very hard on the relationship and we have very good customer retention. We tend to vow our customers over many years,*

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<sup>50</sup> LSP5 has been involved with the provision of logistics-VAS for less than 3 years. The Group Sales Director argues: “The site has been going on for 2 and a half years, and most of our contracts are 3 years contracts, so we haven’t actually hit the point yet where we would expect to see re-negotiations or potential losses so it’s difficult to say”. Consequently, LSP5 is not considered further in regard to how logistics-VAS influences customer loyalty. Additionally, during data collection, LSP8 had not commenced the provision of logistics-VAS. Consequently, definitive arguments concerning the relation between logistics-VAS and customer loyalty could not be made.

<sup>51</sup> Demurrage refers to charges raised for keeping a vessel for longer period than prescribed (Branch and Robarts, 2014)

*so that you would develop a lot of loyalty and everything else, but they are very much aware of the benefits of port centric. Obviously, we must provide the best service possible because there are other people doing it, but the track record is that we've retained our customers over many years".*

Furthermore, the Commercial Director of LSP6 asserts that the cargo owners are loyal to the benefits of the port centric distribution model, rather than being loyal to their company *per se*. He argues: *"they came, and they haven't gone so I would say that the port centric helps with the loyalty, it's not necessary loyal to us individually, sometimes it's loyalty to the supply chain process"*.

Additionally, the Divisional Director of Port4S also asserts that their operator-SLS has formed collaborations with cargo owners. He argues: *"Of course, it has helped with the relationships with our customers [i.e. cargo owners]; we have better understanding of their business. That gives security of throughput by providing that kind of value-added activity"*.

On the same notion the Business Development Manager of LSP4, and the Managing Director of LSP9 also argue that an operator-SLS enables the companies to offer tailored SC-solutions to cargo owners. Further, they argue that this tailored offering transforms transactional relationships to long term partnerships, in which a high level of customer loyalty is inherent.

From the data presented above, it can be argued that an operator-SLS positively affects customer retention levels. An operator-SLS enables the port/intermediary to offer tailored SC-solutions to cargo owners. The provision of such SC-solutions propels the development of long term partnerships between cargo owners with the suppliers of logistics services. The argument made above complements the PCL literature; in that according to Wilmsmeier and Monios (2013), Monios and Wilmsmeier (2014), and Okorie et al. (2016) the provision of logistics-VAS locks-in cargo owners into the use of one port. However, a remark needs to be made, that in the case study of operator-SLS, the logistics-VAS are offered by intermediaries and not by the port, as also identified by Okorie et al. (2016) (with the exemption of Port4S). The lock-in of cargo owners to the use of one port is a "knock-on" effect of the cargo owners' long-term relationship with the operators, who are located at this port.

The arguments made above also complement the SLS literature; in that the offering of tailored solutions to customers tends to influence purchasing decisions (Mathieu, 2001) [Director of LSP2 *"[...] they continue adding new products to their range from this location"*, create customer loyalty (Vandermerwe and Rada, 1988, Baines et al., 2017)

[reported by all of the interviewees], and yield a repetition of sales (Malleret, 2006). It also confirms the argument of Neely et al. (2011) and Kowalkowski et al. (2015), that dependency on suppliers and repetition of sales reforms buyer-supplier relationships to long term partnerships.

However, several remarks need to be made. As it was argued by the Commercial Director of LSP6 cargo owners are loyal to the benefits “*of the supply chain process*” and not to the company *per se*. It would be interesting, as a further research perspective, to identify cargo owners that have contracted with various operators over time, to investigate the reasons for changing suppliers of logistics-VAS; and if that change resulted in the cargo owner importing cargo from another port.

Some of the interviewees argued that the increased loyalty of their customers can be only partially attributed to the SC-solutions that are inherent in their SLS offering. They argue that various intrinsic practices and procedures of the companies help the loyalty of their customers. The Director of LSP2 argues:

*“Very few customers leave us once they come to us and that’s mainly because of the way that we handle their goods because they don’t get many mistakes. We are a small private limited company and we are not a huge organisation. Here the management are on site, that’s really what’s made the difference to customer loyalty really”*

Additionally, the Business Development Manager of LSP1 highlights that beyond the provision of tailored solutions and the benefits of a PCL model, another factor that contributes to the retention of customers is their customer selection process. He argues that LSP1 will not contract with customers that do not fulfil certain criteria. He claims:

*“We are quite selective about the companies we want to work with. Not just because we want to make sure that we can provide what they need but we are looking at the financial stability of the customer and what is their turnover, what is their credit rating, are they going to pay our bills on time, and if it is an organisation we can work with. Sometimes we won’t go further with people because of those reasons”*

The Divisional Director of Port4S highlights that one factor that has helped the port to form collaborative relationships with cargo owners, beyond the provision of logistics-VAS, is an initiative of the company focused on making connections. He argues:

*“It’s an initiative that links key customers together, so that they could share shipping costs. It’s all about trying to link customers with transportation organisations or other kind of third party logistics providers or for example linking the port with rail or road hauliers to make the whole kind of supply chain work seamlessly”.*

As a result, it can be argued that various intrinsic processes and initiatives can positively contribute to the level of customer retention. According to the data of this study these intrinsic processes and initiatives can be the customer selection process, the management style of the company, and the involvement with the “logistics networking” of cargo owners.

Key findings of the operator-SLS case study

From the analysis of the data from the ports/intermediaries that populate the case study of operator-SLS the following arguments can be made. Initially, it can be argued that intermediaries that utilise logistics-VAS for the improvements of internal operations, such as Retailer1 and Retailer2, do not realise marketing benefits because they do not market the logistics-VAS. Concerning the ports/intermediaries that compete on the provision of logistics-VAS it can be argued that an operator-SLS enables them to leverage marketing opportunities by providing logistics-VAS in a port environment. These ports/intermediaries can enter new markets, attract cargo owners that wish to store products close to ports, attract more recognisable cargo owners, and quote to competitor customers. It can also be argued that an operator-SLS positively affects customer retention levels, and propels the creation of long term partnerships between firms that implements an operator-SLS and cargo owners. However, intrinsic processes and initiatives, such as customer selection process, management style, and involvement with “logistics networking” of cargo owners can also contribute to higher customer retention levels. Table 6-10 summarises the key findings of the case study of operator-SLS, and the contributions of this case study to literature.

<b>Key findings</b>	<b>Contribution to SLS and PCL literature</b>	<b>Contribution to ERBT literature</b>
1) Ports/intermediaries that implement an operator-SLS leverage marketing opportunities (i.e. leverage the interest of cargo owners for on-port logistics-VAS), and can: enter new markets, attract more recognisable customers, quote to competitors’ customers, and contract with customers wishing to store products near/at a port. 2) Ports/intermediaries that implement an operator-SLS realise increased customer retention by offering tailored SC-solutions to customers. The	<p><b>SLS literature:</b> The findings of this case study <i>confirm</i> the SLS literature; in that ports/intermediaries that implement an operator-SLS:</p> <ul style="list-style-type: none"> <li>- leverage marketing opportunities by offering logistics-VAS in combination with port services.</li> <li>- offer tailored SC-solutions that influence the purchasing decisions of cargo owners, create customer loyalty, yield to a repetition of sales and propel the development of long term partnerships with cargo owners.</li> </ul> <p><b>PCL literature:</b> The findings of this case study <i>complement</i> the PCL literature; in</p>	<p>The theoretical assumptions of ERBT are confirmed in the context of PCL. Ports/intermediaries that implement an operator-SLS access the idiosyncratic resources of ports to leverage value generating resources. However, a paradox is realised. The idiosyncratic resources of a port can create value for a LSP without those two</p>

provision of such SC-solutions transforms the transactional relationships of cargo owners with the suppliers of logistics-VAS to long-term partnerships.	that firms that implement an operator-SLS: -respond to the increased demand for on-port logistics-VAS by leveraging the idiosyncratic resources of the port. - implicit lock-in cargo owners to use one port (with the exemption of the case that the operator is a port or a retailer).	companies being engaged in a partnership (i.e. LSP3, LSP5).
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**Table 6-10: Key findings marketing impact operator-SLS, source: (author's own)**

### 6.3.3 Hybrid-SLS

The analysis of the data of the present case study resulted in the following findings. The first is that a hybrid-SLS allows ports to leverage or create marketing opportunities. These marketing opportunities are associated with the demand for logistics services at the points of import. In its landlord role a hybrid-SLS allows ports to leverage the demand of cargo owners for the provision of logistics-VAS at the points of imports. In its operator role, a hybrid-SLS also allows ports to leverage the demand of cargo owners for logistics-VAS at the points of import; but in some instances, it enables ports to create marketing opportunities. In either case ports secure cargo throughput for core business functions.

The second finding is that a hybrid-SLS generates customer loyalty. However, a remark needs to be made. In their operator role ports provide tailored SC-solutions to cargo owners directly. As such, ports become more attractive to cargo owners, realise increased customer loyalty, and secure cargo throughput via the “pressure” of cargo owners to shipping lines. On the other hand, in their landlord role, ports realise tenant loyalty, which increases cargo throughput.

#### Leveraging or creating marketing opportunities to support core business functions

Concerning the operator role of a hybrid-SLS, the Head of Commercial Strategy of Port1 asserts that it enables them to offer logistics-VAS to smaller cargo owners who could not find warehousing space at larger ports. He argues:

*“At the time we did it, it was realised that across the UK there were very few opportunities for smaller importers to take the benefits of PCL, because most warehouses were offered either on a dedicated service basis to single players, or to a lesser extent were operated by freight forwarders and LSPs”.*

He further argues that Port1 at that time was inferior in comparison with larger UK container ports, *“there was a lack of interest from the major LSPs to invest and take the risk on running their facility around the port”*. Consequently, Port1 set up an operation specifically targeted at customers importing smaller quantities, *“who*

*potentially needed tactical space as opposed to strategic space. So, we were looking at people who needed extra storage capacity as they run up to seasonal peaks”.*

Furthermore, the Port Director of Port1 explains how their SLS offering meets the requirements of cargo owners for on-port logistics-VAS: *“The pallet racking is not dedicated, it flexes with the customer and that’s what the customer wants, because they have seasonal peaks, so that’s very important”*

It can be argued that the operator role of a hybrid-SLS enables the port to meet the demand of cargo owners for on-port logistics-VAS. This argument confirms the PCL literature; in that according to Chhetri et al. (2014) and Okorie et al. (2016) the development of logistics hubs in the proximity of ports is a response to the increased demand of cargo owners for on-port logistics-VAS. The arguments presented above confirm also the SLS literature, in that according to Gebauer et al. (2006), and Bustinza et al. (2017) organisations offer VAS to leverage marketing opportunities. In this case, the marketing opportunities arise from the interest of cargo owners for on-port logistics-VAS.

A different perspective has been put forward by the Business Development Manager of Port3. Concerning the operator role of their hybrid-SLS, he asserts that the port invested in the resources that are necessary for the provision of logistics-VAS to create an offering that would attract the interest of regional cargo owners. The same offering would also create better opportunities for the core business function of the port. He argues: *“We believed that we could provide a better offer to business and industry by creating a central gateway, not only to our county but in an extended hinterland, trying to get over the challenges that the county's topography presented”*. Further, he argues that to provide a better offering:

*“[we needed to] build our understanding of a more port centric position [by] giving a much higher level of service to the customer and then with a more selfish hat on create better opportunity for this business it was to try and extend our offer beyond that perception of a dock and a crane and link whole host of services”*

Moreover, to demonstrate how the development of a SLS offering enabled them to contact cargo owners and trigger their interest in contracting with the port he provides the following example.

*“There are local businesses importing from China. They bring their mother vessel in [South England] and then they rail to [the Northwest] and then they truck from [the Northwest] locally to the centre of the county. The costs associated with the UK leg are over double than the deep-sea leg from China to UK. Now, I proved, and it was a really eyebrow lifting moment for the client to understand that we can*



*meet their needs in terms of time [and] match delivery aspiration, and that we can also prove to be significantly cheaper and we can save them a significant amount of money in a year if we have their feeder here”.*

Similarly, concerning the operator role included in a hybrid-SLS, the Supply Chain Marketing Manager of Port2 also argues that it enabled them to craft an offering “*that creates a degree of attention*” to cargo owners to store cargo on the port. He postulates that if cargo owners store cargo on port that also “*supports your core business which is moving containers*”.

Based on the above, it can be argued that the operator role of a hybrid-SLS can create marketing opportunities for ports. This argument contradicts the SLS literature; in that according to Gebauer et al. (2006) and Bustinza et al. (2017) organisations offer VAS to leverage marketing opportunities. From the data of this research it can be supported that in the context of PCL the provision of logistics-VAS by a port can also create marketing opportunities. These marketing opportunities will allow the port to contact cargo owners and demonstrate the benefits cargo owners will have if they decide to route their cargo through that port and purchase the bundle of port and logistics-VAS offered by the port.

Concerning the landlord role incorporated in a hybrid-SLS, the Commercial Director of Port2 argues that the development of a new logistics park at Port2 has been encouraged by “*the increased interest in port centric and on dock logistics*” of cargo owners who take advantage of the high connectivity of the port. Consequently, it is asserted that the landlord role of a hybrid-SLS enables the port to leverage marketing opportunities such as the increased demand of on-port logistics-VAS. This argument complements the SLS literature as discussed above. A remark needs to be made. In its landlord role the port does not provide logistics-VAS, it only enables their provision. In this case the logistics-VAS are offered by the tenants of the port, like the case study of landlord-SLS (See Section 6.3.1.)

#### *Customer [cargo owners] loyalty created by offering tailored SC-solutions*

Concerning the operator role of their hybrid-SLS, the Head of Commercial Strategy of Port1 asserts that their bundle of port and logistics-VAS, locked-in cargo owners:

*“When we first started it was about providing tactical-transactional warehousing, rather than strategic or being the only warehouse, so quite different to the way port centric logistics have been positioned up to that point in time. We have ended up being the only warehouse for some of our customers because they’ve seen the benefit and gradually moved more cargo in”.*

Furthermore, the Port Director of Port1 asserts that the provision of bundles of port and logistic-VAS is a determinant factor for cargo owners to contract with the port and

direct their imports through Port1. Additionally, he asserts that the logistics-VAS inherent in their SLS offering underpin loyalty from cargo owners. He argues:

*“We find that the longevity of a customer staying with us is because of the value-added services so it becomes more of a choice not just which is the lowest cost entry into the UK, it’s where there is the lowest cost entry, but does the port offer port centric solutions. So, we are becoming more and more part of the decision-making process”*

Similarly, the Business Development Manager of Port3 also asserts that the provision of tailored SC-solutions enables the port to be more attractive to cargo owners. He argues:

*“We could offer whole series of services where a customer didn't have the headache of necessarily having to go to various suppliers. We could become and forgive the cliché but for me in simple terms it does encapsulate we become, or we've tried to become a one-stop shop”.*

The Sales and Logistics Manager of Port1 asserts that their hybrid-SLS enables the development of long-term relationships with cargo owners. She distinguishes that the port realises an implicit marketing benefit from these long-term relationships:

*“We’ve are dealing with shippers directly rather than just shipping lines or freight forwarders, we find a lot of people to drive the change for the shipping basically rather than us leaving it to the shipping lines where we would say bring more volume over [Port1]. Shipping lines obviously have this conversation with every port and they juggle the volume to make it to their commercial best. But [cargo owners] that support [Port1] and want to increase the volume over here then, they basically go up the supply chain and say to the shipping lines, no I want my volume to come in through this port”*

Consequently, it can be argued that the operator role of a hybrid-SLS, enables the port to offer tailored SC-solutions that are comprised of a bundle of port services and logistics-VAS. The provision of these tailored SC-solutions enables the port to become more attractive to cargo owners, experience increased customer loyalty, and secure cargo throughput. The arguments made above confirm the SLS literature in three ways. Initially, according to Mathieu (2001) and Bustinza et al. (2017) the offering of tailored solutions influences the purchasing decision of customers. In the context of this study it was demonstrated that the provision of tailored SC-solutions influences the decision of cargo owners to contract with the port.

Secondly, according to Vandermerwe and Chadwick (1989), in a manufacturing context, the provision of VAS affects the demand for products, and according to Malleret (2006), it also leads to repeat sales. In the context of this research, the provision of logistics-VAS increases the demand for port services, and leads to repeat sales for both logistics-VAS and port services.

Thirdly, Neely et al. (2011) and Kowalkowski et al. (2015) argue that repeat sales and supplier dependency transform transactional relationships to long term partnerships. In the context of this research it was maintained (i.e. quote from the Head of Commercial Strategy of Port1) that the provision of bundles of logistics-VAS and port services results in the transformation of tactical-transactional relationships for the provision of warehousing services into long-term relationship between the port and the cargo owners. The arguments derived from the data presented above also confirm the PCL literature; in that according to Wilmsmeier and Monios (2013), Monios and Wilmsmeier (2014), and Okorie et al. (2016) the provision of logistics-VAS services has the potential to lock-in cargo owners into the use of one port. The data presented above demonstrate that the provision of logistics-VAS from the port has indeed locked-in cargo owners to the use of one port for the long term.

On the other hand, concerning the landlord role of a hybrid-SLS the Commercial Director of Port2 argues that the port realises increased tenant loyalty, which is influenced by two factors. The first is associated with the benefits realised by tenants that operate within a port environment. The second factor is associated with the cost of the investment of the tenants in port centric facilities, and the costs of establishing new operations at another port. He also argues that the relationships formed between the port and its tenants can be characterised as collaborations. This argument can be further confirmed by the responses of the intermediaries, who are located within Port2 (i.e. LSP6 collaborates with the port for the development of logistics-VAS, and LSP4 collaborates with the port for the development of the port-centric facility at Port2 but also collaborates with the parent company of Port2 to commence port centric operations at other ports managed/owned by the parent company of Port2 on a global scale).

Concerning the landlord role of a hybrid-SLS the General Manager of Supply Chain Marketing of Port2 also asserts that the port realises increased loyalty from its tenants:

*“The port managed through the recession to renew all of its contracts with its warehouse operators, and managed to secure longer contracts with them during this period than ever before. So, it was the case where they [i.e. tenants] wanted to lock down the service they had and concentrate on such things such as reducing overheads knowing the services that they had. So, they were much keener to fix their contracts and know that they would have the service through what would be a very difficult trading period it gave them something else to focus on”*

Consequently, it can be argued that the landlord role of a hybrid-SLS results in increased customer loyalty for the port (considering that the customer of the port in this case is the tenant). This arguments contradicts the SLS literature, in that according to

Davies (2003) and Bustinza et al. (2017) in a manufacturing context the customer loyalty derives from VAS. Such an offering does not characterise the relationship between the port and its tenants in the landlord role of the hybrid-SLS in a PCL context. In this case the port enables the provision of logistics-VAS, as it leases land and/or facilities to tenants, and the tenants' loyalty is derived from the benefits that intermediaries can realise when they are located within a port's environment.

The argument presented above, concerning the landlord role of a hybrid-SLS contradicts the PCL literature; in that according to Wilmsmeier and Monios (2013), Monios and Wilmsmeier (2014), and Okorie et al. (2016) the provision of logistics-VAS results in locked-in customers. In this case the SLS customers of the port are the tenants of the port-centric facilities, and as argued above their relationship does not include provision of logistics-VAS. Nevertheless, the existence of those tenants in the port premises generates cargo throughput for the port. Additionally, the long-term relationships of cargo owners with operators (See Section 6.3.2) results in locked-in cargo owners for the operator and the port. Therefore, it can be argued that even though a hybrid-SLS is not involved in provision of logistics VAS, it implicitly locks-in cargo owners. However, the cargo owners in this case contract with the port for the purchase of port services and not for the purchase of logistics-VAS. Concerning the argument made above, a remark can be made. This remark regards the ERBT literature; in that, the ability of a port to lock-in cargo owners due to the contractual agreements of its tenants with the cargo owners confirms the theoretical assumptions of ERBT (i.e. value generating resources do not have to be proprietary to the firm (Lewis et al., 2010)).

#### *Key findings of the hybrid-SLS case study*

From the analysis of the interviews from the three ports that populate the case study of hybrid-SLS the following arguments can be made. The first argument is that a hybrid-SLS allows the port to leverage or create marketing opportunities, which are associated with the demand for on-port logistics-VAS. The second finding is that a hybrid-SLS results in increased customer loyalty. In its operator role the customer loyalty refers to loyalty of cargo owners that contract with the port for the provision of logistics-VAS, while regarding its landlord role the customer loyalty refers to loyalty of the tenants, which implicitly creates cargo owner loyalty for the purchase of port services from the port. Table 6-11 summarises the key findings of the marketing impact of a hybrid-SLS, and the contributions of this case study to literature.

