Port competitiveness and value creation: the network approach.

Empirical evidence from the Italian port system.

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N° ISBN: 9789089941725

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Samenvatting

Havenconcurrentie wordt steeds relevanter, gegeven het belang van havens als bron van waardecreatie. Dit geldt zowel voor bedrijven die betrokken zijn bij het proces van dienstverlening, als meer algemeen voor de socio-economische effecten van havenactiviteiten op lokaal en nationaal niveau.

De opkomst van de paradigmaverschuiving in de interpretatie van concurrentie, niet meer tussen individuele havens, maar tussen logistieke ketens, heeft bijgedragen tot de verrijking van de perspectieven en analyseniveaus van havenconcurrentie. Hoewel de rol van de haven cruciaal is bij het faciliteren van handel, met implicaties voor haar waardecreatie met betrekking tot de regio en het land, valt het niet te ontkennen dat haar concurrentie afhangt van het vermogen van havenoperatoren om verschillende doelgroepen tevreden te stellen.

Een opkomende groep academici is gestart met het onderzoeken van havenconcurrentie vanuit een supply chain management (SCM) benadering, waarbij relatienetwerken erkend worden als de belangrijkste factor voor waardecreatie en concurrentie van havens. Volgens deze studies bepaalt de SCM benadering de onderscheidende competenties en kenmerken van diensten die de haven zou moeten koesteren om te voldoen aan de klantenvereisten en om de economische en internationale ontwikkeling van het eigen achterland te ondersteunen.

Ondanks deze suggesties is er weinig empirisch onderzoek uitgevoerd naar de rol van havens binnen supply chains. Dit hiaat komt voort uit de moeilijkheid om de multi-bedrijven dimensie van havens aan te pakken, zijnde de ruime waaier aan actoren betrokken bij haven supply chains, zoals terminaloperatoren, rederijen, expediteurs, multimodale transportoperatoren, en logistieke dienstverleners. Op dit punt kunnen modellen, die gebaseerd zijn op het netwerkperspectief en die het concept van waardeketenconstellatie aannemen, een nuttige bijdrage leveren bij het aanpakken van de multi-bedrijven dimensie van havens in supply chains. In het bijzonder nemen deze modellen alle potentiële vormen van interactie tussen meerdere netwerkactoren in beschouwing bij het proces van waardecreatie voor klanten.

Binnen deze onderzoeksstroom heeft dit proefschrift als doel de aard van de relationele dynamiek te verdiepen die waardecreatie vormgeeft in de supply chains; tevens wordt havenconcurrentie volgens specifieke doelgroepen in de supply chain onderzocht. Terwijl waardecreatie wordt bereikt door de ontwikkeling van relaties tussen organisaties voor het controleren en beheren van essentiële middelen doorheen de supply chains, is de toe-eigening van waarde afhankelijk van de onderhandelingsmacht die elke actor kan uitoefenen in de relaties tussen organisaties. In dit opzicht kan de havenautoriteit een actieve rol spelen als community manager en facilitator, en in sommige omstandigheden, een proactieve rol als ondernemer.

De thesis is gestructureerd om analysemodellen van waardecreatie – afgeleid van de literatuur rond supply chain management en service management – aan te passen en toe te passen op de havencontext. Deze modellen kunnen een bijdrage leveren om een licht te werpen op het onontgonnen onderzoeksveld van waardecreatie en relaties doorheen de supply chain. Gegeven de exploratieve aard van het werk zijn de onderzoeksactiviteiten gericht op het definiëren en later het valideren van het analysemodel van waardecreatie in de havencontext.

Waarde en waardecreatie in de managementliteratuur

Het werk start met de bespreking van het concept van waarde en waardecreatie in de supply chain managementliteratuur. Zo worden de elementen geïdentificeerd waarmee de hiaten worden bepaald van de studies die havenconcurrentie hebben bestudeerd volgens de SCM benadering. Vooral het begrijpen van klantennoden – in termen van kosten, kwaliteit, flexibiliteit, betrouwbaarheid, tijd - vormt een cruciale fase in het strategievormingsproces (kostenleiderschap en/of dienstendifferentiatie). Dit komt omdat dit het beheer van relaties in de supply chain beïnvloedt, om zo het gewenste prestatieniveau te verkrijgen. Op basis van de service literatuur vindt waardecreatie plaats in de klantensfeer en wordt het bepaald door de interacties tussen bedrijven en klanten. Bedrijven voorzien hun klanten van middelen die waardecreatie faciliteren. Volgens dit perspectief neemt de klant actief deel aan het proces van waardecreatie.

Een interessant perspectief in de beschrijving van het proces van waardecreatie, is ook de situatie waarin waarde vernietigd kan worden in de supply chain, omdat de samenwerking tussen actoren in de supply chain niet goed werkt. Dit gebeurt vaak als er ongepast of inefficiënt gebruik gemaakt wordt van de beschikbare middelen in een relatie, wat leidt tot waardevernietiging voor ten minste een van de partijen. Tot slot biedt het hoofdstuk een set van prestatie-indicatoren voor de kwantificering van de waardecreatie in de supply chain, in termen van klantentevredenheid (efficiëntie en effectiviteit), en op bedrijfsniveau, in termen van marktaandeel, hogere winstmarge, verbeterde kasstroom en omzetgroei.

Waardecreatie in de havencontext: een nieuw analysekader

Een uitgebreide literatuurstudie over havenconcurrentie is uitgevoerd met als doel kenmerken aan te geven van het proces van waardecreatie in havens. Op basis van de literatuurstudie was de eerste theoretische bijdrage de conceptualisering van de haven als een netwerk van actoren, middelen en activiteiten, die samen waarde creëren door verschillende relaties te ontwikkelen tussen organisaties. Deze interpretatie onderbouwt een systeemweergave van havenconcurrentie die het traditionele waardeketenmodel overwint, om het waardeconstellatieconcept te omarmen.

De andere bijdrage, vanuit theoretisch oogpunt, was de definitie van het analysemodel van waardecreatie van de haven, dat rekening houdt met de aard van de relationele dynamiek tussen de havenautoriteit en private havenoperatoren in de service supply chains van havens. Het model onderscheidt twee niveaus van interacties tussen actoren: publiek-privaat, wat verwijst naar havenautoriteiten en private havenoperatoren, zoals terminaloperatoren en rederijen; en supply chain relaties, vooral met betrekking tot private havenoperatoren. De aard van de interacties tussen actoren vormt verschillende machtsconfiguraties van de service supply chain. Deze configuraties bepalen verschillende patronen van waardecreatie op bedrijfsniveau, op het niveau van de supply chain en op het niveau van de havenautoriteiten.

De Italiaanse institutionele omgeving

Beleidsacties van de havenautoriteiten bepalen de institutionele omgeving waarin potentiële (waarde creërende) samenwerkingsverbanden kunnen ontstaan. Marktregulering is ook een belangrijke factor die de achterlandintegratie van een haven beïnvloedt, alsook de havenconcurrentie in een globaal scenario. Vooral de liberalisering van de spoormarkt heeft een belangrijk effect gehad op de samenwerking tussen rederijen en terminaloperatoren in de meeste Noord-Europese havens.

De institutionele omgeving waarin Italiaanse havens opereren, ondergaat momenteel een grondige verandering door de nieuwe havenhervorming van 2016 en de liberalisering van de spoormarkt, die in 2011 begon. De beschikbaarheid van logistiek en transportinfrastructuur biedt een gunstigere institutionele omgeving voor de ontwikkeling van samenwerkingspraktijken in de havens in Noord-Italië. Sommige Noord-Italiaanse havenautoriteiten hebben in verband hiermee de ontwikkeling van intermodale spoordiensten gestimuleerd door verschillende zakelijke initiatieven, in samenwerking met de lokale administratie, spooroperatoren en private havenoperatoren.

Bovendien zou de Italiaanse havenhervorming, die in 2016 gelanceerd werd, een meer systemische en duurzame aanpak – het haven-logistiek systeem – ondersteunen bij de definitie van ontwikkelingsstrategieën van havens. De nieuwe overkoepelende havenautoriteit (Autorità di Sistema Portuale - ASP) heeft grote mogelijkheden om effectieve beleidsacties te definiëren voor de creatie van een haven-logistiek netwerk en ondersteunt zo de cohesie, het wederzijds vertrouwen en de gedeelde waarden voor de duurzame havenontwikkeling.

Samenwerkingsstrategieën in de Italiaanse containerterminalindustrie

Door de toepassing van de egocentrische sociale netwerkanalyse, besteedt dit onderzoek speciale aandacht aan de evolutie van de netwerken tussen organisaties met focus op Italiaanse containerterminaloperatoren van 2011 tot 2015. Vervolgens is de volledige netwerkstructuur van de Italiaanse containerindustrie in kaart gebracht. Het netwerkperspectief geeft interessante en nuttige informatie over de leidende posities en de machtsposities van sommige terminaloperatoren en hun moederbedrijven. Deze aanpak is nieuw in vergelijking met de andere studies over samenwerkingsovereenkomsten in de containerterminalindustrie, omdat het een bottom-up perspectief aanneemt. Hierbij wordt gestart van de relaties tussen organisaties op het niveau van de terminaloperatoren, om dan het volledige netwerk te reconstrueren.

De resultaten van de analyse tonen het bestaan van een uitgestrekte samenwerkende cluster in de Italiaanse markt. Dit wordt gekenmerkt door verschillende relatienetwerken en machtsposities uitgeoefend door drie belangrijke actoren: Marinvest, Contship Group en Gruppo Investimenti Portuali. Marinvest, een financiële holding die hoort bij MSC (Mediterranean Shipping Company) beheert 12 terminals op een totaal van 25 in 2015, vooral in het noorden van Italië, met de uitzondering van de twee terminals in de haven van Napels. Het bredere relatienetwerk kan gezien worden als een systeem om de capaciteit van de schepen te verzekeren en, in deze context, als een verdedigingsstrategie om de Italiaanse markt te controleren en de toetreding van andere concurrenten te belemmeren.

Dit netwerk draagt, vanuit het perspectief van de haven, bij tot een andere configuratie voor waardecreatie. Deze kwestie is van cruciaal belang en verdient de aandacht van de havenautoriteit, vooral met betrekking tot het concessiebeleid van de terminals.

De samenwerkingsovereenkomsten in de Italiaanse containerlijnvaartmarkt

Na de beschrijving van de globale trends en de marktconcentratie die in handen is van drie globale allianties, focust de analyse op het dienstennetwerk dat kenmerkend is voor de Italiaanse markt. De drie globale allianties – 2M (Maersk en MSC), THE Alliance en Ocean Alliance – lopen vooral havens aan die gelokaliseerd zijn in het noorden van Italië en slechts enkele havens in het zuiden. Het aantal en de frequentie van de diensten naar Amerika en het Verre Oosten zijn hoger in het noordelijke Tyrreense Zee havensysteem (Genua, La Spezia en Livorno)

dan in andere Italiaanse havens. De haven van Gioia Tauro in Zuid-Italië is de belangrijkste Italiaanse overslag hub. Desondanks schrapte Maersk deze haven in mei 2011 uit haar netwerk en herverdeelde het de overslagtrafiek ten gunste van Port Said, waarbij ook een overslagdienst werd gelanceerd die Genua aanloopt voor routes tussen het Verre Oosten en Europa.

Interessant is dat MSC de enige rederij is die indirect betrokken is bij de terminalactiviteiten, door haar financiële holding Marinvest. De opkomst van deze globale allianties heeft geleid tot minder interesse in het bezit van terminals van containerrederijen, tenminste in een overslaghaven, aangezien de nieuwe containerallianties beslissen over de havenaanlopen in een netwerk.

De analyse van Italiaanse havens in de service supply chains

De analyse van service supply chains focust op drie belangrijke Italiaanse havens: La Spezia, Triëst en Napels. De analyse is exploratief en de resultaten bieden nuttige inzichten in de interactie en de relatiedynamiek tussen de overkoepelende havenautoriteit (ASP) en de private havenoperatoren in de meer uitgebreide haven service supply chains, gerelateerd aan intermodaliteit en toegevoegde waarde logistiek.

In de haven van La Spezia treedt de ASP op als facilitator en community manager, en is vooral gefocust op het creëren van synergiën en de wisselwerking tussen haven service supply chains en het lokaal economisch systeem. Het havenbedrijf is actief betrokken bij de ontwikkeling van het haven-logistiek netwerk op regionaal niveau, waarbij win-win interacties worden opgezet met verschillende lokale stakeholders. Zo wordt een evenwicht gecreëerd tussen de private belangen van LSCT (La Spezia Container Terminal) en de Contship Group en die van de lokale gemeenschap.

Met betrekking tot Triëst speelt de ASP een bijzondere rol in de Italiaanse context, door de belangrijkste kenmerken van de facilitator te combineren met een meer commercieel-gerichte houding als investeerder, dienstverlener en consultant. Publieke en private interacties zijn geïnspireerd door een zakelijkere houding (onderhandeling) van de ASP in vergelijking met de private havenoperatoren. De relaties zijn deels win-win, aangezien er een sterke concurrentiestrijd is in de spoormarkt.

Tot slot geeft de gevalstudie van de haven van Napels interessante inzichten in de rol van de ASP bij het overwinnen van de huidige haven-gerelateerde verstorende gebeurtenissen. De strategische visie van de ASP is om een geïntegreerd haven-logistiek systeem te ontwikkelen. Dit start bij de analyse van de productie- en specialisatiegebieden die de Campanië regio kenmerken, om zo de intermodale spoorverbindingen te verbeteren en havenactiviteiten te linken, en meer specifiek de investering in de nieuwe containercapaciteit voor lokale economische ontwikkeling.

Conclusies en verder onderzoek

Deze thesis bevestigt het belang van het opnemen van meerdere actoren en hun onderlinge relaties bij de analyse van waardecreatie van havens. Vooral de focus op de relaties tussen actoren die tot de service supply chain van de haven behoren, maakt het mogelijk om het perspectief van de havenautoriteit te verbreden door de gepaste voorwaarden te creëren voor de haven om haar achterland te ontwikkelen en te bedienen. Een verscheidenheid aan rollen van de havenautoriteit, van community manager en facilitator, tot de meer gevorderde rol van ondernemer, kan geïdentificeerd worden volgens de verschillende configuraties van middelen

en interacties. Deze aanpak heeft als doel om macro-economische studies over havenconcurrentie aan te vullen, aangezien het de analyse-eenheid “haven” ontleedt, en ze een verscheidenheid aan stakeholders en gerelateerde verwachtingen oplevert, die verschillend beïnvloed kunnen worden door het beleid en de beslissingen van havenautoriteiten.

In dit verband ondersteunt het onderzoek de visie om verscheidene rollen van de havenautoriteit te beschouwen met betrekking tot de verschillende niveaus van havenconcurrentie. Op regionaal niveau zou de havenautoriteit moeten optreden als agent en coördinator van logistieke ontwikkeling, waarbij regionale havennetwerken gecreëerd worden en de milieuontwikkeling van de haven ondersteund wordt. Op globaal niveau commercialiseert de havenautoriteit haar expertise in logistieke diensten en milieubeheer wereldwijd om zo private investeringen aan te trekken. Hoe dan ook zou de ondernemersrol van de havenautoriteit, met een sterkere commerciële houding als investeerder en dienstverlener, een tijdelijk standpunt moeten vertegenwoordigen om de onderhandelingsmacht van globale spelers onder ogen te zien en zo de duurzame ontwikkeling van de haven op regionaal niveau te waarborgen.

Om de bevindingen van deze studie te generaliseren, moet het analysemodel van de waardecreatie van havens getest worden in verschillende havencontexten. De typologieën van service supply chains van havens en hun wisselwerking bij het beïnvloeden van de waardecreatie, kunnen de havenautoriteit ondersteunen bij het definiëren van de prioriteiten van de beleidsagenda in verband met de relationele dynamiek die de havencontext vormt.

Summary

Port competitiveness is a topic of increasing relevance, given the importance of ports both as source of value creation for the firms involved in the process of services production and, more in general, for the socio-economic impacts of port activities at local and national levels.

The emergence of the paradigm shift in the interpretation of competitiveness, not anymore unfolding between individual ports, but between logistic chains, has contributed to enrich the perspectives and the levels of analysis of port competitiveness. Although the port's role in facilitating trade is crucial, with implications on its value creation for the region and nation, it is undeniable that its competitiveness depends on the ability of port business operators to satisfy different target groups.

A nascent group of scholars has started to address port competitiveness from the Supply Chain Management (SCM) approach, acknowledging relationship networks as leading factor for port value creation and competitiveness. According to these studies, the SCM approach determines the differential competencies and services' features that the port should foster in order to satisfy customer requirements and to support the economic and international development of its own hinterland.

Despite these suggestions, limited empirical research has been carried out on the role of ports in supply chains. This lack originates from the difficulty in addressing the multi-firms dimension of ports, namely the wide range of actors involved in and across port supply chains such as terminal operators, shipping lines, freight forwarders, multimodal transport operators, logistics service providers. At this regard, models based on the network perspective, adopting the concept of value chain constellation, can offer a useful contribution in tackling the multi-firms dimension of ports in supply chains. In particular, these models take into consideration all the potential interactions among multiple network actors in the process of creating value for clients.

Within this research stream, the thesis aims at deepening the nature of relational dynamics shaping value creation in the supply chains and port competitiveness according to specific target groups. While value creation is accomplished through the development of inter-organizational relationships for controlling and managing key-resources along supply chains, on the other side, value appropriation (capture) depends on the bargaining power that any actor can exert in the inter-organizational relationships. In this respect, the port authority can play an active role as community manager and facilitator, and under certain circumstances, a proactive role as entrepreneur.

The thesis has been structured in order to adapt and apply models of analysis of value creation - derived from the Supply Chain Management and Service Management literature - to the port context. These can contribute to shed light on the unexplored research topic of relational patterns and value creation. Given the explorative nature of the work, the research activities are oriented towards the definition and, then, the validation of the model of analysis of value creation in the port context.

Value and value creation in the management literature

The work starts with the review of the concept of value and value creation in the Supply Chain Management literature in order to define the elements through which the gaps of the studies that have addressed port competitiveness according to the SCM approach are identified. In particular, the understanding of customer's needs - in terms of cost, quality, flexibility, reliability, time – represents a key-stage in the process of strategy formulation (cost leadership and/or service differentiation) as it affects the management of relationships along the supply chain, in order to get the desired level of performance. Drawing on the service literature, value creation takes place in the customers' sphere and it is determined by firm - customers' interactions. Firm

provides their customers with resources thus facilitating value creation. According to this perspective, the customer actively participates in the process of value creation.

An interesting perspective provided in the description of the value creation process, is also the situation when value can be destroyed in the supply chain as the collaboration among supply chain actors does not work well (value destruction). This often happens when there is inappropriate or inefficient use of the available resources in a relationship, leading to value co-destruction for at least one of the parties. Finally, the chapter provides a set of performance indicators for the quantification of the value creation at the supply chain, in terms of customer satisfaction (efficiency and effectiveness) and at firm's level, in terms of market share, higher profit margin, improved cash flow and revenue growth.

Value creation in the port context: a new framework of analysis

An extensive literature review on port competitiveness has been carried out with the aim of highlighting elements which characterize the process of value creation in ports. Based on the literature review, the first theoretical contribution has been the conceptualization of the port as a network of actors, resources and activities, which co-produce value by developing different inter-organizational relationships. This interpretation underpins a system view of the port competitiveness that overcomes the traditional value chain model, to embrace the value constellation concept.

The other contribution, from the theoretical point of view, has been the definition of the model of analysis of port value creation that takes into account the nature of relational dynamics between the port authority and private port operators in the port service supply chains. The model distinguishes two levels of actors' interactions: public-private which refer to the port authority and to port business operators such as terminal operating companies (TOCs) and shipping companies; and supply chain relationships, mainly concerning port business operators. The nature of actors' interactions shape different power configurations of the service supply chain. These configurations determine different value creation patterns at firm's, supply chain's and port authority's levels.

The Italian institutional environment

Port authorities' policy actions determine the institutional environment where potential collaborative (value creating) relationships can develop. Market regulation is also an important factor affecting the integration of a port with its hinterland and port competitiveness in a global scenario. In particular, the liberalization of the rail market has had an important effect on the collaborative practices performed by shipping lines and TOCs in most of the northern European ports.

The institutional environment in which Italian ports operate is experiencing a profound change given by the new port reform of 2016 and the liberalization of the rail market, which started in 2011. The availability of logistics and transport infrastructures would allow a more favourable institutional environment for the development of collaborative practices in the ports located in northern Italy. Some northern Italian port authorities, at this regard, have stimulated the development of intermodal railway services through different business initiatives, in partnership with local administration, rail operators and port business operators.

Moreover, the Italian port reform, launched in 2016, would support a more systemic and sustainable approach - the port logistics system - in the definition of port development strategies. The new Port System Authority (Autorità di Sistema Portuale - ASP) has major possibilities to define effective policy actions for the creation of a port logistics network, thus supporting cohesion, mutual trust and shared values for the sustainable port development.

Collaborative strategies in the Italian container terminal industry

By applying the Ego-centric Social Network Analysis, the present research pays special attention to the evolution of the inter-organizational networks centred on Italian terminal container operators from 2011 to 2015. Subsequently, the whole network structure of the Italian container industry has been mapped. The network perspective provides interesting and useful information on the leading and power positions of some TOCs and their parent companies. This approach is new compared to the other studies on cooperative agreements in the container terminal industry as it adopts a bottom – up perspective, starting from the inter-organizational relationships at the level of the TOCs to then rebuild the whole network.

The results of the analysis show the existence of an ample collaborative cluster in the Italian market. This is characterized by different relationship networks and power positions exerted by three main actors: Marinvest, Contship Group and Gruppo Investimenti Portuali. Marinvest, a financial holding belonging to MSC (Mediterranean Shipping Company), manages 12 terminals of a total of 25 in 2015, mainly located in the North of Italy, with the exception of the two terminals located in the port of Naples. The wide relational network can be viewed as a system to secure the vessels' capacity and, contextually, as a defence strategy to control the Italian market and to impede the entry of other competitors.

This relationship network, from the port's perspective, contributes to a different value creation configuration. This issue is of crucial importance and deserves attention from the port authority, especially with reference to the terminals' concession policy.

The cooperative agreements in the Italian container liner shipping market

After having described the global trends and the concentration of the market in the hands of three global alliances, the analysis focuses on the service network that characterizes the Italian market. The three global alliances – 2M (Maersk and MSC), THE Alliance and Ocean Alliance - call mainly ports located in the northern Italy and few ports in the South. The number and frequency of services to America and to the Far East are higher in the Northern Tyrrhenian Sea port system (Genoa, La Spezia and Livorno) than in other Italian ports. The port of Gioia Tauro in southern Italy represents the main Italian transhipment hub. In spite of this, in May 2011, Maersk excluded this port from its network and re-distributed its transhipment traffic in favour of Port Said, also launching a mother vessel service calling at Genoa for Far East-Europe routes.

Interestingly, the only shipping company indirectly involved in the terminal business is MSC, through its financial holding Marinvest. The emergence of these global alliances has led to less interest to liner ownership in terminals, at least in a transhipment port, as the new shipping alliances set up their port networks.

The analysis of Italian ports in the service supply chains

The analysis of the service supply chains focuses on three main Italian ports: La Spezia, Trieste and Naples. The analysis is explorative and the results offer useful insights into the interactions and relational dynamics between the Port System Authority (ASP) and port business operators in the more extended port service supply chains, related to intermodality and value added logistics.

In the port of La Spezia, the ASP performs as facilitator and community manager, mainly oriented to create synergies and interplay between port service supply chains and the local economic system. The port authority is actively involved in the development of the port logistics network at regional level, setting up win-win interactions with different local stakeholders, thus creating an equilibrium between the private interests of LSCT (La Spezia Container Terminal) and Contship Group and those of the local community.

With reference to Trieste, the ASP performs a peculiar role in the Italian context, combining the main features of the facilitator with a more commercial attitude as investor, service provider and consultant. Public and private interactions are inspired by a more business-oriented attitude (negotiation) of the ASP compared to the port business operators. The relationships are partially win-win as there is strong competitive struggle in the rail market.

Finally, the case study of the port of Naples offers interesting insights in the role of the ASP in overcoming the current port-related disruptive events. The strategic vision of the ASP is to develop an integrated port logistics system, starting from the analysis of the production and specialization areas that characterize the Campania Region, to subsequently improve the intermodal rail connections and link port activities, and specifically the investment in the new container capacity, to local economic development.

Conclusions and future research

This thesis confirms the importance of including a plurality of actors and their mutual relationships in the analysis of port value creation. In particular, the focus on the relationships between actors belonging to the port service supply chain allows to broaden the port authority's perspective in creating the proper conditions for the port to develop and serve its hinterland. A variety of port authority's roles, from community manager and facilitator, to the more advanced role as entrepreneur, can be identified according to the different configurations of resources and interactions. This approach is intended to complement macro-economic studies on port competitiveness as it unpacks the "port" unit of analysis and yields a variety of stakeholders and related expectations that may be differently impacted by port authority policies and decisions.

At this regard, the study supports the view of considering a variety of port authority's roles with reference to the different levels of port competitiveness. At regional level, the port authority should act as an agent and coordinator in logistics development, creating regional port networks and sustaining the environmental development of the port. At global level, the port authority commercializes its expertise in logistics services and environmental management worldwide in order to attract private investments. Somehow, the entrepreneur role of the port authority, with a stronger commercial attitude as investor and service provider, should represent a temporary position for facing the bargaining power of global players, thus ensuring the sustainable development of ports at regional level.

In order to generalize the findings of this study, the model of analysis of port value creation should be tested in different port contexts. The typologies of port service supply chains and their interplay in influencing the value creation, can support the port authority in defining the priorities for the policy agenda in connection to the relational dynamics shaping the port context.

Acknowledgements

This thesis represents a milestone in more than one decade of work at the Institute for Research on Innovation and Services for the Development (IRISS) of the National Research Council (CNR) of Italy. In 2003, my first publication on "*the integration of the port of Le Havre in the Renault supply chain*" was the result of intense and fruitful discussions with my friend and co-author Valentina Carbone, the Le Havre Port Authority and port business operators, on the value of a new and complementary perspective of analysis of port competitiveness: the Supply Chain Management (SCM) approach. Since then, the interest of academia as well as practitioners has grown steadily and nowadays concepts such as "supply chain", "value co-production", "collaboration" and "sharing economy" are of paramount importance in order to face the current societal challenges.

This amazing and long journey has been possible thanks to the support and encouragement of many friends and colleagues.

Firstly, I would like to thank my thesis supervisors Eddy Van de Voorde and Hilde Meersman for their continuous support in guiding my research in the right direction. They continually welcomed me at the Department of Transport and Regional Economics of the University of Antwerp, and the doors of their offices were always open whenever I ran into a trouble spot or had a question about my research or writing. I could not have imagined having better advisors and mentors for my Ph.D study. I would also like to acknowledge all friends and colleagues at the Department for their feedbacks during my doctoral seminars as well as for the pleasant time spent together. A special thank goes to Katrien De Langhe for her positivity and support in the last steps of my thesis.

Besides my supervisors, I would like to thank all my thesis committee members for their insightful comments and encouragement, but also for the crucial question which stimulated me to widen my research from various perspectives: Thierry Vanelslander (University of Antwerp), Seraphim Kapros (University of the Aegean), Valentina Carbone (ESCP Europe), Bart Kuipers (Erasmus University, Rotterdam), Patrick Verhoeven (University of Antwerp).

I would also like to thank the experts who were involved in the empirical analysis and in the validation survey for this research. I am gratefully indebted to Umberto Masucci, president of the Italian Propeller Club, for his very valuable comments on this thesis. Without his passionate participation and input, the survey could not have been successfully conducted. I would also like to express my sincere gratitude to Italian port authorities and port business operators who participated to the research: Filippo Gallo (UASC, Italy), Francesco Tomas (Harbor Master's office, La Spezia), Francesco Cupolo (Contship Italy Group), Carla Roncallo (President, Port System Authority of the Oriental Ligurian Sea), Andrea Fontana (President, Maritime Agent, La Spezia), Guido Porta (Fuori Mura), Zeno d'Agostino (President, Port System Authority of the Eastern Adriatic Sea) Mario Sammaria, (General Secretary, Port System Authority of the Eastern Adriatic Sea), Fabrizio Zerbini (T.O. Delta), Massimo Gardina (AdriaFer), Luigi Merlo (Mediterannean Shipping Company, MSC), Pietro Spirito (President, Port System Authority of the Central Tyrrhenian Sea).

I am also very grateful to Fabio Magnotti, research fellowship at IRISS-CNR, for his patience, assistance and collaboration during these last years of research. His support and suggestions have been of great value to me. A special thank goes to Valeria Catanese for her help in the final revision of my thesis.

Finally, I would express my very profound gratitude to my family and, especially, to Alfonso Morvillo, Director of IRISS-CNR, for providing me with unfailing support and continuous encouragement throughout my years of study and through the process of researching and writing this thesis. This accomplishment would not have been possible without him. I am proud to dedicate this thesis to them.

Grazie.

Marcella

Contents

List of Figures

List of Tables

List of Abbreviations

ACT	Adriatic Container Terminal
AFLAS	Asian Freight, Logistics and Supply Chain Awards
AGCM	Italian antitrust authority
ALP	Agency for the Port Labor
APL	American President Lines
ASP	Port System Authorities
CGM	Compagnie Générale Maritime
CICT	Cagliari International Container Terminal SPA
CMA	Compagnie Maritime d'Affrètement
Co.Na.Te.Co	Consorzio Napoletano Terminal Container SPA
DB	Deutsche Bank
DPW	Dubai Ports World
EBITDA	Earnings Before Interest, Taxes, Depreciation and Amortization
ECT	Europe Container Terminal
EJV	Equity Joint Venture
ELC	European Logistics Center
ESNA	Egocentric Social Network Analysis
EU	European Union
FF	Freight Forwarder
GDO	Organized retailing and distribution industry
GIP	Gruppo Investimenti Portuali
GNV	Grandi Navi Veloci
HMM	Hyundai Merchant Marine
HPH	Hutchison Port Holdings Limited
HTO	Hinterland Transport Operators
ICT	Information and Communications Technology
ISO	Intermodal System Organization
ITSA	International Terminal Service of Augusta SRL
LO	Logistics Operators
LSCT	La Spezia Container Terminal SPA

MCT	Medcenter Container Terminal SPA
MGT	Montreal Gateways Terminal
MOS4MO	Monitoring and Operation Services for Motorways of the Sea
MIT	Ministry for Infrastructure and Transport
MNCs	Multinational companies
MSC	Mediterranean Shipping Company
MTO	Multimodal Transport Operator
OOCL	Orient Overseas Container Line
PA	Port Authority
PD	Port Directorate
PLN	National Logistics Network
PSA	Port of Singapore Authority
PSNPL	National Port and Logistics Strategic Plan
RBV	Resource Based View
RCS	Rail Cargo Austria
RFI	Italian Railway Network
RLM	Milan Logistics Region
ROI	Return on Investment
RSC	Railway Shunting Company
RTC	Roma Terminal Container
RUs	Railway Undertakings
SC	Shipping Company
SCM	Supply Chain Management
SCT	Salerno Container Terminal Spa
S-D	Service-Dominant
SECH	Terminal Contenitori porto di Genova
Ser.M.I.	Servizi Marittimi Internazionali
SMEs	Small and medium-sized enterprises
SNA	Social Network Analysis
SNCF	Société Nationale des Chemins de fer Français
SPA	Public Limited Company

SRL	Limited Liability Company
SSA	Stevedoring Services of America Marine
SSP	Strategy, Structure and Performance
SSS	Short Sea Shipping
TCR	Terminal Container Ravenna SPA
TCT	Taranto Container Terminal SPA
TDT	Terminal Darsena Toscana SRL
TEN-T	Trans European Network-Transport
TEU	Twenty-foot equivalent unit
TGF	Terminal del Golfo
TOCs	Terminal Operating Companies
TIL	Terminal Investment Limited
TIV	Terminal Intermodale Venezia SPA
TMT	Trieste Marine Terminal SPA
TPCS	Tuscan Port Community System
TSG	Terminal San Giorgio SRL
TTI	Total Terminal International
UASC	United Arab Shipping Company
UIR	Union of freight villages
VeCon	Venezia Contenitori SPA
VIT	Venezia Intermodal Terminal SPA
VTE	Voltri Terminal Europa SPA
ZES	Special economic zone

1. Research context

1.1 The concept of competitiveness

The term competitiveness primarily indicates the action of seeking, aiming at, going toward a common direction, objective. In the usual sense, it means to face, fight and compete with rivals in order to show superiority and strength.

In business and economic research, competitiveness is a fuzzy concept which conveys a different meaning when applied to an individual firm (micro-economic level) or an individual sector or economic activity within a country or region (macro-economic level). The first definitions appeared in the economic literature (Table 1.1), by Smith (1937) and Ricardo (1971), and subsequently recalled by Porter (1990) and Krugman (1990), address the concept of competitiveness at the macro-level and they refer to international trade and nations' comparative advantage in the production of certain commodities, which are the subject of foreign trade. From this perspective, the competitiveness of a country (or region) is very often decided by its *productivity* and degree of specialization in producing some particular goods. Raising productivity – that is "*making better use of resources*" – is the driving force behind the growth rate of an economy and it is considered to be the key determinant of the level of prosperity that a location can sustain over time.

Table 1.1. The concept of the competitiveness: some influential definitions

Smith (1937) (*The concept of invisible hand*)	Each party involved in international free trade can gain benefits by specializing in the production of goods in which it holds an absolute advantage. So, let every country export those goods it produces at the lowest costs and import those goods it produces at the highest costs.
Ricardo (1971) (*The concept of comparative advantage*)	A country can benefit from foreign trade even if it lacks of any absolute advantage over its trade partners in the goods' production. It only needs to have relative advantage in any good in order to sell it abroad.
Porter (1990) (*The competitive advantage of the Nation: the Diamond model*)	The only meaningful concept of competitiveness at the national level is national productivity. Competitiveness is the ability of an economy to provide its residents with a rising standard of living and a high employment on a sustainable basis. Four conditions driving the global competitiveness of country include: factor endowments, demand conditions, related and supporting industries (clusters), and firm strategy, structure and rivalry.
Krugman (1990)	If competitiveness has any meaning, it is simply just another way to express productivity. The ability of a country to improve its living standard depends almost entirely on its ability to raise its productivity. Competitiveness is a meaningless word when applied to national economies.
Schumpeter (1936) (*Evolutionary economics*)	Crucial to long-term survival of firms in the marketplace is their constant adjustment to changing environment, mainly due to searching out new innovative recombination of the garnered resources.
Porter (1985) (*The competitive advantage of the firm: the value chain*)	A firm is profitable if the value it can obtain is higher than the costs involved in the product making. To create value for the buyers, higher than production and delivery costs, is the purpose of any generic strategy.

At the macro-economic level, competitiveness can also be viewed as the capacity to create welfare and improve standards of living. Standard of living can be decomposed into employment and labour productivity performances. In the long run, improvements in employment performance are bound by the natural rate of employment, thus leaving the burden of ever increasing living standards to productivity. Finally, competitiveness can be defined as the ability to sell on international markets and is fundamentally concerned with the sustainability of an economy's overall external balance. In this view, competitiveness is a country's share of world markets for its products.

Micro-economic concepts and indicators of competitiveness focus, essentially, on the ability of producer to create customers' satisfaction and loyalty. This ability can be measured by the size or increase of market share, performance, price ratios, cost. Schumpeter (1936) states that the company's ability to innovate is a key for achieving competitive advantage over its rivals. Porter's value chain model (1985) determines which activities are vital to a given firm's competitive advantage (cost leadership and differentiation), respecting the market's competitors. However, from the mid of '90, studies have highlighted the importance of other resources for firm's competitiveness, that can be synthesized according to the following research streams:

- ✓ Human resource management, such as selectivity in staffing, training activities, incentive compensation (Ulrich *et al*, 1995; Delaney and Huselid, 1996)
- ✓ Knowledge and Research & Development capabilities (Christensen, 1995)
- ✓ Relational view of the firm, such as external relationships network involving key actors in the competitive scenario (Dyer and Singh, 1998)

The broadening of competitiveness to an external and inter-organizational network has been the result of the increasingly popular belief in a new way to compete, no longer restricted to the single company but extended to the entire supply chain (Christopher, 1992). According to this approach of analysis, the determinants of competitiveness shift the locus of the "*ability to compete*" from the single firm to the dynamics of collaborative relationships that characterize the supply chain and the regional context. The term competitiveness thus acquires the meaning of "*the action of seeking, aiming at, going toward a common direction, objective*". This paradigm change has been basically sustained by studies on the network approach that consider trust and win-win interactions in the business and public/private relationships management, as an effective approach to face global competition (Hakansoon, 1982; Stabell and Fjeldstad, 1998; Morasch and Lynch, 2002). In particular, these studies overcome the traditional perspective of value creation, based on Porter's value chain concept, and try to develop alternative models of interpretation, such as value constellations, value net, value network or value creating network (Normann and Ramirez, 1994; Stabell and Fjeldstad, 1998; Huemer, 2002; Holzle et al., 2002). In these interpretative models, inter-organizational relationships represent "*bridges of value*", as they give companies access to other actors' resources in the network and they strongly contribute to the so-called value co-production. The collaborative approach in the management of strategic relationships, both upstream and downstream the supply chain, can allow to reduce costs and integrate, build, and reconfigure internal and external competences to address rapidly changing environments. These relationships networks can represent effective structures in responding to contingencies created by changing markets, technology, information and logistics demands.

1.2. Port competitiveness: macro and micro-economic perspectives of analysis

This evolution has also involved scholars of port economics and management. The importance of port for the region and, to a broader extent, for the Nation competitiveness, has been supported by macro-economic approaches of analysis. An efficiently functioning port is an important asset for the social and economic development of the region and country. Richard Goss (1990, p. 211) asserted, at this regard, that: "*any improvement in the economic efficiency of a seaport*[1] *will enhance economic welfare by increasing the producers' surplus for the originators of the goods being exported and consumers' surplus for the final consumers of the goods being imported*".

The macro-economic approach of analysis of port competitiveness has been notably stimulated by the adaptation of the work by Michael Porter (1990) – The Competitive Advantage of Nations - to the seaport's environment. As Nations succeed in particular industries, also with reference to port, competition involves specific categories of traffic (container, dry and liquid bulk, Ro/Ro, conventional cargo) where the seaport excels in the provision of services, if compared to the other competing seaports. Fundamental for the definition of public port policy has been both the definition of the port's competitive advantage with respect to other ports (terminals vs terminals) and the contribution of the port activities to the socio-economic development of the region they serve (Huybrecths *et al*., 2002; Meersman *et al*., 2009). From this perspective, the concept of competitiveness is connected with the port's capacity to generate value for the region, and the related analysis contributes to support policy makers in defining actions for increasing impacts at macro level. However, from client's perspective, the port that contributes most substantially to reducing the generalised costs of the relevant transport chains is most likely to be chosen as a port of call. The concept of port competitiveness has been thus approached from the micro-economic perspective of analysis, through which the port is considered a source of value creation for firms involved in the service production process. Under this perspective, a port is competitive when private port undertakings can generate profits through business management.

In one of the first books on Port Competitiveness (Huybrecths *et al*., 2002), the Authors righty question the meaning of "port", given the highly complex environment marked by conflicting interests of the public port authority and private port undertakings. Accordingly, "port competition is influenced by: (1) specific demand for customers; (2) specific factors of production; (3) supporting industries connected with each private port undertakings, and (4) the specific competencies of each operator and their rivals". Port competition is also affected by Port Authorities and other public bodies. This complexity requires multidimensional approaches of analysis in the effort to correctly address competitiveness at different interconnected levels: between port undertakings (terminal operators) within the same port; between ports of the same range[2]; and between Port Authorities.

The emergence of the paradigm shift in the interpretation of competitiveness, not anymore unfolding between individual ports (terminal vs terminal), but between logistic chains (Meersman and Van de Voorde, 1996), has contributed to enrich the perspectives and the levels of analysis of port competitiveness. Although the port role in facilitating trade is crucial, with implications on its value creation for the region and nation (macro-economic perspective), it is undeniable that its competitiveness depends on the ability of private port operators to satisfy different target clients.

[1] The word "port" and "seaport" are interchangeable in this study.

[2] The word "range" refers to a geographically defined area encompassing a number of ports with a largely overlapping hinterland, thus serving much the same customers.

This last perspective of analysis has been particularly fostered in the last decades by studies addressing port competitiveness from the Supply Chain Management (SCM) approach. In particular, the coordination of the port activities along supply chains increases customer satisfaction, thus ensuring market share and profitability. Much of the literature advocating the integrative role of port in the supply chain highlights the crucial role of relationship as a vehicle for value creation for shipping lines and/or terminal operating companies involved in the supply chain. In the limited empirical analysis, models of analysis show an increase in customer satisfaction through the smooth coordination of the port activities along the supply chain (Song and Panaydes, 2008; Tongonzon, 2009; Tongonzon et al, 2009).

However, the integrative role of port in supply chains is far from being a reality. Ports are very often perceived as sources of value destruction, given low terminal productivity, inefficiency, damage or loss of cargo, shipment delays, congestion at port facilities, collisions, equipment breakdown and a shortage of facilities or equipment (Loh and Thai, 2015). Port-related disruptive events would potentially lead to disruptions of the whole supply chain. Therefore, collaboration with supply chain partners would allow to implement effective coordination mechanisms in order to increase efficiency and reliability of port services, leading to smooth interactions among actors and cost savings. Consequently, collaboration and coordination in the supply chain are the challenges that a port has to face in order to become a source of value creation.

By combining the macro with the micro-economic perspective of analysis, the strategic decision processes aimed at increasing port competitiveness can be more effective in supporting the active role of the Landlord Port Authority, as facilitator/community manager or entrepreneur (Verhoeven, 2010), and boosting collaboration among ports and port actors, in order to face the challenges of port sustainable development (De Martino *et al.,* 2013; Acciaro *et al.,* 2014).

The emergence of the “collaborative culture” to face the current challenges of port sustainable development can be witnessed by the increasing number of European Port Authorities. For example, in 2011, the Amsterdam Port authority has invested in the development of new ship-to-grid solutions that allow inland ships in the harbor to use green energy from the grid instead of their own stationary diesel generators. The project has been possible thanks to the development of an effective collaborative network promoted by the port authority allowing the combination of different specialized competencies and resources, the sharing of risks, the increased awareness of sustainability issues, and the spread of a culture of collaboration.

Since 2014, the Barcelona port authority has performed systematic controls of all port activities and promoted actions to minimize their environmental impacts. The environmental data are shared with the Barcelona City Council and the Government of Catalonia with the aim of drawing up a map of emissions and defining different actions with reference to the levels of pollution. The huge importance attached to environmental issues is visible in an online tool, the *Ecocalculador*a, developed for calculating CO2 emissions and quantifying the carbon footprint generated by logistics activities, both inside and outside the Port.

Finally, there are different examples of collaboration practices between ports and inland ports aimed at enlarging the hinterland region and the port customers, such as that of industrial or trading companies, freight forwarders (Fraunhofer, 2016). The company Europe Container Terminal (ECT) operates terminals in Rotterdam (Delta Terminal and Euromax Terminal) but also an inland port terminal in Duisburg (DeCeTe, Duisburg). Next to barge services, ECT offers regular rail transports, connecting the port of Duisburg at the river Rhine in Germany to the port of Rotterdam three times per week.

1.3 Objective of the research

In light of this scenario, the PhD aims at exploring the nature of relational dynamics shaping value creation in the supply chains and competitiveness according to specific targets of port customers.

Relationship network represents a rich field of research for exploring the interactive nature of value creation, given the multiple interdependencies among port operators and firms of the regional economic system (hinterland). In more detail, it is argued that any port is characterised by different typologies of relationship networks and power struggle. In such networks, value is created through the development of inter-organizational relationships for owing and controlling key-resources along supply chains. Value appropriation, on the other side, is the effect of the bargaining power that any actor can exert on the inter-organizational relationships. The work adopts a bottom-up approach of analysis aimed at defining policy actions according to what "really" happens within the organizational and managerial context of ports. More specifically, it takes into account the nature of relationship networks shaping the competitive and cooperative local dynamics. This perspective allows to identify the boundaries for an active role of the Port Authority, as a facilitator or a community manager and entrepreneur.

1.4 Research questions

In a changing and competitive environment characterized by competition among supply chains, port competitiveness depends on the development of relationship networks through which different resources and competencies can be developed and combined for the pursuit of customers 'satisfaction. Resources, competencies as well as relationships are source of value creation and generation; bargaining power and power struggle determine value appropriation (capture) and distribution among business actors. Analyzing value from this dual perspective has different implications on port authority and port business operators' actions and behaviors. The Landlord port authority is called to contribute to the general interests of the society, that can be resembled in: facilitating trade and business, especially in relation to the development of local economic system; ensuring the sustainability of port activity in economic, social and environmental terms; promoting social and economic growth of the region in terms of value added, wages, local and national taxes paid and jobs; and developing maritime and hinterland connectivity. Thus his "value proposition" is to attract private investments while fostering the public utility of the port for the local community, reducing the negative externalities produced by all service supply chains passing through the port. Within these chains, port business operators exchange resources, share knowledge and invest in technology for the pursuit of productivity, efficiency and, more in general, customer satisfaction, leading to higher profit. It is clear that these value propositions are very often conflicting.

The PhD aims at shedding light on value creation and port competitiveness from a managerial perspective by carrying out an interconnected set of research activities in order to answer to this general research question:

1. **How can port value creation be measured?**

This research question can be split in three alternative research questions:

1.1 What is the meaning of value creation according to a managerial perspective?

1.2 What is the state of the art of the port management literature?

1.3 Which factors determine the convergence of Port authority and port business operators' value propositions?

Moreover, port competitiveness is characterised by competition among global players at global and supply chain levels. The power struggle over value appropriation among port business operators can display horizontally, with direct competitors, as well as vertically, around key supply chain resources. This consideration leads to address a second research question:

2. **Under what conditions, do port business operators develop collaborative relationships?**

This research question, in turn, can be split in three alternative research questions:

2.1 What are the cooperative strategies of Terminal Operators?

2.2 What are the cooperative strategies of Shipping companies?

2.3 What relationships patterns characterize port supply chains?

Finally, it has already been shown that ports are mere "pawns in the game" within global transport systems and that the bargaining power of liner shipping and terminal operating companies affect port development. The last research question refers to the new functions that port authority can perform in order to increase port competitiveness.

3. **What is the role of the port authority in boosting collaborative relationships thus ensuring sustainability and value distribution?**

1.5 The research design and thesis outlines

The structure of the work has been defined in order to adapt and apply models of analysis of value creation - derived from the Supply Chain Management and Service Management literature - to the port context. This can contribute to shed light on the unexplored research topic of relational patterns and value creation. Given the explorative nature of the work, the research activities are oriented toward the definition and, then, the validation of the model of analysis of value creation in the port context (Figure 1.1).

The work starts with the review of the concept of value and value creation in the Supply Chain Management literature in order to define the elements through which identify the gaps of the studies that have addressed port competitiveness according to the SCM approach (Chapter 2).

Subsequently, an extensive literature review on port competitiveness has been carried out with the aim of highlighting elements, which characterize the process of value creation in seaports (Chapter 3). It is acknowledged the existence of a nascent research area drawing on the RBV that focuses on network relationships as leading factors of port competitiveness. Based on port literature review, a model has been developed in order to analyze collaborative relationship patterns among port actors and the other actors in the local economic system for acquiring and sharing resources in the value creation process. In particular, the model provides key variables for the analysis of the relational capacity of both port authority and port business operators and their contribution to value creation at different levels: firm, supply chain and Port.

In order to apply and validate the model of analysis, the thesis adopts a mixed- research method, as it has great explanatory potential for the research, dealing with relationships networks (Domínguez and Hollstein, 2014). Mixing methods applies to the combination and integration of qualitative and quantitative methods. The empirical analysis will be characterized by the collection and analysis of quantitative data in a first phase of the research (Chapters 4, 5 and 6), followed by the collection and analysis of qualitative data in a second phase (Chapters 7) that builds on the results of the initial quantitative results.

The empirical part of the thesis is structured in the following way.

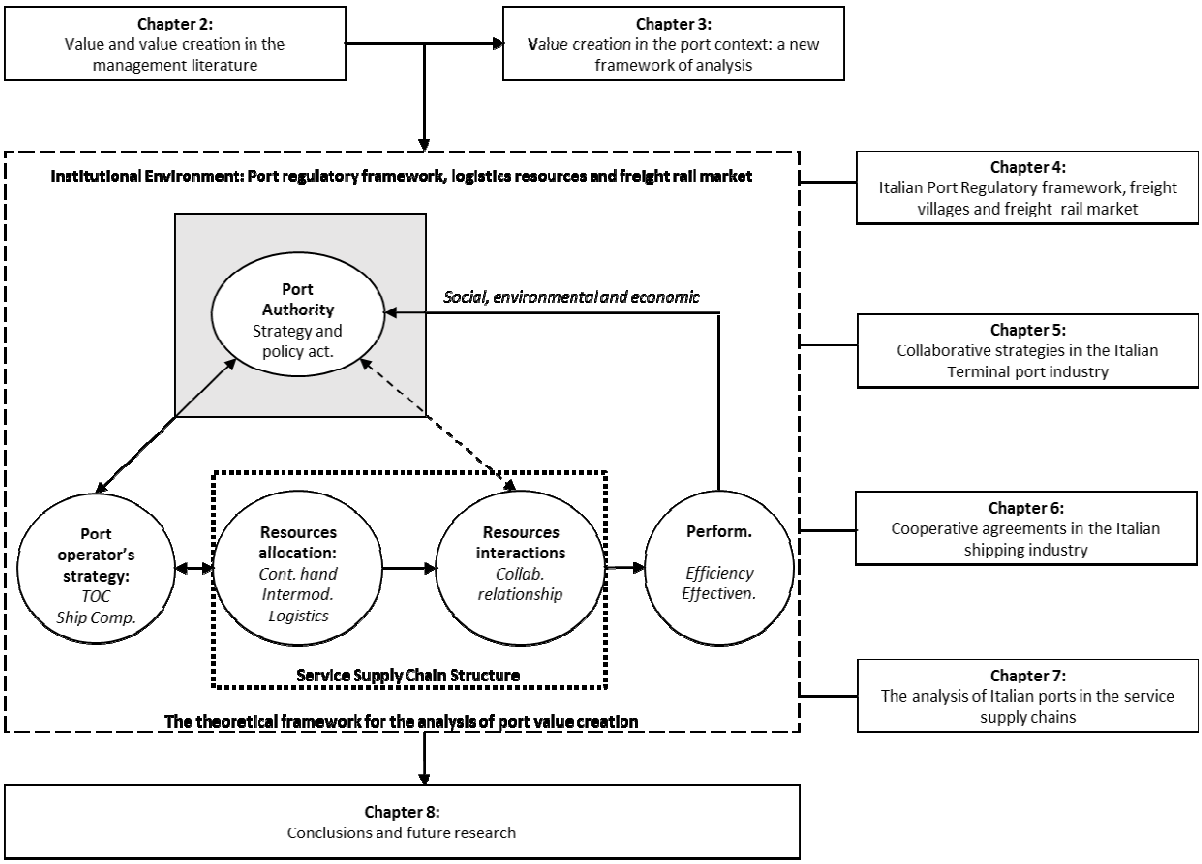

Figure 1.1: The structure of the thesis and the theoretical framework for the analysis of port value creation

As supply chains are embedded in contexts that support or restrict the development of collaborative practices (Ho *et al*., 2002), Chapter 4 analyses the Italian Port regulatory framework, the logistics resources and rail market. Port Authority's policy actions determine the Institutional Environment where potential collaborative (value creating) relationships can develop. Market regulation is also an important factor affecting the integration of port with its hinterland and port competitiveness in a global scenario. In particular, the liberalization of the rail market has had an important effect on the integrative practices performed by shipping Lines and terminal operating companies in most of the Northern European Ports (Franc and Van der Horst, 2010).

Chapter 5 is aimed at analysing the expansion and collaborative strategies of container Terminal Operating Companies (TOCs) in the Italian container terminal industry. By applying the Ego-centric Social Network Analysis, the present research pays special attention to the evolution of the inter-organizational networks centred on Italian terminal container operators from 2011 to 2015. Subsequently, the whole network structure of the Italian container industry has been mapped. The network perspective provides interesting and useful information on the leading and power positions of the some TOCs and their parent companies.

Chapter 6 is dedicated to the analysis of the main port clients: the shipping company. After having described the global trends and the concentration of the market in the hands of three global alliances, the Chapter focuses on the service network that characterise the Italian market.

Chapter 7 examines port service supply chains involving the Italian port system. The aim is to analyse and understand the relational patterns and their contribution to the port value creation at levels of firm and supply chain in two port logistics networks, specifically La Spezia and Trieste. The analysis is explorative and the results offer useful insights into the interactions and relational dynamics between the port authority and port business operators in the more extended port service supply chains, related to intermodality and value added logistics. Subsequently, the analysis of possible evolutions of the port of Naples' network, based on the policy actions undertaken by port authority, has been carried out. In particular, through an in-depth analysis of the port authority's decision making process, the case shows investments, actions and strategic alliances with key local stakeholders aimed at boosting the development of intermodality and value added logistics.

Chapter 8 synthesizes the contribution of the study in answering to the research questions. This is followed by a series of suggestions for future research.

The structure of the thesis allows to answer the research questions, as show in Table 1.2.

Table 1.2: Research questions and thesis outlines

Principal research questions	**Additional research questions**	**Chapter of the thesis**
1. How can port value creation be measured from the management perspective?	1.1 What are the features of value creation in the management literature?	Chapter 2: Value and value creation in the management literature
	1.2 What is the state of the art of the port literature?	Chapter 3: Value and value creation in the port context
	1.3 Which factors determine the convergence of port authority and port business operators' value propositions?	Chapter 3: Value and value creation in the port context
2. Under what conditions, do port operators develop collaborative relationships?	2.1 What are the collaborative strategies of Terminal Operators?	Chapter 5: Collaborative strategies of terminal operating companies
	2.2 What are the collaborative strategies of Shipping companies?	Chapter 6: Collaborative strategies of shipping companies
	2.3 What are the relational patterns of the port service supply chains?	Chapter 4: The institutional environment Chapter 7: The Italian ports in service supply chains
3. What is the role of the port authority in boosting collaborative relationships?		Chapter 7: The Italian ports in service supply chains

2. Value and value creation in the Management literature

2.1 Introduction

The concept of value has been discussed and debated for centuries, but there is still little agreement about its meaning and how to measure it. According to de-Chernatony *et al.* (2000), the difficulties involved in its definition stem from: (1) subjectivity of value interpretation, *i.e.* the perspective from which value can be defined such as the firm, the supplier, the buyer, the customer, the policy maker, the stakeholder, the shareholder; (2) variations between typologies of customers, in the sense that different services and products will determine different paths of value creation; (3) variations within the same customers' segment, as service and product's attributes change according to different geographical markets, cultures and behaviors; (4) finally, the difference between tangible and intangible offerings.

However, the purpose of any business organization is to create value, sell or trade it to customers, and capture some of this value, as profit, in order to be competitive.

The first interpretation of value dated back to Adam Smith (1776), during the Industrial Revolution, and it was theorized in the form of ''*value-in-exchange*'' and ''*value-in-use*''. Value in exchange is associated with the power of a commodity to purchase other goods, and with the monetary value, as an objective measure expressed in the market. Value in use expresses, on the other side, the want-satisfying power of a commodity, the utility received by holding or consuming a good. In classical economics, value creation is equal to the transactions by which these commodities have been exchanged. A transaction represents, at this regard, the exchange of value between two parties, normally taken to be the exchange of producer's goods and services for its value in money.

During the '60s and '70s, the concept of value has been utilized in "*adding value*" sense (Brewer, 2001). The value added equals the total value created with the inclusion of a particular partner or action minus the total value created without a specific partner or action. The value added represents, so far, an important ingredient of firm's competitive advantage and from the 1980s onwards, scholars devote attention to the link between value creation and firm competitiveness. In particular, the contribution of Michael Porter (1985) with the concept of value chain has been decisive in defining a new approach to business management of the firm in the industry leading to the competitive advantage, both in the form of cost leadership and differentiation strategies.

The concept of value chain has been then extended due to the fact that, in a fast-changing competitive environment, successful strategies cannot be easily defined by positioning firm's business as a chain of fixed activities that add value along the production process (Norman and Ramirez, 1993). Value stems from the ability of the firm to build relationships among a constellation of actors (suppliers, partners, customers) in order to mobilize the creation of value by new combinations of players. As a result, a company's strategic task becomes the ongoing reconfiguration and integration of its competencies and customers in a dynamic way, which can be represented as a value constellation.

The concept of value constellation has been a central theme in service literature as the customer plays an active role in the service delivery process, impacting on service outcome quality (Vargo *et al.*, 2008). Vargo and Lusch (2004), founders of the co-called Service-Dominant (S-D) Logic, contend that value is perceived and determined by the consumer on the basis of "*value-in-use*" and that it is contextual, experiential and idiosyncratic. Under S-D Logic, the concept of value creation has been replaced by co-production as the customer is involved

in the realization of the company's value proposition. Central to the premise of value co-creation is the notion that companies cannot provide value, but merely offer value propositions while it is the customer that co-creates it with the company at a given time and context.

The aim of this Chapter is twofold: 1) to provide an overview of the concepts of value and value creation in the supply chain and service management literature in order to highlight the state of the art of port management literature; 2) to present some models of analysis than can contribute to shed light on the elements that determine value creation in the port context, from a managerial perspective .

The Chapter is structured as follows: in section 2.2 the concept of supply chain is provided while in 2.3 the Supply Chain Management approach is described, showing the underpinnings of such a managerial philosophy such as collaboration and coordination of the activities leading to customer satisfaction. The extension of the supply chain concept to the network is then analyzed (section 2.4) as this describes more appropriately the complex reality of business relationships. In section 2.5, the definition of service supply chain is provided as this offers the elements through which the port service supply chain could be defined. In section 2.6, the concept of value and value creation are thus analyzed. At this regard, the Strategy Structure and Performance (SSP) model offers an effective framework for positioning the concepts under investigation. This framework will be used for the review of the papers that have addressed port competitiveness according to the SCM approach (Chapter 3). The Chapter ends with some considerations on the contribution of the managerial research streams to the topic of port competitiveness.

2.2 The concept of supply chain

The supply chain's (SC) concept originates from the logistics literature (Christopher, 1994; Jones and Riley, 1985) and it has been then applied in different disciplines according different approaches of analysis. In general terms, a supply chain is a system of organizations, people, activities, information, and resources involved in moving a product or service from supplier to customer (Mentzer *et al*, 2001). The content of a supply chain can be defined according to three dimensions: flows, activities and actors.

In a wide sense, a supply chain involves four distinct flows: 1) information from buyer to seller, which triggers all later activities; 2) movement of goods from seller to buyer; 3) transfer of ownership rights from seller to buyer; and 4) payment from buyer to seller. Most of SC definitions have stressed mainly two flows - materials and information – given their roots in the logistics literature. Originally, the supply chain definitions emphasized the importance of the physical flow of materials from suppliers through end users, compared to the other flows (Houlihan, 1985; Jones and Reley, 1985). Subsequently, the information flow has drawn great attention in the managerial studies, given its importance for the effective management of the supply chain.

With reference to the supply chain's activities, these can be regrouped according to their technical-economical homogeneity, privileging functions they perform. As such, the logistics activities have been grouped, for example, in the following typologies: store management and control, that allows the availability of goods in the different interchange nodes along the chain; transport, that ensures the "transfer" of goods from the point of origin to the final destination; packaging and unitization, that concern the packing of goods for their storage and transport; production planning, that allows the equilibrium between the customer requirements and the potentiality of the production system; procurement, that refers to the activities for the acquisition of goods from suppliers. The Global Supply Chain Forum (Lambert, Cooper and

Pagh, 1998) considers key business processes as the best way to realize integration and synchronize the activities inside and outside the company.[1]

Finally, the supply chain can comprise all the actors from the procurement of raw materials until the final consumption of the goods.[2] Most of the definitions tend to include the main suppliers, the manufacturers, the retailers and the customers in order to justify the existence of a supply chain. Other definitions also include the carriers and the logistics service providers. Mentzer *et al*. (2001) define the supply chain as "a set of three or more entities (organizations or individuals) directly involved in the upstream and downstream flows of products, services, finances and/or information from a source to a customer". The authors distinguish between "direct supply chain", "extended supply chain", and "ultimate supply chain" (Figure 2.1).

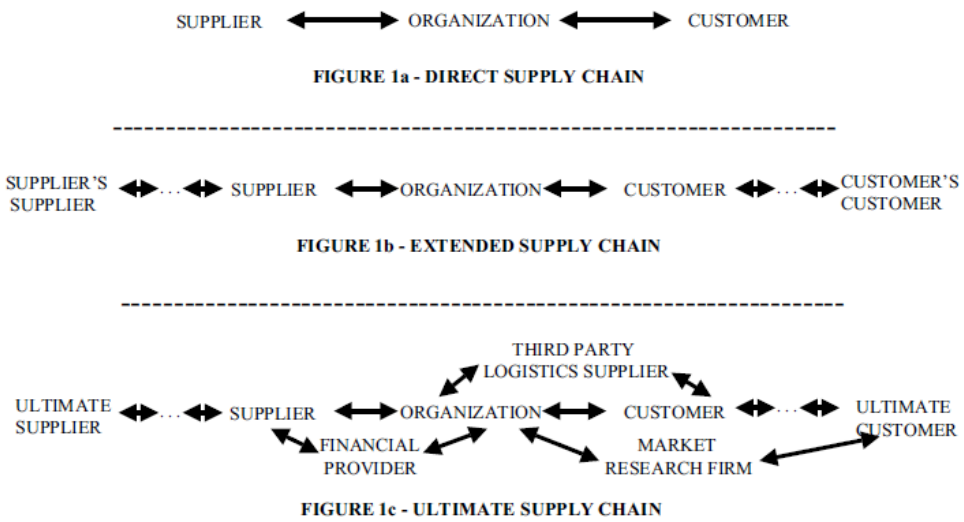

Figure 2.1: The traditional view of supply chains

Source: Mentzer er al., 2001

The direct chain encompasses the focal firm, a supplier and a customer. The extended chain includes the supplier's supplier and the customer's customer. The ultimate supply chain includes all the organizations involved, e.g. third party logistics providers, financial providers and management services providers. Due to the very high number of actors comprising the supply chain, some authors use the term "network", which better describes the complex system of relationships between supplier and customer at each level of the supply chain (Christopher 1992).

Finally, with reference to the service industry, there is an unexplored area that lies behind the concept of the service supply chain. The traditional focus of research on supply chain issues has been on the manufacturing sector. Only in the last decade, the application of SCM principles and practices to service firms has received attention from practitioners and academics (Sengupta *et al*., 2006). As manufacturing firms, service businesses can benefit from effective integration of key processes and relationships across the supply chain (Ellram *et al*., 2004). The service supply chain is the network of suppliers, service providers, consumers and other supporting units that performs the functions of transaction of resources required to produce services; transformation of these resources into supporting and core services; and the delivery of these services to customers (Baltacioglu *et al*., 2007). As services cannot be stored,

[1] The advantage in considering processes is mainly justified by their orientation to specific customer needs.

[2] The final consumer has gaining an increasing importance in defining the attributes of the chain so that in the American literature the term "demand chain" is preferred to "supply chain".

the main characteristic of the service supply chain is the contextual interaction with the customer in the service delivery process. Service providers, at this regard, own and control those resources necessary to deliver services through customer interactions (Gronross, 2011).

2.3 Supply Chain Management: Integration vs coordination

Supply Chain Management (SCM) encompasses the planning and management of all activities involved in sourcing and procurement, conversion, and all logistics management activities. It also includes coordination and collaboration with channel partners, which can be suppliers, intermediaries, third party service providers, and customers[3].

In essence, supply chain management integrates supply and demand management within and across companies. Supply chain integration is a fuzzy concept and it might be understood in different ways within any specific industry (van der Vaart and van Donk, 2004). In the food industry, integration seems a synonym for transparency of information and most efforts are focused on communication and sharing information (e.g. Point-Of-Sale data and CPFR). In the automotive sector, integration is closely linked to concepts like JIT and lean production, as well as co-managed inventory, co-design and systems integrators.

However, coordination can better explain the integration along the supply chain form both the academic and practice perspectives (Frohlich and Westbrook, 2001). Malone and Crowston (1994) define coordination as the managing dependencies between activities. These dependencies can be generated by shared resources, producer/consumer relationships, simultaneous constraints and task/subtask. With specific reference to the producer/ consumer relationships, these represent the traditional dependencies in a supply chain while shared resources and simultaneous constraints can increasingly describe also some supply network's relationships. According to Rice and Hoppe (2001), the prevalent approaches to coordinate the supply network that companies currently experienced are: channel master, collaborative relationships and digital or web-based electronic environment. In many cases, coordination of the supply chain is enforced by the actions of a channel master that is the most powerful company of a supply chain, typically a downstream company near to the end customer. The channel master exercises influence over the other companies, often directing activities, technology and behaviors.

Collaboration is a vehicle that firms use to come together in a joint effort to co-produce goods and services through the effective use of co-specialized assets (Dyer and Singh, 1998). Coordination among partnering firms is the basis on which collaborations succeed. Traditionally, collaboration has been analyzed through two alternative mechanisms (Williamson, 1996): markets and hierarchies. Markets represent cases where economic actors (both firms and final users) coordinate with each other in order to sustain the exchange of goods or services among themselves. Hierarchies entail cases where an entity coordinates through ownership of production resources, maintaining the authority to exercise and impose as one single entity its own decisions through a system of incentives and disincentives (awards and punishments). The industrial economics literature identifies a third type of coordination mechanism between markets and hierarchies, the so-called hybrid, quasi-market or intermediate mode of organization (Williamson, 1996). In hybrids, the firms coordinate with each other through some integration activities often including long-term contracts, without committing to a particular hierarchic model (through, for example, merger or acquisition).

The literature presents different typologies of hybrids (Cooper at al., 1997a). Nevertheless, the study of Rice and Hoppe (2001) offers a comprehensive segmentation of the Market– Hybrid –

[3] This is the definition provided by the Council of Supply Chain Management Professionals (CSCMP), http://cscmp.org/

Hierarchy spectrum. In particular, the Authors consider six typologies of coordination mechanisms (Table 2.1.): transactional relationships, information sharing alliances, collaborative logistics alliances, collaborative network alliances, partnerships, and vertical integration.

Market	**Alliances (Hybrids)**				**Hierarchy**
Transactional relationships	Information sharing alliances	Collaborative operation alliances	Collaborative network alliances	Partnerships	Vertical integration

Table 2.1: Spectrum of coordination mechanisms

Source: Rice and Ronchi, 2002

The simplest and most fundamental market coordination mechanism, transactional relationships entail only buy-and-sell activities in a traditional arms-length relationship.

In alliances, two companies share some common interest, exchange value through buy-and-sell activities, and they also perform some coordination activities. Depending on the coordination activities performed, the alliance falls into one of following categories:

- √ Information Sharing Alliance – This entails only passive information sharing as a coordination activity. The firms maintain their respective information and planning systems and incorporate information from the other firm as possible. This may represent a case where the firms are in the early stages of developing a more meaningful relationship, or where the firms have limited commonality in goals.
- √ Collaborative Operations Alliance – This entails information sharing and active process coordination in one or more domains – product design, engineering, and/or logistics (supply chain). The two firms share some stated common goals, and there may be some dedicated resources committed by each firm to create and maintain a high degree of integration. This relationship presents typically a medium-to-long term commitment.
- √ Collaborative Network Alliance. This alliance describes the most committed level of alliance, where the exchange of value occurs mainly through long-term agreements and includes financial, resource and/or risk sharing. The agreements are supported with fairly open and active information sharing, supply network process coordination and improvement activities, and making network-level financial decisions and tradeoffs (including mutual investments in joint assets, balancing financial risk and rewards).