Key findings	Contribution to SLS and PCL literature	Contribution to ERBT literature
<p>1) The operator role of a hybrid-SLS enables the port to leverage or create marketing opportunities and meet the demand of cargo owners for on-port logistics-VAS.</p> <p>2) The landlord role of a hybrid-SLS enables the port to leverage marketing opportunities by accessing the resources of its tenants.</p> <p>3) The operator role of a hybrid-SLS allows the port to offer tailored SC-solutions. These SC-solutions increase the attractiveness of the port, enable it to realise loyalty from cargo owners, and subsequently lock-in cargo throughput.</p> <p>4) The landlord role enables the port to realise loyalty from its tenants which is caused by the benefits that tenants realise when they operate in a port environment, and the cost associated with establishing new operations at another port. The loyalty of the tenants, implicitly results in increased cargo throughout.</p>	<p><b>SLS literature:</b> The findings of this case study</p> <ul style="list-style-type: none"> <li>• <b>confirm</b> the SLS literature; in that: <ul style="list-style-type: none"> <li>- ports offer logistics-VAS to leverage marketing opportunities.</li> <li>- the provision of tailored SC-solution by ports in their operator role influences the purchasing decisions of cargo owners, affects the demand for port services (core offering of ports), leads to repetition of sales, and transforms transactional-tactical relationships to long term partnerships.</li> </ul> </li> <li>• <b>contradict</b> the SLS literature; in that <ul style="list-style-type: none"> <li>- the operator role of a port can create marketing opportunities for the port as well.</li> <li>- the landlord role of a port results in tenants' loyalty due to the benefits associated with the establishment of logistics operations by its tenants in a port environment, and by the costs associated with the establishment of operations in another port.</li> </ul> </li> </ul> <p><b>PCL literature:</b> The findings of this case study</p> <ul style="list-style-type: none"> <li>• <b>confirm</b> the PCL literature; in that <ul style="list-style-type: none"> <li>- the operator role of a hybrid-SLS enables the port to meet the demand of cargo owners for on-port logistics-VAS.</li> <li>- the provision of logistics-VAS by ports in their operator role locks-in cargo owners to the use of that port.</li> </ul> </li> <li>• <b>contradict</b> the PCL literature; in that: <ul style="list-style-type: none"> <li>-in its landlord role a hybrid-SLS results in the implicit lock-in of cargo owners to the port for the purchase of port services, and not due to the provision of logistics-VAS.</li> </ul> </li> </ul>	<p>The assumptions of the ERBT that value generating resources do not have to be proprietary to the firm are confirmed by the findings of this case study; in that in its landlord role the ability of the port to lock-in cargo owners exists due to the contractual agreements of the port tenants with cargo owners.</p>

Table 6-11: Key findings marketing impact hybrid-SLS, source: (author's own)

#### 6.3.4 Cross case comparison

Based on the findings from the within case analysis, the cross-case comparison for the marketing benefits of SLS can be conducted. Initially, all three SLS in a PCL context allow ports/intermediaries to leverage marketing opportunities. In all three cases these marketing opportunities are associated with demand for on-port logistics-VAS. A landlord-SLS enables the port to leverage marketing opportunities by enabling the provision of on-port logistics-VAS (i.e. lease land/facilities to intermediaries wishing to establish operation within a container port). This practice results in an explicit and an implicit benefit for the port. The explicit benefit is that the port contracts with LSPs, and earns revenue for the leasing of land and/or facilities. Subsequently, the existence of those intermediaries within the premises of the port enhances its market proposition. As a result, ports implementing a landlord-SLS become more attractive to cargo owners, so a landlord-SLS increases cargo throughput for the port, without its active involvement in the provision of logistics-VAS. This argument is the implicit marketing benefit of a landlord-SLS. This benefit has also been identified for the landlord role of the hybrid-SLS.

On the other hand, intermediaries or ports<sup>52</sup> who implement an operator-SLS can leverage marketing opportunities by providing logistics-VAS. They enhance their customer base by: i) contracting with cargo owners that wish to store their products near/at port, ii) attracting competitors' customers, iii) attracting more recognisable cargo owners, and, iv) entering new markets. Similarly, the operator role of a hybrid-SLS results in an enhanced customer base for the port. However, the customer base of a port is enhanced because an operator-SLS enables the port to contract directly with cargo owners for bundles of port and logistics services. This represents a new type of customer for the port, who traditionally contracts with shipping lines or freight forwarders for the provision of port services.

Furthermore, in all three cases studies it is argued that a SLS in the context of PCL positively affects customer retention levels. Several remarks concerning the meaning of the word customer in each case study must be made. In the case study of landlords-SLS, the SLS customers of the port are the tenants of its land and/or its warehousing facilities. It was argued that the leasing agreements between the port and its tenants are long-term, and that ports wish to renew the agreements with their tenants, rather than leaving the

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<sup>52</sup> (i.e. a port that is the sole provider of logistics-VAS)

facilities empty. It was also argued that the long-term leases with intermediaries have a knock-on effect to the cargo throughput of the port and its relationship with cargo owners for port services. Consequently, a landlord-SLS results in a high retention level of tenants and affects the retention level of cargo owners for the core functions of the port. The same benefits have been also identified for the landlord role of a hybrid-SLS.

Conversely, an operator-SLS enables the ports/intermediaries that implement it to provide tailored SC-solutions to cargo owners directly. This capability affects their customer retention level because it propels the creation of long-term partnerships between them and cargo owners. Similarly, the operator role of a hybrid-SLS also results in high levels of retention of cargo owners. In this case the provision of tailored SC-solutions that is enabled by the operator role of a hybrid-SLS increases the attractiveness of the port, results in long-term contractual agreements between the port and the cargo owner, and secures cargo throughput via the “pressure” of cargo owners on shipping lines.

## 6.4 Environmental impact

The following sections, present the responses of the participants concerning the environmental impact of their SLS, and a critical comparison of the findings with extant literature.

### 6.4.1 Landlord-SLS

Both interviewees acknowledged that their SLS yields environmental benefits that are associated with the operational efficiencies of a PCL-distribution model. The Commercial Manager of Port5 argues:

*“the environmental benefits are pretty much aligned with the operational efficiencies, so less dead legs, shorter transport legs, reduced CO<sub>2</sub> emissions and all. We wouldn’t have data about it, but it has to be the case, it has to reduce the environmental impact”.*

He argues that the port does not advertise these benefits but: *“when we sell to someone else, we say, if you are based here you’ll save fuel, which will save you money, which will obviously also cause an environmental impact and further benefit”.* Further, he adds that retailers or LSPs are interested in environmental savings for advertising reasons.

The Head of Commercial of Port4T argues that the port acknowledges the environmental benefits that can be achieved by a PCL-distribution model, and actively uses that to influence cargo owners to use on-port facilities. Therefore, Port4T explicitly markets the environmental benefits that can be achieved if cargo owners use port-centric warehouses.

As a landlord-SLS only enables the provision of logistics-VAS, the operational efficiencies that lead to environmental benefits are a result of the logistics-VAS offered by intermediaries. According to Grant (2005), the bundle of resources that work together, and determine what an organisation can achieve are referred to as organisational capabilities. In this case, the bundle of tangible (assets) and intangible resources (processes) required for the provision of logistics-VAS are considered as the organisational capabilities of intermediaries. Therefore, it can be argued that a landlord-SLS enhances the marketing capability of the port by implicitly or explicitly leveraging the environmental benefits that are associated with the organisational capabilities of its tenants (i.e. intermediaries).

Tsang (2000) maintains that capabilities are considered a particular form of organisational resources. Hoopes et al. (2003) propose that capabilities generate value on their own, or increase the value of a resource. It can be concluded that the organisational



resources of intermediaries enhance the value of the marketing capabilities of landlords. This argument confirms the theoretical view of this thesis; that value generating resources can reside beyond the boundaries of the firm (Gulati et al., 2000; Lavie, 2006; Spring and Araujo, 2013; Prajogo et al., 2016; Hitt et al., 2016).

The argument, that ports that implement a landlord-SLS leverage the environmental benefits that are inherent in a PCL-solution to “strengthen” their idiosyncratic marketing capabilities, complements the PCL literature. That is because the findings of the PCL literature identify the environmental benefits of the shippers/cargo owners (See McKinnon, 2014; Mason et al., 2015). However, the findings of this case study highlight that ports can be also benefit, even though in a different capacity, by the environmental benefits of a port-centric model.

The findings of this case study could not confirm/contradict/complement any of the arguments of SLS literature, because of the divergent nature of environmental benefits identified in the two literature streams.

Key findings of the landlord-SLS case study

The analysis above reveals that a landlord-SLS enhances the marketing capability of ports by the implicit or explicit leverage of the organisational capabilities of its tenants (i.e. intermediaries). Table 6-12 summarises the contributions of this case study to literature.

Key findings	Contribution to SLS and PCL literature	Contribution to ERBT literature
A landlord-SLS enhances the marketing capability of the port by the implicit or explicit leverage of the organisational capabilities (capability to offer cost efficient and environmental friendly SC-solutions) of its tenants.	<p><b>SLS literature:</b> The findings of this case study could not confirm/contradict/complement the SLS literature, because of the divergent nature of environmental benefits of the two literature streams.</p> <p><b>PCL literature:</b> The findings of this case study <b>complement</b> the PCL literature; in that the environmental benefits of port-centric model can enhance the marketing capability of ports.</p>	The findings of this case study confirm the ERBT literature; in that the port leverages the capabilities of its business partners (i.e. LSPs) to enhance the value of its own capabilities.

Table 6-12: Key findings environmental impact landlord-SLS, source: (author’s own)

**6.4.2 Operator-SLS**

The analysis of the data shows that an operator-SLS results in environmental benefits deriving from the operational efficiencies associated with a SC-solution incorporating PCL. It is identified that the environmental benefits stem from the rationalisation of the

inland transportation of cargo owners' SCs. Often this rationalisation results from the elimination of non-value-added transportation segments. It is highlighted that the environmental benefits are strongly associated with cost savings, and that they can enhance the marketing capabilities of the port/intermediary. The enhanced marketing capability of the port/intermediary is dependant on the bundle of its idiosyncratic resources, and the leverage of the resources of its network partners.

This case study also reveals that the environmental impact varies among the ports and intermediaries that implement an operator-SLS, depending on the spectrum of services offered by them. Those who offers inland transportation services will realise environmental benefits. Conversely, those who do not provide inland transportation services are only the enablers of environmental benefits for cargo owners.

#### *Realisation of environmental benefits from firms involved in inland transportation*

The Director of LSP2 argues that an operator-SLS results in reduced environmental impact for the company and its customers (i.e. cargo owners). He comments that an operator-SLS, reduces the number of inland transportation segments because the service of emptying containers at the port eliminates non-value-added transportation segments (i.e. return of empty containers to the port). Similarly, the Commercial Director of LSP5 asserts that because of their operator-SLS they reduce their CO<sub>2</sub> emissions, he argues:

*“Port centric solutions genuinely allow us to cut back on road miles associated with transport solutions, because we remove the secondary movement of the load which obviously has a carbon emission footprint. It’s something that we can report, it’s a fact, but we haven’t actually measured how much it saves”.*

The Commercial Director of LSP6 claims that the environmental benefits of an operator-SLS are realised by the removal of the weight of containers from road transportation, and the subsequent optimised utilisation of road-miles. He says:

*“When you take containers off the road, then you think about the impact of not moving 3-3.5 tons of metal around non-productively, which then you would have to bring back. That alone takes many millions of miles of the road every year. That does directly relate to CO<sub>2</sub> ratings, and you are then getting 3 tonnes worth of products on the outward leg”.*

The Head of Supply Chain of Retailer1 adds that the company has realised CO<sub>2</sub> emissions reductions as a result from the rationalisation of their SC. As discussed in Chapter5, Retailer1 rationalises the SC by moving products through a high velocity channel directly to RDCs, instead of the national distribution centre. Similarly, the Technical Director of Retailer2 argues that the company reduces road-miles following an

operator-SLS. The reduced road-miles enable them to decrease their carbon footprint. Additionally, he argues that one of the elements that enable Retailer2 to reduce their carbon footprint is the rail connectivity of the port, *“it's relatively straight forward to get products onto rail, which has a further benefit to CO<sub>2</sub>”*. Prior to any conclusions, it should be mentioned that LSP2 utilises the backloads of vehicles that are destined to the port. LSP2 uses an online platform that assigns distribution segments to hauliers who approach the port to offload export oriented cargo. The Director of LSP2 argues:

*“...when you consider that this vehicle may have gone back empty anyways, so therefore that's another leg, so we are almost dividing it from possible three journeys into one and when you time that by the number of loads, and by the amount of trucks and so on, it's huge millions of cubic of CO<sub>2</sub> savings”*

He argues that other factors, such as the use of environmental friendly trucks, contribute to the reduced CO<sub>2</sub> emissions achieved by the company. However, he highlights that these savings are *“minute”* in comparison to the savings from the elimination of transportation legs.

From the analysis above, it can be concluded that an operator-SLS that incorporates port-centric distribution services provided or utilised by the port/intermediary, allows the port/intermediary to realise environmental benefits. The environmental benefits are realised in the form of reduced CO<sub>2</sub> emissions, which derive from the elimination of non-value-added transportation segments. The environmental impact of the SCs of cargo owners and shippers is also reduced, which in the case of the two retailers is the same entity. It can also be argued that the utilisation of IT-systems enabling the assignment of inbound oriented loads to backload, and the use of the multimodal capabilities of ports, can further enhance the environmental benefits of an operator-SLS.

The argument above confirms the proposition of Piecyk and McKinnon (2010) that the implementation of a PCL distribution model will result in reduced road-miles and assorted reduced tonne-miles. This argument complements the PCL literature by attributing an environmental perspective to the operational efficiencies argued by Mangan et al. (2008), Monios and Wilmsmeier (2012b), and Mason et al. (2015) in regard with the elimination of non-value-added transportation segments. Additionally, it highlights that the use of IT-systems, and the multimodal capability of ports can further enhance the environmental benefits.

#### *Enablers for the realisation of environmental benefits from cargo owners*

The discussion so far involved firms that provide or internalise port-centric transportation. The analysis of the logistics-VAS revealed that some firms do not provide transportation

services. For example, the Divisional Director of Port4S asserts that the elimination of non-value-added transportation segment results in CO<sub>2</sub> emissions reductions, but he adds that the portfolio of logistics-VAS of the port does not involve transportation services. As a result, the port does not realise environmental benefits from its operator-SLS. The environmental benefits are realised by the cargo owners and their inland transport providers. The Divisional Director of Port4S argues: *“the whole benefit of port-centric is about the benefits of the customers it has to be in conjunction with them”*.

In a similar vein, the Business Development Manager of LSP1 argues that they do not realise any environmental benefits. He confirms that the elimination of non-value-added distribution segments, and the consequent reductions in CO<sub>2</sub> emissions are realised by cargo owners.

Consequently, it can be argued that the realisation of environmental benefits from an operator-SLS is dependant upon the type of services offered. Ports/intermediaries providing transportation services with their proprietary fleet realise CO<sub>2</sub> emission reductions. It can also be argued that ports and intermediaries that do not offer inland transport, or subcontract those services, are enablers of environmental benefits for cargo owners or shippers. From the sample of this study, LSP2, LSP4, LSP5, LSP6, LSP7, and LSP8 provide port centric transportation to cargo owners as part of their SLS-offering. LSP1, LSP3, and LSP9 subcontract inland transportation services included in their logistics-VAS offering, while Port4S does not included inland transportation services in its logistics-VAS.

#### *Association of environmental benefits with operational efficiencies and cost savings*

As argued in previous sections, the environmental benefits associated with a SLS that incorporates logistics-VAS, derive from the rationalisation of inland transportation, which is the result of the elimination of non-value-added transportation segments from the SC. This also results in reduction of road miles and associated CO<sub>2</sub> emissions, and reduced transportation costs. The Commercial Director of LSP6 emphasises that financial benefits are the impetus behind cargo owners' interest in purchasing logistics-VAS. He argues:

*“For every mile that you are not travelling, it might be £1 or £1.30 that you are taking off the cost. So, although they [cargo owners] are doing it for technically the right reasons, there is a financial benefit there”*.

Similarly, the Commercial Manager of LSP7 confirms that the implementation of an operator-SLS resulted in higher productivity for the company. She distinctively

comments that the company achieved “*higher productivity due to reduced mileage, and therefore reduced CO<sub>2</sub> emissions and reduced costs*”. Further, the Supply Chain Director of LSP8 supports that the most important factor for customers is cost. He argues: “*However cost and CO<sub>2</sub> emissions are very closely aligned. Our solutions are designed to reduce wasteful road-miles and activities, which by nature removes cost and CO<sub>2</sub>*”.

On the same notion, the Business Development Manager of LSP1 distinguishes that the environmental benefits are “*kind of an add-on thing really, because it’s all about cost savings and improved efficiency*”. The Business Development Manager of LSP4 also agrees that even though environmental savings are important, the key driver of their customers (i.e. cargo owners) is the cost of the services. He argues:

*“Is it a key driver (?), I would say cost of services is still the key driver. So, it isn’t just the case of being green it is also the case of being sustainable [financially]. So, there is more interest on if that’s achievable year on year and what type of improvements can we achieve. So, the focus moves its position somewhat”.*

Similar notion is also reported from intermediaries that utilise logistics-VAS for the improvement of their internal operations. The Head of Supply Chain of Retailer1 argues:

*“To be honest if you are saving carbon by reducing transport miles, then sustainable transport and low-cost transport are the same thing, because carbon can cost money, so if you are saving carbon you are almost certainly saving money”.*

The Technical Director of Retailer2 argues that “*the environmental benefit is doing fewer miles, the cost saving is doing fewer miles, is actually the same thing*”. However, he comments that even if environmental savings equal cost savings: “*if you ask people what their priorities are, I am convinced that most people will say cost savings before everything else*”. Consequently, it can be argued that the environmental benefits of an operator-SLS, are not an end in themselves. They are complementary to cost savings derived from operational efficiencies associated with the elimination of non-value-added distribution segments. Further, the Technical Director of Retailer2 emphasises in the cost saving opportunities derived from an environment friendly strategy. He comments that companies might be charged for their carbon footprint. Therefore, the implementation of a strategy that reduces the environmental output can result in further potential cost savings for the company. This argument emphasises the importance of SLS that enable environmental benefits.

#### *Enhanced marketing capability*

In the subsections above it was argued that an operator-SLS will result in environmental benefits for ports and intermediaries involved with inland transportation. Additionally,

ports and intermediaries that implement such SLS become enablers of environmental benefits for cargo owners. It was argued that environmental benefits are complementary to the cost savings from the elimination of non-value-added transportation segments. In addition to these aspects, the Sales and Marketing Director of LSP8 argues that an operator-SLS, that incorporates the provision of warehousing and transportation services, would result in an enhanced commercial proposition. He explains that a prominent problem faced by manufacturers in Europe is that:

*“British public is quite environmentally aware. Although they want authentic [food] products, they are very mind-full about food-miles. So, anything an importer can do to be promoted as a green provider, is definitely an advantage”.*

Similarly, the managing director of LSP3 supports that they leverage the fact that a PCL solution will result in CO<sub>2</sub> reduction. He argues: *“it’s a selling point because it’s truly more environmentally friendly keeping the stock by the port”*. Additionally, the Business Development Manager of LSP4 argues that retailers are mostly proactive in advertising their environmental awareness. He claims:

*“I mean it’s a marketing thing, everybody likes to go in the store and see the big sign on the wall that says that they are reducing waste that they are using line coat rack, and they sell fair trade bananas all that sort of stuff, everybody loves all that”.*

An example of the increased interest of UK retailers in the carbon footprint of their operations was given by the Commercial Director of LSP6. He argues that their key customer, a UK super market, utilises the information received in the weekly KPI reports (sent by the LSP), to calculate the amount of CO<sub>2</sub> emissions saved by the SC-solution they purchase. The Business Development Manager of LSP1 argues that most of their customers follow policies that seek the reduction of their carbon footprint. For this reason, they wish to optimise the carbon intensive activities of their SCs, such as road transportation.

From the analysis of the quotes above, it can be seen that an operator-SLS enhances the marketing capability of the ports and intermediaries, because, it enables them to offer services that fulfil the requirements of customers concerning environmental friendly SC-solutions. The argument above complements the PCL literature; in that a marketing perspective is attributed to the operational efficiencies noticed by Mangan et al. (2008), Monios and Wilmsmeier (2012b) Piecyk and McKinnon (2010), and Mason et al. (2015).