Partnerships can be considered as hierarchies in the sense that these alliances entail some equity ownership. The equity ownership enables the equity owner to coordinate by exercising some control by virtue of owning some of the business. Goals and objectives of the two companies are so similar that the financial structure of the relationship changes – the two firms sharing equity interests are no longer two completely separate entities. Some examples can be found in subsidiaries, joint ventures, and equity interests cases.

Vertical integration represents a pure hierarchy – ownership of all the value adding entities and exercise of that ownership to coordinate activities among the entities. This solution enables the owner to coordinate the supply network through control. By virtue of having a controlling interest in the firms, the owner may exercise full control over all the activities performed and the objectives become all the same.

Finally, from an inter-organizational alliance perspective that entails resource dependencies among two or more organizations, coordination costs are a function of how well these firms will manage operational interdependence (Gulati and Sin-h, 1998). Opportunism forms the basis of how these costs come into being in the first place. New alliances typically have more transaction costs associated with them because of opportunism that may exist at alliance outset. These costs may decrease over time as the alliance progresses, more so if partners take measures to reduce the potential for opportunism by building trust. Indeed, if firms do not behave less opportunistically as the alliance moves forward, the lack of trust developed implies a costly or negative outcome of interdependent activities. Trust is, therefore, the basis of reduced transaction costs over time.

2.4 Supply chain versus supply network

Traditionally, the supply chain relies on the notion that sequential and vertical connections among activities exist and that their coordination increases the performances of the entire chain. The incorporation of the term network into supply chain management research can been seen as an attempt to make the concept wider, in such a way to describe more appropriately the complex reality (Dubois *et al*., 2003). Cox (1999) argues that: "*the process in which raw materials are turned into end-products and services is rarely simple linear process chain, and much more like a spaghetti web of complex interconnected relationships*".[4]

A network is "a structure where a number of nodes are related to each other by specific threads" (Ford *et al*., 2003). Supply network can be defined as: "*sets of supply chains, describing the flow of goods and services from original sources to end customers*" (Lamming *et al*., 2000).

Unlike the supply chain, the network approach assumes that firms in business-to-business markets are embedded in a complex network of relationships with suppliers, customers as well as a number of other stakeholders (Harland, 1999). These networks consist of conscious actors, who perform a set of activities based on the resources they have[5]. Actors are connected to other actors via resources and activities. Each actor's unique combination of resources and activities constitutes its identity.

Relationships between the actors represent valuable bridges as they give one actor access to the resources of another. In fact, through relationships, it is possible for individual actors to mobilize resources. A basic assumption in the network approach is that firm's continuous interaction with other players is an important factor in the development of new resources and skills. The assumption entails a change in focus away from how the firm allocates and structures its internal resources towards how the firm relates its own activities and resources to other players' activities and resources in its surroundings.

Supply networks differ in the breadth and the length of the network (Figure 2.2). The breadth of the network reflects the number of suppliers and customers. The length reflects the number of echelons until the end user. In general, the breadth of the supply network is narrowed when considering a limited number of "preferred suppliers and customers".

A supply chain can be considered a special form of a supply network, in which the inter-organizational relationships between the upstream and downstream partners with the focal firm are dyadic (Harland 1999) and limited to a group of preferred actors. Even though the

[4] According to some authors, the prevailing SCM literature tends to simplify in a way that strongly limits the possibilities to take into consideration interdependencies within as well as among the supply chains that constitute the "spaghetti web".

[5] Håkansson and Johanson (1992) created a model in which they described a business network as three interrelated layers of Activities, Resources and Actors (the so called ARA-model)

concept of supply network is more complex than that of supply chain, what is in common in both definitions is the inter-connections between different entities participating in the process of creating value for specific end customers. In practice, such concepts lead to the understanding of inter-organizational relationships in pursuing the satisfaction of individual end customer segments (Zheng *et al*, 2001).

The structural dimensions of the network (determined by actors, resources and activities) are essential and critical, especially when analyzing and managing the supply chain. The supply chains in the network look different from each company's perspective. Every company sees and manages itself as the focal company. As each firm is a member of the other's supply chain, it is important to understand their interrelated roles and perspectives.

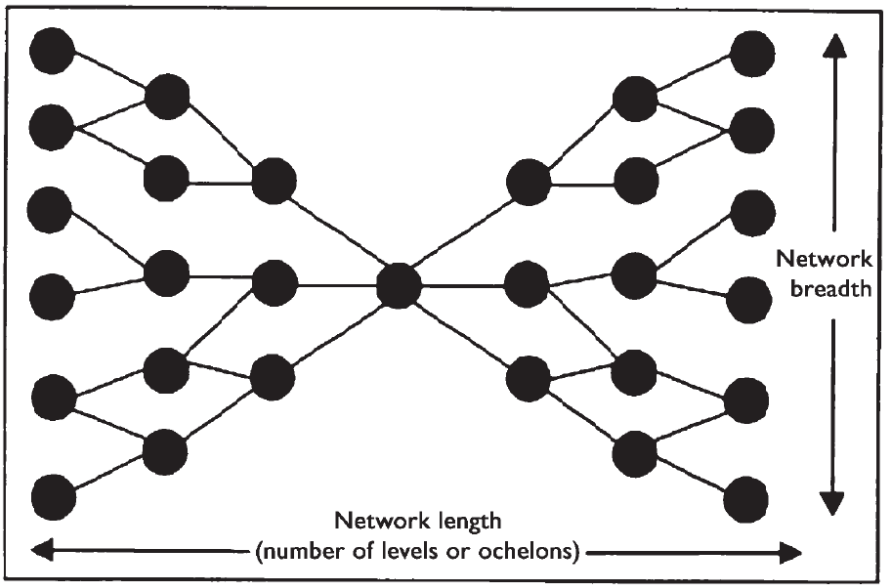

Figure 2.2: The supply network

Source: Harland C., 1999

Three kinds of interdependencies within and among supply chains can be considered from a network perspective: sequential (or serial), pooled and reciprocal (Hakansson and Persson, 2004). According to Thompson's (1967) dependency framework, sequential interdependence is related to a situation where the output of one activity is the input for another activity. Pooled interdependence between two activities means they both are connected to a third activity, or are sharing a common resource and are only indirectly independent. Reciprocal interdependency means that there is a mutual exchange of input and output between two parties.

The supply chain concept strongly relies on the notion that there exists sequential interdependence among activities. This view of the supply chain is closely related to what Porter (1985) labels the firm's value chain system, an approach describing a chain of sequentially interlinked primary activities that gradually transform raw materials into the finished product valued by buyer. By considering pooled and reciprocal interdependencies, the activities performed in a supply chain can be dependent on those performed in others chains, as they use common resources or they are mutually dependent. For instance, Internet-based procurement mechanisms known as business-to-business (B2B) exchanges enable the connection between autonomous agents, thus creating pooled interdependencies between them (Lazzarini *et al*., 2001). Furthermore, a strategic alliance in which parties seek "to

broaden or deepen their skills or to develop new skills jointly" is an example of inter-organizational collaboration involving reciprocal interdependencies.

Supply chain and network suggest alternative source of value in the study of inter-firm collaboration (Lazzaretti *et al*., 2001). The former, related to serial interdependencies, refers to Porter's value chain concept (emphasis on value added), while the latter, related to pooled and reciprocal interdependencies, refers to the recent concept of value constellation (emphasis on value co-production) defined by Normann and Ramirez (1993).

2.5. The review of models of analysis of supply networks and service

In this paragraph, the review of SCM models with a network perspective is presented. One of the first models, developed by Lambert (2001), is composed of three inter-related elements (Figure 2.3): (1) the supply chain network structure, *i.e.* the member firms and their links; (2) the business processes, *i.e.* the activities that produce value to the customer; and (3) the management components, *i.e.* the variables by which the integration can be realized.

The SC network structure describes the complex system of relationships between suppliers and customers at each level of the supply chain. Not all the links through the supply chain are relevant for the firm and the management has to choose the appropriate level of partnership on the basis of firm's capabilities. In the choice of the partners, the focal firm has to determine which members are critical to the success of the company and therefore have a crucial role in bringing value to the customer.

Business processes that are critical or beneficial to integrate and manage between companies will likely vary. Nevertheless, all functions affecting the product and providing information must work together. As a consequence of the choice of outsourcing rather than managing in house specific activities (or business processes), the need to co-ordinate supply chain processes increases since the focal firm becomes more dependent on suppliers' behavior. The last elements of SCM framework are SCM management components that are the managerial variables by which the business processes are integrated and managed across the supply chain.

The management components can be divided into two groups (Lambert, 2001): the first group is the physical and technical, which includes the tangible, measurable components, such as the organization of product and information flows and the related activities. The second group is composed of the managerial and behavioral components. These define the organization behaviuor and influence how the physical and technical management component can be implemented.

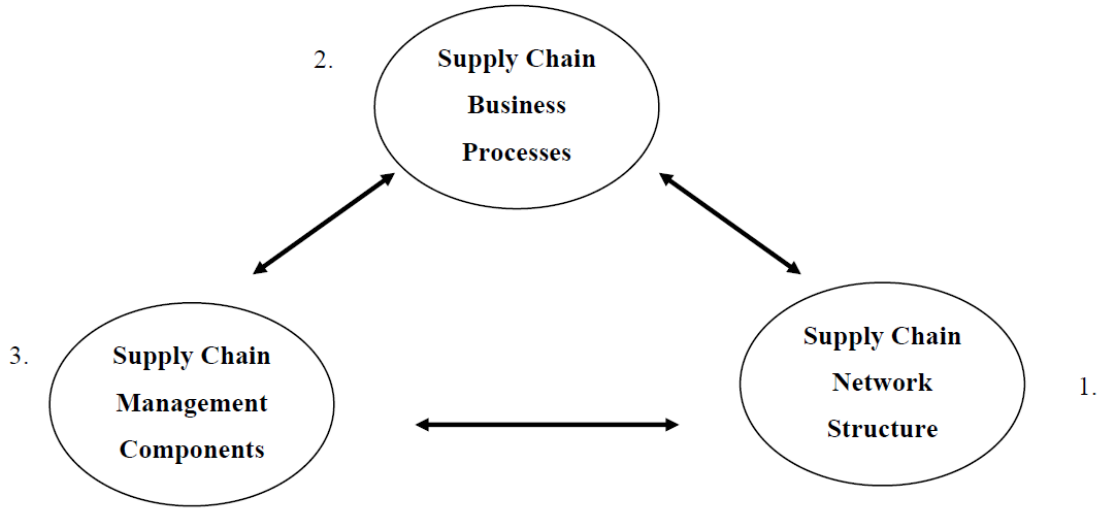

Figure 2.3 - Elements and key decisions in the SCM framework

Source: Cooper *et al.*, 1997a

This model is based on the assumption that the greater the integration between the actors of the network along different business processes, the better the performances that can be achieved in terms of customer satisfaction, and therefore, the greater the competitiveness of the company and the entire supply chain. When dealing with the SC network structure, the model considers mainly serial interdependence within the supply chain, and it proposes to develop partnerships with actors whose activities affect the focal firm's primary activities (emphasis on Porter's value chain concept).

As companies are aware that successful integration and management of key business processes will determine their success, an important issue is to understand the company's supply network structure (Figure 2.4). The Actor Resource Activity model developed by Hakansson and Snehota (1995) can be a useful tool for the focal firm in choosing partners with whom to link business processes, taking into consideration the companies' vital resources that are needed in the partner selection (Pohja, 2004). Considering the network supply chain to be a variable and dynamic structure, crucial elements in selecting players are represented by the businesses' activities and resources that are directly controlled and managed by the company more efficiently and effectively than by other companies. Central role is played by the partnerships, as they represent the means by which the company can gain access to, mobilize and combine different activities and resources in the network, promoting and creating productivity and innovation both inside the company itself and in the network.

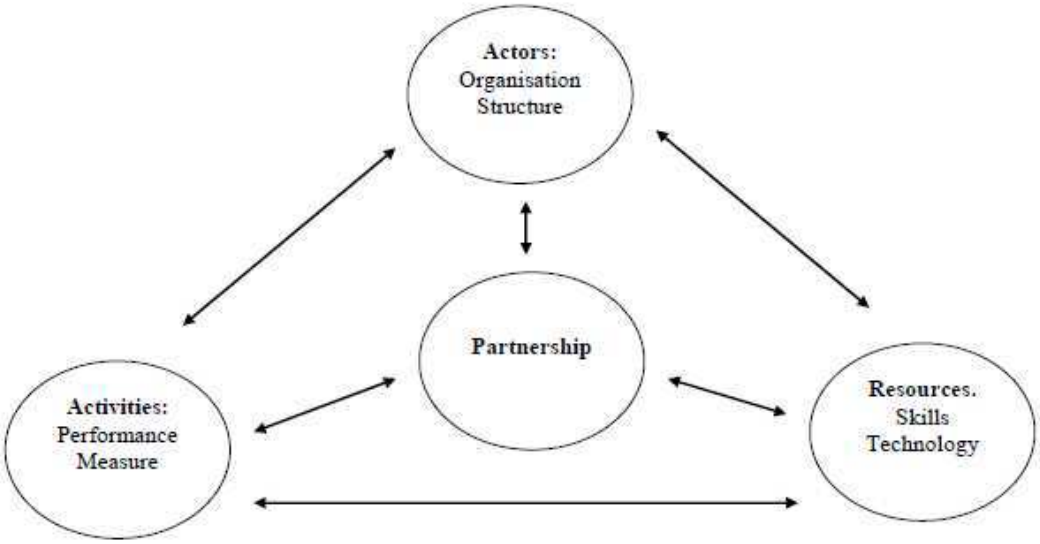

Figure 2.4: SCM and ARA model in partner selection

Source, Pohja, 2004

Dubois *et al*. (2003), in an effort to analyze the complex patterns of interrelated chains (a supply network), suggest a framework consisting of: products, activities and resources, firms (or business units) and relationships. Within such a framework, there are two major assumptions: (1) individual firms try to optimize their respective sets of resources and activities by taking interdependencies across their boundaries into account; and (2) the relationships between firms provide them with means to coordinate their activities and interact in the development of the resources activated by, and of the products resulting from, their respective activities. Figure 2.5 shows a simplified illustration of five (end products related) supply chains that are subject to interdependence. Firms involved in these chains will perceive products differently. For example, for firm F there are three products that will follow three different supply chains and will end up in three different end products (b, c and d). For firm F there are also other products of relevance, namely those supplied by firm E as inputs. Firm F's activities (utilizing a common resource) result in three different products that are further refined by G, H, I and J into end products b, c and d. By this way of organizing the activities, the three supply chains utilize resources also activated in other chains within, for example, firms B, E, F and K. Hence, in this simplified supply network there are a number of interdependence within and among the supply chains that the actors should take into account in order to be efficient. Each firm in the network will have different perspectives on how to organize and manage their activities and resources.

Let us suppose that company B is a logistics operator: there are sequential interdependencies between Companies A and B, and also between B and E. Company B can exploit these interdependencies and create economies of integration - that is to integrate its own activities with those of the companies in the supply chain - so as to generate a more captive demand. Furthermore, from the point of view of B, there are pooled inter-dependencies between supply chains A and E, which can be optimized through the implementation of a communication system or warehouse management, in order to create economies of scale and scope. In conclusion, each company acts in differentiated and changeable business network characterized by different customers' expectations, different activities and perceptions of critical resources. In such environment, a major factor in strategic positioning is the relational capacity of the company. Mobilizing and combining critical resources and activities is connected to company's abilities to combine its own resources and activities with those of

others. Relationships are the mean by which companies access to, mobilize and combine critical resources and processes, promoting innovation and productivity in the network but also within the company.

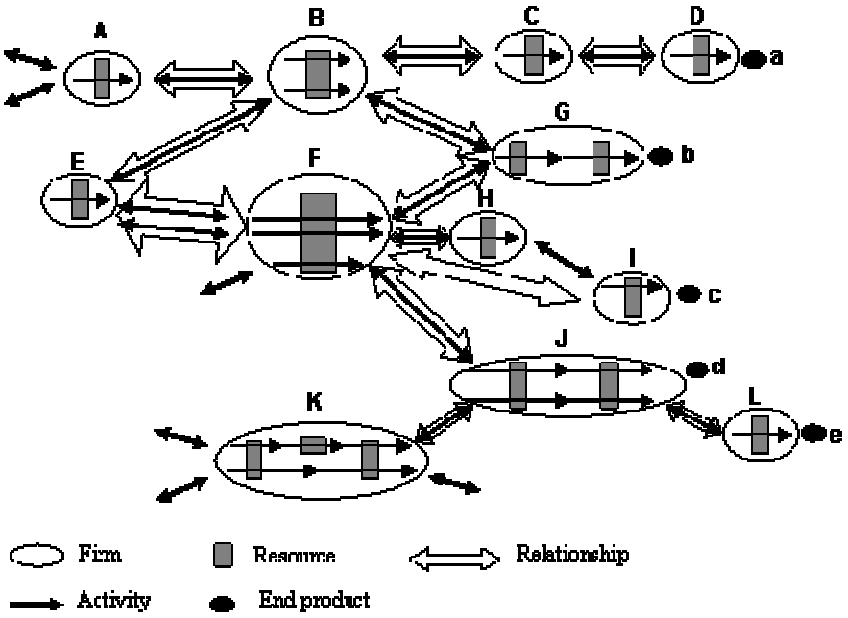

Figure 2.5: A complex pattern of interrelated supply chains (Supply network)

Source: Dubois *et al*., 2003

Finally, some attempts have been made to transfer traditional SCM practices to service organizations as well as to re-conceptualize SCM by taking into account the unique characteristics of services (Ellram *et al*., 2004; Baltacioglu *et al*., 2007). In the service literature, the supply chain is the network of suppliers, service providers, customers and other supporting units performing the function of transaction of resources required to produce services and dealing with the transformation of these resources into supporting and core services and with the delivery of these services to customers (Baltacioglu *et al*., 2007). Building on Ellram *et al*. (2004) models, Baltacioglu *et al*. (2007) proposes a general supply chain model for the service industry. In the model, the ultimate service delivered to the customer is the 'core service' that provides benefit to the customer (Figure 2.6).

When delivering a core service, a number of supporting services may be required and these may be produced by suppliers as well as the service provider itself. In the service supply chain context, the core service and supporting services in combination is the focal subject of transaction. In other words, this combination is the general context that is addressed by a 'service'. The customer perceives all services s/he receives as one and as aiming to provide her/him the ultimate benefit.

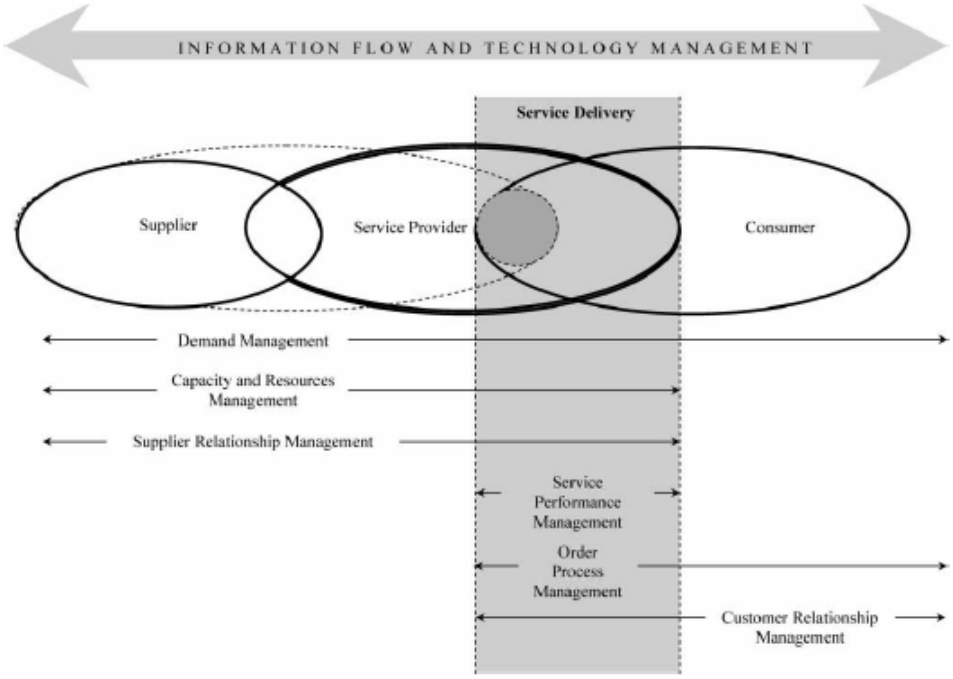

Figure 2.6: The Service Supply Chain Management Model

Source: Baltacioglu *et al*. (2007)

The model includes all elements of the supply chain and defines the managerial activities to be fulfilled for effective management of service supply chains: demand management, capacity and resource management, customer relationship management, supplier relationship management, order process management and service performance management. Additionally, information and technology management is considered as a supra-structural construct in the model, given its strategic role in customer interaction. In any service context, service performance is unique, and it is only possible when both the service provider and customer are present, as service cannot be stored and then resold to an end consumer. Therefore, the service provider and customer are both involved in the production process, as depicted in the model.

2.6 The concepts of value and value creation in the SCM literature

The strategy-structure-performance paradigm can offer an effective interpretative path in order to properly address the concept of value and value creation. In particular, as customer is the leading factor of firm's strategic choices, the understanding of his needs - in terms of cost, quality, flexibility, reliability, time – represents a key-stage for the effective and efficient management of relationships along the supply chain, in order to get the desired level of performance.

In the service literature, value creation is part of a wider process that is defined value generation[6] (Gronross, 2011). In the value-generating process, suppliers provide their customers with resources thus facilitating value creation. This activity performed by suppliers can be labeled value facilitation as they provide the resources to the customer for value creation. Value creation, on the other hand, takes place in the customers' sphere and it is determined, specifically, in the firm - customers' interactions. The result of the process of

[6] In this thesis, the term value creation will be privileged respect generation.

value generation is the created value, which is different from the firm and customer's perspectives.

By using the SSP model, the concept of value creation can be outlined as follows:

1. the *customer value*, through which the firm defines the customer's needs and its competitive priorities;
2. the *value facilitation*, *i.e.* what resources are necessary to deliver services and create customer value;
3. the *value creation*, i.*e.* how to interact with the customer and make available the resources that create a unique value;
4. and, finally, the *created value*, *i.e.* the results of the firm's competitiveness, both at firm's level in terms of financial, economic and market performance, and at supply chain level, in terms of customer satisfaction.

The elements characterizing these stages (Figure 2.7) represent the drivers of decision making process of the firm that traditionally has been framed within the strategic-structure-performance paradigm (Chandler, 1962), which has been currently extended to the supply chain environment (Bowersox *et al*., 1999; Chow *et al*., 1995; Rodrigues *et al*., 2004; Defee and Stank, 2005). The strategy-structure-performance (SSP) paradigm predicts that the firm's strategy, designed in consideration of external environmental factors, drives the development of organizational structure and processes (Galbraith and Nathanson, 1978; Galunic and Eisenhardt, 1994).

This strategy-structure combination allows the firm to perform at a desired level. Those firms with aligned strategy and structure are expected to perform better than competitors who lack the same degree of strategic fit (Galbraith and Kazanjian, 1986; Miles and Snow, 1984). The SSP paradigm is also influenced by contingent factors that lie beyond the realm of strategy and structure. These factors can be categorized as external environmental factors and include competitors, the industry structure, the economy, the regulatory framework and government controls. In the next sections, the strategy-structure-performance paradigm will be used for systematizing and clarifying the concept of value generation.

2.6.1 Customer Value and Supply Chain strategy

The understanding of customer's needs is crucial for the definition of the competitive priorities; these are the areas in which the firm chooses to excel in order to meet customer's demands.

There are a number of different operations-related competences described in the literature as competitive priorities but the most traditional list includes cost, quality, flexibility and delivery. Other lists have included speed, time and innovation as well (Miller and Roth, 1994). These lists are closely related to the idea of generic strategies from the business strategy literature (Porter, 1980). Cost, as a competitive priority, would correspond to cost leadership, while the other elements (quality, flexibility, speed, etc.) would correspond to differentiation. According to Chen *et al*. (2009), cost orientation and customer orientation appear to be the most critical strategic priorities that impact on the coordination along the supply chain.

Supply chain strategy differs from traditionally accepted business strategies as it requires the coordination and commitment of multiple firms to implement company competitive priorities. Supply chain strategy utilizes inter-firm coordination as the capability that facilitates achievement of objectives focused on cost leadership and/or service differentiation. Each firm has to create structures and processes that improve inter-organizational relationships between supply chain partners that share a common vision and objectives. This collaborative perspective is key to aligning the operational processes of multiple firms into an integrated

supply chain system. The objective of the approach is to enable a firm to compensate for its weaknesses and/or resource constraints by linking it with other firms having offsetting strengths, thereby allowing all firms to apply their resources toward areas that are seen as important. In such relationships, shared supply chain goals across participating supply chain firms heighten the chances of success. Strategy must be consistent across all supply chain members; this does not imply that each firm's strategy needs to be the same. Rather, strategies should be complementary across firms to mutually support an overall, shared supply chain objective.

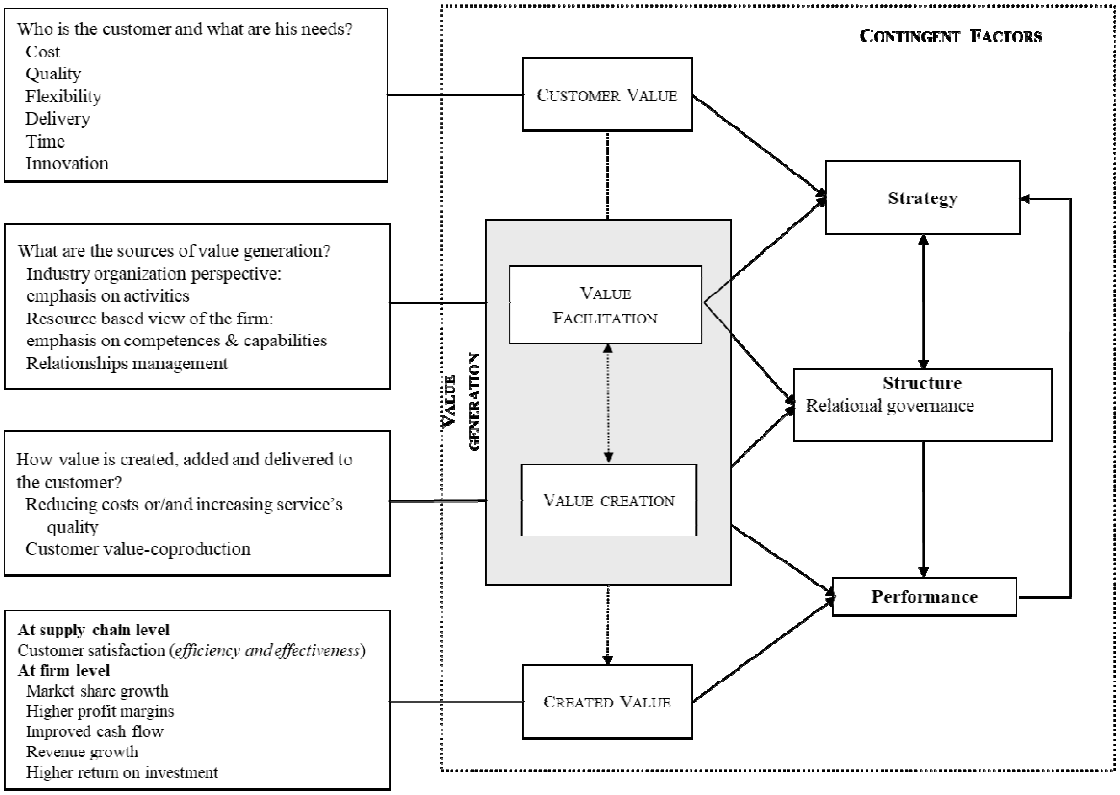

Figure 2.7: Value creation according to the SSP framework

Source: own elaboration

The supply chain strategies are operational excellence and customer closeness, and the supporting capabilities are supply-oriented and demand-oriented capabilities (Morash and Lynch, 2002). Operational excellence strategy can support the cost leadership business strategy through the supply chain management, by seeking ways to minimize costs and eliminate intermediation, while providing high levels of basic services. One would expect operational excellence to be supported by supply chain capabilities such as low cost logistics, distribution coverage and availability, standardization of operations and delivery speed (Morash, 2001). Example of operational excellence strategies are just in time deliveries and lean supply chains. On the contrary, customer closeness strategies can support service differentiation along the supply chain through high levels of service customization, proactive quality and collaborative communications and interactions with customers. One would expect supply chain strategies involving customer closeness to be supported by demand-oriented capabilities such as responsiveness to key customers, value-added customer services, customization and innovative solutions. For example, some supply chain firms do distribution services based on the needs of their customers as there is the awareness that, if their customers succeed, then everyone in the supply chain will grow.

On the basis of competing through specific value disciplines for competitive advantage (*e.g.,* Porter 1985, 1996) and value congruency (i.e., fit), an operational excellence strategy would be expected to be primarily supported by supply-oriented capabilities while at least meeting minimum threshold levels on demand-side capabilities to be order qualified. In contrast, a customer closeness strategy would be expected to be supported particularly by demand-oriented capabilities while at least meeting the minimum requirements on supply-oriented capabilities.

2.6.2 The process of value creation: the Industry Organization and the RBV of the firm

Two theoretical foundations can be recalled for the analysis of value creation in the supply chain context: the Industry Organization perspective (Caves *et al*., 1980; Porter, 1980) and the Resource Based View (Wernerfelt, 1984; Barney, 1991).

The Industry Organization perspective is based on the concept of value chain which refers to a connected series of links of primary and supporting activities, comprising inbound logistics, operations, outbound logistics, marketing and sales, and services that lead to business outcomes of each enterprise (Porter, 1985). The focus of value facilitation is on activities that, in the specific industry, can be source of competitive advantage for the firm. By adopting a cost leadership or a differentiation strategy, firms create value for customers by lowering their costs or raising the quality of the services. Competitive advantage is achieved by creating higher value by driving down overall costs or providing customers with products and services that they consider over competitors' offerings and, therefore, they are willing to pay a higher price for. This approach gave rise to the notion of value added, that is the amount by which the value of an article is increased at each stage of its production by the agent or agents producing it, excluding the cost of materials and bought-in parts and services. Value is further created externally through vertical supply chain linking to the value chains of suppliers and buyers; linkages between these chains not only connect value activities inside the company but also create interdependencies between its value chain and those of its suppliers and buyers.

The other theoretical pathway, the Resource-Based View, is not in contrast with the industry organization one but it implements the view of customer value creation by focusing on the ability and capability of the firms to interact with customers. Value preparation here is seen in terms of amount of resources as a medium of exchange, where resources include not only market inputs (labor, transportation, equipment) and assets (facilities and tools owned by the organization), but also knowledge and capabilities (competencies) (Wernerfelt, 1984; Barney, 1991; Olavarietta *et al*, 1997). In this respect, value preparation depends on the development of competences and distinctive capabilities rather than exclusively on market selection and positioning. Competences and capabilities lead to sustained superior returns, to the extent that they are firm specific (i.e., *imperfectly mobile*), valuable to customers, non-substitutable and difficult to imitate.

Both approaches consider relationship management as crucial in the process of value creation. In the Industry Organization literature, researchers have been studying alliance structures for some time, particularly from the perspective of transaction cost economics (Oxley, 1997). In this view, alliance structural choice reflects the need to deal with behavioral uncertainty such as opportunism and reduce transaction costs between the partners. Equity arrangement can be used to align the partners' interests when the risk of opportunism is significant. Gulati and Singh (1998) find that both coordination costs and appropriation concerns influence alliance structural choices. In the Resource-Based View, there is an increasing interest on the study of strategic alliances (Das and Teng, 2000; Dyer and Singh, 1998; Eisenhardt and Schoonhoven,

1996). According to this perspective, firms gain competitive advantage by combining their resources, especially the knowledge-based one, with those of other firms interconnected through relationships (Lavie *et al*., 2012). Indeed, many organizations have realized that sustainable competitive advantage increasingly depends on the effective use of existing knowledge as well as the fast acquisition and utilization of new knowledge. Knowledge can be considered the most important strategic resource, and many organizations realize that the value incorporated in their products and services is mainly due to the development of organizational knowledge resources[7].

Finally, according to the Industry Organization perspective, value creation rests on the ability of the firm to understand and interprete customer needs and on the capacity to build products and services with attributes that are deemed to be in the customer's interests (the customer is a "value receiver"). According to the RBV, the customer is a value co-producer that participates in the process of value generation of the firm (Gronross, 2011). When the focus of the relationship is on value co-creation, the exchange of services becomes the fundamental source of value and differentiation, and products are regarded to be primarily mechanisms for service provision (Vargo and Lusch, 2008). It is through the exchange of services that the specialized knowledge and capabilities that exist within firms are leveraged to increase innovation, quality, and superior performance (Ramirez, 1999). Value co-creation is inextricably embedded in relational exchanges. Before the interaction occurs, managers make value propositions that strive to be superior than those of competitors (Vargo and Lusch, 2008). Customers and suppliers determine value when the service is exchanged or when the good is consumed. However, the processes and practices by which managers engage in the value co-creation are insufficiently explored in the literature (Payne *et al*. 2008). Most research on the Service-Dominant logic (Gronross, 2011) is based on successful cases of value co-creation, while cases of unfruitful value co-creation efforts (or value co-destruction) have received little attention. Value co-destruction has been defined as an interactional process between service systems that result in a decline in at least one of the system's well-being (Ple and Chumpitaz Caceres, 2010).