Additionally, the Sales and Marketing Director of LSP8 argues that the possibility to utilise the multimodal connectivity of the port increases the sustainability of SC-

solutions. However, he comments that rail distribution for temperature controlled products can be problematic due to the inflexibility of rail services. Nevertheless, he argues that:

*“I do see an opportunity to use the rail from Port4T into Scotland as a more cost-effective way of transporting goods from the port to that part of the world, and I think retailers would buy into that as well, they will see it as a green solution”.*

Therefore, it can be argued that the enhanced marketing capability (i.e. greener and most cost-effective SC-solutions) of an operator-SLS can be further enhanced by the possibility to utilise the resources of network partners. In this case such resources are those that support multimodal capabilities. This argument also confirms the theoretical view of this thesis; in that, according to ERBT, value generating resources (i.e. port multimodal infrastructure) can reside beyond the boundaries of the firm, and can become sources of CA (Gulati et al., 2000; Lavie, 2006; Lewis et al., 2010; Spring and Araujo, 2013; Hitt et al., 2016).

The argument that ports/intermediaries leverage the capabilities and resources of network partners to enhance their marketing capabilities can be extended for all ports/intermediaries not involved in road transportation. Table 6-13 presents which of the ports/intermediaries are enablers of environmental benefits for cargo owners and which realise environmental benefits from their involvement in road transport. Additionally, Table 6-13 presents which proprietary resources allow them to realise environmental benefits, and how ports/intermediaries enhance their marketing capabilities by leveraging their proprietary resources and accessing resources of partners.

#### Key findings of the operator's case study

- An operator-SLS incorporating transportation services, which are marketed or utilised internally, yields environmental benefits and cost savings. These are realised by the ports and intermediaries from the elimination of non-value-added distribution segments.
- IT-enabled assignment of inbound oriented loads with backloads, and use of multimodal capabilities further enhance environmental benefits.
- An operator-SLS not incorporating transportation services does not produce environmental benefits for the ports/intermediaries, instead, allows them to enable the realisation of environmental benefits, and cost savings by the cargo owners.
- Environmental benefits are complementary to cost savings deriving from the elimination of non-value-added distribution segments.

- An operator-SLS enhances the marketing capability of the ports/intermediaries, because it enables them to meet the requirements of cargo owners for sustainable SC solutions.
- Access to the multimodal capabilities of ports further enhance the marketing capability of the ports/intermediaries.

	<b>Characterisation concerning their role in the realisation of environmental benefits</b>	<b>Environmental benefits from proprietary physical capital resources involved in the provision of road transportation services</b>	<b>Enhanced marketing capability from access to partners resources [ERBT]</b>
<b>LSP1</b>	Enablers	-	▲ ●
<b>LSP2</b>	Enablers and beneficiaries	Company owned vehicles and IT systems for utilisation of backloads	▲ ●
<b>LSP3</b>	Enablers	-	◆ ●
<b>LSP4</b>	Enablers and beneficiaries	Vehicles of subsidiary companies	▲
<b>LSP5</b>	Enablers and beneficiaries	Company owned vehicles	◆
<b>LSP6</b>	Enablers and beneficiaries	Company owned vehicles	▲
<b>LSP7</b>	Enablers and beneficiaries	Company owned vehicles	▲
<b>LSP8</b>	Enablers and beneficiaries	Company owned vehicles and IT systems for utilisation of backloads	▲ ★
<b>LSP9</b>	Enablers	-	● ■ ★
<b>Port4S</b>	Enablers	-	●
<b>Retailer1</b>	Beneficiaries	-	▲
<b>Retailer2</b>	Beneficiaries	-	▲ ★
<b>Index: ●: organisational capabilities of operators and/or cargo owners, ▲: port land, ■: port warehousing capabilities, ◆: relative proximity to a container port, ★: multimodal capabilities of the port</b>			

**Table 6-13: Network resources responsible for the enhanced marketing capability of ports/intermediaries concerning the realisation of environmental benefits, source: (authors own)**

Table 6-14, below, summarises the key findings of the case study of operator-SLS, and its contributions to literature.



Key findings	Contribution to SLS and PCL literature	Contribution to ERBT literature
<p>1) An operator-SLS incorporating transportation services, marketed or utilised internally, yields environmental benefits and cost savings. These are realised in the form of reduced CO<sub>2</sub> emissions that derive from the elimination of non-value-added distribution segments.</p> <p>2) IT enabled assignments of inbound oriented loads with backloads, and utilisation of multimodal capabilities of ports can further enhance the environmental benefits of an operator-SLS.</p> <p>3) An operator-SLS not incorporating port-centric transportation does not result in environmental benefits. However, it allows the port/intermediary to be the enabler of environmental benefits and cost savings for the cargo owner.</p> <p>4) Environmental benefits are not an end in themselves. They are complementary to cost savings that derive from the elimination of non-value-added distribution segments.</p> <p>5) An operator-SLS enhances the marketing capability of ports/intermediaries, because it enables them to meet the requirements of cargo owners for sustainable SC solutions.</p> <p>6) Access to the multimodal capabilities of ports can further enhance the marketing capability of the port/intermediary.</p>	<p><b>SLS literature:</b></p> <p>The findings of this case study could not confirm/contradict/complement any of the arguments of SLS-literature, because of the divergent nature of environmental benefits identified in the two literature streams.</p> <p><b>PCL literature:</b></p> <p>The findings of this case study <b>confirm</b> the PCL literature; in that the implementation of an operator-SLS that incorporates port-centric distribution results in reduced road-miles and assorted reduced tonne-miles.</p> <p>The findings of this case study <b>complement</b> the PCL literature; in that:</p> <p>i) the operational efficiencies of port-centric distribution model will lead to realisation of environmental benefits for cargo owners and the port/intermediary (in the case of retailers both are the same entity)</p> <p>ii) the operational efficiencies of a port-centric distribution model enhance the marketing capabilities of the port/intermediary.</p>	<p>The findings of this case study confirm the ERBT literature; in that the port/intermediary can enhance its capabilities by accessing the idiosyncratic resources of its network partners. In this case these resources are those that attribute to the port multimodal capabilities.</p>

**Table 6-14: Key findings environmental impact operator-SLS, source: (author's own)**

### 6.4.3 Hybrid-SLS

The analysis of the data from the three companies that comprise this case study reveal that a hybrid-SLS yields environmental benefits. The environmental benefits associated with a hybrid-SLS do not deviate from the benefits realised in the previous two case studies. As such, the environmental benefits of a hybrid-SLS derive from the operational efficiencies inherent to a port-centric distribution model, and the utilisation of the multimodal capabilities of ports. However, the environmental benefits are realised by the port only when the operator role of the hybrid-SLS imposes vertical SC-integration. Otherwise, the port acts as the enabler of environmental benefits for cargo owners and/or intermediaries. The arguments that environmental benefits are associated with cost saving opportunities, and that a hybrid-SLS enhances the marketing capabilities of the port are also made in this case study.

#### *Realisation of environmental benefits from hybrid-SLS*

The Head of Commercial Strategy of Port1 acknowledges that a port-centric distribution model generates environmental benefits: *“there clearly is a benefit and this would go for all ports that are operating in the port centric space, because you are reducing the number of road-miles, and road-miles are much more polluting than maritime-miles”*

However, Port1, as it was presented in Chapter5, is not involved in inland road transportation. As such, Port1 does not realise environmental benefits from its own practices, but enables the realisation of environmental benefits for cargo owners. Further, the Head of Commercial Strategy of Port1 argues that their hybrid-SLS aims to offer sustainable SC-solutions to customers. One aspect included in these sustainable SC-solutions is the utilisation of inland waterways for the inland cargo transportation. By this practice they replace road-miles, with more environment friendly maritime-miles (Woodburn and Whiteing, 2010). The Sales and Logistics Manager of Port1 comments that one food manufacturer is a *“big supporter”* of their barge service. She highlights that the food manufacturer transports 90% of its imports from Port1 to Northwest England on the barge operated by Port1. She argues that the utilisation of the barge service considerably reduces the road miles of the manufacturer<sup>53</sup>.

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<sup>53</sup> Port1 calculated that each barge sailing in the ship canal results in 1.8 tonnes less CO<sub>2</sub> emissions compared to road transportation of those containers. Additionally, they have calculated that every container taken of the road for the segment between Port1 and East Northwest England equals with 30kg of CO<sub>2</sub> saved.

It should be highlighted that even though in this case the port is the operator of the service, the environmental benefits are realised by the cargo owner. That is because the port does not provide road transportation, so the maritime miles do not replace road-miles for the port. Thus, even in its role as an operator the port does not necessarily realise environmental benefits.

The Commercial Director of Port2 also claims that a port-centric distribution model results in environmental benefits. He explains that these benefits derive from the elimination of non-value-added road-miles. However, he argues that the increased concentration of companies at the port “*means more hauliers moving in and out and around the port*”. Consequently, increased congestion is created.

The Commercial Director of Port2 asserts that in its landlord role the port acts proactively to rationalise the movements of those vehicles. He explains that they have invested in a traffic control system, which generates a specific schedule. This schedule generates specific time windows for hauliers to approach the port, to prevent congestion around the port, and assists the environmental footprint. He argues that the port invests in the advancement of its rail connectivity, to assist inland transportation of cargo on more environment friendly modes. This practice has the potential to enhance further the environmental output of a port-centric model. However, he asserts that in its operator role Port2 does not utilise rail services, so even though it does realise environmental benefits, these are derived from the elimination of non-value-added transportation segments. They are not associated with the replacement of carbon intensive road-miles with less environment harmful freight modes. From the data presented above, concerning Port2, it can be argued that the internal processes and the multimodal capabilities of the port can enhance its role as the enabler of environmental benefits for cargo owners.

The Business Development Manager of Port3 asserts that their hybrid-SLS promotes SC-solutions that employ maritime, and rail miles in replacement of road-miles. He argues, that the cargo owners realise CO<sub>2</sub> emissions reductions from the use of environment friendly freight transport modes. However, these services are arranged by LSP9 and are offered by various subcontractors.

From the discussion above, it can be argued that a hybrid-SLS has a twofold environmental impact on the port. On one hand in its landlord role, the port enables environmental benefits for cargo owners. On the other hand, in its operator role, the port can realise environmental benefits when it is involved in road transportation. Further, the

multimodal capabilities of the port enable cargo owners to further reduce their environmental output.

#### Association of environmental benefits with operational efficiencies and cost savings

As it was argued in the previous subsection, a hybrid-SLS results in environmental benefits that derive from the elimination of non-value-added transportation miles, and the utilisation of the multimodal capabilities of ports. These practices, as argued in Section 6.4.2 result in reduced transport costs. The same argument is also supported by the interviewees of the case study of hybrid-SLS. For example, the Sales and Logistics Developments Manager of Port1 claims:

*“I mean they all say that it [environmental benefits] is very important to them, but at the end of the day it is the money that makes the difference. So, if financially we are equal with other ports, if we are offering a carbon footprint saving then they will often go with us as well”.*

Similarly, the Business Development Manager of Port3 argues:

*“...in sort of public forums businesses talk quite happily about model shift and unitised cargo to support more sustainable forms of transport by reducing emissions. But if you have a commercial meeting with the door shut it's very much cost driven. But I think because of our strategy and with our model we can be very cost efficient and collect those environmental benefits into bargain, nobody will say no to environmental benefits”.*

From the quotes above, it can be argued that the primary interest of cargo owners are the cost efficiencies associated with the reduction of non-value-added transportation segments, and the utilisation of more cost-efficient transport modes. Environmental benefits are perceived as a complementary benefit to cost efficiencies.

Furthermore, the Port Director of Port1 argues that *“obviously with the carbon tax there is an increasing requirement for customers [cargo owners] to demonstrate their green logistics”*. He explains that the capability of the port to provide SC-solutions that result in CO<sub>2</sub> emissions reductions increases the attractiveness of the port. That is, because the reduced carbon footprint of cargo owners will result in lower carbon charges. Therefore, it can be argued that the implementation of a strategy that reduces the environmental output of a company can result in further potential cost savings for the company. This argument emphasises the importance of a SLS that enables the realisation of environmental benefits.

#### Enhanced marketing capability of hybrids

In the previous subsections it was argued that a hybrid-SLS enables the port to realise environmental benefits if it is involved with inland transportation. Additionally, it allows

the port to enable environmental benefits, and associated cost benefits for intermediaries and cargo owners. In this subsection it is highlighted that this capability enhances the marketing proposition of the port. According to the Port Director of Port1 the port has actively marketed the environmental benefits realised by its customers. He argues: “*I mean have we benefited? No, but our customers have benefited significantly. So, we have actively marketed the benefits that have always been seen by our customers*”.

It can be seen that ports explicitly market the benefits realised by the cargo owners for their own purposes.

The Commercial Director of Port2 asserts that their ability to offer a sustainable distribution model acts as a marketing capability for the port. He claims that the port leverages this capability in its landlord role when they sign leasing agreements with tenants (i.e. intermediaries).

The Sales and Logistics Development Manager of Port1 argues that one of the requirements of the shippers is to receive reports concerning the environmental output of the logistics-VAS they purchase from the port. She explains that the contracts signed with these cargo owners include clauses about the environmental performance of the companies because of the services purchased from the port. She argues: “*one of their big things is they want to know every year how much carbon footprint is saved by using [Port1]*”.

Consequently, it can be concluded that the environmental benefits and the associated cost efficiencies imposed by a PCL distribution model act as a marketing capability for the company that can attract cargo owners who want to report reduced carbon footprint. These arguments complement the PCL literature; in that the operational efficiencies imposed by a port-centric SC solution do not only result in reduced cost efficiencies (Coronado Mondragon et al., 2012; Mason et al., 2015; Monios et al., 2018) and environmental benefits (Piecyk and McKinnon, 2010; Mason et al., 2015), but can also enhance the marketing capabilities of POCs.

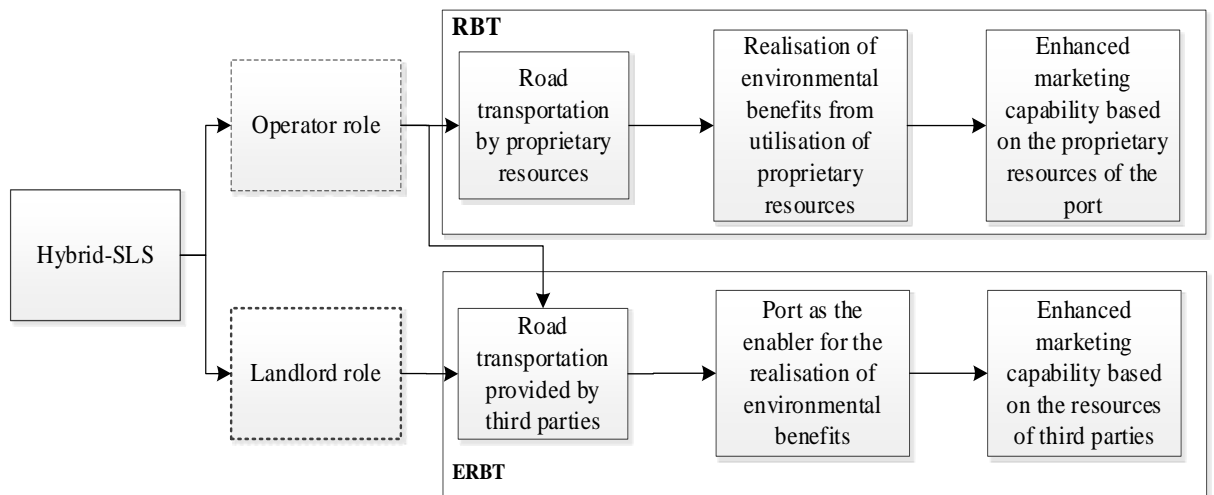
Furthermore, these arguments confirm the assumption of the theoretical foundations of this thesis; in that value generating resources can reside beyond the boundaries of the firm (Gulati et al., 2000; Lavie, 2006; Lewis et al., 2010; Spring and Araujo, 2013; Prajogo et al., 2016). In its landlord role the port leverages the organisational resources of intermediaries to enhance their own capabilities. As it was argued in Section 6.4.1 the organisational resources of intermediaries are determined by their capability to offer

services that result in the realisation of environmental benefits for the cargo owners. Consequently, the combination of the idiosyncratic resources of ports (i.e. land) with the organisational resources of intermediaries and/or cargo owners enhance the marketing capability of ports.

Concerning the operator role a distinction needs to be made. Some ports provide road transportation services. Otherwise they might subcontract the road transport services, or do not offer them (responsibility of the cargo owner or the freight forwarder to arrange these consignments). When the port is not involved in road transportation the same arguments as above apply. Therefore, the port combines its idiosyncratic resources with the organisational resources of the road transport operator and/or the cargo owner to enhance its own marketing capability. However, in this case the idiosyncratic resources of the port in addition to the port land include the physical (warehousing facility and cargo handling and storage equipment) and human capital (warehouse and management employees) resources required for the provision of logistics-VAS. Consequently, the port utilises value generating resources that reside outside of its boundaries; the assumption of ERBT is confirmed.

Conversely, when the bundle of logistics-VAS of the port incorporates road transport based on the proprietary fleet, the port realises environmental benefits from its proprietary resources. Its marketing capability is enhanced by its idiosyncratic resources and their utilisation. This argument does not confirm the assumptions of ERBT. However, it confirms the assumptions of the traditional RBT; in that, firms are a bundle of heterogeneous resources semi-permanently tied to the firm (Wernerfelt, 1984) and that the appropriate use of these resources [as implied by the firm's strategy] can be a source of CA (Penrose, 1959; Molloy et al., 2011).

Figure 6-7 depicts the realisation of environmental benefits from the different roles inherent in a hybrid-SLS and their effect on the competitiveness of the organisations that implements them.



**Figure 6-7: Links between SLS and organisational theories, source: (author's own)**

### Key findings of the hybrid-SLS case study

The analysis of the interviews with the managers and directors of the companies that comprise the case study of hybrid-SLS resulted in the following findings:

- The *landlord role* of a hybrid-SLS enables environmental benefits and associated transportation cost savings for cargo owners. Conversely the *operator role* of a hybrid-SLS results in environmental benefits and transport cost savings for ports that are involved in road transportation.
- The environmental impact of cargo owners can be further enhanced by the multimodal capabilities of the port.
- Environmental benefits are secondary to the cost saving opportunities that are inherent in a port centric distribution model.
- A hybrid-SLS enhances the marketing capability of the port because it allows the port to offer cost efficient and environmental friendly SC-solutions to cargo owners.
- The *landlord* role of a hybrid-SLS enables ports to leverage the value of their idiosyncratic resources (i.e. port land) by accessing the organisational resources of their tenants. The same applies to the operator role of a hybrid-SLS, when the port is not involved in road transportation.

Table 6-15 summarises the key findings of the case study of hybrid-SLS, and the contributions of this case study to literature.

Key findings	Contribution to SLS and PCL literature	Contribution to ERBT literature
<p>1) A hybrid-SLS has a twofold environmental impact on the port. In its <b>landlord role</b>, the port enables environmental benefits and transportation associated cost savings for cargo owners. In its <b>operator role</b>, the port has the potential to realise environmental benefits and transportation associated cost savings when it is involved in the provision of road transportation services.</p> <p>2) The environmental impact of cargo owners can be further enhanced by multimodal capabilities of the firm.</p> <p>3) Environmental benefits are secondary to cost saving opportunities that are inherent in a port centric distribution model.</p> <p>4) A hybrid-SLS enhances the marketing capability of the port as it allows it to offer cost efficient and environmental friendly SC solutions to cargo owners.</p> <p>5) <b>The landlord role</b> of a hybrid-SLS enables the port to leverage the value of its idiosyncratic resources (i.e. port land) by accessing the organisational resources of its tenants. The same applies to the operator role of a hybrid SLS, when the port is not engaged in inland road transportation.</p>	<p><b>SLS literature:</b> The findings of this case study could not confirm/contradict/complement any of the arguments of SLS literature because of the divergent nature of environmental benefits in the two literature streams.</p> <p><b>PCL literature:</b> The findings of this case study <b>complement</b> the PCL literature; in that the operational efficiencies imposed in a port-centric SC-solution do not only result in cost efficiencies and environmental benefits, but also enhance the marketing capability of the port.</p>	<p>The findings of this case study confirm the assumptions of the ERBT literature; in that the port can leverage the value of its proprietary resources by accessing the resources of its business partners. In this case the proprietary resources of the port are the port land (landlord role), and the physical and human capital resources that are required for the provision of logistics-VAS (operator role that excludes transportation).</p>

**Table 6-15: Key findings environmental impact hybrid-SLS, source: (author's own)**



#### **6.4.4 Cross case comparison of environmental drivers**

Based on the findings from the within case analysis presented above, the cross-case comparison for the environmental impact of SLS in a PCL context can be conducted. In all three case studies the interviewees acknowledged that a port-centric transportation model (which is inherent in their SLS) can result in environmental benefits. The realisation of those benefits varies between enablers and beneficiaries in respect to each SLS. Ports that implement a landlord-SLS enable environmental benefits for cargo owners and/or operators involved in road transportation. Ports and intermediaries that implement an operator-SLS realise environmental benefits only when they provide road transportation. Otherwise they enable environmental benefits. An exemption are the intermediaries that utilise logistics-VAS for improving internal operations, because in that case they are simultaneously operators and cargo owners. Using the same logic it follows that the ports that implement a hybrid-SLS are both beneficiaries (operator role expanded to inland transport services) and enablers (landlord role, and operator role without transport services) of environmental benefits.