2.6.3 The measurement of created value: the performance

Performance is the measurable outcome of strategy execution and implementation. Economic theories suggest that achieving economic rents is the goal of any firm (Lado *et al*. 1997). Thus, measures such as profitability, sales volume, return on investment (ROI) should be used to evaluate a firm's financial performance.

Mentzer and Konrad (1991) break traditional performance down into measures of efficiency and effectiveness, and state that both elements are necessary to accurately measure performance. Efficient performance measures how well the resources are utilized while effectiveness assesses the degree to which goals are accomplished. The focus here is to examine a firm's overall performance in terms of market performance, which indicates the firm's success level. A firm's market performance includes both market share and customer satisfaction. While market share is a good indicator of the firm's competitiveness in the marketplace, customer satisfaction reflects customers' value creation. A firm's success in the

[7] Teece *et al*., (1997) have put forward the so-called 'dynamic capabilities' framework. Dynamic capabilities refer to the firm's ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments. In their view, coordination/integration, learning and transformation are the fundamental dynamic capabilities that serve as the mechanisms through which available stocks of resources (e.g. marketing, financial and technological assets) can be combined and transformed to produce new and innovative forms of competitive advantage.

marketplace rests on the firm's ability to attract, satisfy, and retain customers by creating customer value.

Supply chain strategies and their supporting resources and capabilities eventually result in supply chain performance. Supply chain performance is the outcome of both public policy and enterprise strategy effectiveness. It is therefore critical that governmental planning and public policy continuously monitor private sector performance to determine the resources, capabilities, and performance measures that are deemed most important by stakeholders and are most readily available as performance metrics.

The RBV of the firm suggests that, by developing distinctive capabilities, a firm can establish a competitive advantage, which is reflected in its performance (Barney 1991). When a firm develops distinctive supply chain capabilities through supply chain process integration, it is likely to achieve competitive advantage in the market (Day 1994; Olavarrieta and Ellinger 1997) and result in bigger market share. Efficiency-related capabilities focus on cost reduction, while effectiveness-related capabilities such as availability, timeliness, and quality can positively affect customers' value perception. Efficiency and effectiveness are, therefore, key performance indicators in the port services supply chain environment.

2.7. Intermediate conclusions

This Chapter provides an integration of some bodies of theory into a coherent explanation of value and value creation in the supply chain and service management literature. It combines the Resource Based View (RBV) of the firm and the network theory in order to address some of the main theoretical contributions on the topic. It is clear that the managerial literature offers different and further theoretical approaches to value and value creation, which could be used to shed light from other perspectives of analysis. However, the major contribution has been to offer interpretation of value and value creation through the RBV theory and service literature perspectives.

In particular, the understanding of costumer's needs - in terms of cost, quality, flexibility, reliability, time – represents a key-stage in the process of strategy formulation (cost leadership and/or service differentiation) as it affects the management of relationships along the supply chain, in order to get the desired level of performance. Drawing on the service literature (Gronross, 2011), value creation takes place in the customers' sphere and it is determined by firm - customers' interactions. Firm provides their customers with resources thus facilitating value creation. According to this perspective, the customer actively participates in the value creation process.

The strategy-structure-performance (SSP) paradigm offers, at this regard, an effective interpretative path of value creation and appropriation (capture): (1) the *customer value*, through which the firm defines the customer's needs and its competitive priorities; (2) the *value facilitation*, *i.e.* what resources are necessary to deliver services and create customer value; (3) the *value creation*, *i.e.* how to interact with the customer and make available the resources that create a unique value; and, finally (4) the *created value*, *i.e.* the results of the firm's competitiveness, both at firm's level in terms of financial, economic and market performance, and at supply chain level, in terms of customer satisfaction.

Value creation, in the meaning of firm-customer's interactions, can be approached through two different theoretical foundations: the Industry Organization perspective (Porter, 1980) and the Resource Based View. Both approaches consider relationship management as crucial in the process of value creation. In the Industry Organization literature, researchers have studied alliance structures for some time, particularly from the perspective of transaction cost economics (Oxley, 1997). In this view, alliance structural choice reflects the need to deal with

behavioral uncertainty such as opportunism and reduce transaction costs between partners. In the Resource-Based View, there is an increasing interest on the study of strategic alliances (Das and Teng, 2000; Dyer and Singh, 1998). According to this perspective, firms gain competitive advantage by combining their resources, especially the knowledge-based one, with those of other firms through relationships.

An interesting perspective provided in the description of the value creation process, is also the situation when value can be destroyed in the supply chain as the collaboration among supply chain actors doesn't work well (value destruction). This often happens when there is inappropriate or inefficient use of the available resources in a relationship, leading to value co-destruction for at least one of the parties.

Finally, the Chapter provides a set of performance indicators for the quantification of value creation in supply chain, in terms of customer satisfaction (efficiency and effectiveness) and at firm's levels, specifically as far as market share, higher profit margin, improved cash flow and revenue growth are concerned. The proposed framework of analysis of value creation will drive the literature review on port competitiveness, in the Chapter 3. Based on the gaps, the concepts described in this Chapter will be then implemented in the port context, thus offering a new perspective of analysis of port value creation.

3. Value creation in the port context: a new framework of analysis

3.1 Introduction

In the last two decades, the Supply Chain Management approach - that considers the coordination among activities and cooperation among the actors of the supply chain as a source of value creation - has become of great relevance in addressing port competitiveness. However, the concrete applicability of this managerial philosophy to the port context has internationally stimulated the scientific debate on:

- √ The conditions that favour the development of cooperative relationships among port actors leading to value creation in the local economic context (Bichou and Gray, 2004; De Martino and Morvillo, 2008);
- √ The extent to which the Landlord port authority can perform an active role as entrepreneur and facilitator/community manager in logistics development, creating regional port networks and sustaining the environmental development of the port (Comtois and Slack, 2003; Verhoeven, 2010).

Value creation from the SCM approach has, indeed, a different meaning for port authority and private port operators. While the Port Authority's objective is to attract private investments while fostering the public utility of the port for the local community, reducing the negative externalities on the side, the private port operators try to maximize the value for the final client in order to increase their own profits. It is clear that these two value propositions are very often conflicting.

The purpose of this Chapter is twofold:

- √ To provide an extensive literature review of the value creation concept in port competitiveness studies;
- √ To propose a model of analysis of value creation able to address the convergence of value propositions of private port operators and Port Authority.

The Chapter is structured as follows: in the next section (3.2), the concept of value creation in the port literature is analysed. The literature review addresses key issues of the value creation process, and specifically: the customer perspective, the focus and unit of the analysis, the approach of the analysis, and the performance indicators.

Based on the main gaps of the literature, two main contributions to the port literature may be given. In particular, section 3.3 provides the boundaries for the definition of port as a network of actors, given the great number of interdependencies that can exist among resources and activities in the port-market interactions. The typologies of services that generate from such a network can be described by drawing on the concept of service supply chain.

Section 3.4 contributes, in this regard, by proposing three typologies of port services supply chains, based on different typologies of customers: the shipping company, the freight forwarder/multimodal transport operators, and finally the manufacturing firm of the port-hinterland. For each service supply chain, it is possible to identify the bundle of resources and competences that contribute to value creation.

In section 3.5, the model of analysis of value creation is then described, taking into consideration the possible interactions and relational dynamics between port authority and private port operators for managing supply chain resources (convergence of their value propositions toward the common strategic objectives and customers satisfaction). The subparagraph is thus dedicated to the analysis of public-private interactions and business relationships along the supply chain.

The Chapter ends with a presentation of possible value creation patterns of the three typologies of port service supply chains, and the expected performance at firm, supply chain and Port Authority's levels.

3.2 Value creation in the port context

The literature review focuses on key-features of the value creation process according to the SSP framework: customer value, the focus and the unit of analysis, and the conceptual category and approach of analysis. As value creation is affected by port regulatory framework too, the Port Authority's strategies have been also investigated. In particular, the first feature under investigation, the port customer, determines the contents and trajectories of port operators' strategies. The second feature, the focus of the analysis, concerns the elements and the leading factors of port competitiveness and customer's satisfaction. The third feature is the unit of analysis of port relational dynamics that could refer to the dyad, the supply chain or the network. A further feature is the conceptual category and approach of analysis adopted in these studies. Finally, the last issues under investigation is the Port Authority's strategies for facilitating the port integration in the "supply chain". The papers under review are those published in the last two decades in specialized international journals such as *Maritime Policy* and *Management and Maritime Economics and Logistics*, and in other journals included in the Web of Knowledge database. Selected papers are those that have addressed the following topics: customer value, supply chain management, inter-organizational relationships and performance (Table 3.1). Although the review is not exhaustive and related to a subjective evaluation, it contributes to the understating of the process of port value creation from the managerial perspective and offers insights that can be addressed in future research.

The first feature under investigation is the port customer's perspective. Three main groups of port customers have attracted the interest of research, in the last decades: the shipping companies, the freight forwarders and the shippers. These groups increasingly express the integrative role of the port into logistics and supply chains. It is interesting to note that most of the researches drawing on Industrial Organization's perspective focus on key factors that lead to port's selection according to shipping companies (Heaver *et al.*, 2001; Ng, 2006; Song, 2003; Song and Panayides, 2008; Tongzon et al, 2009; Yap and Lam, 2004). Apart from only two studies that focus on port's choice criteria according to the manufacturing firm (Carbone and De Martino, 2003) and freight forwarder (Tongzon, 2009), the frameworks used in the empirical analysis deal with terminal productivity and efficiency as port value creation rests on the ability of Terminal Operating Company to satisfy shipping company's requirements. Studies drawing on mixed approach of analysis (Cetin and Cerit, 2010; Mangan and Lalwani, 2008; Paixao and Marlow, 2003) and the RBV (Harrison and Håkansson, 2006; De Martino and Morvillo, 2008), although acknowledging the fundamental role of shipping companies in determining port competitiveness and attractiveness (Ng, 2006), extend the analysis to other customers such as freight forwarders, shippers and manufacturing firms. In particular, in these studies, the advantages in providing value-added logistics services and expanding port business, depend on the port's ability to manage port services within logistics and supply chains efficiently. As Bichou and Gray (2004) note, the adoption of Supply Chain Management (SCM) frameworks in the port context would be beneficial for assessing value-added logistics services, once internal integration has been realized. De Martino and Morvillo (2008) believe that the SCM approach has great relevance for ports that serve a natural hinterland, being oriented to specific customers' groups.

With reference to the focus of analysis, it is in the last decades that the strategic importance of relationship networks and port supply chain integration have become central issues in the development strategies (Bichou and Gray, 2004; Carbone and De Martino, 2003; Cetin and Cerit, 2010; Harrison and Håkansson, 2006; Mangan and Lalwani, 2008; Paixao and Marlow, 2003;

Robinson, 2002; Song, 2003; Song and Panayides, 2008; Tongzon *et al.*, 2009; Yap and Lam, 2004). This trend is consistent with the process of privatization in ports that brought to a variety of governance structures in different countries (Brooks and Pallis, 2008). In particular, European ports witness a strong competitive struggle between terminal operators and shipping companies, which in some cases has led to increasing investments in the hinterland in order to improve container handling. However, although shipping companies have a fundamental role in port competitiveness, port can differentiate its service supply by considering different port clients such as freight forwarders and the manufacturing firm located in the hinterland. It is acknowledged, at this regard, that the SCM approach can represent an effective tool for the definition of the development strategies of those ports, defined gateway, that have a regional economic system and can potentially strengthen their relationships with key local stakeholders.

Consistent with the shift in the focus of the analysis, the unit of analysis has also changed towards logistics systems of which ports (in particular terminals) are components. Robinson (2002) has already described the interactive changes in the individual components of the logistics systems, to which ports belong, and related them to the changing values of shippers. In this respect, port has been interpreted as: a value chain system (Robinson, 2002; Yap and Lam, 2004); a logistics system/networking site (Bichou and Gray, 2004; Mangan and Lalwani, 2008; Paixao and Marlow, 2003); a network of actors (Carbone and De Martino, 2003), a bundle of resources and activities (De Martino and Morvillo, 2008), an actor of the business relationships network (Harrison and Håkansson;, 2006); an open system (Cetin and Cerit, 2010). In accordance with these interpretations, the unit of analysis has become increasingly complex, going further the terminal as key actor of port competitiveness, embracing actors' inter-organizational relationships – at dyad, supply chain and network levels (Carbone and De Martino, 2003; Compés Lòpez and Poole, 1998; De Martino and Morvillo, 2008; Tongzon, 2009; Tongzon *et al.*, 2009) – and more intangible characteristics: resources activation (Harrison and Håkansson, 2006), port management and organization (Brooks and Pallis, 2008; Cetin and Cerit, 2010).

With reference to the conceptual categories and framework of the analysis, the research is very rich and heterogeneous. In the first studies adopting the Industrial Organization's perspective (Heaver, 1995; Robinson, 2002), the reference to Porter's value chain and system is predominant and approaches of analysis are directed towards the definition of competitive strategies (cost leadership and/or differentiation). In later time, scholars have adopted a more systematic view of value creation and studies are aimed at the understanding of collaborative and competitive relationships among port business actors and the assessment of their impact on port performance. In particular, a group of researchers (Heaver *et al.* 2001; Song, 2003, Yap and Lam, 2004) analyze the effect of cooperative and competitive strategies between Port Authorities and other port players on port competitiveness. Carbone and De Martino (2003) apply the Lambert tri-dimensional model in the analysis of port integration in a specific supply chain. Based on this framework, other authors focus on terminal integration and orientation (Song and Panaydes, 2008; Tongonzon, 2009; Tongonzon et al, 2009). Bichou and Gray (2004) define a new framework to measure port performance according to the SCM approach. In these studies, relationships are vehicles for value creation as they allow to address behavioral uncertainty such as opportunism, reduce transaction costs between the partners of the logistics and supply chains, thus increasing port efficiency and customer satisfaction. Another group of researchers have used a mixed approach of analysis of port competitiveness in an effort to analyze agility (Paixão and Marlow, 2003; Mangan and Lalwani, 2008), attractiveness (Ng, 2006) and organizational effectiveness (Cetin and Cerit, 2010). In particular, the optimization of port business processes in the supply chains is not sufficient to succeed. Indeed, knowledge, human resources, port reputation are crucial in order to compete, since they can be acquired through time and experience, thus becoming a hard-to-imitate competency.

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Table 3.1: The analysis of port value creation, according to the SCM approach, in the port literature

PORT CUSTOMER	FOCUS OF THE ANALYSIS	UNIT OF THE ANALYSIS	THEORETICHAL FOUNDATIONS	MAIN ISSUES FOR P.A'S STRATEGY
Shipping company Heaver *et al*. (2001); Notteboom and Winkelmans (2001); Song (2003); Yap and Lam (2004); Tongzon and Heng (2005); Ng (2006); Song and Panaydes (2008); Tongzon *et al.*, (2009). **Shipper** Heaver (1995); Compés Lopez and Poole (1998); Robinson (2002). **Client portfolio** Carbone and De Martino (2003); Bichou and Gray (2004); Yeo *et al*., 2008; De Martino and Morvillo (2008); Mangan and Lalwani (2008); Brooks and Pallis (2008). **Freight forwarder** Tongzon (2009).	**Port Authority strategy** Heaver (1995); Notteboom and Winkelmans (2001); Brooks and Pallis (2008); Tongzon and Heng (2005). **Relationships and performance** Compés Lopez and Poole (1998); Heaver *et al*. (2001); Carbone and De Martino (2003); Song (2003); Bichou and Gray (2004); Ng (2006); Yap and Lam (2004); Harrison and Håkansson (2006); De Martino and Morvillo (2008). Yeo *et al*., 2008; Tongzon *et al.* (2009) ; Tongzon (2009); Cetin and Cerit (2010). **Paradigm shift** Robinson (2002); Paixão and Marlow (2003); Mangan and Lalwani (2008).	**Terminal** Heaver (1995); Heaver *et al*. (2001); Notteboom and Winkelmans (2001); Paixão and Marlow (2003); Song (2003); Bichou and Gray (2004); Yap and Lam (2004); Tongzon and Heng (2005); Ng (2006); Song and Panaydes (2008); Mangan and Lalwani (2008). **Shipping company** Robinson (2002); Yeo *et al*. (2008). **Supply chain and network** Compés Lopez and Poole (1998); Carbone and De Martino (2003); De Martino and Morvillo (2008); Tongzon (2009); Tongzon *et al.* (2009); Harrison and Håkansson (2006).	**INDUSTRIAL ORGANIZATION** **Competitive strategies** Heaver (1995); Notteboom and Winkelmans (2001); Song (2003). **Efficiency and effectiveness** Ng (2006); Brooks and Pallis (2008); Cetin and Cerit (2010). **SC integration and orientation** Robinson (2002); Carbone and De Martino (2003); Bichou and Gray (2004); Song and Panaydes (2008); Tongonzon (2009); Tongonzon *et al* (2009). **MIXED APPROACHES** **Lean and Agile** Paixão and Marlow (2003); Mangan and Lalwani (2008). **Cooperation and competition** Heaver *et al*. (2001); Song (2003); Yap and Lam (2004); Tongzon and Heng (2005). **RESOURCE-BASED VIEW** **Business relationships and resource activation** Harrison and Håkansson (2006); De Martino and Morvillo (2008).	**Terminal and performance measurement** Heaver, 1995; Heaver *et al.* 2001; Notteboom and Winkelmans (2001); Robinson (2002); Song (2003); Bichou and Gray (2004); Yap and Lam (2004); Tongzon and Heng (2005); Ng (2006); Song and Panaydes (2008); Brooks and Pallis (2008); Yeo *et al*. (2008); Tongzon, 2009; Tongzon *et al.* (2009); Cetin and Cerit (2010). **Resources and network** Paixão and Marlow (2003); Carbone and De Martino (2003); Harrison and Håkansson (2006); De Martino and Morvillo (2008). Mangan and Lalwani (2008).

Source: De Martino *et al*., 2013

Moreover, there is an emerging field of research drawing on the RBV that focuses on business network relationships (De Martino and Morvillo, 2008; Harrison and Håkansson, 2006) as leading factors for port competitiveness. In particular, in these studies, the relational capacity of the Port Authority and port business operators are key features for acquiring and combining critical resources (knowledge and dynamic capabilities) that create value for customers.

Finally, there is a clear recognition of the need to adopt a bottom-up approach in the Port Authority's decision making process in order to define an active (and pro-active) role for ports in the new competitive scenario. Most of the studies have considered terminal as a key resource (critical asset) in the Port Authority's decision making process, especially with respect to the shipping company's requirements (Bichou and Gray, 2004; Heaver, 1995; Heaver *et al.*, 2001; Notteboom and Winkelmans, 2001; Robinson, 2002; Song, 2003; Song and Panayides, 2008; Tongzon and Heng, 2005; Tongzon *et al.*, 2009; Yap and Lam, 2004; Yeo, Roe, and Dinwoodie, 2008). Others have tried to define comprehensive port performance measurement aimed at quantifying the effectiveness of policy actions consistent with the organizational and managerial context of the port (Brooks and Pallis, 2008; Cetin and Cerit, 2010; Ng, 2006). Few contributions have considered the crucial role of knowledge and other resources in boosting inter-organizational relationships (Carbone and De Martino, 2003; De Martino and Morvillo, 2008; Harrison and Håkansson, 2006; Paixao and Marlow, 2003).

From the literature review, it become apparent that the issue of "who is the real actor of the competition" has generated different interpretations of port that have led to different results for what port competitiveness and value creation are concerned. The port's interpretation of Robinson (2002) as a Third Party Logistics provider draws on the concept of value constellation and his work represents a fundamental contribution to the definition of a model of analysis of port competitiveness. In his exemplification, however, the framework deals with value exclusively from the perspective of the shipping companies. At this regard, models based on a network perspective can offer a contribution to the understanding of the modalities of interaction among port actors, in the management of business activities and resources in the process of creating value for the client. In this regard, port authority can develop a facilitator and community manager roles at local and regional levels (Verhoeven, 2010).

3.3 The conceptualization of port as a network of actors

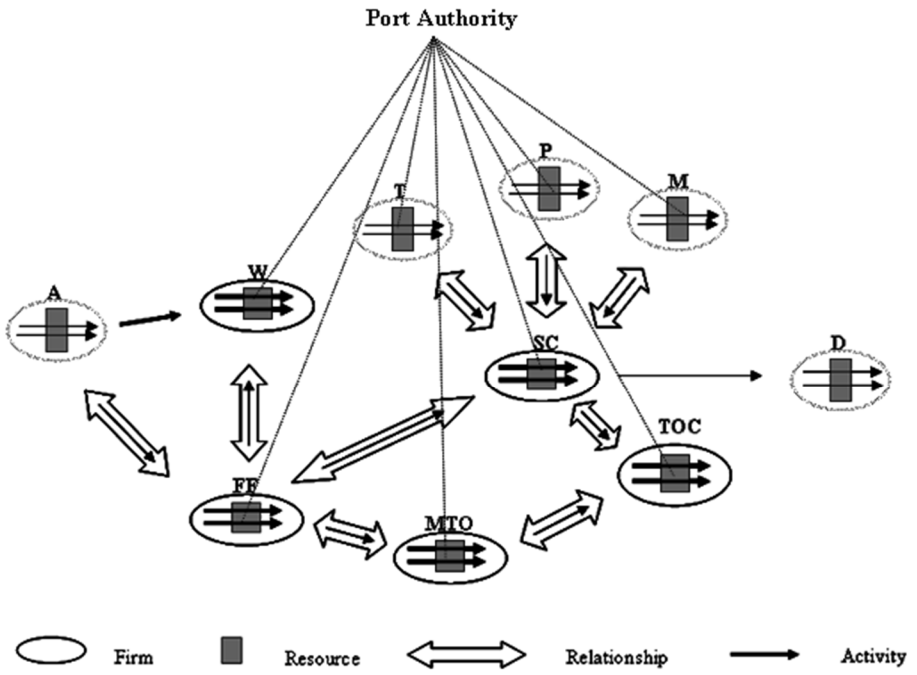
From the examination of the SCM models developed in Chapter 2, the work by Dubois *et al.*, (2003) proves to be particularly useful in representing the creation of value for port in supply chains. The model, based on the value chain constellation concept already applied by Robinson (2002), allows to interpret the port as a network of actors who co-produce value by promoting different interdependencies (sequential, pooled and reciprocal) between supply chains. In reality, the port is involved in a number of supply chains (each one characterized by a specific customer value) and, contextually, the services supply in a specific supply chain is generated by different port actors (the port is a network of companies) that pursue a common strategy in satisfying the specific needs of the customer.

To apply this model to the port's environment, two components of the concept of integration can be distinguished: firstly, the Port Authority, which determines the quality of the hardware component (infrastructure and their inter-connections with the market place) of the port's offer; secondly, the software component, which is defined by the capabilities or the development of distinctive competencies of other port actors in managing various activities in the supply chain. Even though the two components are closely interdependent, the software one is considered the determining factor in port competitiveness, at least for industrialised countries (Huybrechts et al, 2002).

Port Authorities are called to ensure and enable the efficient management of supply chains through policy actions. These should be aimed at:

- √ Improving port infrastructures and their connections within existing transport systems, keeping in mind the criteria of environmental, social and economic sustainability;
- √ Allowing free competition between port operators through concessions of terminals and spaces for the supply of value added services;
- √ Enhancing the collaboration and coordination of port activities through IT systems;
- √ Promoting the development of its own hinterland by creating economical, relational and social connections between the port and the market place.

The ability of "port" to recognise and exploit interdependencies within and between different supply chains will determine its ability to create value in supply chains. Figure 3.1 provides a simplified overview of port value constellation.



Legenda: SC= Shipping Company; TOC = Terminal Operator; T= Towage; P= Pilotage; M= Mooring; MTO= Multimodal Transport Operator; FF= Freight Forwarder; W= Warehousing for value added services

Figure 3.1: A simplified view of port value constellation

Source: De Martino *et al.,* 2013

In this framework, the port is represented as a network of actors that carry out a number of activities in the supply chain in close collaboration, sharing different resources. The level of collaboration will depend on the benefits that actors will perceive in promoting the pooled and reciprocal interdependencies between the various supply chains. The features of the supply chains play a key role in defining the port development policies, because they determine the importance of the resources to be owned and controlled.

In this value constellation, the landlord Port Authority[1] has different modalities to intervene in supporting, creating and marketing the port community. At this regard, Chapter 5 provides a set of Port Authority's policy actions for boosting collaboration and port integration with the hinterland.

[1] The ownership structure of port can be represented by four types of models: Public Service Port; Tool Port; Landlord Port and Fully Privatized Port. Each of this model is characterized by a different power of regulation and

Port activities are generally performed by private business operators, who exchange resources, share knowledge and build supply chain capabilities in the pursuit of customer satisfaction. In the simplified view of port network, firm A has to export products to D; many port operators are involved in performing activities through different resources, that is to say the shipping company SC, the towage, pilotage and mooring operators (T, P and M), the terminal operator TO, the multimodal transport operator MTO and the freight forwarder FF. From the FF's perspective, the main customer is the manufacturing firm A that requires specific services attributes (cost, time, frequency and quality) to export products overseas. FF will be in charge of the logistics and transport chain organization through the involvement of different service providers: MTO for the inland transport, SC for the maritime transport. From the SC's perspective, the main customer will be FF, and service providers will be the terminal operating company (TOC) and pilotage and mooring operators (T, P and M).

Three ideal types of port service supply chains can be defined that represent configurations of value constellation with reference to specific targets of port's customers: shipping company (α), multimodal transport operator/freight forwarder (β) and shipper/manufacturing firm (γ). Each of this supply chain will be characterized by different bundles of resources that can foster the development of relationship networks as driver of value creation in the port.

3.4 The conceptualization of the Port Service Supply Chain

The objective of this section is to define the service supply chains that originates from the port. In the service literature, the service supply chain is the network of suppliers, service providers, customers and other supporting units performing the function of transaction of resources required to produce services and dealing with the transformation of these resources into supporting and core services and the delivery of these services to customers (Baltacioglu A. *et al.*, 2007). Also with reference to port, the different typologies of services can be conceptualized as service supply chains involving suppliers, service providers, customers and resources. These resources play an important role as they can promote the development of relationship networks among the port operators and other actors of the regional economic system. In the same vein, value creation originates from port operators' interactions for the acquisition and control of those resources that represent critical assets in the process of customer's satisfaction.

The conceptualization of service supply chain in the port according to the Resource Based View of the firm (Barney, 1991) relies on two core assumptions.

First, resources allocation and interaction (Baraldi *et al.*, 2012) enable to analyze the strategic orientation of both the port authority and port operators towards the customers' satisfaction. In other words, the strategic orientation of the port meant as a network towards customer's satisfaction relies on the bundle of resources available for the service provision. Following Penrose's (1959) concept of resource heterogeneity, the value of a resource always depends on which other resources it is combined with (Håkansson and Snehota, 1995). The interactive nature of resources needs a focus on resource bundles or combinations of resources across firm boundaries rather than on the characteristics of a single resource (Håkansson and Snehota, 1995). Within port, resources are those necessary to perform cargo handling, transport and value-added logistics activities, as they are crucial to create services for different target groups (De Martino and Morvillo, 2008). Traditionally, strategic resources in ports were mainly physical and subdivided into those of public property - infrastructures such as terminals, quays, inter-modal connections, etc. - and those of private property - superstructures, *i.e.* assets for the supply of transport and logistics services such as cranes, depots, equipment, etc. However, in combination with these physical resources, the knowledge-based assets-human capital, cooperation and joint problem solving, knowledge sharing and acquisition, IT systems

administration of the public body, the Port Authority. In this paper, the focus is on the Landlord Port model, typical ownership structure of most of the European ports and its pro-active roles (Verhoeven, 2010).

- are increasingly becoming source of competitiveness and innovation as they define competences hard to imitate.

Second, resources are closely linked to activities and actors utilize them within specific activities where their potential value can become visible and be exploited (Håkansson, 1987). As in the service production process value is co-produced through the interactions service providers - customers (Normann and Ramirez, 1994; Vargo, 2008; Baltacioglu *et al*., 2007), also with reference to the port service production process, port operators (terminal operating companies, shipping companies, freight forwarders, logistics operators) co-produce value through the interactions with their customers. Depending on the focus of the analysis (firm, dyad, supply chain and network), the customer in a dyadic relation can be the supplier in a supply chain or network. According to De Martino *et al*. (2012), the network perspective is particularly effective in the decision making process of port authority (or lead firm in the port context).

The unit of analysis of value creation is the dyad within the port perimeter and, extensively, the service supply chain and network, extending the analysis to other actors of local economic system. This is also in line with the study carried out by Coopens *et al.*, (2007) that analyze the economic impact of the port activities by considering three typologies of relationships among port actors: among the port actors in the port perimeter; between the port actors in the port perimeter and port actors outside the port perimeter; between other sectors (non-port actors) in the port perimeter and other sectors (non-port actors) outside the port perimeter.

In the port context, the traditional dyadic relation (Figure 3.2) is characterized by the interactions between the port service provider (TOC) and the port customer (SC). With reference to port service suppliers (T, M, P operators), pilotage is a mandatory technical-nautical service organized on a monopoly basis in most European ports whereas towing and mooring services can be provided by either the public or private sector on a voluntary or mandatory basis, exclusively or in competition with other operators. The core service - the supply of technical/nautical and terminal services (vessel tie-up services, container/cargo handling and transfers) - is represented by the sphere generated by the matching of supply and demand. Physical resources necessary for providing these services are those allocated by the port authority such as terminal and quay and those deployed by port operators (assets for the supply of maritime transport and cargo handling).

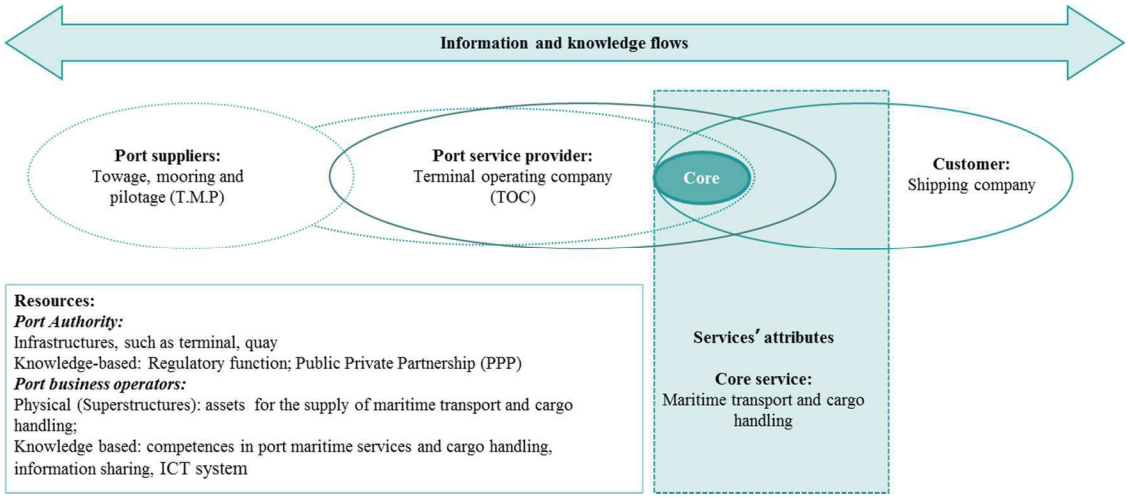


Figure 3.2: Port service supply chain α: the core service of the port

Source: De Martino *et al.,* 2013

The port shows an approach mainly focused on internal logistics, based on the supply of cargo handling services as the main customer is represented by shipping companies. In this case, strategic options are aimed at maximizing throughput, improving shipping companies' satisfaction and increasing the efficiency of port operations, while reducing their environmental impact. This is the typical and

traditional port service supply chain, know-how and ICT systems being well established and available in the market. The application of this framework to real cases contributes to highlighting the network of suppliers, service providers, customers and the port authority role, as well as the required resources to produce services for customers.

For example, Montreal Gateways Terminal (MGT), a global terminal operator which operates in North American ports, provides handling services to some of the major shipping companies, such as Hapag-Lloyd, Maersk, Hanjin Shipping, CMA-CGM, APL and MSC (Figure 3.3).

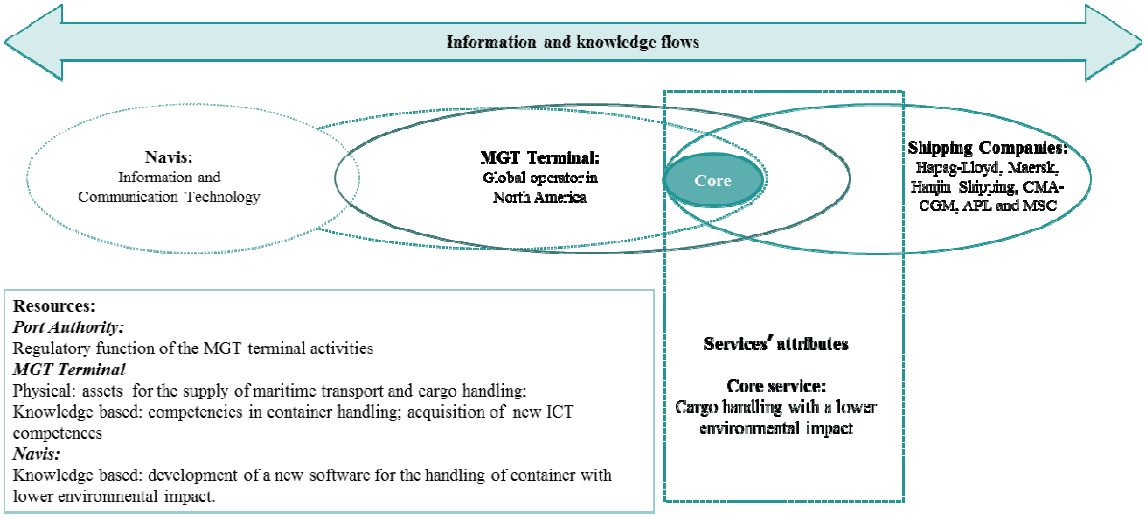


Figure 3.3: Port service supply chain of MGT terminal

Source: MGT Terminal website and www.canadiansailing.ca

In 2011, MGT signed a cooperation agreement with Navis, a California-based company operating in the field of Information and Communication Technology, in order to develop a new terminal and referee containers management software, with the aim of reducing the impact of port operations, while maintaining high levels of production efficiency (www.canadiansailings.ca). For the realization of this software, the Navis has developed an intense cooperation relationship with the main MGT's customers, the shipping companies, aimed at identifying the costs and benefits of their activities, not only in economic but also in environmental terms. The MGT is also one of the founders of Green Marine, a voluntary basis initiative for the promotion of the environmental programme for the North American marine industry. This initiative has involved over the years a growing number of port operators, including the shipping companies, which intend to further improve their environmental performance beyond regulatory requirements.