The participants of all the case studies acknowledged that the real motivation of cargo owners is the financial efficiencies associated with SC rationalisation. The rationalisation of the SCs results from the elimination of non-value-added transportation segments. Therefore, the realisation of cost efficiencies is analogous to the realisation of environmental benefits.

In all cases the environmental benefits and associated cost efficiencies enhanced marketing capabilities. Therefore, the interest of cargo owners is focused on the organisations that can facilitate their sustainability strategies.

Ports that implement a landlord-SLS utilise idiosyncratic resources (port land) and organisational resources and capabilities (physical and human capital resources required for logistics-VAS) of their tenants to market the benefits that can be achieved by cargo owners that decide to route cargo through their port. Ports market the possibility given to intermediaries to facilitate the sustainability strategies of cargo owners if the intermediary decides to establish on-port logistics operations.

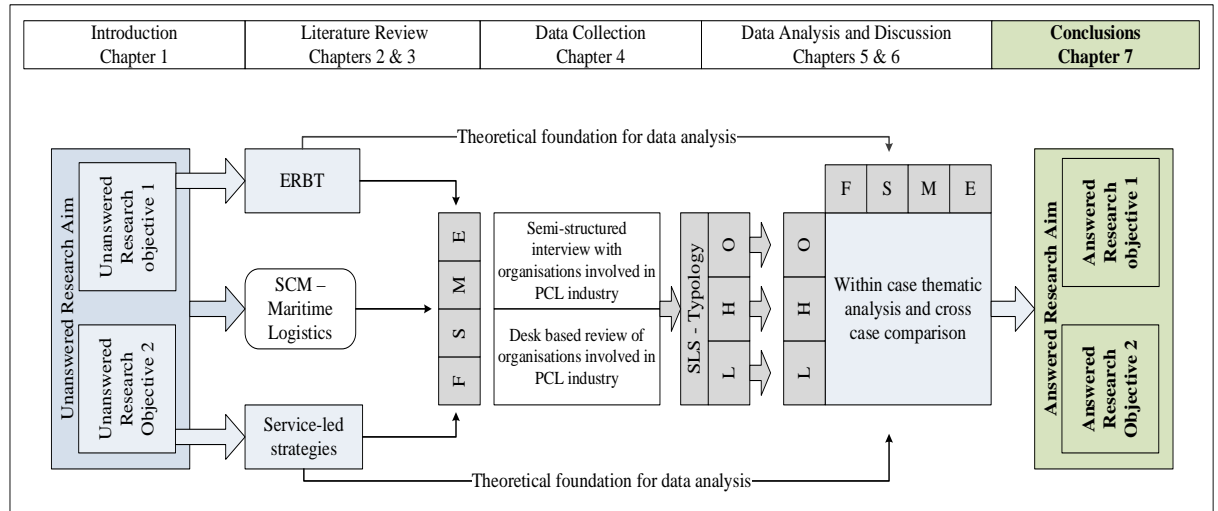
Furthermore, ports and intermediaries that implement an operator-SLS depending on their involvement in road transportation and use of logistics-VAS leverage different resources to enhance their marketing capabilities. Ports that implement a hybrid-SLS in their landlord role also leverage the organisational capabilities and resources of their partners in combination with their idiosyncratic resources to enhance marketing

capabilities. However, in their operator role a distinction is made. When the port provides transportation services then its marketing capability derives from its idiosyncratic resources. Conversely, if the operator role is not associated with inland road transportation then the enhanced marketing capability derives from organisational resources of network partners.

### **Chapter Summary**

This chapter presented the within case analysis and cross-case comparison of the three emergent case studies of this research. This enabled the identification of the financial, strategic, marketing and environmental impact of each of the three SLS, and thus, addressed RQ2 of RO2. Additionally, the chapter contrasted the empirical findings of this thesis with the SLS, PCL, and ERBT literature streams to identify convergence or divergence of literature with practice. Based on this discussion, the chapter also presented the contributions of this thesis to the respective literature. In Chapter 7 the results of the two data analysis chapters will be discussed in the light of the two research objectives of the thesis, and the central research aim will be addressed.

## Chapter 7 Conclusions



**Figure 7-1: Thesis outline and focus of Chapter 7**

Chapter 7 revisits the research objectives of this thesis and addresses its aim by relating the findings presented in Chapters 4 & 5 with the research objectives. Additionally, it reflects on the contributions and limitations of this research, and suggests directions for future research. Section 7.1 answers each of the two research objectives and presents a critical discussion of the key findings. Section 7.2 and 7.3 summarise the implications for theory, and methodology, while 7.4 summarises key managerial implications. Section 7.5 discusses the limitations of this research and section 7.6 outlines future research directions.

### 7.1 Conclusions about the research objectives

The main aim of this thesis, as outlined in Chapter 1, was to investigate the impact of SLS on the competitiveness of UK ports and intermediaries involved with PCL, building upon previous OM, SCM, and ML literatures. To facilitate this investigation and to underpin empirical findings on the impact of SLS on the competitiveness of UK ports and intermediaries, theoretical claims from ERBT have been employed. In line with the main research aim, two research objectives have been developed.

***Research objective 1: Identify a typology of SLS implemented by UK ports and intermediaries for the provision of on-port logistics VAS.***

In line with the views of Kowalkowski et al. (2015) on the existence of multifaceted and multidirectional SLS in a manufacturing context, and the call for research outside of the manufacturing focus of SLS literature of Kowalkowski et al. (2017), RO1 attempted to investigate SLS implemented by UK ports and intermediaries involved in PCL. Following desk based research, 25 interviews among 18 organisations were conducted to identify different SLS, how and why those SLS were implemented, and what their impact is on ports and intermediaries that implement them. Following the concept of casing three cases studies were developed. Each of these case studies represent a different SLS.

The ports that implement a “*landlord-SLS*” provide land and/or facilities to intermediaries wishing to establish operations for the provision of on-port logistics-VAS. Their SLS related revenue derives from leasing land/facilities. Ports and intermediaries that implement an “*operator-SLS*” actively provide logistics-VAS for external use (SLS revenue from the provision of services) or operate port centric warehousing facilities for the internal use of logistics-VAS (use of logistics-VAS for optimisation of internal functions). The last SLS combines characteristics of the previous two. Ports that implement a “*hybrid-SLS*” actively provide logistics-VAS for external use, and lease land and/or facilities to intermediaries. The SLS related revenue of those ports derives from the provision of logistics-VAS, and from leasing of facilities/land to intermediaries.

The three case studies enabled the development of a typology of SLS in a PCL context. Such typology serves several purposes. Methodologically, the typology allows data to be reduced into a manageable manner (Mills and Margulies, 1980), as it framed the 18 participating organisations in three groups based on their common characteristics within an industry. The proposed typology implies a different role and level of resource commitment for the port/intermediary within the PCL market. It suggests that intermediaries, in a UK context, can only be directly involved with the provision of logistics-VAS, in contrast to ports that follow direct (in-house development and operation of warehousing facilities) or indirect (leasing of land and/or warehousing facilities to intermediaries) paths. The data analysis reveals that ports implement SLS to outsource non-core activities, meet market demands, and secure influx of revenue; whilst intermediaries implement SLS to enter new markets, offer end-to-end SC solutions, and optimise internal functions.

Additionally, the proposed typology, to the best of the author's knowledge, has not been provided so far in PCL literature. Thus, this typology is a valuable contribution of this study to the PCL literature, because it provides a comprehensive guide to ports and intermediaries regarding the resource investments required for the provision of on-port logistics-VAS depending on their role in the industry. As identified in Chapter 3, and as argued by Mason et al. (2015), there is lack of empirical research on PCL. Most of the identified papers rely for their arguments on the seminal PCL paper of Mangan et al (2008). Exceptions to this phenomenon are the papers of Demirbas et al. (2014), McKinnon (2014), and Okorie et al. (2016). However, none of these studies utilise literature that investigates both “*why*” and “*how*” ports and intermediaries move beyond core offerings and implement strategies enabling them to co-create value with customers. Therefore, the present study by linking PCL with SLS literature, and adopting the contemporary understanding of multidirectional SLS, proposes a novel perspective in PCL research.

The identification of multidirectional and multifaceted SLS of UK ports and intermediaries has a twofold contribution to the SLS literature. It addresses the call of Kowalkowski et al. (2017) for research outside of the manufacturing industry. This study also confirms the existence of different trajectories of organisations adopting SLS, and different service levels in accord with customer demand, and in accord with Kowalkowski et al. (2015) and Beditinni (2015). Furthermore, the identification of the resources utilised in the provision of logistics-VAS, and the way ports/intermediaries that implement SLS interact and share resources (relationships) with business network partners for the provision of those services is of importance for this study, because the theoretical underpinning of this research assumes that organisations form business networks in which they share network resources to achieve SCA (Lavie, 2006; Lewis et al., 2010; Spring and Araujo, 2013; Xu et al., 2014; Hitt et al., 2016; Prajogo et al., 2016). This typology also contributes empirically to the ERBT literature stream.

***Research objective 2: Identify the impact of each SLS on the ports or intermediaries that implement them.***

Driven by the research gap in the SLS literature beyond a manufacturing context, this research aimed to identify the impact that such strategies have on service providers which are not involved in the design and production of goods, but move towards provision of services which lie outside of their core offerings. Drawing from a thorough literature

review manufacturers implementing SLS are anticipated to realise increased and more stable profit from additional revenue sources (Wise and Baumgartner, 1999; Neely, 2008; Baines et al., 2009b; Eggert et al., 2014; Cusumano et al., 2015; Bertoni et al., 2016; Baines et al., 2017), increased and sustained competitiveness derived from additional value-added capabilities and differentiation (Mathieu, 2001; Malleret, 2006; Fischer et al., 2010; Bustinza et al., 2017), long-term relationships with customers (Gebauer et al., 2006; Neely et al., 2011; Kowalkowski et al., 2015; Bertoni et al., 2016; Baines et al., 2017) and improved environmental outputs (Tukker, 2004; Lockett et al., 2011; Wang et al., 2011; Qu et al., 2016; Bertoni et al., 2016). The anticipated impacts have been segregated into four distinct themes; financial, strategic, marketing and environmental. These themes acted as a lens to review extant PCL literature and create attributes that would facilitate primary data collection and analysis. Following the development of the three cases studies, from RO1, interview transcripts from participating companies and secondary data were analysed using template analysis. This analysis allowed the identification of how each identified SLS (i.e. landlord-SLS, operator-SLS, and hybrid-SLS) impacts UK ports and intermediaries in financial, strategic, marketing and environmental terms. All SLS appeared to have a positive impact on each of these attributes, however the impact varied depending on the type of SLS.

### **Financial impact**

From a financial point of view all three SLS create a positive financial impact, which is realised as increased and stabilised revenue streams. Table 7-1 summarizes the financial impact per SLS. From the discussion provided in Chapter 6 it can be argued that a hybrid-SLS results in the most financial benefits in comparison to the other SLS because of the duality of roles imposed in this SLS. The duality of roles results in additional revenue from leasing land/facilities to intermediaries, and from the vertical SC integration of the ports that implement this SLS. Thus, a hybrid-SLS is anticipated to yield higher revenue in comparison to a landlord-SLS. Compared to revenue opportunities of an operator-SLS, a hybrid-SLS results in more stable revenue because of the longevity of the leasing agreements with tenants. Increased stability over the operator-SLS is also attributed to the nature of the warehouses operated by the ports that implement a hybrid-SLS. These ports usually operate multiuser warehouses, and are thus able to optimize the warehouse use by balancing peaks and troughs of demand for logistics-VAS. Further, the stability of the hybrid-SLS revenue is reinforced by the limited bargaining power of their customers because they tend to be smaller customers.

	<b>New revenue streams</b>	<b>Enhanced core revenue</b>	<b>Stabilised revenue</b>
<b>Landlord SLS</b>	<ul style="list-style-type: none"> <li>• from leasing land and/or facilities to intermediaries.</li> </ul>	<ul style="list-style-type: none"> <li>• by leveraging excess cargo throughput created by the existence of intermediaries on port.</li> </ul>	<ul style="list-style-type: none"> <li>• based on the longevity of leasing agreements with intermediaries.</li> </ul>
<b>Operator-SLS</b>	<ul style="list-style-type: none"> <li>• by vertical SC integration, only if the SLS is implemented by a port, and sole provider of logistics-VAS.</li> </ul>	<ul style="list-style-type: none"> <li>• from premium charges for logistics-VAS.</li> <li>• from increased demand for on-port logistics-VAS, and the capability to be marketed as providers of those services.</li> <li>• reduced transportation, warehousing and inventory costs for retailers using logistics-VAS for internal efficiencies.</li> </ul>	<ul style="list-style-type: none"> <li>• by offering sustainable and cost-efficient SC solutions. Challenged by seasonality of demand for logistics-VAS. Collaboration with customers, and agile solution mitigate these turbulences.</li> </ul>
<b>Hybrid-SLS</b>	<ul style="list-style-type: none"> <li>• from leasing land and/or facilities to intermediaries.</li> <li>• from the vertical SC integration of the port.</li> </ul>	<ul style="list-style-type: none"> <li>• by excess cargo throughput created by the existence of intermediaries on port and contracting with cargo owners directly for the provision of logistics-VAS.</li> </ul>	<ul style="list-style-type: none"> <li>• based on the longevity of the leasing agreements with intermediaries.</li> </ul>

**Table 7-1: Financial impact of SLS in the context of PCL, source: (author’s own)**

### **Strategic impact**

All three SLS generate value-added capabilities, which increase competitiveness and can confer CA. In some instances the CA can be sustained in the long-term (Table 7-2). The operator-SLS can result in CA by differentiation, because mere provision of land/facilities for logistics-VAS, as suggested by the landlord-SLS and the landlord function of a hybrid-SLS, has become a prerequisite for competition of ports in the container market. These strategies enable ports to diversify their offering depending on the market segments they operate in, and if they collaborate with respective intermediaries they can achieve differentiation. The same applies for the operator role of a hybrid-SLS, because the logistics-VAS usually is limited to basic offerings, thus it cannot allow differentiation on its own. LSPs that implement an operator-SLS can realise CA if they achieve two levels of differentiation (among LSPs not implementing SLS, and among LSPs in PCL industry). Such differentiation can result in SCA due to relative inimitability, caused by the limited port land available for the development of port-centric warehouses, and the lengthy processes of developing collaborative services with ports. As such, an operator-SLS for LSPs appears to be the most compelling market position due to the possibility to obtain CA from two sources. Landlord and hybrid-SLS appear as market qualifiers for ports with the potentials to become market winners in conjunction with other strategies.

	CA by value-added capabilities (VAC)	CA by differentiation
Landlord-SLS	<ul style="list-style-type: none"> <li>• VAC by the creation of an organisational network, which enable the development of network resources, secure cargo throughput, and fulfil customer demand for end-to-end SC solutions, thus enhancing the competitiveness of ports that implement such a SLS.</li> <li>• The relative inimitability of network resources creates conditions for realisation of SCA.</li> </ul>	<ul style="list-style-type: none"> <li>• N/A from the SLS <i>per se</i>. The combination of the VAC attributed from the landlord-SLS and other intrinsic firm strategies, related to selection of specific market segments, and subsequent selection of network partners that underpin demand for core services, create differentiation.</li> </ul>
Operator-SLS	<ul style="list-style-type: none"> <li>• Increased competitiveness due to operational efficiencies<sup>54</sup> associated with port-centric model. Potential CA affected by two non-exhaustive factors; warehouse location, and intrinsic processes and capabilities.</li> <li>• Potentials for SCA based on asset specificity and technical expertise, when interaction of human capital resources with firm assets is complex.</li> <li>• For ports potential for SCA if they collaborate with specialists LSPs, and thus compete in a niche market.</li> <li>• For intermediaries potential for SCA if warehousing facility is located within the port's bounded land, and logistics-VAS are a result of the co-existence of idiosyncratic and network resources.</li> </ul>	<ul style="list-style-type: none"> <li>• Ports implementing an operator-SLS cannot achieve differentiation by the SLS <i>per se</i>. Trade orientation and competition in specific markets can create differentiation.</li> <li>• LSPs implementing an operator-SLS can realise long-term CA if they achieve a two-level differentiation. The first level concerns differentiation among LSPs not implementing an operator-SLS. The second concerns differentiation among LSPs in the PCL industry.</li> </ul>
Hybrid-SLS	<ul style="list-style-type: none"> <li>• Creation of an organisational network, which enables the development of network resources, secures cargo throughput, and fulfils customer demand for end-to-end SC solutions, thus increasing competitiveness. The relative inimitability of network resources creates conditions for realisation of SCA.</li> <li>• Increased competitiveness due to offering of operational efficiencies associated with a port-centric model, and the possibility to contract directly with cargo owners.</li> <li>• Potentials for SCA from extrinsic to the SLS factors.</li> </ul>	<ul style="list-style-type: none"> <li>• N/A from the SLS <i>per se</i>. It only enables ports to diversify the use of their assets, and has become a prerequisite for competition in the container market.</li> </ul>

Table 7-2: Strategic impact of SLS in the context of PCL, source: (author's own)

<sup>54</sup> elimination of non-value-added distribution segments, facilitation of cost efficient end-to-end SC, faster route to market based on increased container and product availability, increased visibility and control of imported goods, and increased SC flexibility in terms of fast-tracking or delaying containers according to demand.



Marketing impact

From a marketing point of view all three SLS in a PCL context allow ports and intermediaries to leverage marketing opportunities, which are associated with demand for on-port logistics-VAS, resulting in increased customer base, and in increased customer retention levels. Table 7-3 summarizes the marketing impact per SLS. Hybrid-SLS appears to have the most beneficial marketing impact because of the duality of functions imposed by this SLS, however, further analysis is needed to identify the financial returns of those marketing opportunities.

	<b>Increased customer base</b>	<b>Increased customer retention</b>
<b>Landlord-SLS</b>	<ul style="list-style-type: none"> <li>• Explicit impact: contracting with intermediaries and earning revenue by the leasing of facilities/land.</li> <li>• Implicit impact: increased attractiveness of the port to cargo owners due to enhanced marketing proposition, thus increased cargo throughput and revenue for port services</li> </ul>	<ul style="list-style-type: none"> <li>• Long-term leasing agreements with tenants affect the retention level of cargo owners for core port services.</li> </ul>
<b>Operator-SLS</b>	<ul style="list-style-type: none"> <li>• Enhanced customer base by ability to: i) contract with cargo owners wishing to store their products near/at port, ii) attract competitors' customers, iii) attract more recognisable cargo owners, and, iv) enter new markets.</li> </ul>	<ul style="list-style-type: none"> <li>• The operational benefits of a port-centric model propel the creation of long-term partnerships between ports/intermediaries that implement an operator-SLS and cargo owners, who are loyal to the cost savings associated with the operational benefits.</li> </ul>
<b>Hybrid-SLS</b>	<ul style="list-style-type: none"> <li>• Explicit impact: hybrid function: contracting with intermediaries and earning revenue by the leasing of facilities/land. Operator function: contracting directly with cargo owners, new customer type for ports.</li> <li>• Implicit impact: increased attractiveness of the port to cargo owners due to enhanced marketing proposition, thus increased cargo throughput and revenue for port services</li> </ul>	<ul style="list-style-type: none"> <li>• Long term leasing agreements with tenants, from the landlord function, affect the retention level of cargo owners for core port services, and loyalty of cargo owners to the cost savings achieved through a port-centric model propels long-term partnerships between the port and cargo owners.</li> </ul>

**Table 7-3: Marketing impact of SLS in a PCL context, source: (author's own)**

Environmental impact

From an environmental point of view all three SLS can result in a positive environmental impact. The impact is associated with environmental benefits of a port-centric transportation model. However, the environmental impact varies between enablers and beneficiaries in respect to the role of organisations as implied by their SLS. The environmental benefits enhance also the marketing capabilities of ports and intermediaries implementing SLS, because cargo owners have an interest in reducing the

CO<sub>2</sub> emissions of their SC. Table 7-4 summarizes the environmental impact of SLS in a PCL context. It should be noted that the real motivation of cargo owners is the financial efficiencies associated with SC rationalisation. The rationalisation of the SCs results from the elimination of non-value-added transportation segments. Therefore, the realisation of cost efficiencies is analogous to the realisation of environmental benefits.

	<b>Reduced CO<sub>2</sub> emissions</b>	<b>Enhanced marketing capabilities</b>
<b>Landlord-SLS</b>	<ul style="list-style-type: none"> <li>• Enabling environmental benefits for cargo owners and intermediaries involved in road transportation (enablers)</li> </ul>	<ul style="list-style-type: none"> <li>• From leveraging of idiosyncratic resources (port land) and organisational resources and capabilities (physical and human capital resources required for logistics-VAS) of tenants to market benefits that can be achieved by cargo owners that decide to route cargo through their port.</li> <li>• From marketing the possibility given to intermediaries to facilitate sustainability strategies of cargo owners if intermediaries decide to establish on-port logistics operations.</li> </ul>
<b>Operator-SLS</b>	<ul style="list-style-type: none"> <li>• Realisation of environmental benefits if they provide road transportation (Beneficiaries)</li> <li>• Enablers of environmental benefits if they do not provide road transportation.</li> </ul>	<ul style="list-style-type: none"> <li>• From leveraging different idiosyncratic and network resources depending on their involvement in road transportation and use of logistics-VAS.</li> </ul>
<b>Hybrid-SLS</b>	<ul style="list-style-type: none"> <li>• Beneficiaries in the operator role if they provide inland transportation</li> <li>• Enablers in their landlord role and if their operator role does not include inland transportation</li> </ul>	<ul style="list-style-type: none"> <li>• Landlord role: from leveraging organisational capabilities and resources of partners in combination with idiosyncratic resources.</li> <li>• Operator role: When the port provides transportation services then its marketing capability derives from idiosyncratic resources. If port is not associated with inland road transportation, then the enhanced marketing capability of the port derives from organisational resources of network partners.</li> </ul>

**Table 7-4: Environmental impact of SLS in a PCL context, source: (author's own)**

## 7.2 Theoretical contributions

The theoretical implications of this research are threefold. Firstly, the abductive reasoning of this research enabled the elaboration of ERBT in a new context, allowing this theory to become a more dynamic tool in the form of explaining the strategic choices of organisations. Secondly, this research used extant SLS literature in a different context, addressing the call of Kowalkowski et al. (2017). Thirdly, this research provided a rich empirical underpinning and pragmatic assessment to the theoretical claims of PCL literature, and addressed the literature gap identified in Chapter 3. The three following subsections elaborate on the contributions of this research to each literature stream.

### *Contributions to ERBT literature*

ERBT fills the gap in theory between the traditional theories of the firm and the strategic behaviour and performance of allied firms (Lavie, 2006; Lewis et al., 2010; Xu et al., 2014; Hitt et al., 2016). The ERBT was considered as an appropriate theoretical framework to underpin this research, because contemporarily ports are perceived as parts of business networks (Van der Lugt et al., 2013; Mason et al., 2015), and SLS are highly linked with inter-organisational synergies (Martinez et al., 2010; Bustinza et al., 2015). The discussion presented in Chapter 2 enabled the construction of a framework that summarises the theoretical constructs of ERBT. This framework has been used to underpin the empirical findings of this research concerning the identification of resources utilised in the provision of logistics-VAS. It also theoretically underpinned the interactions and resource sharing of ports and intermediaries that implement SLS with business network partners for the provision of logistics-VAS and the investigation of the financial, strategic, marketing and environmental impact of SLS.

For example, ports that implement a landlord-SLS leverage the value of proprietary resources (i.e. port land, monetary resources for the development of facilities, and marketing capabilities) by accessing organisational resources of business partners (i.e. relationships with cargo owners) for the realisation of internal rents, CA, enhanced marketing proposition, and widened customer base. **Thus, this study confirms the theoretical constructs of ERBT that value generating resources reside outside of firm boundaries in a new context.** Other findings of this research suggest that those benefits can be achieved by leveraging the resources of another firm, without those firms having established a formal collaborative agreement. This finding is important because it adds another element in the type of commercial relationship resulting in the realisation of internal rents and CA. **As such this study suggests that adversarial commercial relationships might result in positive financial, strategic, and marketing impact for firms from leveraging the marketing power of the resources of one of the two organisations. However, it is noted that the imitability of such commercial relationship restricts the sustainability of this CA.**

It was also identified that if intermediaries and ports share resources that result in the creation of a rent that cannot be realised by either firm in isolation, then conditions for the appropriation of relational rent, and SCA are created. In this case, the intermediary shares intangible human capital resources (i.e. relationships with customers) and accesses

the shared physical capital (i.e. warehouses, cargo handling equipment, and rail connectivity) and human capital (i.e. labour required for the provision of the logistics-VAS) resources of the port. Therefore, this research confirmed the theoretical arguments of ERBT in a new context, by proposing that in a PCL context value generating resources can reside beyond the boundaries of the firm.

This study also identified that organisational capabilities of network partners can assist the differentiation strategy of the firm. **This finding further adds to extant ERBT literature as it provides the perspective of differentiation to the positive outcomes of resources/capabilities sharing among network partners. As such, this research contributes empirically to the ERBT literature stream, as it uses it in a new context and allowed for this theory to become a more dynamic tool in the form of explaining the strategic choices of organisations within the PCL industry.**

#### *Contributions to SLS literature*

As discussed in Chapter 2, SLS literature focuses on the transition of manufacturers towards service provision. Consequently, this literature with few exceptions, investigates organisations in manufacturing settings. Extant SLS literature assumes a unidirectional transition of companies implementing such strategies. This thesis investigated SLS in a PCL context, thus it widened the contextual setting of SLS literature, and identified multiple SLS and implementation trajectories. This research addresses the call of Kowalkowski et al. (2017) for SLS research outside of manufacturing settings, and reinforces the claim of Kowalkowski et al. (2015) for the existence of multifaceted and multidirectional SLS. Furthermore, this study proposed a quadruple framework for assessing the impact of SLS. Previous studies, such as Baines et al (2009b), Baines and Lightfoot (2013), and Ulaga and Loveland (2014) have investigated SLS from a financial, strategical, and marketing point of view. This research combining literature from PSS to other mainstream SLS literature, added a fourth perspective, the environmental impact of SLS. Thus, it proposes a more holistic framework for the investigation of the impact of SLS on ports and intermediaries. The environmental impact is considered of importance, considering the EU 2020 strategy for smart inclusive and sustainable growth, and the United Nation's sustainable development goals. **The addition of the environmental perspective addresses the call for more research on the environmental impact of SLS by Qu et al. (2016).**

It was shown in Chapter 2 that manufacturers that implement SLS leverage marketing opportunities by responding to increased demand for VAS (Gebauer et al.,

2006; Ostrom et al., 2010; Bustinza et al., 2017), and offering tailored solutions to customers (Baines et al., 2009b). Thus, they are anticipated to realise new, increased and more stable revenue streams from the provision of VAS (Smith et al., 2014; Cusumano et al., 2015; Bertoni et al., 2016; Baines et al., 2017) and to transform tactical relationships to long term partnerships based on customer loyalty and supplier dependency (Neely et al., 2011; Kowalkowski et al., 2015; Baines et al., 2017). The findings of this research confirmed that all SLS in a PCL context allow leveraging of marketing opportunities from the increased demand for tailored SC solutions and logistic-VAS at points of import, and subsequently enhance demand for core services. Ports and intermediaries that implement SLS in a PCL context can realise new, increased and more stable revenue streams, and transform transactional relationships to long-term partnerships, but the stability and growth of revenue depends on the type of SLS implemented. Firstly, while in other settings new, increased, and more stable revenue streams derive from the actual provision of VAS, in a PCL context the ports that implement a landlord-SLS or a hybrid-SLS derive new, increased and more stable revenue streams from enabling logistics-VAS. These revenue streams are associated with leasing on-port facilities/land to intermediaries and are more stable in comparison to traditional revenue streams because of the long-term landlord tenant contractual agreements. Similarly, the long-term landlord-tenant partnerships transform tactical relationships to long-term partnerships. This is reflected in the relationships of ports with their tenants (i.e. intermediaries), but also in the relationships of ports with cargo owners. Therefore, ports increase cargo owner retention by enabling logistics-VAS, instead of offering them.

Leasing-related revenue streams are more stable from revenues realised by operator functions of SLS in a PCL context, which due to the seasonality of demand for logistics-VAS are perceived less stable. Nevertheless, collaboration with customers and agile solutions have been suggested as mitigation strategies of this impact. Furthermore, concerning the operator-SLS, increased revenue is realised from the higher prices ports/intermediaries can apply to services included in their SLS offering, in comparison to other logistics services. The offering of tailored SC-solutions influences the purchasing decisions of cargo owners, creates customer loyalty, yields to a repetition of sales and propels the development of long term partnerships with cargo owners. Positive financial impacts were identified for retailers who use logistics-VAS internally. **Therefore, even though the empirical with theoretical findings are similar, context related additions have been identified** as discussed above. **These context related additions are**

**considered important as they address the call of Baines et al. (2017, p.268), who argue that “from a prescriptive orientation, few studies establish contextual conditions for servitisation”.**

Similarly, in Chapter 2 it was identified that SLS can attribute CA by the addition of value-added capabilities and by differentiation, and that the inimitability of service related resources can lead to SCA (Baines et al., 2009b; Fischer et al., 2010; Bustinza et al., 2017). This research identified that SLS in a PCL context can attribute CA by the addition of value-added capabilities. However, in some cases the CA from value-adding capabilities derive from accessing resources of network partners, and not from intrinsic resources. Concerning the landlord-SLS, ports increase their competitiveness in the container port market by “accessing” the resources of their tenants (i.e. intermediaries). Similarly, LSPs who establish operations at a port and develop a joint logistics-VAS offering realise higher competitiveness among the LSP market from leveraging the resources of the port. The only exemption is the operator function of hybrid-SLS, where the ports that implement such a SLS increase their competitiveness by investments in idiosyncratic resources. It was also identified that if the logistics-VAS offering is a result of network resources, then conditions for the realisation of SCA are created. Furthermore, in this study it was identified that SLS in a PCL context result in CA by differentiation only for LSPs implementing an operator-SLS and achieving two levels of differentiation. Otherwise, SLS *per se* cannot result in differentiation unless they are combined with other intrinsic strategies. Even though convergence between mainstream-SLS and PCL-related SLS has been identified, this is only partial. **Consequently, this study suggests that the strategic impact of SLS in a PCL context is mostly affected by the addition of value-added capabilities, rather than differentiation, and that a collaborative service offering, rather than internally developed services can create conditions for the realisation of SCA.**

In Chapter 2 it was also argued that SLS in manufacturing settings results in a positive environmental impact from the use of the asset instead of ownership of the asset. **However, this study identified that the environmental impact of SLS in a PCL context results from the SC rationalisation associated with a port-centric model. Therefore, the findings of this study diverge from the mainstream SLS literature are because of contextual idiosyncrasies.**

### Contributions to the PCL literature

The critical review of PCL literature in Chapter 3 identified that many papers rely for their arguments on Mangan et al. (2008), showing that empirical research on PCL is limited. This finding is in line with Mason et al. (2015) and Monios and Wilmsmeier (2012b, p.208) who argue that PCL has been “*used rather loosely as concept over the last decades [and] has not been given sufficient theoretical grounding*”. In alignment with this argument is the observation that many of the papers reviewed do not contribute to the elucidation on PCL. Authors use the term but do not discuss it further, or do not provide empirical research relevant to the term. By associating mainstream SLS with PCL literature and investigating the trajectories of 18 organisations, this research identified a typology of context related SLS, and proposed a novel perspective in PCL research. The proposed typology implies a different role and level of resource commitment for ports and intermediaries within the PCL market, and explains “why” and “how” organisations implement strategies enabling co-creation of value with customers and move beyond core offerings. To the best of the author’s knowledge such a typology does not exist in extant literature. This typology also facilitates the investigation of the impact of three context related SLS. Thus, this research provides a rich empirical underpinning and pragmatic assessment to PCL literature, and addresses the respective research gap. **Moreover, by using theoretical claims from ERBT to underpin empirical findings, this study provides the theoretical underpinning lacking in PCL literature, thus addressing the gap identified in Monios and Wilmsmeier (2012b).**

This study identified several clarifications to the arguments proposed in PCL literature. Studies such as Mangan et al. (2008), Demirbas et al. (2014), argue that the provision of non-core services can result in higher profit margins for ports. Monios and Wilmsmeier (2014) and Monios et al. (2018) argue that logistics-VAS lock-in customers, and thus results in stable revenue. This research clarified that ports following a landlord-SLS, or a hybrid-SLS in its landlord function, can realise new, increased, and stable revenues by enabling rather than providing logistics-VAS. New revenue streams are associated with the more profitable use of their land bank. The increased revenue derives from the lock-in of tenants, and subsequently cargo owners, who will be buying port services. **However, in addition to customer lock-in this study clarified that the stability of new revenues is associated with the length of leasing agreements.** It follows that the duality of the roles of hybrid-SLS will result in new revenue from leasing land/facilities, and from the provision of logistics-VAS.

Additionally, **this study clarified that PCL is a concept not tied only to ports, as frequently organisations providing on-port VAS are either LSPs or retailers. Thus, it reinforced the findings of Okorie et al. (2016).** In particular, the finding of this thesis identified that LSPs providing on-port logistics-VAS realise increased revenue because of the higher prices they can charge for those services compared to logistics-VAS not associated with PCL. Similarly, organisations marketing themselves as port centric, can realise the same type of financial benefits compared to organisations located on port land. This finding shows the marketing power of the term PCL. **This study identified also that retailers utilising internally on-port logistics-VAS realise positive financial impact beyond the buyer-supplier relationship. Thus it reinforced the arguments of Mason et al. (2015) and Monios et al. (2018).**

In Chapter 3, it was identified that provision of warehousing and other logistics-VAS can be regarded as enhanced port capabilities, which have the potential for CA for the port (Feng et al., 2012). It was argued that provision of logistics-VAS enables ports to satisfy complex customers' demand, and set the basis for realisation of SCA (Barney, 1991; Mangan et al., 2008; Woo et al., 2013; Spring and Araujo, 2013). **This study added to the above literature by suggesting that ports following a landlord-SLS can realise CA, potentially SCA, based on the joint value proposition with network partners. Further, this study proposed that conditions for the realisation of SCA are only partially dependent on the idiosyncratic resources of the port; network resources and/or idiosyncratic resources play a determinant role in the development of the conditions required for the realisation of SCA. Similarly, this study proposed that ports by leveraging idiosyncratic resources and organisational capabilities of tenants, and LSPs leveraging resources and capabilities of ports, can respond to the increased demand for on-port logistics-VAS, to enhance their market proposition, and lock-in cargo owners. Thus, this study further clarifies extant PCL literature.**

Additionally, it was asserted that PCL has the potential to confer CA to a port, based on diversified land utilisation and differentiation of its offering. It was noted that investigation is required concerning the specific offering of ports that have implemented a PCL strategy to identify differences among their offering. This study confirmed the argument that ports following an SLS in a PCL context can diversify the use of assets in ways that create value for the customer and increase revenue. Further, this study identified that a SLS in a PCL context is only a fragment of a wider strategy that enables ports to achieve CA based on differentiation. Other intrinsic strategies and factors determine the



differentiator of ports. **As such, this study contradicts the argument of Monios and Wilmsmeier (2012b; 2014), and suggests that the provision of logistics-VAS is not a differentiator of medium-sized UK-ports; but a prerequisite for competing in the UK container market.**

Furthermore, extant PCL literature suggests that a port-centric model will result in environmental benefits, which are associated with operational efficiencies and cost savings (Piecyk and McKinnon, 2010; McKinnon, 2014; Mason et al., 2015). Other studies put forward that the environmental benefits of a port-centric model can act as leveraging points for government support for infrastructural upgrades of ports (Monios and Wilmsmeier, 2012b). This study confirmed the environmental benefits of a port-centric model and suggested that they enhance the marketing capability of ports and intermediaries. **This study associates the environmental impact of SLS in a PCL context, with enhancement of marketing capabilities of firms that implement SLS. This study suggested that depending on the SLS implemented the firm can be either the enabler or the beneficiary of environmental benefits.**

### **7.3 Methodological contribution**

From a methodological point of view, this study made several contributions. First of all the use of CR as a research paradigm overcomes the dominance in SCM research of positivistic approaches (Adamides et al., 2012). This paradigm facilitated the investigation of motivations and behaviours of actors within a subsystem of a wider organisational structure. At the same time, it allowed for temporal, geographical and contextual characteristics, and the need to gain an “inside-out” view acknowledging several elements of this subsystem as universal truths. The abductive approach allowed the researcher to go back-and-forth between theory and data permitting for an iterative reconciliation of empirical claims with theoretical assumptions (Dubois and Gadde, 2002), thus offering in-depth analysis and external validity to the research through analytical generalisability (Yin, 2003). Also, it allowed for elaboration of theories through reconciliation of general theory with contextual idiosyncrasies (Ketokivi and Choi, 2014).

Moreover, the abductive approach underpinned flexible qualitative data collection and analysis techniques. Such as multiple case studies through semi-structured interviews and observation, the method of casing for defining the unit of analysis, and template analysis of the data. Semi-structured interviews ensured a systematic approach in data collection, but did not preclude the researcher from following emerging threads. Observations and secondary data allowed the researcher to verify claims made by

informants. Casing allowed multiple case studies to emerge during data collection and analysis, permitting contextual idiosyncrasies to shape the unit of analysis, facilitate the exploratory nature of this research, and facilitating a more pragmatic conceptualisation of the researched phenomenon. The use of casing is considered a novel approach within the wider O&SCM research (Spring and Santos, 2015). Furthermore, template analysis, allowed for a rigid yet flexible data analysis method. This was achieved by the combination of a-priori with emergent codes. Thus, theoretical assumptions were contrasted with empirical observations, without excluding emergent themes which led to further theoretical enquiries. **This research suggests that flexible qualitative data collection and analysis techniques are appropriate for a more holistic, and comprehensive understanding of complex business and managerial phenomena.**

#### **7.4 Implications for practice**

As more industries are increasingly interested in augmenting core offerings with value-added services, and moving beyond core capabilities, the identification of appropriate strategies that will guide them in the provision of tailored and valued offerings is important. Through a critical review of extant O&SCM, and ML literature, and the development of a rigorous research design, this research initially proposed a useful typology of multidirectional trajectories organisations can follow to implement strategies enabling the co-creation of value with customers. Secondly, this research proposed a multifaceted framework for the identification of the quadruple anticipated impact SLS have on ports and intermediaries. As such the proposed typology of multidirectional SLS in a PCL context, suggests that ports and intermediaries can investigate alternative growth trajectories in their respective markets. Depending on the position of the organisation in the PCL industry, it might be possible to augment the service offering with resource investments for the provision of logistics-VAS, or with investments in the development of collaborative relationships with network partners. Such multidirectional trajectories might not have been clear if organisations were thinking in terms of unidirectional trajectories for the implementation of SLS. **Thus, those who implement SLS should consider how each SLS fits in with their wider organisational growth strategy prior to deciding how to enhance their service offering.**

Each of the proposed SLS imposes different bundles of service offerings. Organisations should evaluate the demand of their customers and tailor their SLS-offering accordingly. Scoping of customer demand and evaluation of existing capabilities within the organisation and its direct network can result in targeted resource investments. To this

end, the proposed typology provides a comprehensive guide to ports and intermediaries regarding the resource required for the provision of on-port logistics-VAS depending on their role in the industry, and the type of service bundle they wish to offer. Of importance here is the theoretical underpinning used in this thesis, which suggests that value generating resources exist beyond firm boundaries, and that resources generated within business networks are rare and less imitable by competitors. **Thus, decision makers should examine opportunities to collaborate with organisations that would allow the development of network resources and joint services valued by customers.**

The attributes of the four themes comprising the multifaceted framework of this study could be adapted to different contexts and can guide practitioners towards the identification of the anticipated outcomes of their SLS. Each of the impacts identified could guide practitioners in the development of appropriate Key Performance Indicators (KPIs), thus being able to measure the performance of their SLS. Of importance is the inclusion of an environmental aspect to the proposed framework, because decision makers become increasingly aware of the importance of reducing the carbon footprint of SCs in the light of sustainability policies of the European Union and the United Nations.