When the port expands its core business to include the supply of complementary services such as inland transport, rail intermodality and warehousing, the bundles of resources increase. Physical resources need to be allocated by the port authority allowing the port to be interconnected with the local transport system as well as the knowledge-based one, which can be related to the training and educational services, networking activity and technology development (Figure 3.4). In order to provide intermodal services, different forms of inter-organizational relationships will be developed by port actors for the control and sharing of resources leading to customer's satisfaction, such as the assets for the provision of supplementary services, as in the case of road or railways transport.

In particular, the development of new rail connections, while it represents a first strategic objective for the integration of ports with the market (especially in the context of the hinterland), it is however complex and requires substantial investments. Rail operators are reluctant to start new connections unless risks are limited; in this respect, Port authorities can play a strategic role, by making direct investments in the hinterland or by developing partnerships with the main local railways operators finalized at acquiring the adequate competences to guarantee the sustainability of these services. In

an increasing number of ports such as Le-Havre, Genoa, Barcelona, Rotterdam, Antwerp, Trieste, the Port Authorities have invested in adequate network of railway and road connections in order to favor container traffic growth and overcome the lack of space within the port perimeter. In this services configuration, the port authority can play the role of community manager by coordinating and mediating conflicts between the port and local communities; by solving collective action problems in and outside the port area, such as hinterland bottlenecks (Verhoeven, 2010). In some cases, it can perform an entrepreneurial role not only to guarantee the financial sustainability of these services, - by making direct investments in the hinterland, - but also to foster knowledge transfer and firms' competences development by forming partnerships with the main local railways operators.

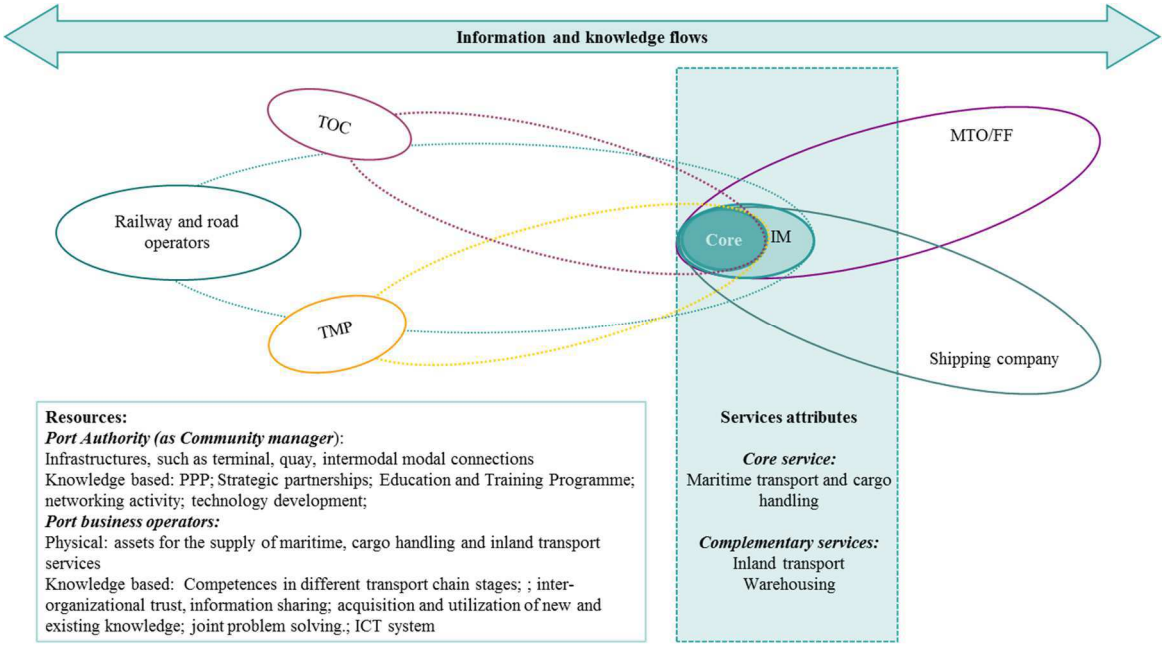


Figure 3.4: Port service supply chain β: intermodality

Source: De Martino *et al.*, 2013

This framework can be used to interpret, at this regard, the initiatives undertaken by the Amsterdam port authority in order to develop the concept of Smart Port (Figure 3.5). The port authority has led the development of new ship-to-grid solutions that allow inland ships in the harbor to use green energy from the grid instead of their own stationary diesel generators (Amsterdam Smart City 2011).

In this case, the technology itself is not innovative, rather it is the development of an effective collaboration among a wider range of seaport and city stakeholders the major challenge and outcome of the project. Indeed, for the deployment of the new solution, a close collaboration among many stakeholders from the municipality and several service providers with complementary competences (ICT infrastructure, engineering, grid operator) was required. Moreover, to standardize the grid solution for the ship, the seaport of Amsterdam worked closely also with the National Port Council and the World Port Climate Initiative (European Parliament/ITRE 2014). Thus, the logistics innovation pursued by the Amsterdam port authority does not primarily involve novel technological solutions, but is centered on the development and promotion of an effective collaborative innovation network allowing the combination of different specialized competencies and resources, the sharing of risks, the increased awareness of sustainability issues, and the spread of a culture of innovation. Moreover, in line with the service innovation perspective, organizational innovation (*i.e*. a new inter-organizational structure) and social innovation (*i.e.* increased awareness of environmental issues such as energy saving and lower Co2 emissions) were, in this case, strictly combined with the technological dimension (Errichiello and Marasco, 2014).

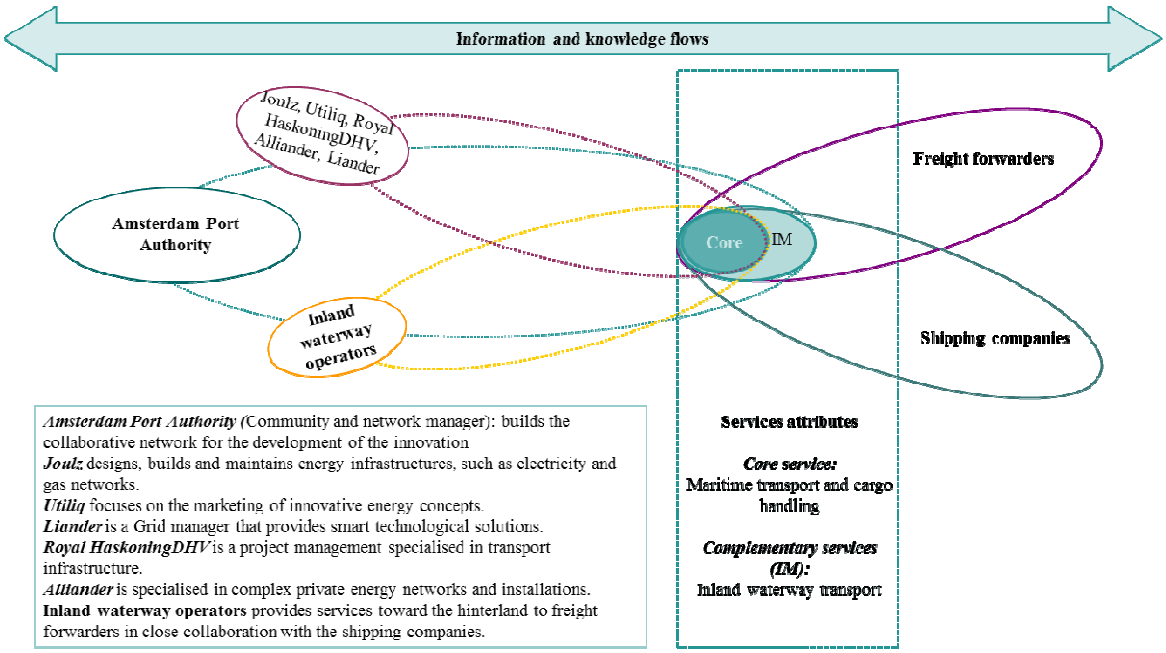


Figure 3.5: The ship-to-grid project managed by the Amsterdam port authority

Source: Amsterdam Smart City, 2011

Finally, the port can further extend its influence beyond the traditional boundaries towards the hinterland, including activities, resources and actors of the regional economic system (Figure 3.6). Value creation, in this case, will be more reliant on external and complementary resources and competences that hardly port business operators own internally. Collaborative relationships become particular crucial for effective interactions even with actors external to the port context for the development of value-added logistics services. In this case, the port authority can have an active role in the development of port service networks, not only as community manager but also as entrepreneur. Specifically, the port authority can sustain the initiation, consolidation and institutionalization of a great number of interactions among port actors and other firms of the regional economic system, for the provision of core and supplementary services such as inland transport and warehousing; value-added logistics, manufacturing and distribution.

For example, in order to strengthen the role of the port of Le Havre in the service supply chains, the port authority has invested in the construction of three logistics platforms: the Parc Logistique du Pont de Normandie, the Parc de Port in 2000 and Hode. The objective is to encourage the establishment of specialized operators such as Gefco, Zanussi, Daher, Buffard, Danzas for the provision of a wide range of value-added logistics services such as labelling, stock management, conditioning and pricing. The logistics operator Gefco, in particular, is responsible for the organization of the European distribution of cars of different producers, including Renault. The company participates in the Ro-Ro Max project, involving the Ro-Ro terminals (SETH), shipping companies (such as Hual-Cetam and MOL), railways operators (RSC), customs, for the realization of innovative and sustainable distribution services (http: //www.terminal-roro-lehavre.fr).

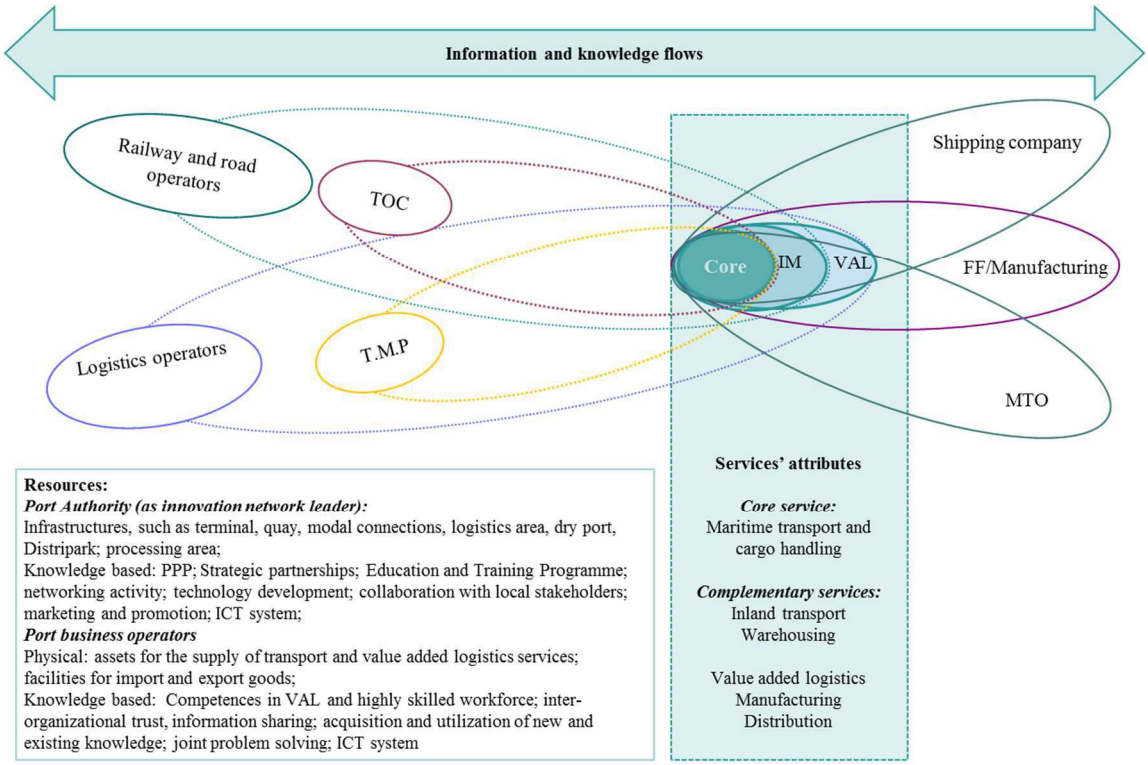


Figure 3.6. Port service supply chain γ: value added logistics

Source: De Martino *et al.*, 2013

In particular, through the implementation of new technologies (which connect the various activities of the intermodal transport chain to customs controls) and collaborative network developed under the project, Gefco is able to provide different services (intermodal, assembly cars, quality control and compliance with European standards), in agile and efficient way, depending on the customer requirements. The shipping company MOL, which is partner of the project, has created a company, MOL Logistics, to provide logistics services in the European Logistics Center (ELC) in Rotterdam. RSC provides rail services to Rotterdam (Figure 3.7).

In the cases shown, different relationship networks can characterize the port service supply chains: hierarchical, collaborative, hybrid and the last driven by the Port Authority's intervention. Each of these network configurations will lead to different patterns of value creation and distribution: within the firm or corporate realm, in the dyad, along the supply chain and at network's level. Power control and cooperative behaviors will shape the relational dynamic in the port service supply chains and the contribution of the port network to local economic development.

Port Authorities can embrace concession policy as a mean to promote competition among port operators within the same business, but also to enhance the collaboration and coordination of port activities through resource allocation, thus creating economical, relational and social connections between the port and the hinterland. At this regard, strategic alliances and partnerships can be increasingly implemented to pool different resources and skills, that generally port business operators do not own internally. The intermodality and the development of logistics are therefore crucial for generating value in the port-market relationships.

In conclusion, resources (both public and private) play a leading role for the port integration with its territory; however, the coordination mechanisms – such a transactional relationships, collaborative alliances, partnerships or vertical Integration – of the port activities determine value creation and distribution. This consideration supports the need to investigate power struggle and cooperative dynamics shaping the port service supply chains.

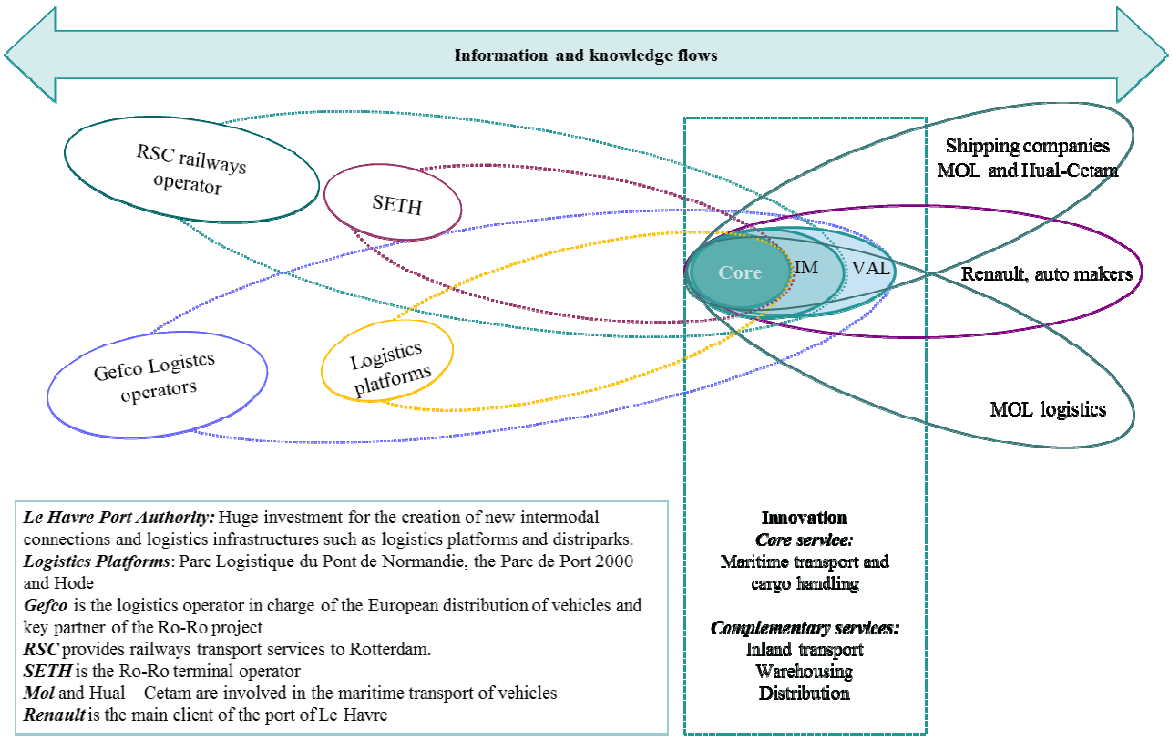


Figure 3.7. The Ro-Ro Project in the port of Le Havre

Source: www.terminal-roro-lehavre.fr

3.5. The model of analysis of port value creation

The basic assumption of the model is that port value creation depends on interactions and relational dynamics between port authority and private port operators for managing supply chain resources (convergence of their value propositions toward the common strategic objectives and customer satisfaction). The availability of transport and logistics resources is a condition that determines port's ability to generate value (Figure 3.8).

As port service supply chains are embedded in contexts that support or restrict the development of collaborative practices (Ho *et al*., 2002), the model considers the Port regulatory framework, freight villages and rail market as external and contextual factors. Other external factors can potentially affect the development of collaborative practices along the port service supply chain such as Market Regulation, the opening to foreign investments, the customs procedures. Market regulation is an important factor affecting the integration of port with its hinterland and port competitiveness in a global scenario. In particular, the liberalization of the railways market has had an important effect on the integrative practices performed by Shipping Lines and Terminal Operating Companies in most of the northern European Ports (Franc and Van der Horst, 2010). Although important, the proposed model focuses mainly on the role of port authority meant as an active actor of port competitiveness through its policy actions. This is also in line with the increasing acknowledgment of the strong interplay between Public Policy and supply chain capabilities and performance (Morash and Lynch, 2002).

The active role of the port authority in supply chains is a crucial topic debated in the port management literature and the discussion focuses on whether its role should be restricted to enforcing regulation or whether it should more actively participate as market player (Verhoeven, 2010). This issue can be addressed by considering public policy as an input or a resource into port service supply chains (Morash and Lynch, 2002).

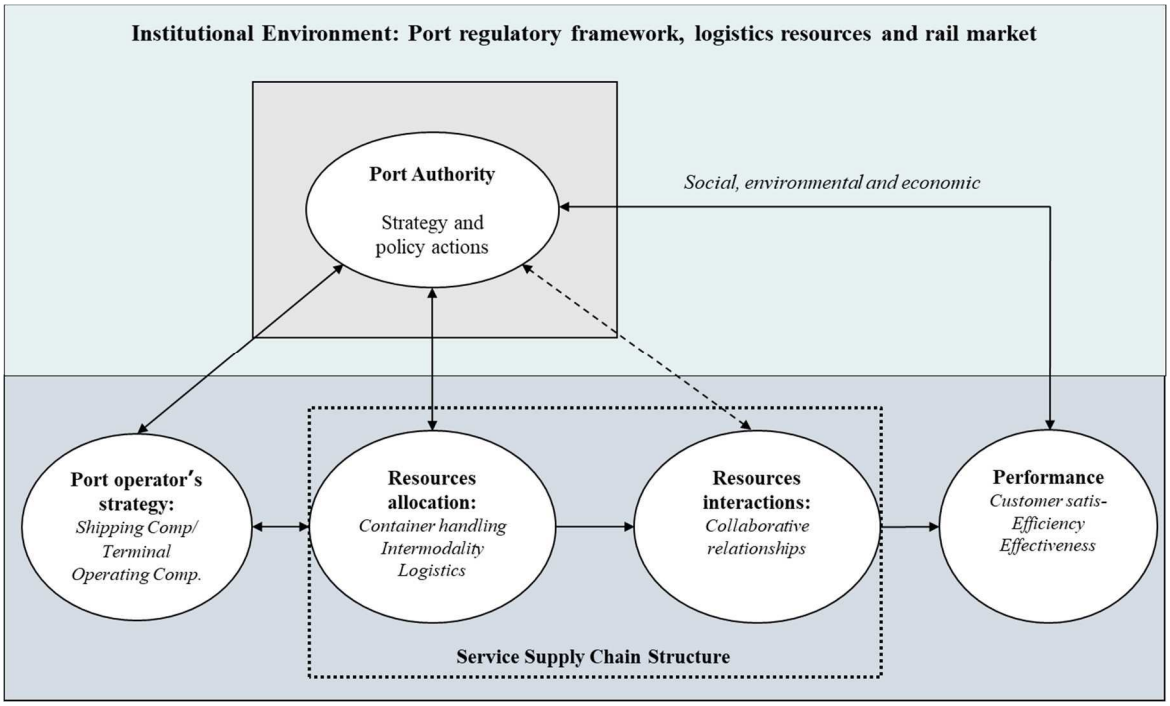


Figure 3.8: The model of analysis of port value creation

Source: own elaboration

The proposed model of analysis of port value creation considers the contribution of public and private resources to the processes of port value creation. The power struggle among port business operators for their control determines:

- ✓ Horizontal competition for those competing in the same business, such as container handling, or railways and intermodal services, in order to keep their competitive position in the port-hinterland market;
- ✓ Vertical competition over the value appropriation along the service supply chain, through the control of key resources in each stage of the chain.

Vertical competition between port business operators around key supply chain resources, as well as the horizontal contestation between direct competitors, shape a wide variety of service supply chains structures, each of which will have different structural configurations of power. In this regard, the port authority can assume a conservator, a facilitator/community manager and/or an entrepreneur role (Verhoeven, 2010).

The proposed model is innovative in comparison to the other models of analysis of port competitiveness as it explores the contribution of public and private resources to the port value creation processes. These determine horizontal competition between those actors who compete to own and control a particular supply chain resource. At supply chain level, there will be, at the same time, a vertical struggle over the value appropriation among port business operators at each stage of the service supply chain. The understanding of the power struggle over value appropriation among port actors around particular supply chain resources, as well as the horizontal contestation between direct competitors, determine the strategic and operational environment within which companies and enterprises operate. This leads to the existence of a wide variety of port service supply chains, each of which will have a different structural configuration of power. At this regard, the port authority can assume a pro-active role depending on the port developing stage. This issue will be deeply addressed in Chapter 4 that deals with the Port Authority's roles in promoting collaboration and supply chain integration.

3.5.1 Relationships in port service supply chains

The model distinguishes two levels of actors' interactions:

- √ Public and private relationships, that refer mainly to port authority and port business operators such as terminal operating companies and shipping companies;
- √ Supply chain relationships, mainly concerning port business operators.

Public/private relationships can be reciprocal in the sense that port authority may depend on port business operators' capabilities to identify the effective policy actions, such as infrastructure development, internationalization and marketing strategies. On the other side, port business operators are aware that their competitiveness depends on the availability of supply chain resources made available by Port Authority. Key supply chain resources support port business operators' competitiveness, representing strategic investments for attracting new businesses at local level, thus creating value networks.

Public/private relationships can also be cumulative in the sense that resources and capabilities continue to develop and grow over time and become increasingly committed and specialized to the international markets and public policy relationships. Although in most cases the public-private relationships can be perceived as adversarial (in terms of sovereign nation tariffs; import quotas; antidumping prohibitions; environmental standards), in principle there are no absolute reasons that port business actors and port authorities could not seek collaborative relationships and partnerships that would result in win-win or synergic outcomes (Morash and Lynch,2002). Examples of such synergic outcomes might consist of tailored transportation infrastructures, public-private partnerships for infrastructure development, customized and synchronized custom procedures, active promotion and marketing policy. At this regard, Verhoeven (2010) identifies new functions that the port authority could perform in order to reduce the frictions and conflicts between port and local stakeholders: the facilitator/community manager and entrepreneur roles.

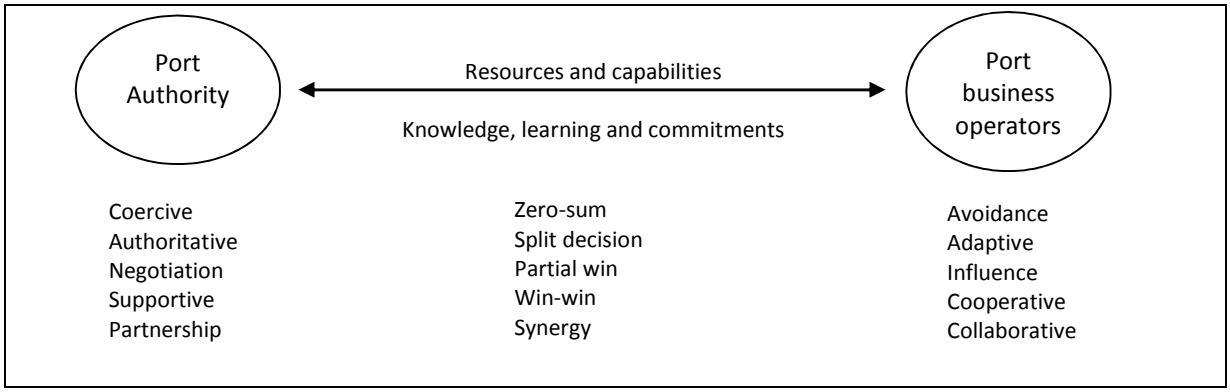


Figure 3.9: Dynamic model of Public-Private interactions for resources and capabilities' development

Source: adaptation from Morash and Lynch, 2002

The community manager is essentially oriented to solve collective actions problems in and outside the port area, such as hinterland bottlenecks, training and education, ICT, marketing and promotion activities. In particular, the port authority is actively involved in finding an equilibrium between the economic and social dimensions of the port development, between the private interests of the port business operators and those of the local community in order to defend the "license to operate". At this regard, Comtois and Slack (2003) consider the Port Authority's actions at two levels: the regional level, where the port authority acts as an agent and coordinator in logistics development, creating regional port networks and sustaining the environmental development of the port, and at global level, where the port authority commercializes its expertise in logistics services and environmental

management worldwide. The entrepreneur Port authority will perform the facilitator/community manager function but with a stronger commercial attitude, as investor, service provider, and consultant at local, regional and global levels.

Collaborative relationships along the port service supply chain can be analyzed based on two factors that justify the explorative nature of this study: the content and the legal form of the relationship (Figure 3.10).

The content (why the relationship has been developed) can be determined by the need to acquire similar or complementary resources (Das and Teng, 2000). Relationships that exchange complementary property- and knowledge-based resources are more typical between the firms participating in the supply chain (customer-supplier). Relationships that integrate similar resources, which are either property- or knowledge-based, are more typical of direct competitors wishing to generate economies of scale, increase market share or deal with the large distributors in a more equitable way. In other words, they are set up to increase focal firms' bargaining power.

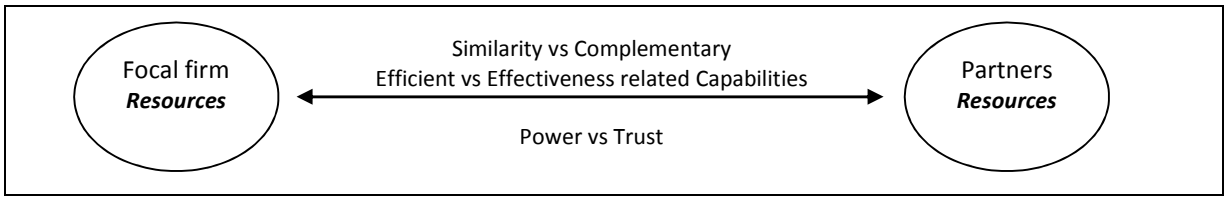


Figure 3.10: The collaborative relationships in the port services supply chain

Source: own elaboration

The content of a relationship can be also related to the development of capabilities (Day, 1994), complex bundles of skills and collective learning, exercised through organizational processes that ensure superior coordination of functional activities. At supply chain level, business actors would develop (Chen *et al.*, 2009): efficiency-related and effectiveness-related capabilities. Efficiency-related capabilities refer to the firm's ability to utilize resources (*i.e.* minimize costs) in order to get operational excellence. It has been stated that companies pursuing operational excellence seek ways to reduce costs, eliminate intermediate production steps and reduce transactional and other friction costs. Suppliers are frequently selected based primarily on cost and reliability, and the main output of the services supply chain are standardized or basic services. Effectiveness-related capabilities are the firm's ability to fulfil customer's requirements (*i.e.* enhance customer service).

The legal form (how to interact and make available the resources to the partner) can be determined, among different dimensions, by the level of power and control exerted by the focal firm on the other actors or by reciprocal trust and cooperative behavior among supply chain partners.

Most of the works addressing the legal form of the relationship have used the dichotomy equitable alliances vs. inequitable alliances (Gulati, 1995). However, four types of formal structures can be suitable to the port context (Das and Teng, 2000: Rice and Ronchi, 2002): joint ventures, minority equitable alliances, alliances based on bilateral contracts and alliances based on unilateral contracts. According to these authors, the joint venture constitutes the form of relational governance with the greatest hierarchical control and the contractual alliance the one with the lowest, while minority investment is the relational governance structure that offers an intermediate level of hierarchical control. This classification is also in line with the studies that have analyzed strategic alliances in the maritime and port sector (Heaver *et al.*, 2001; Meersman *et al.*, 2009, Franc and Van der Host, 2010).

3.5.2 The performance indicators

Performance is the extent to which a firm's goals are achieved (Ellinger, Daugherty, and Keller 2000). A firm's market performance includes both market share and customer satisfaction. While market share is a good indicator of the firm's competitiveness in the marketplace, customer satisfaction reflects customers' value perception. A firm's success in the marketplace rests on the firm's ability to attract, satisfy, and retain customers by creating customer value (Johnson 1998). When a firm develops distinctive supply chain capabilities through supply chain process integration, it is likely to achieve competitive advantage in the market (Day 1994; Olavarrieta and Ellinger 1997), that results in higher market share. Efficiency-related capabilities focus on cost reduction, while effectiveness-related capabilities such as availability, timeliness, and quality can positively impact on customers' value perception.

Efficiency, meant as cost-efficient and time-efficient operation, has been generally recognized as the most important port performance' indicator, given the traditional role of port as node between land transport and sea transport (Bichou and Gray, 2004). The increasing importance of the integration of port in the supply chain has led to consider the effectiveness aspects of ports in relation to customers' perspectives and expectations (Bichou, 2007; Song and Panayides, 2008). Efficiency and effectiveness are, therefore, key performance indicators in the port services supply chain environment. These contribute to the port competitiveness. Based on the literature review, Woo *et al.* (2012) identify measures to evaluate port performance encompassing aspects of both effectiveness and efficiency. Effectiveness includes external aspects of port operations such as service quality (reliability, timeliness, information provision), customer orientation (*e.g.* responsiveness, flexibility) and service price (*e.g.* cargo handling fees, storage charges). Efficiency includes internal operational aspects such as sea-side and land-side operations and other cargo handling activities (ship waiting time, ship turnaround time, cargo handling time, time from entry to exit of port, and other measures).

However, comprehensive concept of port performance should encompass competitiveness and sustainability for local economies and the use of local resources, to satisfy all stakeholders (Musso, 2009). At this regard, Table 3.2 provides a set of performance indicators at firm, supply chain and Port Authority's levels according to the different service supply chains.

3.6 Intermediate conclusions

When dealing with value creation in the port context, it is still debated who the actor of competitiveness is. The complexity of port in the supply chain is still an open issue as port has been very often characterized by the lack of a "*competitive community spirit*" among the actors, both public and private. From a theoretical perspective, the unit of analysis has become increasingly complex, going further the terminal as key actor of port competitiveness and embracing actors' inter-organizational relationships – at dyad, supply chain and network levels. Nevertheless, models applied to the analysis of port value creation still originate from the manufacturing industry and the role that resources play in boosting supply chain collaboration and value creation in port has been only recently addressed.

The opening towards the RBV and the network approach allows to unbundle complex processes and inter-organizational relationships that characterize ports and their contribution to customer satisfaction in the service supply chain. At this regard, the service supply chain insight is also very valuable to catch the specifics of the value proposition provided to different actors.