### **7.5 Limitations of the research**

A common principle of management research is the degree of generalisability of findings, so that they can be inferred to an entire population, and thus able to predict future behaviour concerning the research phenomenon. This principle is mostly applicable to quantitative studies. Several tests have been developed to confirm the generalisability of the findings through identifying the statistical significance of the sample, and to ensure reliability, validity, and credibility. However, as argued in Chapter 4 this research employed a qualitative case study research design, which is concerned with the analytical generalisability of findings and not statistical generalisability (Dubois and Araujo, 2007). Qualitative case study research is context specific, and attempts to enable the understanding of underlying mechanisms and causal relationships in managerial processes and decisions (Benbasat et al., 1987; Gummesson, 2008). Consequently, the sample of this research was purposively selected to provide insightful explanations regarding the decisions of the companies in adopting certain strategies, and allowing for the investigation of the impact of those strategies.

The data collection was restricted to the willingness and availability of invited informants to provide an interview. Interviews, due to their open nature, are time consuming, and a certain fear of divulging sensitive information occurs. Thus, many

invited informants declined or ignored the invitation, resulting in a relatively small sample size. Potentially, a more structured data collection technique could lead to a larger sample. However, structured data collection techniques cannot provide the same level of detail of interactive techniques and cannot expose relationships between the variables imposed in the investigation of complex phenomena (Worley and Doolen, 2006). The involvement of multiple organisations in the data collection, the observational data, the secondary data, and their amalgamation into case studies, allowed multiple sources of evidence to be compared for the development of the arguments of each case study.

The sample of this study was restricted to the UK and represented only the supply side of the industry. While, a multi-stakeholder approach allows for a comparison between perceived and realised value of services offered, the time and resource constraints of this thesis did not allow for such approach. The uniqueness of UK ports concerning their ownership status poses another difficulty in identifying comparable entities. Therefore, the results of this study are not generalizable to other geographies. While this can be a limitation, it can also be an opportunity for future research.

Furthermore, the purposive sampling of this thesis was followed by snowball sampling. As such some informants were referred to by previous interviewees. This can potentially lead to informant bias and like-minded opinions. However, the referrals were for informants in other organisations, as such bias of similar organisational culture was avoided. The use of secondary and observational data to verify claims of informants also mitigate this bias to a certain extent.

Another limitation of this study is its static and non-longitudinal nature. All interviews were conducted within a 6-month period, and even though the narrative of interviewees reflected on developmental decisions spanning a decade, the analysis of the impact was conducted regarding the current situation. This might pose a limitation concerning the dynamic aspect of the investigated SLS, and their resilience in the case of environmental changes. One change that is anticipated to have a considerable effect on the competitiveness and operational aspects of UK ports and intermediaries is currently Brexit. That is because tariffs and further custom regulations might considerably affect the lead-times of SCs passing through UK ports. Further, the static nature of this research does not allow the mobility of organisations along the landlord-operator-hybrid spectrum to be observed. Some companies started as landlords and moved towards a hybrid-SLS (e.g. Port 1, and Port 2). However, during the data collection they claimed that a move from the hybrid-SLS towards a landlord-SLS was possible in a long-term scale.

Therefore, the possibility to investigate the reasons for this mobility and the potential development of a framework of mechanisms underpinning these changes could not be developed. Regardless of the static nature of this research, the research objectives were sufficiently addressed, and the time dimension poses a limitation but does not affect the reliability of the research findings. Future case research could address time dimension. Reflecting on the limitations discussed above it can be argued that generalisation of the findings of this study to a wider population is not possible due to the restricted sample and its scope. This study aimed to increase the understanding about a phenomenon, to theorise the decisions of the main actors, and to provide a framework for the investigation of the impact of managerial decisions in an era of servitisation. The limitations of this study can be addressed by future research, as discussed in Section 7.6.

## **7.6 Future research**

This research explored multiple important issues in the fields of O&SCM, and ML, such as defining multidirectional SLS implemented by UK ports and intermediaries, identifying VAS included in the portfolio of these organisations, investigating the mechanisms employed for offering those VAS, and identifying the quadruple impact of those SLS on ports and intermediaries. The research findings are comprehensive and specific to the research context. The exploratory nature of the research provides an initial understanding of the enquired phenomena. Several avenues for prospective future research in the fields of O&SCM and ML are created.

### ***Future research on the same context***

This research investigated the impact of SLS on ports and intermediaries, and identified conditions for the long-term sustainability of their competitiveness from a provider's perspective. Future research could investigate the impact of these SLS from a customer perspective to understand if claimed and perceived value converge. Such research could identify the elements most valued by customers and propose mechanism to include them in the development of logistics-VAS more effectively. Such a perspective could address calls for research on dyadic or even triadic relationships, and could address the need for innovation in collaboration with the customer as suggested by Bustinza et al. (2017). ERBT could be used as a theoretical underpinning framework in this case too. Such research could benefit by linking ERBT with the concept of open innovation, which advocates that companies should use external innovation sources (Chesbrough, 2006). Both theories reflect the contemporary business environment where companies cannot

rely solely on internal resources to compete in global markets, and acknowledge that SCA can be achieved using network resources. This research could provide further insights on the longevity of the competitiveness of SLS. Data collection should include buyers of on-port logistics-VAS. An interesting aspect would be also to identify customers that have contracted with various intermediaries over time, and investigate the reasons for changing suppliers of on-port logistics-VAS. Future research could attempt to quantify the identified impact of SLS in a PCL context, to validate the quadruple-impact framework of this thesis, and provide a benchmark of performance to practitioners. Such research would address the call of Qu et al. (2016) for more quantitative research on the assessment of the influence of SLS on the economy, the society and the environment. Future research could employ a longitudinal research design, to overcome the static time dimension of this research, and investigate the resilience of the identified strategies when the circumstances of the ecosystem of the case organisations changes. As suggested earlier one of the biggest ecosystem changes is currently Brexit. A socio-economic and political shock to the business-as-usual domain. Thus, a longitudinal study could compare how ecosystem changes affect the competitiveness of SLS and what mechanisms and mitigation strategies are implemented to secure the positions of organisations. A longitudinal research could also investigate the mobility of companies along the landlord-operator-hybrid continuum and identify a framework of mechanisms underpinning these changes. Ultimately, a longitudinal research would validate the claimed impact of SLS.

#### ***Future research on different contexts***

Except from the future research avenues discussed above, this research could act as the starting point for research in different contexts. This research investigated SLS in the context of PCL, thus it addresses the call for research on SLS beyond “*traditional product manufacturing firms*” of Kowalkowski et al. (2017, p.87), who call for research on SLS on other contexts to improve our understanding on SLS beyond the potential biases and barriers inherent in manufacturing settings. The abductive methodology and method of casing implemented in this research could be used in other settings to understand how and why different organisation types develop their offerings to changing demand patterns. Such research could validate the suitability of the quadruple framework of anticipated impact identified in this research in a different context. The findings of such research could be contrasted with the findings in this thesis to increase the generalisability of the identified framework.

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## **Appendix A: Cover letter for Interview and Interview guides**

### **A1) Cover letter for participation in research interview**

Dear Mr. / Mrs. ....,

My name is Nikolaos, I am a PhD researcher at the School of Management and Languages of Heriot-Watt University in Edinburgh.

My thesis focuses on the development of Port Centric Logistics as a contemporary strategy of UK ports and logistics providers in an era when more companies turn to the provision of value-added services. Your expertise would provide a valuable input into my research.

Therefore, I would like to interview you for my study. The length of the interview should not be more than 45 minutes, after the general information about the organisation are covered, and I would be happy to share the questions with you in advance.

If you are willing to participate, please contact me at [nnv1@hw.ac.uk](mailto:nnv1@hw.ac.uk), so that we can arrange an interview either in person or via phone/Skype according to your schedule and availability.

My research project is supervised by Dr. Maja Piecyk and Dr. Nigel Caldwell. It has been reviewed and received ethics clearance through Heriot-Watt University's Research Ethic Board.

Should you have any questions regarding this research do not hesitate to contact me.

In exchange for your time you will receive a report of the findings of my research once it will be completed.

Your participation in my research would be highly appreciated.

Kind Regards

**Nikolaos Valantasis - Kanellos**

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## A2) Interview guide for POC/PA

<b>PART A - Interviewee profile</b>	
Name:	
Job title and Role in the company:	
Number of years in this role:	
Number of years in port and logistics industry:	
<b>PART B – General questions</b>	
1. What percentage of your port’s annual throughput is PCL oriented?	
2. What new services did you introduce as a result of the implementation of PCL strategy?	
3. What is the main cargo types you provide logistics-VAS for (i.e. containerised/non-containerised, commodity type etc.)?	
4. What resources did your company acquire to provide these services? (e.g. physical, human capital, IT etc.)	
5. Are you the sole provider of logistics-VAS at your port?	
6. Do you carry out logistics-VAS yourself or do you outsource some of them?	
<b>PART C – Benefits and challenges of PCL</b>	
7. Has your company experienced higher and more stable revenue streams due to the provision of logistics-VAS?	
8. Do you think PCL has impacted your long-term competitiveness?	
9. Do you think that the provision of logistics-VAS has helped you to achieve differentiation from your competitors?	
10. Has your company experienced increased customer loyalty because of being able to offer tailored logistics-VAS?	
11. Are there any environmental benefits your company has experienced because of PCL (e.g. improved container utilisation, reduced CO <sub>2</sub> emissions)	
<b>PART D – Closing-up</b>	
12. What are the main benefits of implementing PCL?	
13. What are the main challenges you experienced in the provision of PCL?	
14. Have you experienced the benefits/results you anticipated since the implementation of PCL strategy?	
15. Does your company have any plans to expand its PCL operations?	
16. Are there any other managers in your company you could refer me to for further interviews?	
<b>Notes:</b>	
Duration of the interview:	
Place and date of the interview:	
Interview mean and recording device:	

## Appendix B: Studies applying ERBT

Source	Context	Other theoretical frameworks/literature utilised	Application of ERBT and key findings of the study
(Singh and Mitchell, 1996)	U.S. hospital software systems industry	Evolutionary theory of business strategy; collaboration	Quantitative longitudinal study that evaluates the opposing influences of collaboration between alliances members on business performance, the authors proved statistically that interfirm collaborations can often lead to CA. However, they also demonstrate that the firm will face the risk of dissolution if they cannot find a new partner in the case that the current partners cease operations or find new partners.
(Saxton, 1997)	Partnerships in the chemicals and allied products sectors	Resource Dependence Theory; TCE; Game theory; Organisational learning	Two stage quantitative longitudinal study that explores the behaviour of alliances and tests their outcomes. The analysis of 98 industrial alliances in the chemicals and allied products sector proved that the reputation of alliance partners, shared decision making and strategic similarities among partners can lead to the realisation of CA for the firm.
(Stuart et al., 1999)	Biotechnology firms	RBT; Contingency Theory; Critical success factor	Quantitative longitudinal study that investigates how start-ups leverage the resources of their network partners for survival and growth. Emirical research on 301 privately funded firms revealed that the technological and commercial expertise of alliance partners positively affects the initial public offering performance and market capitalisation of new biotech companies.
(Afuah, 2000)	IT companies	Co-opetition strategy	Mixed methods study that investigates the impact of exogenous technological changes on the capabilities of the firm's partners and the competitiveness of the firm. The analysis of the characteristics of 23 IT companies demonstrated that exogenous technological changes negatively influenced the capabilities of suppliers as it created an adverse effect. Consequently, the CA of the firm (customers of the supplier) has been affected.
(Das and Teng, 2000)	-	RBT; TCE	Conceptual paper that develops a framework for RBT for strategic alliances. The proposed framework is comprised by four attributes; namely: rationale, formation, structural preferences, and performance. One of the key arguments of the paper is that the resources of the network partners collectively affect the performance and competitiveness of the network.

(Stuart, 2000)	Semiconductor industry	Strategic alliances	Longitudinal quantitative study that investigates the impact of interfirm technology alliances on the focal firm. The analysis of secondary data from various databases revealed that the improved technological capabilities and resources of alliance partners have yielded sales growth, increased innovation rates and public confidence for the firm.
(Lee et al., 2001)	Korean IT start-ups organisations	RBT; Entrepreneurial orientation; Innovation	Quantitative study that investigates the impact of idiosyncratic and network capabilities and resources on the performance of Korean IT start-ups. Empirical research showed that internal capabilities and resources are determinants for the performance of the start-up. However, the analysis also indicated that the access to resources of venture capital companies can enhance the performance of start-ups; and consequently, positively affect the competitiveness of start-ups.
(Rothaermel, 2001)	Biopharmaceutical industry	Complementary assets; Strategic alliances	Quantitative study investigating the role of interfirm collaborations and complementary assets in the adaptation of radical technological advancements from incumbents and new entrants in the biopharmaceutical industry. The analysis of 889 alliances among 32 large biopharmaceutical companies proved that the incumbents that focused their network strategies on the exploitation of partner's resources outperformed those that developed those resources internally.
(Mathews, 2003a)	-	RBT; Resource economy; Economic learning;	Conceptual paper that proposes a framework for the analysis of economic learning. The framework draws upon RBT and extends its principles to the entire economy. The framework adopts an entrepreneurial angle and suggests that the initiatives and investments of the entrepreneur determine how effective the exploitation of internal and external resources will be.
(Lavie, 2006)	-	RBT; Relational rents	Conceptual paper that extends RBT by considering network resources of interconnected firms and proposes a model that distinguishes shared resources from non-shared resources and identifies what type of rents will be appropriated by the focal firm and its network partners if network partners remove resource barriers. Additionally, the framework identifies 5 factors that affect the rent appropriation level of the focal firm. The paper concludes that the type of the relationship among network partners might be of higher importance compared to the nature of shared resources.
(Arya and Lin, 2007)	Non-profit organisations	RBT; Collaboration; Network structures	Quantitative study that investigates how the collaboration outcome of organisations is affected by organisational characteristics, partner idiosyncrasies, and network structures. The analysis of 52 non-profits organisation networks revealed idiosyncratic, shared and network resources are of high importance for the development of the capabilities and competencies of the organisation.
(Squire et al., 2009)	Manufacturing buyer - supplier relationships	-	Quantitative study that investigates the connections between supplier capabilities, SC collaboration and buyer responsiveness by testing hypotheses from a review of ERBT literature. The empirical analysis shows that the responsiveness of the buyer is directly affected by the capabilities of the supplier. However, this impact is moderated by the buyer-supplier collaboration level. Additionally, the study identifies the existence of an optimal point between the buyer supplier relationship, after which the returns on the relationship decrease.

(Mathews, 2010)	-	Organisational learning; RBT; Porter's competitive forces; Lachman's disequilibrium framework	Conceptual paper that investigates various theoretical frameworks and suggests that a simplified framework about strategizing. The paper suggests that strategies should incorporate the role of the entrepreneur regarding the exploitation of internal and external resources. That is because such strategies will correspond better in the dynamic nature of the market; and thus, allow capture of resource complementarities, and development of dynamic and learning capabilities.
(Lewis et al., 2010)	Food manufacturers	RBT	Qualitative longitudinal single case-study research that utilises two theories to investigate how CA evolves in time. The analysis of data accumulated over a 50-year period reveals that the investigated firm sustained its competitive edge by the synchronisation of proprietary (internal) and network (external) resources. Additionally, it is identified that in many instances the detection and/or development of network resources occurs in faster cycles compared to the detection and/or development of internal proprietary resources, which usually occurs on a sequential and iterative development cycle.
(Jin et al., 2013)	US manufacturing sector	RBT; Social network theory; Supplier-buyer relationship	Quantitative paper that aims to assess if the proprietary technological resources of a manufacturer can lock in the customer in a partnership and if the internal and external technological resources of a manufacturer can enhance the flexibility and CA of the firm. The analysis of 201 questionnaires from US manufacturers reveals that the level of technological proprietary resources of the supplier positively influences the decision of the buyer to form a partnership. Additionally, the analysis shows that supplier's technological proprietary resources influence directly the potentials for the realisation of CA by the supplier and impact indirectly the flexibility of the supplier. However, the opposite relationship is identified for the impact of external technological resources for the supplier.
(Spring and Araujo, 2013)	Supplier of components to OEM of gas turbines	Penrose's conception of services; Chase's concept of service factory; RBT; Dynamic capabilities	Qualitative single case study that utilises multiple theoretical perspectives, to investigate the nature of relations between service and manufacturing in industrial supply networks. The analysis of the case study reveals that a successful transition from the manufacturing to the service end in the product-service continuum requires close collaboration with the network partners of the firm to reconfigure the network of the firm. Additionally, the analysis shows that the role of the entrepreneur is very important as it will determine the productive opportunity of the firm.
(Jia and Lamming, 2013)	Chinese-Western manufacturing supply-buyer relationships	Cultural adaptation; Buyer-supplier relationships	Mixed method multiple case study research that proposes "cultural adaptation" as a distinctive faced of international dyadic learning and links it to supply relationship performance. The analysis of the four case studies demonstrated that cultural adaptation can result in mutual relational rents for both partners in a dyadic relationship, as well as inbound spillover rents for each party individually.

(Moxham and Kauppi, 2014)	Fair trade SCs	Institutional theory	Conceptual paper that utilises ERBT and institutional theory to identify if sustainability and fair-trade affect SCM practices and to evaluate if fair trade can become a source of CA for the firm. The study proposes seven research questions that encourage future research on the identification of the factors impacting fair trade SCs and on the identification of methods for the advance of social sustainability in SCM.
(Xu et al., 2014)	Chinese manufacturing firms	RBT	Quantitative research that utilises a sample of 176 Chinese manufacturers to investigate the effects of network resources including ICT and top management support on network capabilities related with supply chain integration and business performance. The study identifies that supply chain integration can be facilitated by top management support and ICT, whilst integration of suppliers has a greater impact on CA of the organisation in comparison to the integration of customers.
(Prajogo et al. 2016)	Australian manufacturing firms	Porter's value chain	Quantitative research that examines for the first time value chain processes between supply logistics integration and competitive operational performance in 102 Australian manufacturing firms. To address their aim the researchers constructed a model comprising of a series of linkages from supply logistics integration to operational outcomes using Porter's value chain and ERBT as theoretical lenses. The findings of the research highlight the need for integrated management of both internal (production processes) and external processes (logistics and supply chain) of the operations of a firm in which supply logistics integration affects the competitive performance and the experience of consumers.

**Table B-1: Studies applying ERBT, source: (author's own)**

## Appendix C: Development and future dimensions of Logistics and SCM

Appendix C reviews the evolution of logistics and SCM after 1950<sup>55</sup>s, based on Coyle's et al. (1996) timeline.

### *Logistics evolution in 1950s – 1970s*

Bibliographic evidence regarding the trade-off between transportation and inventory costs, and the benefits of OTIF delivery, existed before the 1950s. However, logistics costs were high and customer service low, because logistics activities within the firm were fragmented (Ballou, 2007). During 1950s and early 1960s, distribution systems were neither planned nor specifically formulated. Each SC member focused on core activities while product distribution was undertaken by the haulage industry or manufacturers' proprietary fleet. During this period, the physical distribution<sup>56</sup> concept emerged in academia and practice (Ballou, 2007; Rushton et al., 2017). The importance of which was realised during the 1960s and early 1970s. However, it was the introduction of the concept of *total logistics cost (TLC)* that completely altered the perception about physical distribution (Bowersox and Closs, 1996; Ballou, 2007). TLC considers all expenditures required to complete a specific logistics task. The application of TLC revealed several interrelations amongst functional costs (i.e. it proved that high transport cost could be balanced-out by reductions in inventory and warehousing costs) (Bowersox and Closs, 1996). Furthermore, the application of the TLC enabled a systems approach on logistics, under which the physical distribution manager was able to provide reduced cost and increased customer service by the planning and management of various distribution related trade-offs (Rushton et al., 2017).

### *Logistics evolution in 1970s and 1980s*

During the 1970s and 1980s, organisations recognised opportunities for further cost savings by combining materials management with physical distribution. The combination of these functions "was described as business logistic" (Coyle et al., 1996, p.6). During the 1970s major changes in distribution were observed when distribution was recognised as a crucial element of organisations' functional management structure. Indicative example is the development of RDCs by retailers to control SCs and reduce costs (Rushton et al., 2017).

Furthermore, during the 1980s, rapid increases of other costs advanced the distribution activities of organisations (Rushton et al., 2017). As such, long term planning and cost-saving

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<sup>55</sup> That is because prior to 1950s, logistics were perceived only in military terms (Ballou 2007)

<sup>56</sup> *Physical distribution* regards assorted business activities involved with transportation of finished and/or raw material inventory to the designated place, on the correct time and in the appropriate condition. Even though the value-added element of physical distribution was recognised, organisations treated it as a fragmented or supporting process, because at that time organisations were merely focused on marketing rather than the physical handling of goods (Ballou 2007).



measurements (e.g. centralisation of inventory) were introduced to the logistics management. Additionally, the increased use of computers enhanced information flow and control over logistics operations.

Another major development of the 1980s was the expansion of LSPs who further developed information systems and material handling equipment; and triggered the emergence of the concept of integrated logistics systems (Hertz and Alfredsson, 2003). Moreover, external and internal factors, such as globalisation, sophisticated consumer demand, technological development and industrial deregulations triggered changes in the business environment. Academics and practitioners turned to logistics to find solutions to cope with these radical changes (Lee et al., 2012). The notions that logistics positively influences the performance and the outcomes of organisations (Grant and Lambert, 2006), and that logistics reduce costs and allow for market repositioning (Rushton et al., 2017), depicts the development of logistics.

During the 1990s the increased global market competition resulted in advanced challenges for organisations that wished to compete on global scale. Consequently, mere intra-organisational efficiencies were not enough, the entire SC had to become more competitive. On this notion SCM became an essential prerequisite for survival in the emerging global market (Li et al., 2005). The recognition that the competitiveness of companies in global markets is based upon collaboration and access to the resources of SC partners is aligned with the key attributes of ERBT, fact that further supports the use of ERBT as an appropriate theoretical framework to underpin the empirical findings of this research.

### ***Emergence and early developments of SCM***

SCM was introduced in 1982 by Oliver and Webber (Cooper et al., 1997). However, the term can be traced back to 1950s when Forrester (1958) argued that the interrelations of organisations can affect their performance, creating the basis of what today is called SCM (Mentzer et al., 2001). Initially, SCM focused on external networks and the flow of materials. Inter-organisational relationships, the importance of information flows and the incorporation of internal and external networks were considered at later stages alongside with the realisation of the outcomes of efficient SCM. These outcomes are added value, efficiency, and customer satisfaction (Stock et al., 2010).

The contemporary understanding about SCM is that it “*explain[s] the planning and control of materials and information flows as well as the logistics activities not only internally within a company but also externally between companies*”. However, SCM, as a theory, has been used by researchers to investigate strategic inter-organisational issues, organisational forms alternative to vertical integration, supplier-buyer relationships, and purchasing and supply issues (Chen and Paulraj, 2004, p.120).

The explosion of SCM as a concept that changed business management practice has been discussed by Lambert and Cooper (2000), who argue that organisations focused on SCM upon recognition that unilateral or autonomous competition of organisations was no longer effective. However, although organisations realised the necessity of SCM, effective application of SCM had not be realised widely. A reason for this paradox is that organisations confused SCM with integrated logistics management or supplier management (Li et al., 2005). Another reason why SCM experienced misfortunate paradigms is the failure of organisations to sort product

categories to the most suitable SCM strategy (Childerhouse and Towill, 2000). Product categorisation as functional or innovative is a prerequisite for the provision of customer service that matches the requirements of the customers for those products types (Fisher, 1997).

**Functional** are products with long life cycle, low variety, predictable demand, which enables lower forecast errors, low contribution to profit margins, as they are perceived as commodities, and long lead time to market as they have longer life cycle and relatively stable demand (Fisher 1997). On the other hand, **innovative products** are characterised by short life cycle, higher contribution to profit margins, high variety which would increase forecast errors as the demand could be characterised highly unpredictable, fact that could lead time to obsolescence stock for the company. Additionally innovative products require fast time to market due to their short life cycle (Fisher, 1997).

Based on the above product categorisation, different SCM techniques are required to accommodate the needs of each product category. Thus, innovative products, due to high demand uncertainty, require a responsive SC strategy. While functional products require an efficient SC strategy (Childerhouse and Towill, 2000).

The responsiveness required for innovative product dictates an **agile SC strategy**, while the efficiency required for functional products dictates **lean SC strategy**. Agile SC strategy enables the use of “*market knowledge and a virtual corporation to exploit profitable opportunities in a volatile market place*”. While lean SC strategy promotes the development of “*a value stream to eliminate all waste, including time, and to enable a level schedule*” (Mason-Jones et al., 2000, p.54).

The combination of those two strategies in a single SC is defined as the **leagile SC strategy**; which enables effective response to volatile demand downstream while allows efficient planning upstream the decoupling point. The decoupling point is the point in the SC that enables “*differentiation between order driven and forecast driven planning*”, by the keep of strategic stock (Childerhouse and Towill, 2000, p.341).

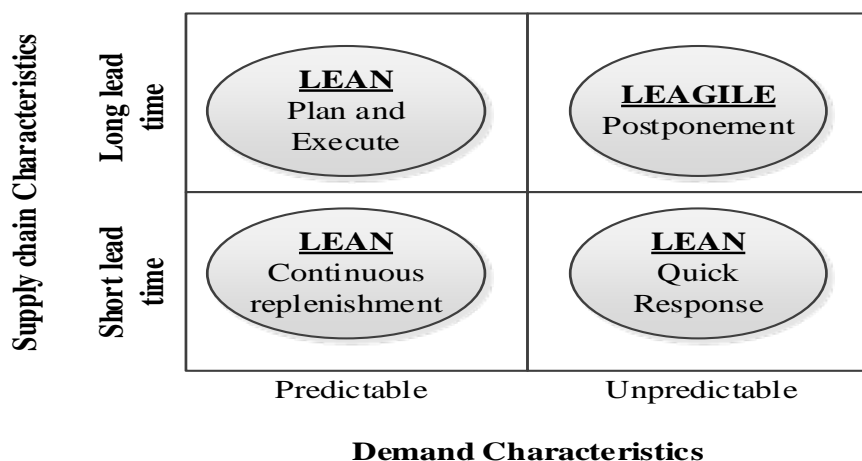


Figure C-1: SC strategies, source: (Christopher et al. 2006, p. 18)

The importance of choosing the appropriate SC strategy in the context of a dynamic environment characterised by global sourcing, global markets and off-shore manufacturing has been highlighted by Christopher et al. (2006), who support the statement that “one size does not fit all” and draw insights from the OM literature which suggests that manufacturing

strategies must be tailored in ways that will match marketplace's order winning criteria. They argue that firms based on the demand characteristics (i.e. predictability level), and supply characteristics (i.e. lead time), can classify their products in one of the four quadrants of the taxonomy depicted in Figure C-1. Once products are allocated firms should endeavour to implement the suggested SC strategies (Christopher et al., 2006).

### ***SCM in 2000s and future directions***

In early 2000s, SCs evolved from purely product oriented strategies, characterised by push systems, to customer oriented strategies, characterised by pull systems (Childerhouse and Towill, 2000). During 2000-2010, logistics and SCM were acknowledged as key success factors, and as value-added activities. Consequently, many organisations redefined their business goals and reengineered their systems to encompass the ideas suggested by logistics and SCM (Rushton et al., 2017).

Nowadays SCM is a well-established concept. However, current SCM practices were built during a period of relative stability that no longer exists. SCs operate in an extreme turbulent and volatile environment (Christopher and Holweg, 2011) that will be further influenced by the following megatrends:

- Demographic and global spending patterns changes, caused by the increased and ageing world population, increased cross-borders migrations, expansion of mega-cities, and western world's wealth redistribution (PWC, 2015).
- Volatile input costs, such as oil, energy, and availability of materials will force many organisations to change their SC's "centre of gravity" and become more flexible and adaptable to demand and supply changes. Similarly, pressures for CO<sub>2</sub> emissions reductions, and further expansion of mega-cities will force organisations to move supply closer to demand, and reinforce the use of "logistics platforms" located closer to those cities for shipment consolidation (Christopher 2011).
- Expansion in the Omni/Multi-channel revolution caused by the changing purchasing pattern of consumers after the introduction of e-retailers (Fernie and Sparks, 2009), and the increased use of subscription supply chains, where the manufacturer directly replenishes end consumers' stock (Cook and Garver, 2002).
- Resource scarcity will also shape the design of SCs, requiring organisations to move away from large scale manufacturing and distribution facilities, and aim for operations with reduced footprint. An example of such developments is the predicted increased use of Rapid Manufacturing (3D printing) (Holmström et al., 2010), or the use of PSS systems (Wang et al., 2011).

To support the success of organisations, SC design of the future will require increased agility and capability to cope with fast changes, inflated variety and increased level of customisation. Additionally, SCs must respond to the change of the market characteristics from general mass production and mass marketing to mass customisation and one-to-one marketing. Therefore, SCs of the future must become demand driven (Christopher 2011). This realisation is considered very important as it impacts the design of logistics and SCM strategies of organisations.

## Appendix D: Top 20 UK Container ports, 2000-2012

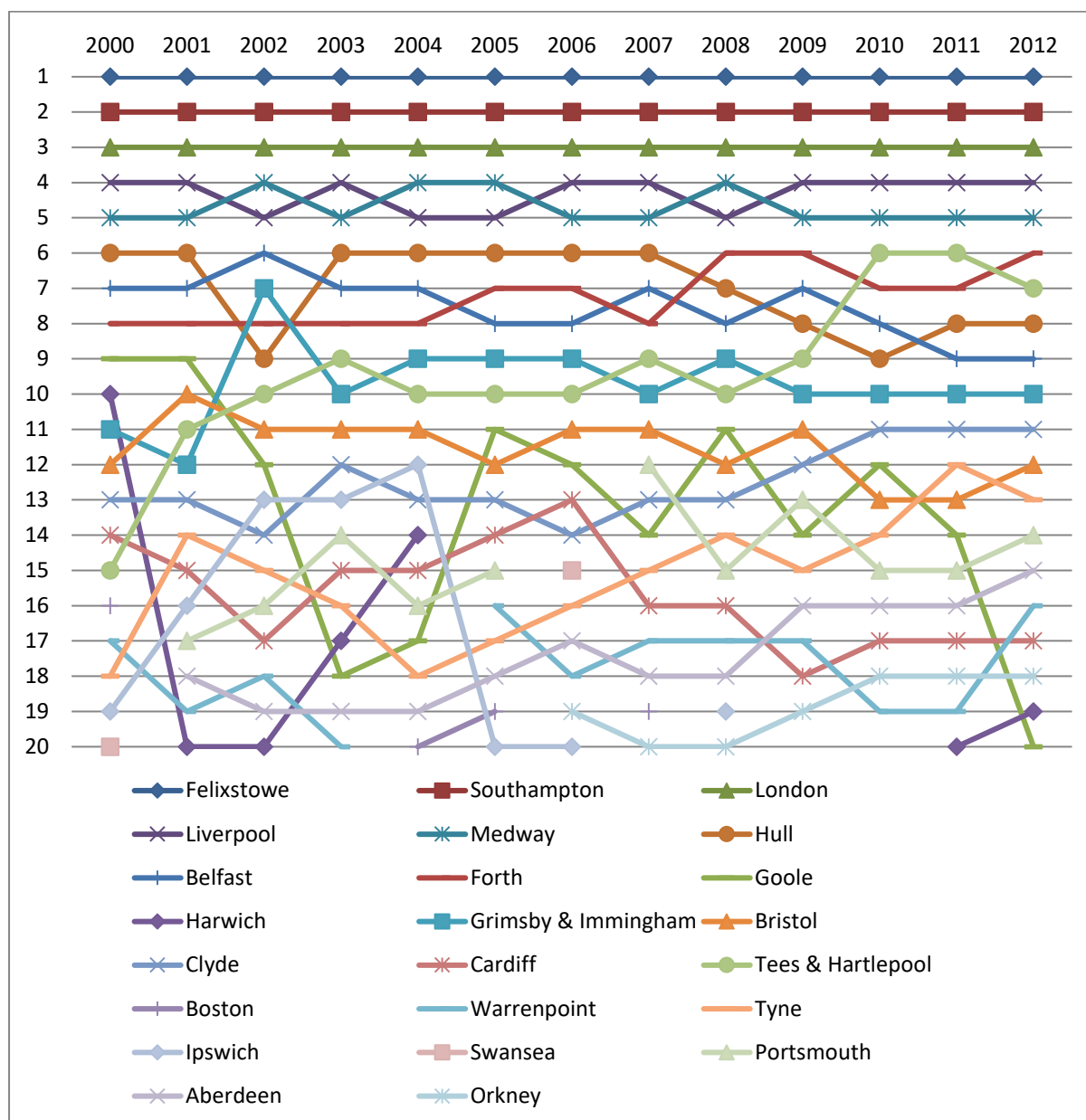


Figure D-1: Top 20 UK container ports taxonomy, 2000-2012, adapted from: (DfT 2013 and Wilmsmeier and Monios 2013)

## Appendix E: Sources of secondary data

<b>List of Secondary Data</b>	
<b>Annual Reports</b>	
A1	Port of Felixstowe (2015) Port of Felixstowe: The port of Britain [online] Available: <a href="https://www.portoffelixstowe.co.uk/files/pof/ebook-2015/index.html">https://www.portoffelixstowe.co.uk/files/pof/ebook-2015/index.html</a> , Accessed: 02/02/2015
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W41	NFT (2015), Chill - Client case study: Greencore [online], Available: <a href="http://www.nft.co.uk/clients/case-studies/chill/">http://www.nft.co.uk/clients/case-studies/chill/</a> , Accessed: 26/01/2015
W42	NFT (2015), Deep chill - Client case study: Major UK cooked meat manufacturer [online], Available: <a href="http://www.nft.co.uk/clients/case-studies/deep-chill/">http://www.nft.co.uk/clients/case-studies/deep-chill/</a> , Accessed: 26/01/2015
W43	NFT (2015), Ambient - Client case study: Brioche Pasquier [online], Available: <a href="http://www.nft.co.uk/clients/case-studies/ambient/">http://www.nft.co.uk/clients/case-studies/ambient/</a> , Accessed: 26/01/2015
W44	NFT (2015), Responsibility: Infrastructure NFT [online], Available: <a href="http://www.nft.co.uk/responsibility/infrastructure/">http://www.nft.co.uk/responsibility/infrastructure/</a> , Accessed: 26/01/2015
W45	TESCO (2014) Tesco wins top award for cutting carbon emissions [online] Available: <a href="http://www.tescopl.com/mobile/index.asp?pageid=2&amp;newsid=960">http://www.tescopl.com/mobile/index.asp?pageid=2&amp;newsid=960</a> , Accessed: 08/04/2015
W46	Drac Logistics (2015), About us [online], Available: <a href="http://www.draclogistics.co.uk/index.php/about-us">http://www.draclogistics.co.uk/index.php/about-us</a> , Accessed: 30/01/2015
W47	Arcus (2015), Investments [online] Available: <a href="http://www.arcusip.com/portfolio">http://www.arcusip.com/portfolio</a> , Accessed: 06/04/2015

## **Appendix F: Implementation Barriers of a SLS in the context of PCL**

Appendix D presents the implementation barriers for each SLS. The implementation barriers are presented as factors challenging the competitive edge of the implementers of a SLS.

### **F1: Landlord-SLS implementation barriers**

Two companies are assigned to the case study of landlords, Port4T and Port5. A factor that threatens the competitiveness gained by a landlord-SLS is the lack of land for expansion, and the bureaucracy involved in the development of on-port facilities. The Head of Commercial of Port4T claims:

*“we are basically out of space, it's been such a success that we don't have any land left, so we are having to buy land and the difficulties with buying land is obviously it takes years to get the planning permission through and go through all the correct environmental laws that we have to”*

This argument is aligned with Demirbas et al. (2014) who argue that the development of the PCL activities of ports can be hindered by limited land availability for the development of facilities. Market dynamics can also challenge the implementation of landlord-SLS. The Commercial Manager of Port5 argues:

*“The biggest challenge is the market dynamic that most end users have. Let's take one major UK supermarket for example, they only give contracts for 3 years, and at the very best for 5 years, and the problem that the PCL community and the LSP that tries to serves those projects is that they if they are looking for new build space [...] there is no way that we would build a new warehouse even if it was for [Retailer2] [...] if they asked us to build a £15million warehouse and we are going to give you a three year lease,[...], we would say look appreciate that you are [Retailer2] but we are not building you a warehouse for a 3 years lease,”*

Consequently, it can be asserted that the fleeting commitments of cargo owners, who commit to shorter contracts, than the 10-15-year leases that LSPs sign with POC/PA, pose an implementation barrier for a landlord-SLS. That is because LSPs will not commit to such long contracts if they cannot ensure full utilisation of the building. A solution to overcome this problem was witnessed in Port5, whereby one warehouse is leased by the cargo owner, who outsourced the operation of the warehouse to an LSP. Consequently, having the flexibility to terminate the contract with the current operator if they are not satisfied by their performance, whilst allowing the port to secure a long-term contract for the warehouse.

### **F2: Operator-SLS implementation barriers**

Twelve companies are assigned in the case study of operators. These are LSP1, LSP2, LSP3, LSP4, LSP5, 3PPL6, LSP7, LSP8, LSP9, Retailer1, Retailer2, and Port4S.

Interviewees reported various factors challenging the competitiveness gained by an operator-SLS. The most frequently mentioned factor is the aversion of customers to change current SCs. The Business Development Manager of LSP1 comments:

*“...one of the challenges is that we try to sell the port-centric model and a lot of companies have their own warehousing, with their own in-house operations in the Midlands or wherever. To them making a change to a LSP like us is a reasonably big change, particularly if they own the warehouses or they have their own labour force”*

Similarly, the Managing Director of LSP9 states:

*“The challenge is convincing the importer and exporter that this is the way forward and that it's a viable option for them. If you deal with importers and exporters that use a particular service and are used to plan distribution from their own warehouse it's convincing them that using the port's warehouse will reduce distribution cost and green footprint”.*

The Sales and Marketing Director of LSP8 justifies the aversion about the change of their SC patterns with the following quote: *“it's not companies who lose their jobs if a supply chain goes wrong. It's the individuals who made the decision to execute the change”*. Further, the Commercial Director of LSP6 argues that the *“solo mentality”* is another reason than can justify the reluctance of customers. He argues that many customers do not consider the entire SC cost, but on sub-optimising costs in specific facets of the SC. He comments:

*“...if you're just a person doing the job you won't necessarily understand the bigger picture and you don't really look at a complete supply chain right all the way through. Because you might need to spend an extra £300 at one place to save £500 somewhere else”*

The Divisional Director of Port4S further supports that the reluctance of customers to change established SC patterns can be an implementation barrier of an operator-SLS. He asserts: *“it is the slow case of which LSPs change and sometimes their unwillingness to change things when they perceive them as already working. So, you'd have to work very hard to get acceptance of the port centric concept”*.

However, to overcome this challenge various measures can be implemented. The Director of LSP2 comments that: *“to persuade companies to change the way that they do things, we have to prove to them that this is a viable option and a cost-effective option that works to their advantage and we do this through PR”*.

Furthermore, the Sales and Marketing Director of LSP8 argues that to mitigate the risk involved in the transition of organisations from one SC to another, the company provides a dedicated implementation team. He comments:

*“Our business implementation team not only reports into the operations, it also has a line with our in-house legal team and our corporate governance team. Because the best way of reassuring a customer that the change can be engineered to minimise risk is that we have a business and a brand to protect as well. So, we can't afford for an implementation to go wrong, that's extremely damaging for our future”.*

Moreover, LSP6 has developed internally processes targeted in educating customers. The Commercial Director of LSP6 argues:

*“...part of our job is to educate customers as to what's right and what's wrong. We will never try to sell PCL to someone we don't believe it will fit, we'll suggest them what they*

*should do even if that won't include us. Because, there is no point in bringing someone in that then ultimately will move away”*

Consequently, one of the greatest challenges to the competitiveness gained from an operator-SLS is the aversion of customers to change their SCs. However, various measures can be implemented to mediate the risks involved with SC-structure change. These measures can be summarised as follows:

- Public relations targeted in increasing customers’ awareness concerning the benefits of a port centric solution.
- Development of an implementation team that mitigates the risks involved.
- Development of customer education processes.
- Focused marketing to products well suited for PCL.

Another factor that can challenge the competitive edge of an operator-SLS is the pricing structure of counterparties involved in the offering to customers. The Commercial Manager of LSP7 argues that high port charges prevent further cost reductions that could potentially be made in the final price given to customers. Similarly, the Director of LSP3 argues:

*“your parcel carriers and your pallet carriers have got to offer the same rate from the port as they do from elsewhere in the country, because if that ever changes that would be an issue, a big issue”.*

Consequently, it can be argued that the competitiveness of an operator-SLS is vulnerable to extrinsic factors such as the pricing structure of third parties.