Table 3.2: Strategy, structure and performance in port service supply chains

		Supply chain Strategy	Actors involves	Supply chain relationships	Performance indicators
Port service supply chain	**Value added logistics**	**Strategy**: cost minimization and service differentiation	**At least three dyads:** **TOC-SC-** HTO – FF (Freight Forwarder)/ LO (Logistics Operators)/ shippers	**Complementary** resources for cargo handling and maritime transport, intermodality and logistics services: strategic importance of knowledge-based networks **Efficient and effective** related competencies: knowledge acquisition for new and improved logistics services **Hybrid legal form**: cooperative network (strategic alliances) for logistic services	**FIRM LEVEL:** Revenue and Market share **SUPPLY CHAIN LEVEL:** Cost minimization, service differentiation and innovation **PORT AUTHORITY'S LEVEL:** Performance indictors related to intermodality plus the followings: Diversification of the existing economic activity and rise in new productions Growth in the turnover and/or profitability of freight forwarders and manufacturing firms Increase of social cohesion sense Increase in the employment in the regional economic system Growth in the number of creative businesses in the regional economic system Improved image of the port city/region such as the title of Smart Port
	Intermodality	**Strategy**: cost minimization and time delivery	**At least two dyads:** **TOC-SC**- HTO (Hinterland Transport Operators)	**Complementary resources** for cargo handling and maritime transport, intermodality: importance of knowledge-based resources **Efficient and effective** related competences: knowledge acquisition for intermodal services **Hybrid legal form**: hierarchical for cargo handling and maritime transport, cooperative governance structures for intermodality	**FIRM LEVEL:** Revenue and Market share **SUPPLY CHAIN LEVEL:** Cost minimization and time delivery **PORT AUTHORITY'S LEVEL**: Performance indictors related to cargo handling plus the followings: Improvement of economic attractiveness and competitiveness Growth in the turnover and/or profitability of multimodal transport operators and freight forwarders Increase in the employment in the port-related activities Perception of belonging to a specific community Improved visibility of environmental information
	Container handling	**Strategy**: cost minimization	**Dyad:** **TOC (**Terminal Operating Company)- **SC (**Shipping Company**)**	**Similar resources** for cargo handling and maritime transport **Efficient related competencies** (internal logistics) for cargo handling and maritime transport **Hierarchical control** and equity-base governance structures for cargo handling and maritime transport	**FIRM LEVEL:** Revenue and Market share **SUPPLY CHAIN LEVEL**: Cost minimization Efficiency, internal logistics **PORT AUTHORITY'S LEVEL**: Growth in the turnover and/or profitability of terminal operators Increase in safety and security Air pollution reduction Water pollution reduction Noise pollution reduction

The main contribution of this Chapter has been the definition of a new model of analysis of port value creation drawing on the RBV theory and service supply chain literature. The model stresses the importance of understanding the relational dynamics between port business operators in the process of port value creation. It emphasizes the role of the port authority in nurturing and developing supply chain capabilities by promoting and sustaining synergic and win-win interactions with port business operators. The recognition of the interactive nature of the service supply chains capabilities represents a critical issue for spreading a culture of collaboration as a means for value creation. Collaborative spirit and mutual trust are fundamental to create reciprocal benefits and a higher level of involvement of the port business actors in the network. In this respect, it is important that the port authority owns the leadership and vision attributes that are required to effectively coordinate these efforts and promote a culture of collaboration and sustainability in the port. Building on a collaborative view of port service supply chain, many initiatives can be realized that bring together policy, business, government and research perspectives to generate solutions able to address port value destruction along the supply chain, competitive and social challenges.

In this respect, multi-criteria evaluation techniques are a key tool for the quantification of the benefits (economic, social, environmental) deriving from collaborative service supply chain and for the assessment of the priorities for actions in the specific port context. At this regard, the Chapter provides an overview of value creation at firm, supply chain and port levels for each port service supply chains. In this direction, the empirical analysis carried out in this study is aimed at testing and validating the proposed framework through an in-depth analysis of some port service supply chains in the Italian port system. The multiple case study analysis will shed light on the features and relational patterns of the port service supply chains and provide useful insights for the effective management of multi-firms collaborative arrangements that are functional to the development of port logistics networks.

4. The Institutional environment: Italian Port regulatory framework, logistics resources and freight rail market

4.1 Introduction

European port authorities are undertaking a process of profound change characterised by a more market and corporate-like orientation aimed at ensuring financial sustainability, maximisation of added value and port throughput. Combined with these economic objectives, Port Authorities are called to contribute to the general interests of the society, that can be resembled in: facilitating trade and business, especially in relation to the development of local economic system; ensuring the sustainability of port activity in economic, social and environmental terms; social and economic growth of the region in terms of value added, wages, local and national taxes paid and jobs; and developing maritime and hinterland connectivity. In order to pursue such objectives, Port authorities can exploit a number of tools defined by the institutional and regulatory context in which they operate. The survey undertaken by ESPO (2017) on EU port governance shows that most of EU Port Authorities already comply with normal commercial law. However, the efficacy of their actions for the accomplishment of economic and non-economic objectives depends on their ability to develop strategic partnerships with local and international stakeholders.

In Italy, the new port reform approved in 2016, the so called "Ports decree", is aimed at addressing the limits and weaknesses of the former law 84/94, trying to apply a more systemic and sustainable approach - the port logistics system - in the definition of port development strategies. This reform, analysed in section 4.2, provides the institutional and regulatory framework in which the port authority can actively affect port competitiveness and the socio-economic development of its own hinterland. The active role of the port authority both as local community manager and/or facilitator of trade and business in the local economic system depends on the presence of certain logistics resources in the region such as freight villages, intermodal nodes and railway connections. Section 4.3 focuses, at this regard, on the description of freight villages and railway connections. These resources allow the supply of intermodal and value added logistics for the export of Italian products and to the import of products to be distributed in Italy. In this scenario, the port authority can perform a crucial role in boosting the development of port logistics network, through the definition of interventions and actions aimed at increasing the relationships with key local stakeholders. Based on the literature review of the recent European port governance tools, section 4.5 provides a set of policy actions that the Italian port authorities could implement in order to favour the development of port logistics network. Based on the framework, section 4.6 is dedicated to the analysis of the main actions taken by the Italian Port Authorities, in the last years. Discussion and conclusions are provided in the last section.

4.2 The Italian "Ports Decree": Reorganization, rationalization and simplification of Port Authorities.

The "Reorganization, rationalization and simplification of Port Authorities decree" - the so called "*Ports Decree*" - has been approved on 21st January 2016[1]. It focuses on the competitiveness of

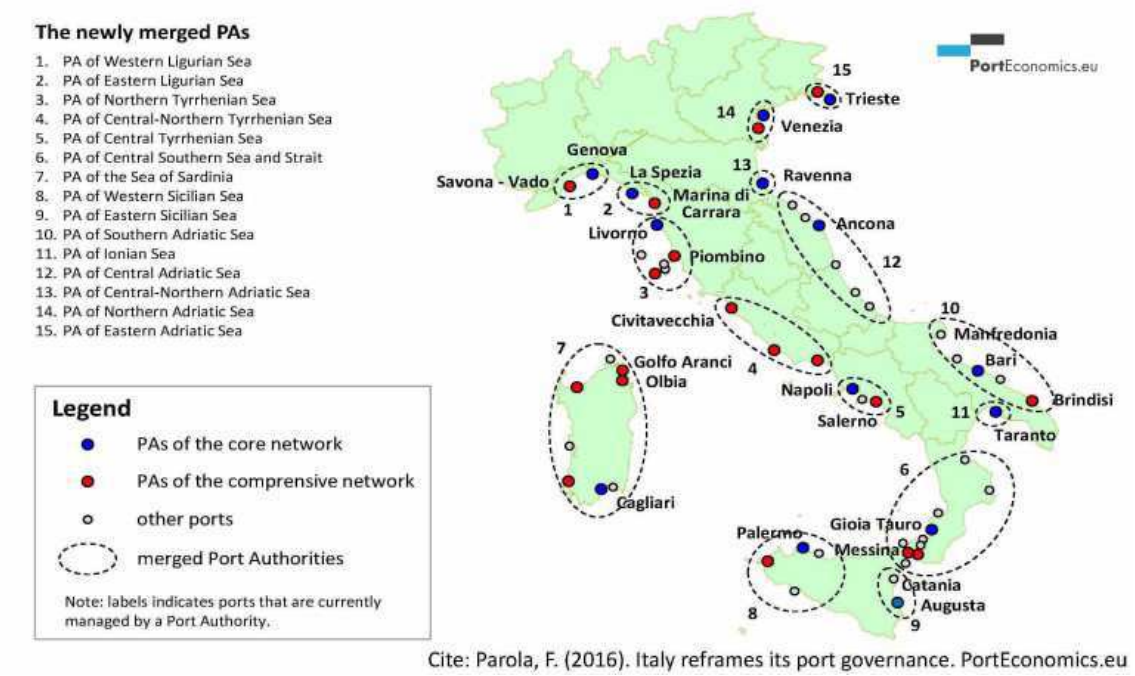
[1] The Ports Decree is part of broad strategy of the Ministry for Infrastructure and Transport (MIT) to develop the transport and logistics in Italy as defined in the document "National Strategic Plan for Ports and Logistics". The target of the National Strategic Plan of Ports and Logistics is the integration of the Italian logistics network, connecting the ports with the railway systems, with the logistics platforms,

Italian ports and supports the role of Italy - crossed by four of the TEN-T rail corridors - as a hub in the Mediterranean and European logistics platform.

The main changes that the Ports Decree has brought can be summarized as follows:

- ✓ The abolition of the port authorities and the creation of strategic decision centers managed by Port System Authorities (ASP);
- ✓ The simplification and internal re-organization of ASPs;
- ✓ The centrality of MIT and the national coordination board for the evaluation of the port development plans;
- ✓ The creation of the Partnership Table of Sea Resources;
- ✓ The adoption of Single Customs and Controls Window.

The Italian port system has been reorganized into 15 ASP based in the Italian "core" ports as set out by the EU (figure 4.1). These are: Genova, La Spezia, Livorno, Civitavecchia, Cagliari, Napoli, Palermo, Augusta, Gioia Tauro, Taranto, Bari, Ancona, Ravenna, Venezia and Trieste. The new ASP will be in charge of 54 national ports. In line with the rationale of the document, ASPs inherit the duties and the power of traditional PAs, with a broader geographical scope. For example, the three Ligurian ports were included in two different ASPs while three Apulian PAs formed a single ASP joining also a couple of minor ports.



Cite: Parola, F. (2016). Italy reframes its port governance. PortEconomics.eu

Figure 4.1: The Port Authorities in Italy after the reform

With the reference to the selection of the President, in the past reform he was appointed by Decree of the Ministry of Infrastructure and Transport, upon agreement with the Region of reference. In particular, the President of the ASP could be chosen among a group of three experts with excellent and proven professional qualifications in the fields of transport and port economy, proposed by the City/Province/Chamber of Commerce). With the new reform, the president is appointed directly by the Minister for Infrastructure and Transport in agreement with the president or presidents of the interested Regions. Moreover, a special department within the Ministry has been introduced, called the national coordination board, with the aim to rationalize and coordinate investments and financial resources of different ASPs, as a whole.

freight villages, and industrial districts and while reducing the road transportation and intervening on delays, disruptions and inefficiencies of the current organization.

With reference to the internal organization of ASPs, although extant planning tools (i.e. master plan, TOP and concession agreements) will endure the reform, the new Authorities will be organised in a different way. In particular, the Port Directorate will hold direct responsibility of ports[2] and, conversely, the Port Committee, representative of major port stakeholders categories, will lose decisional power in respect to the past, having only a consultative role.

The ASP has a strategic role in policy, programming and coordinating the ports in their own area. They will aim at attracting investments on behalf of the different harbors in conjunction with the public administrations. The relationship with MIT will also be relevant, especially for the Planning of Port Systems and infrastructure programs with national or European contributions.

The ASP will have a simple corporate governance structure that will be composed of: the President, the management committee (made up of just a few members), the secretary general and the Audit Committee (*Collegio dei Revisori dei Conti*). The change from the Ports Committee to the ASP will mean a drop in the members of the Port Authorities from the present 336 to 70 on a national level.

Each ASP will have a "sea partnership board" to communicate with the social and economic players operating in the ports. This board will also have advisory functions.

The Ports Decree establishes also the "Customs and controls single window", under the coordination of the Customs Agency, and the "Single administrative window", a front office dealing with all administration and authorization for non-commercial and non-industrial activities. The two "single windows" will replace the 23 offices, which are currently in charge of 113 port-related administrative processes so that custom clearance times should be drastically reduced. The Ports Decree also simplifies the arrivals and departures of vessels.

Finally, MIT is also focusing on several other initiatives to strengthen logistics ports system in the coming years:

- Simplification of dredging of the seabed through a relaxation of the rules within the "*Collegato ambientale*";
- Improvement of the "last mile" rail links: activation of several port rail links within the Rete Ferroviaria Italiana [3]("RFI") contract.
- Reassessing unimplemented projects and the unfreezing of investments: selection and review of strategic projects with the MIT and acceleration of construction sites with national and European funds.
- "*Ferrobonus*" and "*marebonus*": incentives for rail cargo and maritime transportation.
- Reduction or exemption from anchorage tax and excise duty in transhipment ports.

4.2.1 The terminal concession policy

Concession contracts represent the most important instruments that a port authority (PA) has to directly affect the management of port activities. In the landlord model, the PA can bargain with the terminal operator to reach some specific goals (Verhoeven, 2010). This may happen when the port area has yet been assigned to a private company (e.g. a pure terminal operator, a vertical integrated carrier), or during the renewal stage of the agreement if it is foreseen in the concession agreement (Theys and Notteboom, 2010). In general, once a terminal area has been

[2] ASPs are expected to play a coordination role, while for each former PA, a special Port Directorate (PD) will be in charge of the current PA tasks and duties, after proposing the implementation of different actions to the President of the ASP it belongs to.

[3] RFI is the owner of Italy's railway infrastructure network, it provides signaling, maintenance and other services for the railway network.

awarded, the concession contract sets the “rules of the game” (also in terms of investments) of both the actors involved: the stevedore operator and the PA.

Port concession agreements in Italy are public acts through which the PA awards the right to operate to a private company a defined activity in a certain specific port area. Because of the “public act” nature, changes cannot be made to the act until its expiration (Brignardello, 2010). Through the concession agreement, the PA establishes the number of port players allowing them to act as monopolists on their own awarded area. For this reason, the concession agreement is also accompanied by an operative authorization. This latter act gives the right to effectively operate the activity following the common port rules.

Port concession policy is still regulated by art. 18 of the Law 84/94 and each port authority has the right to apply a specific regulation based on the specific features of the port. In particular, the terminal is granted, through a public tender, to the party who demonstrates "*more profitable use of the concession and that, in the judgment of the port authority, responds to a more relevant public interest*". However, the new regulation of terminal concession (Ship2Shore, 2018) is in the stage of the approval by the Ministry of Infrastructure and Transport (MIT). The text is inspired by the recent pronouncement of the AGCM (2017), on the criteria for evaluating port concession offers; the Antitrust, in particular, asserted that generic references “profitable use” and “public interest” are not sufficient, but instead, the Port System Authorities are required to outline the specific and objective criteria, based on the concrete situation of the port. MIT has therefore drawn up a series of parameters, to which the individual authorities will have to relate when delineating the evaluation criteria for the new public tender. Among these, particular importance is given to the coherence of the proposed projects with the National Port and Logistics Strategic Plan (PSNPL), and then with the development guidelines established at central level to avoid overcapacity in the port area and the construction of new terminal that do not reflect the real needs of the market. Moreover, MIT believes that it is necessary to foresee a reward for those terminal operators who guarantee a greater use of the railway transport for the inland distribution, thus reducing the environmental impact of the port activities.

4.3 The Italian freight villages system and freight rail services

In Italy, the main types of intermodal transport relate to road and rail transport to / from the ports (sea-rail and sea-road intermodality). Specifically, sea-rail intermodal system can be conceived as a nexus of nodes and links that are sufficiently interconnected in order to allow movement of goods without bottlenecks. These nodes can be ports, freight villages, multimodal terminals and logistics platforms.

The Italian freight villages[4] system is characterized by the presence of a large number of nodes that have different characteristics not only in terms of volumes and physical infrastructures, but also of typologies of supplied services.

An in depth analysis of national freight villages would require the availability of a homogeneous set of data; this is not possible due to the high degree of fragmentation of the system. However, some useful indications for understanding the characteristics of the freight villages system can be deduced by data provided by Unione Interporti Riuniti[5].

[4] A Freight Village is an area within which all activities relating to transport, logistics, and distribution of goods both at the domestic and international level are carried out by various operators (EUROPLATFORMS, 2000).

[5] UIR (Unione Interporti Riuniti) is the national association of all freight villages whose aim is to promote the development of intermodality through the establishment of relationships with all others nodes of the maritime-transport cluster.

Currently, there are 46 multimodal terminals and 20 freight villages in Italy, mainly located in the North of Italy, particularly in Veneto (Verona, Rovigo, Padua), Emilia Romagna (Parma and Bologna) and Piemonte (Turin, Rivalta Scrivia). In the regions of the Center, there are 4 freight villages - Livorno, Prato, Jesi and Civitavecchia - while in the South, the only region with two freight villages is the Campania: Nola and Marcianise. In Apulia, there is the Bari freight village, while Sicily is planning to build two freight villages with the aim to support the traffic generated by the main industrial areas close to Palermo and Catania.

In figure 4.2, it is possible to identify different logistic and freight villages systems in the different geographic areas of the country (UIR, 2013).

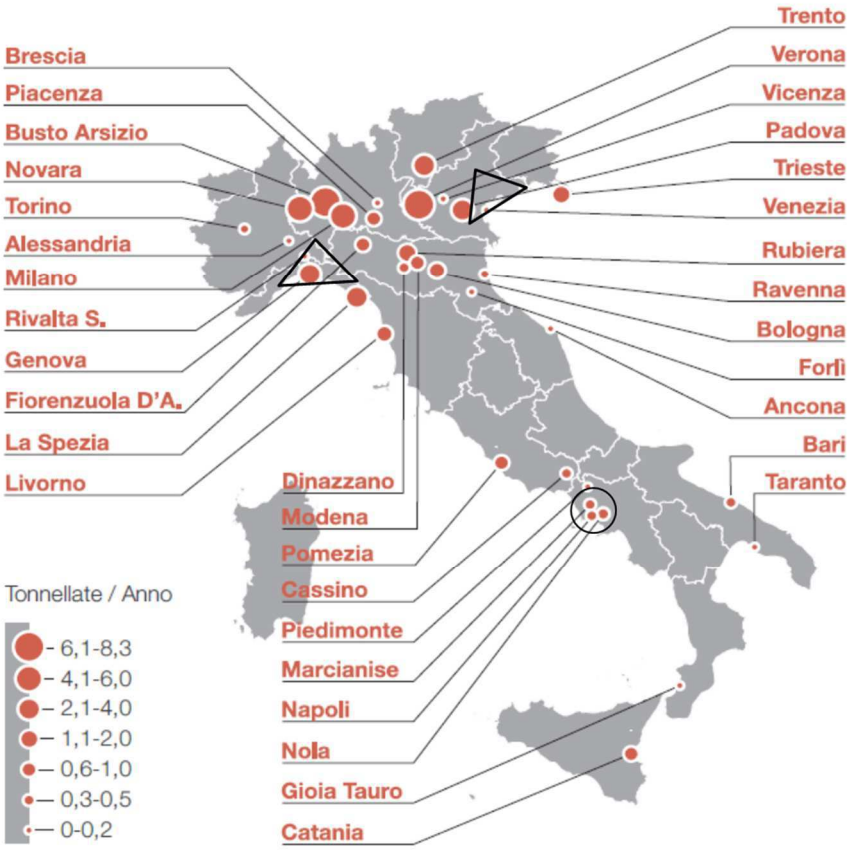


Figure 4.2. The Italian port logistics system.

Source: UIR, 2013

The first one is North-West, where the Piemonte's logistic system integrates with Ligurian port system. This territory is characterized by the presence of two European corridors, which have not yet been completed, but which give the area strong potentials and interesting development prospects. This system logistics can be described by distinguishing 4 "sub - systems" with different vocations and specialization:

- ✓ The south-east area, characterized by the strong relationships between freight villages, such as Rivalta Scrivia's node, and Ligurian ports;
- ✓ The Novara area, which focuses on traffic routes to the Milan area and is characterized by being the main Italian terminal in service to the Northern Range ports;
- ✓ The Turin area, whose evolving dynamics appear to be closely linked to the intermodal perspective of Corridor 5 and, in particular, to the realization of the high speed railway connection Torino-Lyon line;

- ✓ Ligurian ports system, which is one of the main providers of national intermodal rail services. This area is characterized by the presence of two logistic subsystems: the ports of Genoa and Savona, on the one hand, whose operations are focused on the market of North-West Italy; these ports will play a crucial role in the multimodal trans-European network, once the Genoa-Rotterdam corridor will be completed. The port of La Spezia, on the other hand, is characterized by an important production hinterland and daily connections with Verona, Bologna and Padua, as well as on the Melzo inland terminal.

The second is North-East area, where Trentino and the Venetian areas can be regrouped, and the hinterland of the port of Trieste. Intermodality is strongly influenced by the relationship with Austria and it intensively employs the railway mode. The strategic objectives to pursue in this context are: (1) The enhancement of freight villages and railway connections; (2) The reorganization of rail operators in consequence of the liberalization of the market; (3) The reduction of road transport.

In this area, it is important to mention also the choice of the Veneto Region in collaboration with the Port Authorities to adopt a specialization strategy of the ports based on the cargoes flows. The presence of one of the most important national freight village, Verona, ensures the provision of specific logistics services to the export flows. Another important project refers to the development of inland navigation network centered on Rovigo

The Centre-North area is characterized, on one hand, by Emilian freight villages system whose competitiveness will be increased thanks to the Corridor 5; on the other hand, by Tuscan freight villages system, that increasingly cooperate with the port of Civitavecchia, and it could intercept the cargo flows from the South. As far as Reggio Emilia is concerned, the area is characterized by the presence of a production sites whose commercial flows are mainly with the Central and Eastern Europe markets.

The Center-South, characterized by a dual-port system - Ancona and Civitavecchia - and a freight villages system in which three different regional realities coexist:

- ✓ Lazio Region that suffers from unclear logistics programming. There is a freight village in Orte which, although operating, have delays in completing their infrastructure, particularly with reference to intermodal infrastructures;
- ✓ Umbria Region, where two logistic platforms, Foligno and Terni, are planned to connect to the railway network and are intended to provide concrete support to local manufacturing companies. This is a "second tier" logistic system that is aimed at connecting operationally to the first level of freight villages system in the neighboring regions;
- ✓ Marche Region, whose intermodality is based on Jesi freight village, which, in 2010, has reached full operational status through the realization of links to the road and rail network. To date, the prospects for development of the Marche logistic system and its business area are linked to the guidelines that will be defined at regional level, in particular with regard to the degree of concentration of flows (both regional and transit) at the Jesi freight village.

The Southern Tyrrhenian area, characterized by strong delay in the realization of intermodal connections that can increase the traffic flows between the ports (Naples, Salerno, Gioia Tauro, Taranto, Bari) and the Marcianise and Nola freight villages.

The Southern Adriatic area, characterized by the presence of only one freight village in Bari. Puglia is currently engaged in a process of strengthening its logistics and port systems, with the aim of becoming the logistics gateway in the Mediterranean area for what the Far East trade concerned. In this context, the Regional Administration has recognized a "logistics vocation" of the territory, approving, within the framework of the Regional District Law, the creation of a Production District for Advanced Logistics. Currently, Bari freight village offers only road to road connections; the completion of intermodal railway infrastructures is still in progress.

Overall, considering the territorial distribution of intermodal flows, it is evident the strong territorial imbalance between the North and Central-South of Italy. The most significant component of freight transported on railway to freight village (Table 4.1), approximately 70% of the total, originates from the ports of North Italy (UIR, 2013).

Table 4.1: Freight rail transport from and to the main Freight villages in 2012 (TEUs)

Freight villages	TEUs	%
Interporto Quadrante Europa (Verona)	667.000	36.5
CIM Novara	380.000	21.3
Interporto Padova	250.000	14.2
Interporto Bologna	151.000	8.5
Interporto Trento	144.000	8
Interporto Rivalta Scriva	105.333	5.8
CePIM	55.000	3
Polo Logistico Integrato Mortara	48.000	2.7
Total	**1.800.000**	

Source: UIR (2014) website

In 2012, the container flow handled by the Italian freight villages systems was about 1.8 mln: Interporto Quadrante Europa (36.5%, 667.000 TEUs), CIM di Novara (21.3%, 380.000 TEUs) and Interporto Padova (14.2%, 250.000 TEUs). The remaining traffic (about 30%) is still concentrated in northern freight villages: Interporto di Bologna (151.000 TEUs), Interporto di Trento (144.000 TEUs), interporto di Rivalta Scrivia (105.333 TEUs), Cepis (55.000 TEUs) and Polo Logistico Integrato di Mortara (48.000 TEUs). In the Central and South of Italy, there are some freight villages but the lack of efficient railway connections as well as the presence of an inadequate network infrastructure, the sea-rail intermodality is not enough developed. Moreover, the strengthening of industrial and commercial relations between Southern Italian ports and freight villages remains a crucial issue for the development of an efficient and competitive port logistics network.

Figure 4.3 provides a representation of the relationships between ports and freight villages, based on the volumes and frequency of the rail services. The intensity of relations is high in the North-West triangle, with Liguria ports that have a high connection with the Rivalta Scrivia, Bologna, Livorno, Padova, Parma, Prato and Verona.

Ports

Freight villages	Genova	Gioia Tauro	La Spezia	Livorno	Napoli	Ravenna	Savona Vado	Taranto	Trieste	Venezia	Northern Range
Bologna	High	Low	High	Average		Average		Low	Average		
Cervignano									High		
Livorno				High							
Marcianise		Average			High			Average			
Nola		Average			High			Average			
Novara	Average										High
Padova	High	Average		High					Average		Average
Parma			High	High							
Prato	Average		High	High							
Rivalta Scriva	High		Average			Average					
Rovigo										High	
Torino							High				
Trento	Average		Low			High				Average	
Venezia										High	
Verona	High		High	Average						Average	Low

Figure 4.3: Relationships between ports and freight villages

On the Adriatic triangle, the Venice port, and its freight village, has frequent services from / to Rovigo; the port of Trieste, however, mainly focuses on Cervignano, while Ravenna works in close contact with Trento. Finally, the port of Naples can take over the freight villages of Marcianise and Nola. The Southern Tyrrhenian area has not developed yet given the lack of frequent rail services that connect the port of Naples and the freight villages.

With reference to rail services, these are provided by an increasing number of Italian and foreign rail operators that currently operate on the Italian railway network (Table 4.2).

Table 4.2: Freight rail operators in the Italian market: main services connecting ports and freight villages in 2015

Railway operators	Shareholders	Main connections
Captrain Italia S.r.l.	SNCF Logistics (FRA) (100%)	France – Trieste, Genova, Milano
Compagnia Ferroviaria Italiana S.p.A.	Guido Bernardini srl (34,5%), Giacomo Di Patrizi (23%), Icaria srl (22,7%), Nikel srl (19,8)	South – North Italy: Bari, Melfi, Terni, Civitavecchia, Ravenna, Trieste, Venezia, Torino. Marcianise – Slawkow (Polonia)
Crossrail Italia S.r.l.	LeJeune Capital & Partners (20%), LKW Walter (25%); Hupac AG (25%), GTS General Transport Service (10%), MSC Belgium NV (10%), Bertschi AG (10%)	Belgium, Netherlands, Germany, North Italy through the Alps
D.B. Cargo Italia Srl	100% Deutsche Bahn (GER)	Novara and Milano
DINAZZANO PO	TPER Spa (95,40%), Autorità Portuale di Ravenna (1,53%), Sapir (1,53%), ACT Reggio Emilia (1,53%)	Port of Ravenna, Regional O/D
Ferrovie Udine Cividale S.r.l.	NA	Regional O/D Udine
FUORIMURO Servizi portuali e ferroviari S.r.l.	Tenor (60%), InRail (40%)	Marseille - Castelguelfo (Parma) Marseille - Mortara (Pavia) Shuttle trains among port areas, dry ports and freight villages in North Italy: Genova, Rivalta Scrivia, La Spezia
G.T.S. Rail Spa	Gts Logistic (100%)	South – North Italy: Bari, Piacenza, Milano Marcianise - Pomezia - Piacenza
Hupac S.p.a.	Gruppo Svizzero	Antwerp, Ghent, Zeebrugge, Rotterdam, Ludwigshafen, Kaldenkirchen, Singen, Hamburg/Hannover, Köln, Busto Arsizio, Brescia, Novara, Verona, Milano, Bologna, Nola, Bari
InRail S.p.a.	Tenor (63%), Inter-Rail SpA (27%)	NA
Interporto Servizi Cargo S.r.l.	Interporto di Nola, Gruppo ferrovie dello Stato	Milano (Segrate) – Roma (Pomezia) – Verona (Quadrante Europa) – Bologna (Interporto)
Mercitalia Rail S.r.l.	Gruppo Ferrovie dello Stato (100%)	North Italy – North Europe
Oceanogate Italia	Sogemar (100%) Gruppo Contship	Porto di La Spezia, Genoa to Rail Hub Milano, Padova, Verona and North Europe
Rail Cargo Italy Srl	Rail Cargo Group (100%)	Port of Trieste to Germany, North and Est Europe Port of Genoa North and East Europe
Rail Traction Company S.p.a.	STR SpA (95,53%) DB Schenker Rail (4,47%) Deutschland AG	Verona – Monaco, Hamburg, Colonia, Hannover, Kiel Wuppertal, Antwerp Milano - Monaco Riem Port of Trieste and Venice
SBB Cargo Italy S.r.l.	FFS Cargo SA (75%), Hupac SA (25%)	North Italy, Germany and Northern Europe
Serfer	Gruppo Ferrovie dello Stato (100%)	Port of Genoa across Italy
Sistemi Territoriali Trasporti Spa	Regione del Veneto (99,83%)	Regional O/D, Venice Region

Sources: Rail operators' websites; Ministry of Transport Infrastructure (MIT); Musso and Piccioni (2014)

Along with the ex-monopolistic Trenitalia Cargo Division , these new entrants include some regional operators, which until a few years ago were operating exclusively on their local networks, and new foreign operators. There are currently almost 18 rail operators holding a safety certificate and therefore entitled to provide freight services on the national infrastructure. Rail Traction Company was the first rail operator to enter the Italian freight market in 2001, and followed by InRail, Serfer and several companies controlled by foreign capital. It is interesting to note that Oceangate is the only rail operator belonging to a Terminal Operating Company (Contship Group).

Table 4.3 provides a comparison between rail freight traffic volumes managed by the ex-monopolistic FSI Group (Trenitalia Cargo Division) and the new operators. In 2006, the market share of the new entrants was 7% compared to about 93% of the incumbent FSI Group. Over the years, although a significant reduction in traffic occurred in the Italian rail freight market, new companies have increased their overall share reaching 43% in 2016.

Table 4.3: Rail freight traffic in Italy: the FSI Group and new entrants (train-km)

	2006	2007	2008	2009	2010	2011	2016
FSI Group	60.683.916 *(93%)*	57.970.890 *(90%)*	53.101.824 *(88%)*	36.947.825 *(83%)*	31.218.000 *(74%)*	29.834.023 *(70%)*	27.200.00 *(57%)*
New operators	4.798.964 *(7%)*	6.094.570 *(10%)*	7.138.810 *(12%)*	7.752.911 *(17%)*	10.782.000 *(26%)*	12.892.064 *(30%)*	20.300.00 *(43%)*
Total	**65.482.880**	**6.406.5460**	**60.240.634**	**44.700.736**	**42.000.000**	**42.726.087**	**47.500.00**

Source: FerCargo, 2017

The new foreign entrants are controlled by major rail operators such as SNCF (France), Hupac (Switzerland Group) and DB (Germany). The financial capability of these groups has been an essential factor to counter the incumbent's dominant position of FSI Group (Musso and Piccioni, 2014). However, the liberalisation process has to be fully implemented in order to open the market to a growing number of new operators, so making the rail freight sector a competitive environment.

4.4 Port policy actions for boosting the development of port logistics network

Port System Authorities have a crucial role for the development of port and local economic system. In general, the traditional role of the port authority, with reference to the Italian context, has been “conservator”, mainly a rather passive and mechanistic implementation of regulatory functions at local level. A “facilitator” port authority tries to combine the economic and societal interests, hence performing the community manager function. In doing so, facilitator port authorities enter in strategic regional partnerships with external stakeholders, aimed at ensuring the social and economic sustainability of port in the local system. It is the type of port authority, which so far seems to find most support in literature (Verhoeven and Vanoutrive, 2012). The port authority with a entrepreneur’s role combines the main features of the facilitator with a more outspoken commercial attitude as investor, service provider and consultant at local, regional and global levels.

The Table 4.4 shows possible Port authority’s actions in boosting the development of collaborative relationships. The concession of terminal, inland terminal and other logistics resources to port operators, is one of the most important tools for port authority to affect collaboration in the seaport. Through concession policy, port authority can retain some control of the organization and structure of the supply side of the port market, while optimizing the use of scarce resources such as the land. Landlord Port Authorities can embrace concession policy not only as a mean to promote competition between port operators, but also to enhance the collaboration and coordination of port activities through resource allocation and create economical, relational and social connections between the port and the marketplace.

Table 4.4: Port Authority's policy actions in boosting the development of collaborative relationships and competitiveness

		Container Handling	Intermodality	Logistics
POSSIBLE POLICY ACTIONS	Networking	Concession policy and appropriate legislative framework for terminal management Strategic partnerships - For the development of new and improved services - PPP for infrastructure development.	(Dynamic) use of the concession policy and appropriate legislative framework for inland terminal management. - Shareholder in private business (for ex. Rail operator) for the development of intermodal services; - PPP for infrastructure development (interoperability) for port integration in the transport systems at local, national and European levels - For mitigating local conflicts (union, industry associations, Non-Governmental Organization-NGO	(Dynamic) use of concession policy and appropriate legislative framework for the development of port-logistics systems. Strategic partnerships for the development of logistics services with: - Freight villages, also thanks shareholder in private business - With local business areas or industrial districts; - Universities, Knowledge centers, and other key-local stakeholders PPP for infrastructure development (logistics parks and platforms)
	Know.	Acquisition of new knowledge for terminal and container management	Competences and intermodal chain learning; Education and Training programs.	New knowledge generation and acquisition through developing value added logistics services; Education and Training programs.
	Tech.	Oriented to the terminal management	Oriented to the custom and transport chain integration; Electronic Data Interchange (EDI).	Oriented to supply chain integration Highly specialized and customized; Port community information system (PCS).
COMPETITIVENESS SUSTAINABLE PERFORMANCE	Economic	Growth in the turnover and/or profitability of terminal operators	Improvement of economic attractiveness and competitiveness Growth in the turnover and/or profitability of multimodal transport operators and freight forwarder	Diversification of the existing economic activity and rise in new productions Growth in the turnover and/or profitability of freight forwarder and manufacturing firms
	Social	Increase in safety and security	Increase in the employment in the port-related activities Perception of belonging to a specific community	Increase of social cohesion sense Increase in the employment in the regional economic system Growth in the number of logistics businesses in the regional economic system
	Envir.	Air pollution reduction Water pollution reduction Noise pollution reduction	Improved visibility of environmental information and any green project or action	Improved image of the port city/region (Smart Port)

Source: Based on De Martino *et al*., 2013 and Acciaro *et al*., 2014, Verhoeven and Vanoutrive, 2012.

At this regard, Public-Private Partnerships can be used to share the risks associated with huge investments in the hinterland and develop the networks that underpin the value generation process. These partnerships allow the pooling of resources and combination of skills. An appropriate legislative framework needs to be in place to allow the balance between the management of physical resources to the private sector and the sustainability – from the economic, social and environmental perspectives - of these resources with respect to various local stakeholders.

The active role of the port authority should also be directed to making port actors aware of the existence of a network of interdependencies between the activities they perform and those of the firms of the regional economic system, and hence that the development of collaborative relationships can improve performance and long lasting competitive advantage. Policy formulation and implementation should be the result of intensive communication, close interaction and consensus building among all local Institutions and Government. The port authority can play a facilitating role in this respect by stimulating the dialogue and the development of strategic partnerships with inland ports, dry ports and co-operation or "co-opetition" with other, neighboring seaports.

Knowledge and learning processes, education and training activities, are progressively perceived as the crucial driver of port competitiveness. In container handling, knowledge flows are typically exchanged within the dyadic interaction between the TOC and the shipping company. Shifting to the other two configurations, the variety and complexity of knowledge flows increases in terms of actors involved in the learning processes as well as domains of application. In this regard, the PA can play a crucial role not only in facilitating intermodal learning processes within the port's networks, but also in fostering the generation and exchange of new logistics knowledge.

Port business operators, especially Terminal operating and shipping companies, could benefit from the quality standards of education and training activities as these contribute to increase the efficiency of the services, improving the quality and availability of labor (such as the port services provided by the port unions). In this respect, education is considered as a public service in many countries and port authority and public education institutes can play a major role. The ability of port authorities to create coalitions that invest in training and education infrastructures is nowadays crucial. Many European Port Authorities have developed of specific research programs with Universities and Research centers. Just to mention few examples, a number of courses and workshops are directed to strategic issues such as risk management strategies; freight mobility policy; sustainability strategy; yard management best practices; latest gate technologies; security and safety in the port and in the supply chain.

Finally, technology represents a further point of port authority's agenda. The Port Community information System (PCS) is an example of technology that has allowed the port to expand its own boundaries toward the hinterland. In this system, generally managed by the port authority, each network actor (shipping companies, terminal operating companies, port service providers, maritime agents, MTO, freight forwarders, logistics operators, distributors, retailers and manufacturing firms) shares customized information on inbound and outbound flows, increasing the communication efficiency and effectiveness in the seaport.

Assuming that the sustainable development of the port is key-priority in any port service configurations, the port authority's actions should be directed to the diffusion of a "green culture" in the port community, avoiding the increase of negative externalities linked to the economic development of the port activates. Its regulatory function should hamper and correct any less environmentally responsible behavior through the application of incentives and penalty schemes either within lease contract or as voluntary actions, either at a port specific level or among various ports (Acciaro *et al*., 2014).

With the expansion of the port's boundaries towards the hinterland and its regional economic system, the context of reference of port authority's actions is not exclusively restricted to port perimeter but increasingly to the port-regional innovation system. The active (as community manager) and pro-active (as innovation network leader) roles of the port authority would rely on collective actions that will affect the economic and social development of the port and its region. Innovation and sustainability become, therefore, a unique objective of the port development strategies. Indeed, the involvement of different local stakeholders in the processes of port innovation should reduce the conflicts between the port and local communities, increasing the sense of social cohesion. At the same time, the increase in the number of innovative businesses in the regional economic system would lead to a higher level of employment in the regional economic system, and therefore, would generate a shared economic welfare.

4. 5 The role of Italian Port Authorities for the development of port logistics network

Given the importance of intermodal and logistics for port competitiveness, Italian Port System Authorities (ASPs) have tried to intervene more effectively in these businesses, with the aim of giving greater impetus to the rail traffic originated from their ports and to favor the establishment of logistics businesses.

In this section it will be analysed the role of Italian Port Authorities for the development of port logistics networks, by focusing on networking activities and investment in technology. In in particular, the analysis will focus on the participations of Italian Port System Authorities in freight villages, rail and other businesses based on the documents published on their websites and other sources of information such as specialized journals, Italian newspapers and internet. Table 4.5 shows a very heterogeneous and dynamism networking activities of the Northern ASPs respect to those of the Southern Italy.

The Port System Authority (ASP) "*Mar Ligure Occidentale*", whose core port is Genoa, has the greatest number of participations in different businesses. In addition to companies that promote, develop and manage infrastructures, there are companies involved in the management of passenger terminals. Others perform territorial marketing initiatives, in collaboration with other local authorities, such as:

- ✓ "Finporto di Genova": promotional and training activities in the field of intermodality, logistics and transport network.
- ✓ "Il Porto e Genova": promotional activities and organizes socio-cultural events
- ✓ "F.I.L.S.E": territorial marketing for the attraction and localization of new businesses.

Table 4.5 - The Italian Port System Authorities: the participation and the investment in ICT

Port System Authority	Participations	ICT	Description
Mare Adriatico Centrale (**Ancona**, Pesaro, Ortona)		**LISy** Platform for the information sharing along the supply chain	
Mare di Sardegna (**Cagliari**)	Cagliari Free Zone (50%)		Cagliari Free Zone is a society created for the management of a free trade zone in the port. The other shareholder is the consortium for the industrial development of Cagliari (50%).
Mar Tirreno centro-settentrionale (**Civitavecchia**, Fiumicino e Gaeta)	Port Mobility (19%) Port authority Security (100%) Interporto Centro Italia Orte (0.47%), Tirreno Brennero (0.55%)	**Giada** - Port community System	*Port Mobility manages parking areas in the port. *Interporto Centro Italia Orte is a freight village. *Tirreno Brennero is a company aimed at promoting, encouraging and supporting the construction of an efficient and modern railway and road system that, through the Brenner, connects Europe and Northern and Southern Italy. The strategic nodes of this system are: Verona, Parma, La Spezia, Livorno and Civitavecchia.
Alto Tirreno (Piombino, **Livorno**, dell'Isola D'Elba e di Capraia)	Interporto Toscano (5,56%), Porto di Livorno 2000 (72%), Porto Immobiliare (72%), Tirreno Brennero (3,2%), Fondazione L.E.M. (14%)	**TPCS -** port community system	*Interporto Toscano is a freight village. *Porto di Livorno 2000 carries out tourism activities. *Porto Immobiliare manages real estate assets. *Fondazione L.E.M. is a cultural association for the integration in the Mediterranean area.
Mar Tirreno Centrale (**Napoli**, Salerno)	Idra porto (20%), Sepn (25%) Terminal Napoli (2%)		*Idra porto manages the water provision in the port. *Sepn carries out cleaning activities.*Terminal Napoli is the passenger terminal.
Mare Adriatico Settentrionale (**Venezia**)	Autovie Venete (0,03%), Esercizio Raccordi Ferroviari (15.9%), Venice Newport Container and Logistics (80%), Consorzio per la Formazione Logistica Intermodale (99.5%), APV Investimenti (100%), Consorzio Venice Maritime School (44.9%)		* Autovie Venete provides road traffic information. * Esercizio Raccordi Ferroviari provides rail services. * Venice Newport Container and Logistics is the terminal and logistics construction business. *Consorzio per la Formazione Logistica Intermodale provides training activities and it is involve in the project management. *APV Investimenti manages real estate assets. * Consorzio Venice Maritime School educational and training activities in the maritime field.
Mare Adriatico Orientale (**Trieste**)	Trieste Terminal Passeggeri (40%) Porto di Trieste Servizi (100%) Adriafer (100%), Agenzia del Lavoro Portuale - ALPT (51%), Alpe Adria (33%)		*Trieste Terminal Passeggeri is the passenger terminal. *Porto di Trieste Servizi fornitura di servizi interni al porto. *Adriafer carries out rail services in the port. However, the company will provide also services connecting the port with external destinations. *ALPT is the agency for the port work (employment). * Alpe Adria is a railway company created with Friulia S.p.A. (financial holding of Friuli Venezia Giulia Regin 33%) e Trenitalia S.p.A. (Gruppo Ferrovie dello Stato, 33%).
Mare Adriatico Meridionale (**Bari**)		Gaia - Port community System	

The Institutional environment

Mare Adriatico centro-settentrionale (**Ravenna**)	Traghetti e Crociere (100%) Dinazzano Po (1.5%) UIRNet (0.09%)	UIRNet	*Traghetti e Crociere manages the ferryboat terminal and is involved in the promotion of Motorways of the Sea. *Dinazzano Po carries out railway intermodal services. *UIRNet has been created by MIT for the realization of a technological platform for the integration of all transport and logistics stakeholders.
Autorità Portuale **Gioia Tauro**	Gioia Tauro Port Security (100%)		
Mar Ligure Orientale (**La Spezia**, Marina di Carrara)	100% APLS Investimenti, La Spezia Railways Shunting (20%), Consorzio Discover La Spezia (30%), Ce.p.im. (0,74%), Infoporto (19%), SLALA (0,51%), Spedia (6,62%), Tirreno Brennero (2,73%), D.L.T.M. (2,78%) Sistema Turistico Locale (1,50%), Associazione Promostudi (10%), FILSE (2,32%)		*APLS Investimenti carries out promotional and development activities in the field of intermodality and rail transport. *La Spezia Railway Shunting carries out rail transport. The other shareholder is Contship Italy tha manages La Spezia Container Terminal. * Ce.p.im. is a freight village in Parma. *Infoporto is an association of all local logistics and transport stakeholders. *Tirreno Brennero is a company aimed at promoting, encouraging and supporting the construction of an efficient railway and road system that, through the Brenner, connects Europe and Northern and Southern Italy. *F.I.L.S.E. carries out activities for the attraction and localization of new businesses.
Mar Ligure Occidentale (**Genova**, Savona e Vado Ligure)	Finporto di Genova (100%), Aeroporto di Genova (60%), Ente Bacini (89%), Il Porto e Genova (17%), Stazioni Marittime (10.3%) Porto Antico (5.6%), F.I.L.S.E (2.7%), Servizi Ecologici Porto di Genova (1.6%), Autostrade Centro Padane (1.4%), Milano Serravalle - Milano Tangenziali (0.2%), Sistema Turistico (0.3%), Società Servizi Generali del Porto di Savona-Vado (46%), Funivie (4%), I.P.S (3.8%), Interporto di Vado (72%), Fer.Net (10%), RivaltaTerminal Europa (0.07%)	UIRNet E-port - Port community System)	*Finporto di Genova carries out promotional and training activities in the field of intermodality, logistics and transport network. *Il Porto e Genova carries out promotional activities and organizes socio-cultural event.s *F.I.L.S.E. carries out activities for the attraction and localization of new businesses. *Autostrade Centro Padane is in the business of road construction. *Milano Serravalle - Milano is in the business of road construction. *I.P.S carries activities for the economic development of the port and the region. *Interporto di Vado is a freight village. *FER.NET manages rail services. *Rivalta Terminal Europa is a freight village.

Source: own elaboration on the Italian Port System Authorities websites

The Ravenna Port authority has been the first one to enter in UIRNet S.p.A., the company in charge of the implementation and management of the National Logistics Network (PLN) Platform. UIRNet is the Company created by MIT with the task of establishing a National Logistics Management Platform with the aim to improve the efficiency of logistic processes and increase the security and sustainability of the transport system, allowing interactions among all transport and logistics stakeholders. UIRNet will coordinate and integrate this Platform with the individual Port Community System implemented in the different ASPs. Concerning the creation of the Port Community System, each Italian ASP seems to be oriented to implement its own electronic platform, in order to enable intelligent and secure exchange of information between public and private stakeholders. This is a great challenge for Port Authorities at international level, given the difficulties to create a common platform for all transport and logistics operators. For this reason, a great number of research projects funded by the European Commission dealt with the issue. For example, "Alto Tirreno (Livorno)" ASP has developed its own Tuscan Port Community System (TPCS) under the Monitoring and Operation Services for Motorways of the Sea (MOS4MOS) of the TEN-T Priority Project 21. This European Project has involved 28 international partners from Greece, Slovenia, Italy and Spain, working together to achieve the common objective of developing technological solutions in the support of Motorways of the Sea[6].

There is another interesting initiative that have brought some ASPs (La Spezia, Livorno, Civitavecchia) to work together with other public and private stakeholders, such as "Tirreno Brennero". This company, created in 2005, is a private and public partnership constituted by: Chambers of Commerce, Port Authorities and private transport and logistics operators, such La Spezia Container Terminal and Tarros International. The overall objective is to create a competitive network in Tyrrhenian-Brenner route, connecting and building connections among railway, motorways, airports, ports, freight villages and logistic platforms. The company carries out also activities directed to the promotion and support of the economic, social and cultural integration process of all the involved regions.

Finally, during the political process leading to the definition of the new reform, the Government has involved groups of experts and relevant port stakeholders in order to gather their opinions on Italian ports performance and reform[7]. Based on this documents, the Minister of Infrastructures and Transport has appointed experts coming from transport and logistics world in order to get the desired outcome identified for each ASPs, upon agreement with the Region of reference. This should ensure a pro-active role on the territory through the creation of strategic partnerships with key local stakeholders. Recently, the Trieste port authority and the AREA Science Park, a center of excellence of innovation, have signed a collaboration agreement aimed at increasing the impact of port activities on the local economic development of the region (news press, 07/19/2017, Trieste website). The appointment of the president of "Mar Tirreno Centrale" ASP, with expertise in the rail industry, is aimed at developing intermodal services in the Campania region and favoring the interconnection of the port of Naples with the national transport and fright villages system. The MIT, finally, has decreed the creation of two Agencies of the port work (like in the port of Trieste) in order to favor the local employment and

[6] The partners involved in the project are: Port authority of Piraeus, Global Maritime Agency S.A., Neptune Shipping Agencies S.A., University of Piraeus, Ocean Finance, Luka Koper d.d., Intereuropa Global Logistics Service, Port authority of Valencia, Fundación Valenciaport, Port authority of Barcelona, Indra Sistemas, Escola Europea de SSS, Atlantica di Navigazione, Arkas Spain, Port authority of Livorno, Italian Ministry of Infrastructure and Transport, Interporto Toscano "Amerigo Vespucci", Port authority of Salerno, Grimaldi Group, Interporto Bologna S.p.A., IFS International Forwarding SL, Continental Rail, Compass Ingeniería y Sistemas S.A, Intereuropa Global Logistics Service.

[7] This document has inspired the National Strategic Plan for the Ports and Logistics Systems, reported by the Italian Ministry of Transport, in July 2015.

to activate specific training courses for increasing the efficiency of the terminal activities in ports of Taranto and Gioia Tauro (Sole24ore, 2017).

4.6 Intermediate conclusions

The institutional environment in which Italian ports operate is experiencing a profound change given by the new port reform and the liberalization process of the rail market. What emerges from the analysis is an increasing interest of the Italian ASPs to enter into the rail business. This follows the need to lunch new services in a liberalised market[8] and to keep competitive the services in order to create a demand in the hinterland and to favour a change from the road to the rail – sea intermodality. Business reality shows that corporate participation makes sense if there are a number of situations, such as the existence of a potential market and demand, the willingness of rail operators to operate in a new market and the "leverage" to compete against the road; the knowledge of the market and the capacity to attract new business. The case of the port of Trieste is emblematic at this regard. The port authority and the Friuli Venezia Giulia Region have strongly believed in the development of the intermodal business. They have worked together in order to pursue such objectives, like the creation of two rail operators Adriafer and Alpe Adria. In this case, the Trieste port authority has performed the role of facilitator and entrepreneur, making the sea-rail intermodality model a best practice in the Italian scenario.

Another result of the analysis is that, even though the port regulatory framework defines the general rules for all the Italian ASP, there is a North–South duality which not only involves the availability of logistics and transport infrastructures, but also some governance elements, such as functional and financial autonomy, which are typically more limited in the south. At this regard, the number of participations of Northern Italian Port Authorities have been higher than those of the Southern ones. The availability of key transport and logistics infrastructures is, of course, a condition for the development of port logistics network. However, it is believed that much depends on the collaborative spirit and on the willingness to cooperate al local level, among public and private stakeholders. At this regard, port authority should act as a "community manager" trying to solve internal and local conflicts, and finding the most effective institutional framework for boosting public and private partnerships. This could be particularly important for Southern Italy, where the delay in the development of intermodality and value added logistics are not exclusively related to infrastructural issues but on the lack of efficient and effective service providers; custom procedure in order to smooth port-hinterland freight flows; and finally the consolidation and aggregation of the demand, in order to ensure enough cargo for intermodal services.

A common vision, shared by all involved actors, is required for a political approach aimed at taking into consideration the current and potential role of key network elements (i.e. terminals, stations, freight villages, ports and inland ports) that are necessary to increase the competitiveness of port logistics network at a local and European level. At this regard, freight villages can represent crucial logistics resources by increasing national railway network connectivity with local/regional rail lines, and by seeking operational solutions to better manage full and/or mixed trains. In this way, traffic could also be distributed in terminals/nodes that are

[8] The deregulation of rail transport is governed by Legislative Decree 08/07/2003, No. 188 ('Implementation of Directives 2001/12/EC, 2001/13/EC and 2001/14/EC concerning the railway transport field') and subsequent legislation. This has induced significant changes in the rules allowing Railway Undertakings (RUs) to operate on the Italian railway network. In addition to the specific license issued by the Ministry of Infrastructure and Transport, a safety certificate issued by the National Agency for Railway Safety is now a mandatory requirement.

currently underemployed and are at risk of closure due to lack of economic sustainability (Musso and Piccioni, 2014).

The research carries out in this Chapter has limitations due to the fact that the analysis cover just few issues of the Institutional environment of the Italian port system: the port authority's participations in other businesses and their investment in ICT; the structure of the fright villages and freight rail market. Data were gathered through a content analysis of the information available mainly on websites and publication of business association such as UIR (Italian freight villages) and FerCargo (association of the main rail operators). A more in depth analysis, according to a system approach, is necessary in order to provide a quantification of the freight flows that characterised the port logistics network at local and Italian levels. This contributes to define effective policy actions aimed at fulfilling the current inefficiency of the port logistics system not only with reference to the North-South duality but also to the improvement the connections national rail network at local and regional levels.

5. Collaborative strategies in the Italian container terminal industry

5.1 Introduction

In recent years, the container terminal industry has been deeply affected by an extensive internationalization process undertaken by Global Terminal Operators through the implementation of expansion strategies leaning on horizontal and vertical integration processes (Drewry, 2016; Parola *et al.,* 2014). This phenomenon can be ascribed to the extraordinary pressure on profit margins and rates of return that have characterised the container terminal industry worldwide, due to (Drewry, 2016):

- *Significant softening of demand growth*. The collapsing of Hanjin Shipping in August 2015 had an enormous impact on ports of call that are now trying to catch new demand for their services fall.
- *Higher operating costs and capital investments due to bigger ships*. These costs can increase by 10-20% when it is necessary to handle the cargo load from bigger vessels.
- *Increased business risks from larger liner alliances*. Alliances can add to port costs because cargo handling becomes more complicated when vessel assignments change and require movement of containers between cargo terminals.
- *Loss-making carriers pressuring for lower terminal handling charges*. This is an additional stress for terminals that have to reduce cargo handling costs. The larger the alliance, the more leverage it has to negotiate more favourable rates with ports.

Maritime shipping has been traditionally a multinational activity and there are numerous cases that show the internationalization processes of the liner shipping companies both horizontally for the realization of their global services network and vertically for the control of the container terminal industry. For example, Maersk Line and Mediterranean Shipping Company (MSC), the two largest container lines, created in 2007 the 2M Alliance, which has a combined capacity of about 6 million TEUs, and that's about 29.5% of the overall global market share in container capacity in 2015 (www.joc.com). Maersk announced at the end of 2016 its plans to acquire Hamburg Sud, subject to regulatory approval. The new merger would push 2M's container market share to 33.4% (https://www.flexport.com/blog/what-are-ocean-alliances/). With reference to vertical integration, MSC-PSA European Terminal (MPET) is a joint venture between TIL (a holding company belonging to MSC) and PSA and is the largest container terminal in the port of Antwerp. In 2015, MPET handled over 7 million TEUs (www.mpet.be).

This internationalization process has also taken place in the container terminal industry; many terminal operators have established an international portfolio, shifting the interest from one single port to many ports strategically located in the main maritime routes and commercial traffics (Notteboom and Rodrigue, 2012). Just to mention some examples, Cosco and China Shipping have merged; CMA CGM has acquired APL; APM Terminals has purchased Group TCB (Port Technology, 2016). Beyond taking over as shareholder of global competitors, terminal operators internationalize and expand their business, through the development of partnerships with other firms entwined with local and regional port-logistics system's setting (Notteboom and Rodrigue, 2012). The number of equity agreements and partnerships created by such Global Players has increased steeply in the last years (Parola *et al.,* 2014) and there are very few independent and local container handling providers generally performing their business activities in niche or regional market, such as ro-ro traffic or short sea shipping.

At the light of this international competitive scenario, the purpose of this Chapter is to analyse the structure of the Italian container terminal market, by focussing on expansion and collaborative strategies of container Terminal Operating Companies (TOCs). The analysis focuses on the inter-organizational networks centred on the Italian TOCs. These networks can be the

result of: expansion strategies of Global Terminal operators in the Italian market through the development of partnerships and Equity Joint ventures; or vertical integration strategies along the supply chain of both global and local service providers (Langen and Chouly, 2009).

In reaching such an objective, the analysis has been carried out by applying the Ego-Centric Social Network Analysis (Hanneman and Riddle, 2005) in a longitudinal way by comparing the inter-organizational network structures of the Italian TOCs in 2011 and 2015. This approach belongs to the Social Network analysis and allows to identify the set of relationships that one actor, called Ego, has with others actors of the network. The structural characteristics of the Ego-Networks contribute in defining the cooperative behaviours of TOCs as it has been already shown in other industries (Johannisson, 1988; Fyrberg and Jüriado, 2009; Batjargal *et al*., 2013). The whole network that characterise the Italian Container Terminal Market is subsequently constituted by the interplay between each TOC's network. This approach is new respect to the other studies on cooperative agreements in container terminal industry (Parola *et al*., 2014; Notteboom and Rodrigue, 2012; Satta *et al*., 2014) that generally analyse the expansion strategies and the network structures at corporate level of Global Terminal Operators. On the contrary, the approach used to build the whole network has been bottom – up, starting from the inter-organizational relationships set up by the TOCs. This perspective provides interesting and useful information on the leading and power positions of the some TOCs and their parent companies in the Italian market.

The Chapter is structure as follows. Section 5.2 provides a description of the typologies of Global container terminal operators and an overview of the main collaborative forms for the realization of their expansion strategies. Given the rise of equity agreement in the terminal industry at international level, the research methodology addresses the study of Equity Joint Venture (EJV) according to the Social Network Analysis (SNA) (section 5.3). After having described evolution of Equity Joint Venture in the global port container terminal industry (section 5.4), in section 5.5 it has been carried out an analysis of EJV and collaborative behaviours of Italian TOCs. In particular, 25 Italian container TOC's relationship networks have been identified and analysed based on their balance sheets (related to the years 2011 and 2015), newspapers and information available on their websites. The analysis has been enriched with data related to Container Traffic (TEUs) per TOC; financial indicators (EBITDA, ROI) and employees. By comparing the Italian container terminal networks from 2011 to 2015 (section 5.6), the analysis provides critical view on the evolution of power positions and control roles of some players, and it sheds light on value creation process at TOC (firm) level. Conclusions and further steps of the research are provided in the last section.

5.2 Global container terminal operators: strategies and collaborative agreements

The terminal operating industry has been deeply affected by international economic integration. Multinational companies (MNCs) increasingly purchase international logistics services rather than shipping or forwarding services. Consequently, some shipping lines expand their business scope to gain greater control over the supply chain (Heaver *et al.*, 2002; Van Der Horst and de Langen, 2008; Notteboom and Rodreigue, 2012).

Terminal Operating Companies (TOCs) face fewer but more powerful customers (shipping lines or shippers) and have to redefine their role in supply chains, because these supply chains become much more integrated (Robinson 2006). At this regard, at international level, some global terminal operators have implemented dual strategies such as internationalization and integration along the supply chain (de Langen and Chouly, 2009). While the former is aimed at expanding the market and increasing the market share thanks to scale economies and a stronger bargaining position, the vertical integration can result in economies of scope. Vertical integration can differentiate a TOC from competitors and increase the competitiveness at local

and regional level, where hinterland can represent an opportunity to catch new market segments (Soppe *et al.*, 2012)

A strict categorization of terminal operating companies is difficult to establish. However, with specific reference to the container market, global/international operators can be sub-divided into three main categories (Parola *et al.*, 2014; Drewry, 2016):

- *Stevedores.* Companies that have container terminal operations as their core business and invest in container terminals for expansion and geographical diversification. Port of Singapore Authority (PSA) is the largest global terminal operator coming from a stevedore background.
- *Ocean Carriers/Maritime shipping companies*. Companies with container shipping as their core business and with a network of terminals to serve this liner shipping activity. The terminal facilities can be operated on a single-user dedicated base or alternatively also be open to third shipping lines, APM Terminals, a sister company of Maersk Line, is the largest global terminal operator coming from a maritime shipping background.
- *Financial holdings.* This category includes various financial interests ranging from investment banks, retirement funds to sovereign wealth funds attracted by the port terminal sector as an asset class and for revenue generation potential. The majority has an indirect management approach; acquiring an asset stake and leaving the existing operator take care of the operations. Others will manage directly the terminal assets through a parent company. Dubai Ports World (DPW), a branch of the Dubai World sovereign wealth fund, is the largest global terminal operator coming from a financial background.

This distinction is important as stevedores manage terminals as profit centres while ocean carriers manage terminals mainly as costs centres - (Olivier *et al*. 2007; Slack and Fremont, 2005; Parola and Musso, 2007). The interest of financial holding involved in the stevedoring business is to generate a high return on investment (Parola *et al*, 2014).

These global/international terminal operators pursue different expansion strategies, leaning on diversification strategies and horizontal and vertical integration processes. Consequently, they affect port competitiveness and determine its integration along the port service supply chains (Robinson, 2006; Rodrigue and Notteboom, 2009). The value creation process of a terminal is thus linked to the specific attributes of the supply chains that run through the terminal and the logistics network configuration in which the terminal plays a role.

Traditionally, the pure stevedores – whose core business was port operation - pursued expansion strategies toward ports located in the main maritime traffic routes through mergers and acquisitions of existing terminals or the construction or expansion of new terminal facilities (Table 5.1). The horizontal integration has been in part a strategic choice pursued in order to counterbalance the consolidation trend in liner shipping. As terminal operators are urged toward a better integration of terminals in supply chains and shipping lines are acquiring container terminal assets worldwide, leading terminal operating companies are developing diversification strategies toward the control of larger parts of the supply chain (Van Der Horst and De Langen, 2008).

With reference to shipping lines, vertical integration strategies allows them to gain control of terminal capacity deployment and to better deal with problems of vessel schedule integrity. The integration can be realized through shareholdings of the shipping line in a terminal or contractual berthing or volume agreements between a third-party stevedore and the shipping line. At this regard, joint ventures between the shipping line and a third-party stevedore are particularly widespread and often linked to the dedicated use of the terminal by the shipping line.

Table 5.1: Global operators: strategies, tools and value propositions in the container handling business.

	Stevedores	Shipping companies	Financial holdings
Strategies	Horizontal and vertical integration	Horizontal and vertical integration	Portfolio diversification
Collaborative schemes	Mergers and acquisitions of existing terminals; Equity joint ventures for new terminal management; Equity co-operative agreements; Partnerships.	Mergers and acquisitions of existing terminals; Equity joint ventures for new terminal management; Contractual berth of volume agreements.	Mergers and acquisitions of existing terminals.
Value propositions	Increase the efficiency of the container handling.	Control the cost of the maritime transport chain.	Generate high Return On Investment (ROI).

Source: own elaboration based on different sources

Finally, the terminal industry has been penetrated by an array of large equity firms and financial corporations, whose prime objective is to generate a return on investment. Terminals are often seen as assets that generate economic rent and which are tradable through buying and selling to the stock exchange market.

The progressive scarcity of available port spaces for greenfield projects, the end of the privatization waves that has invested the European seaports, the enormous financial resources required for infrastructural investments and the variety of skills required for realizing modern terminal facilities have induced ITOs to experiment with various forms of co-operation (Heaver *et al.*, 2001; Soppé *et al*., 2009): contractual and equity co-operative agreements; equity consortia; alliances and mergers; horizontal and vertical partnerships and other inter-firm co-operative ventures.

In particular, over the last decade, there has been an increase of equity joint-ventures (EJVs) to enter new foreign markets and develop new terminal projects. Parola *et al* (2014) show that the number of Equity Joint Ventures developed by the International Terminal Operators has doubled between 2002 and 2010, going from 135 to 284 container facilities. These co-operation agreements include both traditional EJVs (i.e. a separate jointly owned firm created by two or more parties which assign their own resources to the new entity) and direct minority equity investments, which take shape when a party acquires an equity stake in a partner firm.

5.3 Research methodology: Equity Joint Venture and Social Network Analysis

Joint ventures are hybrid forms of organization between pure market and hierarchy, and they are often discussed under concepts of strategic alliance and inter-organisational relationships, which the prior researchers have used to refer to many kinds of dyadic or network-like arrangements (Mainela, 2001). Joint ventures are, therefore, formal cooperative arrangements between two or more legally independent organizations that through a jointly owned business entity, pooled resources and shared risks in order to achieve some common goals (Parkhe 1991). Joint ventures can be either contractual or equity joint ventures. In the establishment of an equity joint venture is created a new firm which needs to be positioned in the market and whose activities are continuously organized as a response to various change forces.

An equity joint venture is already by definition a small network as it is a sum of contributions of at least two separate firms (Killing 1982). Through the parent relationships, the joint venture becomes already in its initiation embedded in a network of relationships, which influences the management of the business unit. Every business unit needs also to be in contact with its environment and other actors outside it at least to obtain resources and create markets for products or services (Håkansson and Snehota 1989).

Studies on subsidiary roles and their embeddeness in the multi-national companies and local networks have noticed the influences of the subsidiaries' relationships on the development of business units (Birkinshaw 1999). Actors in business relationships makes it possible to access other actor's resources and refers to company's relations with and dependence on various networks (Halinen and Törnroos 1998).

Research on joint venture belonging to the IMP Group apply the network approach to study the firm's inter-organizational relationships and they can refer to the focal net concept (Möller and Halinen 1999). A focal net is a central construct that describes the environmental context of actors. From the perspective of an individual firm, a focal net consists of those actors that the management perceives as relevant, that are within its network horizon. From a strategic perspective, the focal net concept also is used to refer to an interrelated group of actors pursuing a joint strategy within a network. Tikkanen (1998) emphasises that a focal net is always part of a broader network and thus could be viewed as a local network or micro network. However, the difference is that a focal net is studied from the viewpoint of a certain, single network actor, which usually is a company.

Social Network Analysis (SNA) methods (Hanneman and Riddle, 2005) provide some useful tools for addressing one of the most important aspects of social structure: the *sources and distribution of power*. The network perspective suggests that the power of individual actors is not an individual attribute, but arises from their relations with others. Network approach emphasizes that power is inherently relational. An individual does not have power in the abstract, they have power because they can influence and exert control over others' actions. Because power is a consequence of patterns of relations, the amount of power in social structures can vary. If a system is very loosely coupled (low density) not much power can be exerted; in high density systems, there is the potential for greater power. Power is both a systemic (macro) and relational (micro) property. Power in a system and its distribution across actors are important issues addressed in the SNA. Two systems can have the same amount of power, but it can be equally distributed in one and unequally distributed in another. Power in social networks may be viewed either as a micro property (i.e. it describes relations between actors) or as a macro property (i.e. one that describes the entire population). Macro and micro are closely connected in social network thinking.

Among the different SNA methods, the Egocentric Social Network Analysis (ESNA) is a methodological tool used to understand the structure, function and composition of network ties around an individual (Opsahla *et al.*, 2010). As for the socio-centric (i.e. whole) network analysis, the basic assumption of egocentric network analysis is that behaviours, attitudes and values of individuals are shaped through contact and communication with others (Figure 5.1).

This method is very time and cost-effective given the fact that in many cases it would not be possible or necessary to track down the whole network. In this case, the analysis starts from the selection of focal nodes (egos) that characterize the context of analysis. In this research, focal nodes are firms involved in the terminal container industry and located in the Italian territory. Then, each identified node in the first stage can be connected to one another, shaping a small network centred on focal actors. Such data are, in fact, micro-network data sets, samplings of local areas of larger networks. This kind of approach provides a good and reliable picture of the networks in which individuals are embedded. The result is that it is possible to identify

connections among nodes and the extent to which these nodes are close-knit groups. Some properties, such as overall network density, the prevalence of reciprocal ties, cliques can be reasonably estimated with ego-centric data.