Another factor that can challenge the inherent competitiveness of the company from its operator-SLS is the reaction of market in terms of retaining volume. The Sales and Marketing Director of LSP8 argues that a shipping line to protect volumes, might offer a discount in freight-cost equal with the cost-saving that can be achieved by the operational efficiencies of PCL model. However, such risks are only short-term risk. He comments:

*“In the short term, people might commercially try and protect those volumes, but it gets to a point that the whole solution becomes unsustainable because your margins are eroded, the profitability of your accounts and your business is eroded, your stakeholders lose faith and you are on a down spiral at that point”.*

Moreover, the inability to comply with market requirements and the development of e-commerce are factors challenging the competitiveness of an operator-SLS. The Commercial Director of LSP6 argues that port-centric warehousing is an “*ideal solution*” for cargo purchased and consolidated abroad. He comments:

*“...if the customer buys directly from the Far Est in an Ali-Baba type of commerce, which rises considerably, then port centric logistics is right because there is no point in moving anywhere else because, obviously, you don't know where it's going to go in the country. Then it makes sense to break bulk at this point and then look at how you get it through the country”.*

However, he argues that LS6 is systematically unprepared to handle such inquiries. He comments: “*We’ve had a couple of inquiries about how we could do that, but momentarily we haven't got the right systems in place to do that, we would need to work with a partner to do that”.*

Consequently, it can be argued that an operator-SLS enhances the competitiveness of implementers in the e-commerce market. However, implementers need to be capable to

accommodate the requirements of an e-commerce offering. Therefore, implementers need to identify which resources have the potential to result in increased rents for them and invest in them. A physical capital resource might not be able to sustain the competitive edge of a firm due to its imitability. However, the way that this resource will be exploited within the company and the way it will complement the bundle of resources and capabilities of the company can be a potential source of SCA (Prahalad and Hamel, 1990). Consequently, firms need to identify which resources have the potential to enhance the value realised by customers and invest in them. Table F-1 summarises the factors challenging the competitiveness of an operator-SLS.

<b>Factors challenging the competitiveness of an operator-SLS</b>	<b>Solutions to overcome the challenges</b>
Aversion of cargo owners to SC change due to high risk involved or lack of education	<ul style="list-style-type: none"> <li>• Public relations targeted in increasing customer awareness concerning the benefits of a port centric solution</li> <li>• Development of an implementation team that mitigates the risks involved</li> <li>• Development of customer education processes</li> <li>• Focused marketing to products that are well suited for PCL</li> </ul>
Pricing structures of counterparties	
Reaction of market to sustain current share	
Resource incompatibility with market requirements	<ul style="list-style-type: none"> <li>• Identification of firm and activity specific resources</li> </ul>

**Table F-1: Implementation factors of operator-SLS, source: (author’s own)**

### **F3: Hybrid-SLS implementation barriers**

Three companies are assigned in the case study of hybrid-SLS. These are Port1, Port2, and Port3. Various factors could challenge the competitiveness gained by a hybrid-SLS. The first factor threatening the sustainability of the CA of a hybrid-SLS regards warehousing capacity planning, and land availability issues. The Port Director of Port1 comments:

*“The biggest challenge is lack of space to build warehousing, which we fixed, but the challenge is as soon as I build a warehouse it’s full. So, the biggest challenge is making sure that the warehousing stock will cope with demand, to ensure that we have that capability”*

Similarly, the Sales and Logistics Development Manager of Port1 argues competitive edge can be challenged by warehousing capacity planning issues. She comments:

*“there are big peaks and drops and recently [before Christmas] we had issues where we got too much products and not enough space to put it, because we offer a very flexible service where we don’t make customers commit to a guaranteed volume in the time in the warehouse, because it’s a flexible overflow type situation so capacity planning is an issue”*

Additionally, the Commercial Director of Port2 argues that the limited available land for the developments of warehousing facilities can be a potential threat for the competitive edge of a hybrid-SLS. He expects *“strong competition on land when all stakeholders expand to a certain size, land will be become scarce and expensive”*. Such competition might result in tenants moving

to ports with land reserves. The consequence of that is that the port will lose the locked-in customers, and related cargo volumes.

Consequently, it can be asserted that implementers of hybrid-SLS should develop the capability to balance warehousing stock with the demand for warehousing. This capability needs to consider demand profiles of products stored in port-warehouses. Additionally, ports that implement a hybrid-SLS need to acquire land for the expansion of tenants.

Furthermore, per Port1 Head of Commercial Strategy, another factor compromising the competitive edge of a hybrid-SLS is cargo owners' contractual commitment. He comments that *"while the economy recovers there are very few companies willing to provide that level of contractual certainty that would justify the investment in space"*. This further complicates warehouse capacity planning issues faced by ports. Consequently, it can be argued that long-term partnerships are preferable because they justify the expenditures for the development of new facilities, and mitigate the challenge of balancing demand and supply for warehousing capacity.

Moreover, the CEO of Port1 argues:

*"...getting the customer to appreciate the commercial value of the service that you deliver is crucial. There are times when you are moving from being a traditional service operator, to where this vision is taking us, being able to provide these value-added service, it is too easy to give away that value, and you'll find it very difficult to take it back. So ultimately for me if we are going to create value for the customer there must be something in it for us, and making sure that that's crystallized isn't always an easy task"*

Therefore, another factor that can challenge the competitiveness of a hybrid-SLS is the difficulty to clearly demonstrate the value of the service to the customer. Consequently, the commercial proposition of the company must specifically highlight the customer value, because that influences the monetary exchange regarding the provision of this value.

Further, the Commercial Director of Port2 argues that the competitive edge of a hybrid-SLS can be compromised by opportunistic behaviours of stakeholders. He comments:

*"Port centricity requires each of the stakeholders to buy-in the concept and to work together to protect the result/advantages of using port centricity. If anyone or some of them seeing themselves as a big customer at the port rather than a business partners by working towards the port centricity direction, the cooperation may then become more difficult. The mentality of collaboration is required to keep this concept works"*.

Therefore, it can be argued that opportunistic behaviour of network partners can negatively influence the sustainability of the competitiveness that is realised from the reconciliation of the resources of the port with its network partners. Lavie (2006) argues that the opportunism of network partner influences rent appropriation of other partners and their subsequent competitive edge. Consequently, it is important to identify the partners that can potentially decimate the collaborative value generation, and to contractually protect the interests of the company and the network from their behaviour.

Furthermore, the Business Development Manager of Port3 argues that the competitive edge of a hybrid-SLS can be restrained by imbalance of infrastructure inside and outside the port. He comments:

*"When it comes to providing port centric services it's crucial that infrastructure in and out of the port can match. We could have the best facility in the world inside the fence, but if*

*suddenly cargo goes out of the gate and there are issues on the rail, and there an issue on the road then the system falls. For any integrated service to perform at its best, it got to be matched by services and infrastructure on the outside”.*

Therefore, it can be argued that the port needs to ensure that hinterland infrastructure can support the requirements for inland transportation. Table F-2 summarises the factors that can challenge the competitiveness of a hybrid-SLS as reported from the interviewees.

<b>Factors that can challenge the competitiveness of a hybrid-SLS</b>
Availability of land for the development of warehousing facilities
Balance between demand and supply for warehousing capacity
Length of contractual agreements with cargo owners
Value spill-over and commercial protection of the interest of the company
Opportunistic behaviour of network partners
Mismatch of port’s infrastructure with the infrastructure of its hinterland

**Table F-2: Implementation barriers of hybrid-SLS, source: (author's own)**

## Appendix G: Current state, product types and future development of participating companies

Appendix G presents the current state of the PCL facilities of each participating company. Additionally, it summarises the product type served by each company, and future PCL developments of those companies.

	Current State	Product types	Future PCL development
	<b>Landlord-SLS</b>		
<b>Port4T</b>	<ul style="list-style-type: none"> <li>- 5,000,000sq. ft of on-port warehousing</li> <li>- 900,000sq. ft on recently developed logistics park adjacent to the port</li> <li>- facilities leased to 120 companies ranging from LSPs, freight forwarders to manufacturers.</li> </ul>	<ul style="list-style-type: none"> <li>- perishables and reefer trade,</li> <li>- building trade, and</li> <li>- waste and renewables.</li> </ul>	-
<b>Port 5</b>	<ul style="list-style-type: none"> <li>- 2,000,000sq. ft of on-port warehousing spread across 10 facilities located 100meters away from the container terminal leased to LSPs and one retailer who subcontracts the operation of the facility to a LSP</li> </ul>	<ul style="list-style-type: none"> <li>- super market traffic,</li> <li>- local agricultural products</li> <li>- material handling vehicles.</li> </ul>	-
	<b>Operator-SLS</b>		
<b>Port4S</b>	<ul style="list-style-type: none"> <li>- One 180,000sq. ft on-port warehousing facility designed for general warehousing type activities that handles approximately 30% of the container traffic of the port.</li> </ul>	<ul style="list-style-type: none"> <li>- Iron steel</li> <li>- forest products,</li> <li>- Scots Whisky industry</li> <li>- equipment destined for the North Sea oil and gas industry</li> </ul>	<ul style="list-style-type: none"> <li>- Additional warehousing capacity developed on existing 70-acre land located near the container terminal and the railhead.</li> </ul>



LSP1	<ul style="list-style-type: none"> <li>- One state of the art 248,000sq. ft. warehousing facility on the container terminal of the South England port.</li> <li>- 3 state of the art facilities in an 8mile radius from the port.</li> <li>- 100% of the cargo handled in these facilities is imported from the South England port.</li> </ul>	<ul style="list-style-type: none"> <li>- Toys and gifts,</li> <li>- sport and leisure products, and</li> <li>- electronics.</li> <li>- Capacity to handle other product types constrained due to warehouse specifications<sup>57</sup>.</li> </ul>	<ul style="list-style-type: none"> <li>- Development of a PCL facility at the logistics park of a container port in Essex.</li> </ul>
LSP2	<ul style="list-style-type: none"> <li>- 200,000sq. ft. of storage capacity in three bonded warehouses leased from Port4T.</li> <li>- 350, 00sq.ft of outside space used for storage of products.</li> <li>- 90% of LSP2's cargo is port related, while the rest 10% is derived from the local storage offering of the company.</li> </ul>	<ul style="list-style-type: none"> <li>- Building materials (e.g. bricks, paving slabs, plywood, chipboards, plasterboard, doors, flooring, and skirting boards),</li> <li>- food products (e.g. fruits, corn flakes and biscuits), and</li> <li>- General commodities such as cardboard cartons and paper products.</li> </ul>	-
LSP3	<ul style="list-style-type: none"> <li>- 7 warehousing facilities with accumulated storage space of 400,000sq.ft.</li> <li>- 90% of the facilities' throughput is derived from Port2. The rest 10% is Ro-Ro traffic coming in from a port in North Essex.</li> </ul>	<ul style="list-style-type: none"> <li>- Mainly for products from the nursery sector, and</li> <li>- commodities such as wooden flooring, perfumes, toys, clothing etc.</li> </ul>	<ul style="list-style-type: none"> <li>- 100,000sq. ft warehousing facility on Port2's land, once an opportunity rises.</li> </ul>
LSP4	<ul style="list-style-type: none"> <li>- 500,000sq. ft. of warehousing capacity at two bonded warehouses at Port4T.</li> <li>- 100% of the throughput of the existing facilities is port related as LSP4 <i>"is not involved in "country centric logistics offering"</i>.</li> </ul>	<ul style="list-style-type: none"> <li>- Drinks and ambient frozen food products,</li> <li>- garments,</li> <li>- electronic devices, and</li> <li>- pharmaceuticals.</li> </ul>	<ul style="list-style-type: none"> <li>- First phase of Port2 facility will cover 500,000sq. ft. of warehousing.</li> <li>- Future additions of 1m sq. ft. capacity on the Port2 PCL facility.</li> </ul>
LSP5	<ul style="list-style-type: none"> <li>- 110,000sq. ft. of warehousing capacity.</li> <li>- <i>"Almost the entirety of products that this warehouse handles are products generated from [Port2]"</i>.</li> </ul>	<ul style="list-style-type: none"> <li>- Home furnishing products (e.g. cushions, lightings),</li> <li>- garden products,</li> <li>- organic foods,</li> <li>- alcoholic beverages (wine and beer)</li> <li>- sport car engines, and</li> <li>- tissue papers.</li> </ul>	<ul style="list-style-type: none"> <li>- Expansion of the product coverage of the PCL facility by the addition of kitchen products and non-chemical related DIY products.</li> </ul>

<sup>57</sup> *"We receive sales enquiries from companies that want us to do something else, to handle a product that is completely different. But because of the capabilities of our warehouses we cannot handle them. For example, some products will not fit in our racking"*.

LSP6	<ul style="list-style-type: none"> <li>- 6 warehouses with an accumulated storage space of 800,000sq.ft.</li> <li>- During peak periods they would lease from other companies extra warehousing space on an ad-hoc basis, either at the company's primary location or in other ports.</li> <li>- 90% of throughput generated by Port2, while 10% comes from local suppliers of their main retail customer.</li> </ul>	<ul style="list-style-type: none"> <li>- For their major retailer customer: Mediterranean food products, and non-food products imported from the Far East (e.g. kitchen equipment, house furnishing and seasonal products).</li> <li>- For other customers bottled water from Turkey and stone from India.</li> <li>- On an outbound basis they export machinery for the build industry, cars and food products.</li> </ul>	-
LSP7	<ul style="list-style-type: none"> <li>- one 75,000sq. ft warehousing facility located on port1 estate.</li> </ul>	<ul style="list-style-type: none"> <li>- Forest products imported by Port1 occupy 80% of the facility.</li> <li>- The remaining capacity is reserved to accommodate cargo transported on road.</li> </ul>	
LSP8	<ul style="list-style-type: none"> <li>- one 225,000sq. ft temperature controlled facility in JV with Port4</li> <li>- 35-50% of the facility's throughput generated from Port4T. The remaining capacity is filled with products either sourced locally or imported by other ports in the SE England.</li> </ul>	<ul style="list-style-type: none"> <li>- Imported and locally sourced temporary controlled food products such as dairy goods (e.g. cheese, yoghurts, smoothies etc.), meat goods, pastries, and juices.</li> </ul>	<ul style="list-style-type: none"> <li>- Use their PCL facility to enter new product markets such as fresh fruits, <i>"that's a market that we until today haven't really got involved in and that's the new opportunity that PCL lends itself to"</i>.</li> </ul>
LSP9	<ul style="list-style-type: none"> <li>- LSP9 does not own any assets. They provide end to end SC solutions to customers via collaboration with various ports and LSPs since 2009, but formed a joint working agreement with Port3 in 2013.</li> </ul>	<p>Imports<sup>58</sup>:</p> <ul style="list-style-type: none"> <li>- electric goods,</li> <li>- clothing,</li> <li>- food products (e.g. ethnic food and spices from China, India and Pakistan).</li> </ul> <p>Exports:</p> <ul style="list-style-type: none"> <li>- food products such (e.g. seafood, meat, cereals, biscuits, shortbreads and other confectionery products),</li> <li>- chemical products,</li> <li>- new and second-hand cars.</li> </ul>	

<sup>58</sup> The MD of LSP9 argues that PCL is not suitable for commodities such as waste paper and plastic scrap for recycling because they are loose material and require special recycling plants. Additionally, he argues that distribution channels incorporating PCL might not be preferred by the Whisky industry even if they would be stored in bonded warehouses because they would be prone to multiple frictions.

<b>Retailer1</b>	<ul style="list-style-type: none"> <li>- 360,000sq.ft. DC for general merchandise located within the premises of the North Yorkshire port.</li> <li>- 100% of the facility's throughput is cargo generated from the port.</li> </ul>	<ul style="list-style-type: none"> <li>- Imported general merchandise products (e.g. toys, electronics, and home furnishing and decorating products)</li> </ul>	
<b>Retailer2</b>	<ul style="list-style-type: none"> <li>- 900,000sq. ft semi-automated imports' DC at the North Yorkshire port.</li> <li>- 100% of the facility's throughput is cargo generated from the port.</li> </ul>	<ul style="list-style-type: none"> <li>- Imported non-food products such as clothing and electronics<sup>59</sup></li> </ul>	
<b>Port1</b>	<ul style="list-style-type: none"> <li>- In 2012 100,000sq. ft. and 4 staff members dedicated to these facilities</li> <li>- In 2015, 600,000sq.ft. across 6 warehouses (5 on-port, 1 along the ship canal) and 100 staff members including agency labour during peak periods.</li> </ul>	<ul style="list-style-type: none"> <li>- Canned drinks and food products (e.g. cocoa beans, sugar, corn flakes, and tea beans)</li> <li>- Building industry products (e.g. steel and plywood, paper products)</li> <li>- Seasonal products (e.g. Christmas decoration and outdoor garden furnishing).</li> <li>- Specialised equipment (e.g. parts of machinery arriving arrive in containers)<sup>60</sup></li> </ul>	<ul style="list-style-type: none"> <li>- 4 new warehouses because to accommodate the increased traffic anticipated by the opening of the new container terminal between Q3 2015 and Q1 2016.</li> </ul>

<sup>59</sup> The Partner and Technical Director of the Port2 argues that PCL is mostly suitable for companies that import more than 80% of their product range. Additionally, he argues that if a company has many locally sourced products or products requiring fast delivery, then it should not aim to invest in portcentricity as it would add cost and time in their SCs.

<sup>60</sup> The diversity of the cargo type accommodated by the Port1 that benefits the port in terms of capacity planning of the warehouses. The Port Director claims: *"It doesn't really matter for our business what commodity we move in that the more value-added we can get in terms of vertical integration into that port centric solution. We have several facilities around the port and when you've got a wide portfolio of customers you create a balance. We do get a bit of seasonality prior to Christmas but broadly because we have a diverse customer base it does fit fairly well, and that's been pretty key to our success really. The portfolio is so diverse from industrial products to consumer goods so it's a full spectrum of product from high value, to low value, from fast moving to very diverse, so broadly speaking everything if that makes sense"*.

Port2	<p>- 2,200,000sq. ft. of warehousing space both on-port and on land adjacent to the port. (700,000sq. ft. of that capacity is bonded). 1,500,000sq. ft. of warehousing capacity on a recently developed logistics park</p>	<p>- Port2 establishes relationships with retailers and their suppliers to accommodate the increasing demand for imported temperature controlled food products and non-foods and general merchandise<sup>61</sup>.</p>	<p>- Plans to increase its overall warehousing space to 5,500,000sq. ft.</p>
Port3	<p>-31,183sq.ft of on-port warehousing spread across 3 warehouses</p>	<p>Food products Domestic, commercial and industrial waste Products associated with the coastal nuclear and renewable energy sectors</p>	

<sup>61</sup> In regard to the suitability of FMCGs for PCL the Supply Chain Marketing Manager of the port argues: “...the value of portcentricity lies in throughput not stay-put, if you have any desire to store you should be storing further inlands on cheaper sites. For example, you wouldn’t store Christmas decoration or garden furniture and barbeques in a port centric warehouse because they only turn once a year. [PCL is for] products that don’t have seasons like food goods, something that turns all year round and turns quite quickly. These should be handled in a port because they move very fast”.

## Appendix H: Publications

Selected parts of this thesis, have been presented in conferences and have been published as peer reviewed conference papers and book chapters.

### Conference papers

- Valantasis Kanellos, N., Caldwell, N., and Piecyk, M.I. (2016) 'A typology of multidirectional and multifaceted service led strategies of UK ports and intermediaries', in *7th Irish Transport Research Network*, Dublin, Ireland, 1-2 September 2016
- Valantasis Kanellos, N., Caldwell, N. and Piecyk, M.I. (2014) 'Contemporary competitive strategies for UK container ports in the era of servitisation: A Conceptual framework', in *3rd International Conference on Business Servitisation*, Bilbao, Spain, 13-14 November 2014.
- Valantasis Kanellos, N., Caldwell, N. and Piecyk, M.I. (2014) 'Contemporary operations strategies of UK container ports in the era of servitisation: A Conceptual framework', in *7th International EurOMA Service Operations Management Forum*, Tilburg, The Netherlands, 21-23 September 2014.
- Valantasis Kanellos, N., Piecyk, M.I. and Caldwell, N. (2014) 'Port Centric Logistics: An operations strategy for UK ports in the era of servitisation', in *19th International Symposium on Logistics*, Ho Chi Minh City, Vietnam, 6-9 July 2014.
- Valantasis Kanellos, N., Piecyk, M.I. and Song, D.-W. (2013) 'The Port Centric Logistics concept: A systematic literature review', in *18th Annual Logistics Research Network Conference*, Birmingham, UK, 4-6 September 2013.

### Book Chapters

- Valantasis Kanellos, N. and Song, D.W. (2015) 'Port Centric Logistics in concept and practice', in Song, D.W. and Panayides, P.M., eds., *Maritime Logistics: A Complete Guide to Effective Shipping and Port Management*, 2<sup>nd</sup> ed, London and Philadelphia: Kogan Page, 243-274

### Invited presentations

- Valantasis Kanellos, N. (2016) 'Service led strategies of UK ports and intermediaries', invited presentation in the *Workshop on Satellite Services for Integrated Port Logistics*, organized by Transport Systems Catapult and European Space Agency, Milton Keynes, UK, 10 March 2016