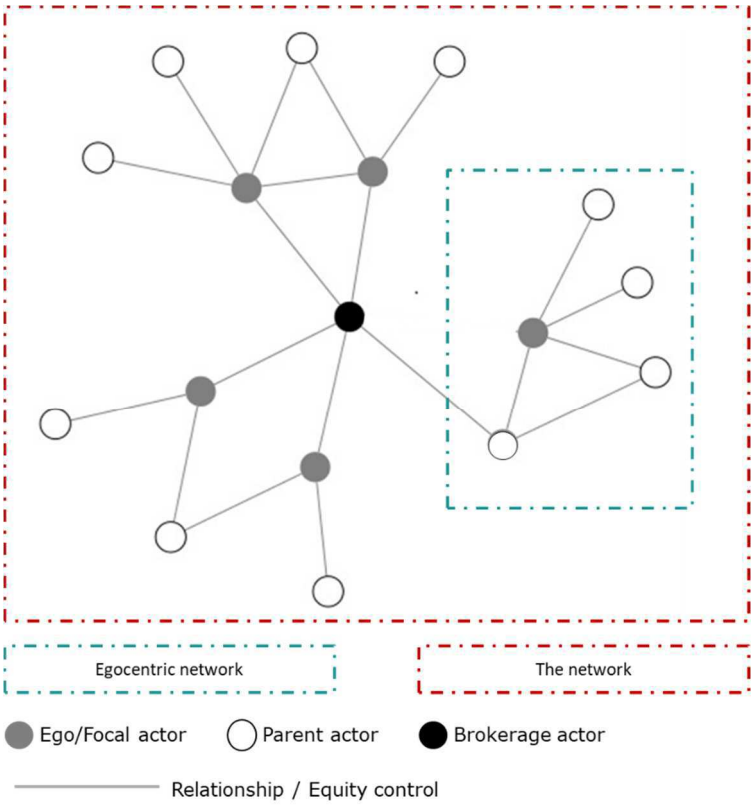


Figure 5.1: Egocentric and network: the analytical framework

Source: own elaboration

With specific reference to the port context, the ESNA can be an effective approach to analyse the network of relationships centred on Terminal Operating Company of the Italian Market. The following information will be derived:

- ✓ *Size of TOC network* is the number of nodes linked to the TOC, plus TOC itself (one-step out neighbours of TOC);
- ✓ *Number of directed ties* is the number of connections among all the nodes in the TOC network.
- ✓ *In-degree link* refers to the percentage of the capital share of the TOC that a company or a person possesses.
- ✓ *Out-degree link* is the percentage of the capital share of others nodes/companies that TOC possesses.
- ✓ *TOC network composition*: this refers to the typologies of nodes/companies in terms of main business activity. This allows to analyse the horizontal and vertical integration processes undertaken by the TOC through the development of equity agreements.

Then, the whole network, represented by the interconnections among the TOC-centric networks has been identified and analysed by using complementary information provided by industry journals and specialised websites. At this regard, all news and info related to new joint venture, contracts and partnerships were taken into account. At this level, two important concepts will be analysed:

- ✓ *Network composition*: this refers to the existence of homogeneity or heterogeneity among the nodes/actors consisting the whole networks. This provides a picture of the actors/activities through which the TOC's networks are interconnected.
- ✓ *Brokerage and gatekeepers roles*. Structural holes theory (Burt, 1992) emphasized importance of brokerage and gatekeeper roles of the actors in a social network. Structural holes represent unconnected parts between actors and brokers are the actors who connects the unconnected parts of the social systems. If there are many structural holes in a network, there could be brokerage opportunities for some actors in an organizational network (Sozen and Sagsan, 2010).

5.4 The evolution of Equity Joint Venture in the global port container terminal industry

Table 5.2 shows the world's 20 leading container ports for the period 2012–2015. The top 20 container ports accounted for approximately 45.7 % of world container port throughput in 2015. Sixteen of these ports are located in Asia, signifying the importance of the region as a manufacturing hub.

Table 5.2 - Top 20 container ports in the World (million TEUs)[1]

Port	2015	2014	2013	2012	2011	% 15-14	% 14-13	% 13-12	% 12-11
Shanghai, China	36.540	35.290	36.617	32.529	31.740	***3,42***	*-3,76*	*11,16*	*-3,76*
Singapore	30.920	33.869	32.600	31.649	29.940	***-9,54***	*3,75*	*2,92*	*3,75*
Shenzhen, China	24.200	24.040	23.279	22.940	22.570	***0,66***	*3,17*	*1,46*	*3,17*
Ningbo-Zhoushan, China	20.630	19.450	17.351	15.670	14.720	***5,72***	*10,79*	*9,69*	*10,79*
Hong Kong, China	20.070	22.200	22.352	23.117	24.380	***-10,61***	*-0,68*	*-3,42*	*-0,68*
Busan, South Korea	19.450	18.678	17.686	17.046	16.180	***3,97***	*5,31*	*3,62*	*5,31*
Qingdao, China	17.470	16.62	15.52	14.50	13.020	***4,87***	*6,62*	*6,57*	*6,62*
Guangzhou Harbor, China	17.220	16.580	15.552	14.503	14.420	***3,72***	*6,20*	*6,75*	*6,20*
Dubai, Arab Emirats	15.600	15.200	13.641	13.270	13.000	***2,56***	*10,26*	*2,72*	*10,26*
Tianjin, China	14.110	14.060	13.000	12.300	11.590	***0,35***	*7,54*	*5,38*	*7,54*
Rotterdam, Netherlands	12.230	12.298	11.621	11.865	11.880	***-0,56***	*5,50*	*-2,10*	*5,50*
Port Klang, Malaysia	11.890	10.946	10.350	10.001	9.600	***7,94***	*5,44*	*3,37*	*5,44*
Kaohsiung, Taiwan, China	10.260	10.593	9.938	9.781	9.640	***-3,25***	*6,18*	*1,58*	*6,18*
Antwerp, Belgium	9.650	8.978	8.578	8.635	8.660	***6,96***	*4,46*	*-0,66*	*4,46*
Dalian, China	9.450	10.130	10.015	8.064	6.400	***-7,20***	*1,14*	*19,48*	*1,14*
Xiamen, China	9.180	8.572	8.008	7.201	6.470	***6,62***	*6,58*	*10,08*	*6,58*
Tanjung Pelepas, Malaysia	9.100	8.500	7.628	7.700	7.500	***6,59***	*10,26*	*-0,94*	*10,26*
Hamburg, Germany	8.820	9.729	9.258	8.863	9.010	***-10,31***	*4,84*	*4,27*	*4,84*
Los Angeles, U.S.A.	8.160	8.340	7.869	8.077	7.940	***-2,21***	*5,65*	*-2,64*	*5,65*
Keihin Ports, Japan	7.520	7.85	7.81	7.85	7.640	***-4,39***	*0,51*	*-0,51*	*0,51*
Total top 20	**312,470**	**311,923**	**298,673**	**285,561**	**276,300**	***0,18%***	***4,25%***	***4,39%***	***3,24%***
Share of the top 20	45.5%	*45,57%*	*45,87%*	*45,73%*	*47,03%*				
World Total	**687,000**	**684,429**	**651,200**	**624,480**	**587,484**		***4,85%***	***4,10%***	***5,92%***

Sources: Drewry (2016), Unctad (2015).

[1] It is worth mentioning that the top 20 container ports present a varying percentage of transshipment function. These data suffer of double counting as each container transshipment is counted twice.

Ningbo continues to show good performance, passing from the fifth position in 2014 to the fourth in 2015; this port achieved the highest growth in 2014 at 10,79 %, a growth rate closely followed by Dubai and Tanjung Pelepas. The port of Tanjung Pelepas moved up two places to eighteenth position following completion of infrastructure investments. The port of Long Beach was displaced from the top 20 list due to low growth as a result of labour disputes at the port and the higher rates of growth of other ports. Jakarta port was a new entrant to the list as a result of a continued steady increase in demand that has seen throughput at the port grow by more than 50 per cent since 2009 due to the buoyant economy (Drewry, 2016).

In Europe, the port that has kept good performance has been the port of Antwerp; Rotterdam lost about 0,56 % in 2015 while Hamburg had a strong decrease (-10,31%) given the weak Asia-Europe volumes, which are believed to have fallen by 4% because of the poor demand for imports in Europe and the depreciating of Euro (www.joc.com). China is Hamburg's most important trading partner and it is clear that any variation of production has an impact on maritime flows. Hamburg's troubles were exacerbated by the loss of transhipment cargoes to Russia, whose containerized imports from Asia are often trans-loaded onto feeder ships at the port.

The attractive nature of the industry has long meant that there is typically a high level of interest in privatisations and acquisition opportunities. However, this has intensified in recent years due to the emergence of aggressive new players keen to expand internationally. The merger of China Shipping and Cosco in 2016 will have a great impact on the sector in capacity terms, even tough container terminal operators are faced with the dual challenges of weaker demand growth and rising operating and capital costs due to larger vessels and alliances. At this regard, Cosco Shipping Ports Limited operates 46 container terminals worldwide with overall throughput reaching 62,8 Mln TEUs, making it the world's fourth biggest terminal operator with a market share of 9,2% of container throughput in 2015 (Table 5.3). Looking at the market share of others global terminal operators, Hutchison Port Holdings is the leading player with a share of 11,8%. APM Terminals and PSA international have respectively a market share of 10,1% and 9,3%. DP World had an extraordinary increase in 2015, +3,1% respect to the previous year, reaching a market share of 8,8%. This company provides also management services for ports.

Table 5.3 - Throughput and market shares of Top 5 global terminal operators, 2015

Terminal Operator	Throughput 2015 Mln TEUs	Growth/Decline	Market share* (2015)
Hutchison Port Holdings	81.0	+1.1%	11,8%
APM Terminals	69.3	-3.3%	10,1%
PSA International	63.8	-2.1%	9,3%
Cosco Shipping Ports Limited	62.8	+1.4%	9,2%
DP World	60.5	+3.1%	8,8%

*** The market share has been calculated considering the World Container throughput in 2015, Table 5.2**

Source: Drewry, 2016

Looking at the equity agreements among these Global Terminal Operators (Parola *et al*., 2014), PSA and HPH share 49 container facilities, thanks to the 20% share of PSA in Hutchison Port Holdings. APMT has the different relationships with different global players; for example, it has 32 Equity Join Ventures container terminals with the Cosco Group. DPW collaborates also with CMA-CGM; they share four EJV container terminals: Antwerp Gateway Terminal, Fos Container Terminal-Eurofos, Mourepiane Container Terminal Marseille and Terminal de France.

This consolidation process in the terminal container may be, form one side, slowed down by institutional factors in order to avoid dominant positions in regional container markets (Notteboom and Rodrigue, 2012). On the other side, it could be characterised by (Drewry, 2016): stronger collaboration between terminal operators and shipping lines aimed at mitigating the negative impact of larger ships and alliances; local terminal operators may choose to leave the market given lower margins and returns; global terminal operators choose not to invest in new capacity because the returns are insufficient for their shareholders.

Give such international scenario, the next paragraph investigates the effects and the structure of the Italian container terminal market.

5.5 The Italian Container terminal market

In 2016, the Italian ports handled 10.51 millions TEUs, showing an increase of 2.9% compared to the previous year. This positive result, however, should be compared with the throughput volumes before the onset of the 2008 global financial crisis. In particular, Italian ports handled fewer boxes (143.000 TEUs) in 2016 respect to 2007, which leads to a compound annual growth rate of -0.1% from 2007 to 2016 (Table 5.4).

To better understand these data, it is necessary to consider pure transshipment hubs that handle mainly transshipment cargo (over 80% of total throughput) and gateways that mainly cater to domestic import and export. Pure transhipment hubs found almost all their success on sea-to- sea handling operations. Gateway ports present a very low transhipment incidence and therefore based almost all their competitiveness on import/export cargo and the commercial relations with the hinterland.

In comparison to the throughput volumes before the global financial crisis in 2009, Italian gateways performed better than hubs. The country's regional ports/gateways present a cargo volume increase of 2,2% in 2016, compared to 2007. Altogether, 6.9 million TEUs entered or left Italy in 2016, compared to 5.9 million TEUs in 2007. In contrast, Italian transhipment hubs recorded an average yearly decrease of 3% during the period from 2007 to 2016 (Figure 5.2). In absolute numbers, Italian transhipment hubs handled a volume of 3.5 million TEUs in 2016, whilst the 2007 pre-crisis throughput figure amounted to 4.8 million TEUs.

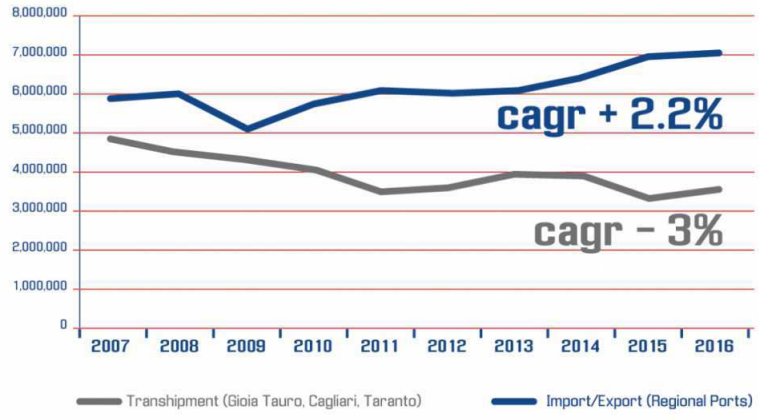


Figure 5.2- Italian gateways vs Italian transhipment hubs throughput

Source: Contship (2017)

Table 5.4 - Container flows in the Italian ports 2006-2016 (TEUs)

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Ancona	87.193	119.104	105.503	110.395	120.674	142.213	152.394	164.882	178.476	185.846
Bari	64	113	55	680	11.121	29.398	31.436	35.932	60.063	71.593
Brindisi	5.359	673	722	1.107	485	94	566	407	407	1.857
Cagliari	547.336	307.527	736.984	629.340	603.236	627.609	702.143	717.016	748.647	723.037
Civitavecchia	31.143	25.213	28.338	41.536	38.165	50.965	54.019	64.386	66.731	74.208
Genoa	1.855.026	1.766.605	1.533.627	1.758.858	1.847.102	2.064.806	1.988.013	2.172.944	2.242.902	2.297.917
Savona	242.720	252.837	196.317	196.434	170.427	75.282	77.859	85.311	98.033	54.954
Gioia Tauro	3.445.337	3.467.824	2.857.440	2.852.264	2.304.987	2.721.108	3.094.254	2.969.802	2.546.805	2.762.000
La Spezia	1.187.040	1.246.139	1.046.063	1.285.155	1.307.274	1.247.218	1.300.432	1.303.017	1.300.442	1.272.425
Leghorn	745.557	778.864	592.050	628.489	637.798	549.047	559.180	577.470	780.874	800.475
Naples	460.812	481.521	515.868	534.694	526.768	546.818	477.020	431.682	438.280	483.481
Salerno	385.306	330.373	269.300	234.809	235.209	208.591	263.405	320.044	359.328	388.572
Ravenna	206.786	214.324	185.022	183.577	215.336	208.152	226.692	222.548	244.813	234.511
Taranto	755.934	786.655	741.428	581.936	604.404	263.461	197.317	148.519	-	375
Trieste	265.863	335.943	276.957	281.643	393.186	408.023	458.597	506.019	501.222	486.499
Venice	329.512	379.072	369.474	393.913	458.363	429.893	446.428	456.068	560.301	605.875
Others	58.120	57.099	59.506	63.132	52.273	46.022	52.275	48.643	63.273	95.118
Total	**10.609.108**	**10.549.886**	**9.514.654**	**9.777.962**	**9.526.808**	**9.618.700**	**10.082.030**	**10.224.690**	**10.190.597**	**10.538.743**

Source: www.assoporti.it

By analysing more in depth the situation at terminal level, it is possible to observe some specific trends in the throughput and market shares of the TOCs operating in the specific port system (Table 5.5). Italy presents an high fragmentation of the supply, especially in the ports that perform as gateways.

Table 5.5 - The container Terminal Operating Companies in Italy: TEUs and market shares

Port System	Terminal Operating Company	2011		2015		2016*	
		TEUs	*Market %*	TEUs	*Market %*	*Market %*	Δ 2016-2007
Ancona	Adriatic Container Terminal (ACT)	105.000	*1,10*	178.476	*1,75*	*2*	*113%*
Augusta (+ Catania)	International Terminal Service of Augusta	-	-	-	-	-	-
Cagliari	Cagliari International Container Terminal SPA (C.I.C.T.)	557.730	*5,85*	748.647	*7,35*	*7*	*23%*
Civitav.	Roma Terminal Container (RTC)	38.305	*0,40*	66.731	*0,65*	-	-
Genoa (+ Savona)	Gruppo Spinelli (ex Ind. Rebora)	145.261	*1,52*	319.529	*3,14*		
	SECH	280.019	*2,94*	385.806	*3,79*		
	Terminal San Giorgio Srl (TSG)	48.020	*0,50*	99.951	*0,98*		
	Voltri Terminal Europa (VTE)	1.140.123	*11,97*	1.237.224	*12,14*		
Sub-Total	*Genoa*	1.613.423	*16,93*	2.042.510	*20,05*	*22*	*12%*
Gioia Tauro (+ Messina)	Medcenter Cont. Terminal (M.C.T.)	2.204.982	*23,15*	2.546.805	*24,99*	*27*	*-19%*
La Spezia (+ Carrara)	Terminal del Golfo	124.621	*1,31*	104.000	*1,02*		
	La Spezia Container Terminal (L.S.C.T.)	1.069.274	*11,22*	1.196.000	*11,74*		
Sub-Total	*La Spezia*	1.193.895	*12,53*	1.300.000	*12,76*	*12*	*7%*
Leghorn (+ Piombino)	SINTERMAR	22.480	*0,24*	31.234	*0,31*		
	Lorenzini & C. Srl	114.130	*1,20*	153.200	*1,50*		
	Terminal Darsena Toscana (TDT)	471.188	*4,95*	593.464	*5,82*		
Sub-Total	*Leghorn*	607.798	*6,39*	777.898	*7,63*	*7*	*4%*
Naples (+ Salerno)	Co.Na.Te.Co	435.031	*4,57*	363.772	*3,57*		
	Soteco Srl	20.000	*0,21*	16.654	*0,16*		
	Terminal Flavio Gioia	65.000	*0,68*	45.471	*0,45*		
	Amoruso Giuseppe	80.000	*0,84*	91,258	*0,90*		
	Salerno Container Terminal (S.C.T.)	235.000	*2,47*	268.070	*2,63*		
Sub-Total	*Naples + Salerno*	835.031	*8,77*	694.058	*7,71*	*8*	*2%*
Pozzallo	Ser.M.I. Srl	4.489	*0,05*	-	-		
Ravenna	Terminal Container Ravenna (T.C.R.)	198.419	*2,08*	244.813	*2,40*	*2*	*12%*
Taranto	Taranto Container Terminal	612.574	*6,43*	-	-	-	*-100%*
Trieste	Trieste Marine Terminal (TMT)	393.195	*4,13*	443.882	*4,92*	*5*	*83%*
Venice	VeCon SPA	232.967	*2,45*	290.000	*2,85*		
	Terminal Intermodale Venezia (TIV)	225.396	*2,36*	270.000	*2,65*		
Sub-Total	Venice	458.363	*4,91*	560.000	*5,5*	*6*	*84%*
Total		**9.526.808**		**10.190.597**			

*** Data provided by Contship (2017)**

Source: own elaboration based on different sources: TOC Balance sheets, ports websites, TOCs websites and Assoporti.

This is countertrend respect to international trends that see the concentration of the container traffics in few ports as response to the concentration of the shipping market, currently characterized by the presence of three global alliances. Northern Italy gateway ports perform better than Southern Italy ones. The presence of industrial areas, freight villages and intermodal connections (especially railways) have favored the development of transport and logistics systems centered on ports, such as La Spezia, Trieste, Venice and Genoa.

In Southern Italy, there is a great potentiality for growth only if the intermodal connections will be developed (PGT, 2016). The recent port reform should favour a development of the railways system between the port of Naples and the two freight villages of Nola and Marcianise. Some concerns refer to the development of Bari that could have a negative impact on the development of Naples given the same hinterland.

Finally, in 2015 there has been the collapse of the Taranto Container Terminal, born as transhipment hub for the liner shipping Evergreen, due to the lack of the dredging and infrastructural investments already planned in 2012. The Taranto Container Terminal is not operative yet and still waiting the new tender for the concession. This has clearly contributed to the decline of throughput (-3%) in the Italian transhipment hubs. The difference in performance is the result of strategic choices and relational network structures of Italian TOCs in their specific local context. In the next section, based on the SNA approach, strategy and networks of the 25 container TOCs of the previous Table will be analysed.

5.6 The evolution of the Italian container terminal network from 2011 to 2015

The extraordinary rise of equity agreements in the container industry at international level has affected, to some extent, the competitive dynamics of the Italian market, given the presence of international investments and interests of some of the most important Global Players. In this section, the equity agreements of the Italian TOCs have been analysed both at horizontal and vertical levels, comparing 2011 to 2015. The application of the ego-centric network approach to each of the 25 TOC located in the Italian port system allows to envisage the set of relationships set up with competitors and other transport and logistics service providers, in the pursuit of expansion strategies.

The use of the Ego-centric Social Network Analysis (ESNA) is very effective when the aim of the research is to analyse the strategic choices of MNC and national subsidiaries, or business operators in general (Mainela, 2001). With specific reference to TOCs, the analysis focuses on equity agreements, a collaborative forms particularly spread in the industry (Parola *et al*., 2014). Specifically, the 25 TOC-centric networks allow analysing:

- ✓ Horizontal expansion strategies in the form of equity agreements for the management of others TOCs in the Italian market (Figure 5.6);
- ✓ Vertical diversification strategies, and in particular the supply chain integration, through equity agreements with others local service providers (Figure 5.7).

The identification of their inter-organizational networks has been carried out through an in depth analysis of their balance sheets in two years: 2012 (with data related to 2011) and 2016 (with data related to 2015). The balance sheet provides, at this regard, information and data related to the shareholders, participations in others companies and investments. These data have been used to build 25 TOC - centric networks in 2011 and 2015, characterised by different capital shares and formal relationships with others actors/companies belonging to others industries. Subsequently, starting from these 25 TOC - centric networks, the whole network structure of the Italian Container Terminal Market has been built by using complementary data provided by industrial journals and specific websites such as Containerizational International, Sole24ore, Ship2Shore, Informare, Drewry, PortTechnology and TOCs and Financial Holdings' websites. These data allows to "fulfil" the structural holes of the network and to identify brokerage roles.

The ESNA shows the presence of 25 TOC centric networks in 2011, with a total number of 104 equity agreements in 2011, and 24 in 2015[2], with a total number of 112 equity agreements (Table 5.6). These data highlight a trend towards a greater control and horizontal and vertical integration of the Italian market. Indeed, the number of out-degree that represents the TOC's control over other terminals and transport and logistics companies has increased from 2011 to 2015. With reference to the in-degree, the shareholders of the Italian TOCs, there are 55 actors that control the Italian Terminal Container market in 2011 while 52 in 2015.

Table 5.6 – The characteristics of TOCs centric networks

	TOCs	Degree	In-degree	Out-degree
2011	25	104	55	49
2015	24	112	52	60

In order to provide a qualitative description of the evolution of Equity agreements among TOCs, all the data have been processed through a software called *Gephi*[3] that allow generating TOC centric network (Figure 5.3). The direction of the arrow indicates who controls what and its length, the degree and percentage of capital share possessed by the actors (small arrow indicates high control of the financial capital).

The Italian Terminal Container market results to be characterised by a great number of independent TOCs, and by the presence of a cluster of TOCs controlled by 4 Financial Holdings/groups: Marinvest, Contship Italia, Europe Terminal N.V and Sinport. The situation deeply changed in 2015, where it is possible to acknowledge the leading role of Marinvest, which directly controls 7 TOCs.

In particular, Marinvest, owned by Aponte's Trading and Projects Limited[4], is a holding company that interest in major national and international companies, including the Grand Navi Veloci (GNV), MSC Cruises and Aprile SPA. In addition to cruise companies, the holding started to expand interest in container terminal and other logistics and transport businesses with the first acquisition of 40% of La Spezia Container Terminal (LSCT) in 1993. Since then, Marinvest pursued horizontal expansion strategy in the Italian market, by having financial stakes in others container terminals: Ancona Container Terminal (ACT), CoNaTeCo (Naples), Lorenzini (Leghron), Soteco (Naples), Trieste Marine Terminal (TMT) and Terminal Intermodal Venezia (TIV) (Table 5.7).

Table 5.7 -The Italian TOCs controlled by Marinvest

	2011	2015
Shareholders (in-degree)	Trading and Project Limited (100%)	Trading and Project Limited (100%)
Direct Participations (out-degree)	ACT SPA 45% Co.Na.Te.Co SPA 50% L.S.C.T. SPA 40% Soteco 40% SCT SPA 15% TCR SPA 30%	ACT 45% Co.Na.Te.Co SPA 100% L.S.C.T. SPA 40% Lorenzini & C. Srl 34% Soteco 30% T.M.T. SPA 50% TIV SPA 50%

[2] Taranto Container Terminal closed in 2015.

[3] Gephi is open-source and free software for the visualization and exploration of all kinds of graphs and networks (https://gephi.org/). It represents one of the main software used in various disciplines (social network analysis, biology, genomics…).

[4] Trading and Project Limited is controlled by Alexa Aponte Vago (99,826%) and Franco Ronzi (0,002%) (Marinvest balance sheet, 2016). Moreover, Alexa Aponte Vago is the Chief Financial Officer (CFO) of the MSC group. https://www.msccruises.co.uk/en-gb/About-MSC/News/Flag-Ceremony-MSC-Meraviglia.aspx

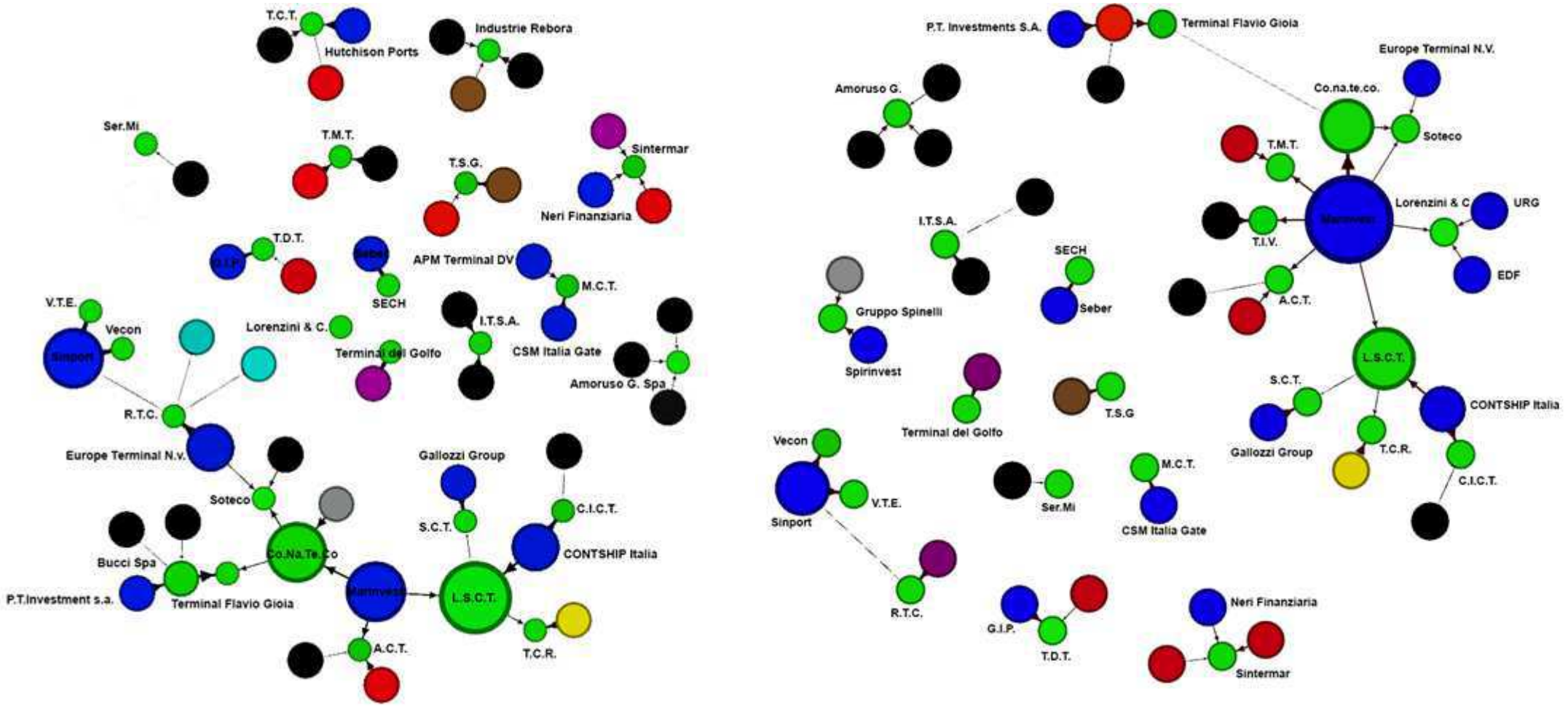


Figure 5.3: The evolution of Equity agreements among TOCs in the Italian market 2011-2015

Green = Terminal Container; Orange = Railways Transport; Sky-blue = Warehousing; Yellow = Freight village /intermodal Hub; Grey = other transport related activities; Brown = Road Transport; Red = Logistic services; Violet = Shipping Company; Black = other activities or persons

Through another financial holding, the Europe Terminal of Antwerp, it acquired the majority of Rome Container Terminal (RTC) in 2011. The horizontal integration strategy has been also carried out abroad through the participation to a Dutch financial holding company belonging to the Aponte family, Terminal Investment Limited (TIL) (www.tilgroup.com). This holding manages 34 container terminals located in 16 countries around the world, handling about 15 million TEUs in 2015. In Europe, TIL controls the main container terminals located in the ports of Valencia, Bremerhaven and Antwerp.

In 2012, through the acquisition of 50% of CSM Italia-Gate SPA, Marinvest indirectly controls a capital share of 33% of Medcenter Container Terminal (Gioia Tauro). Contship Italia SPA is the company of a group established in 1969 by Angelo Ravano, and which directly operates in the ports of La Spezia, Gioia Tauro, Cagliari, Ravenna, Salerno, and in the Rail Hub of Milan, Melzo. In 2015, the main shareholders of the group are Eurokai KG (66,6 %) and Eurogate International Gmbh (33,4 %). Its main core business is the container handling and logistics, through direct participation to container terminals - La Spezia Container Terminal (60%), Porto Industriale Cagliari (92%) (Table 5.8) – and others transport and logistics companies such as Sogemar (100%), a multimodal transport operators located in the port of La Spezia . Thanks to the acquisition of 50% of CSM gate in 2015, Contship has interest in Medcenter Container Terminal (Gioia Tauro). The group has indirect relationships with Ravenna Container Terminal and Salerno Container Terminal. Contship Italia offers, moreover, vertically integrated transport solutions through directly owned businesses, which further extend the geographical scope in connecting additional ports in Italy. Europe Terminal N.V is a company located in the port of Antwerp, belonging to Mediterranean Shipping Company (MSC). In 2011, its interest in the Italian TOCs was mainly Ravenna Container Terminal (99%) and Soteco (30%). In 2015, the Ravenna Container Terminal was fully acquired by Gitaurco, a company indirectly linked to MSC group. Europe Terminal N.V. has currently 30% of Soteco in the port of Naples.

Table 5.8 -The Italian TOCs controlled by Contship Italia

	2011	2015
Shareholders (in-degree)	Eurokai 66,60 Eurogate International 33,40	Eurokai 66,60 Eurogate International 33,40
Direct Participations (out-degree)	L.S.C.T. SPA 60% CSM Italia gate 100% C.I.C.T. SPA 92% SAPIR SPA 100%	L.S.C.T. SPA 60% CSM Italia gate 50% (MCT) C.I.C.T. SPA 92% Sogemar 100%

Sinport is a holding located in Genoa, was fully controlled by PSA Europe in 2011. In 2015, Gruppo Investimenti Portuali SPA acquired a share of 40% of the capital. Sinport fully controls the two container terminals: V.T.E. (100%) in the port of Genoa) and VeCon (100%) in the port of Venice (Table 5.9).

Table 5.9 -The Italian TOCs controlled by Sinport

	2011	2015
Shareholders (in-degree)	PSA Europe Ltd 100%	PSA Europe Ltd 60% Gruppo Investimenti Portuali SPA 40%
Direct Participations (out-degree)	R.T.C. SPA 0,63% V.T.E. SPA 100% VeCon SPA 100%	R.T.C. SPA 0,05% V.T.E. SPA 100% VeCon SPA 100%

Finally, GIP[5] is a financial holding created in 1993 by Luigi Negri (Finsea Group), Giovanni Cerruti (Gastaldi Group), and Magill, Giulio Schenone (Thomas Carr). The holding created in 1996 the intermodal company Logtainer in order to connect the container terminal SECH, in the port of Genoa, with the main freight villages of the North Italy. In 2004, GIP and MSC created a new consortium called Calata Bettolo (65% MSC and 35% GIP) for the management of a new terminal container in the port of

[5] http://gipholding.com/it/chi-siamo/

Genoa, that should be operative in 2018. From 2011 to 2015, GIP increased its interest in the container terminals, as shown in Table 5.10. In particular, the GIP acquired a 50% share of the TDT terminal (Terminal Darsena Toscana), in 2010. After few years, it secured a majority of the TDT, by acquiring a further 30% of the terminal. The other three TOCs are controlled indirectly by having participations in other two financial holdings: SEBER controls 100% of SECH while Sinport, VeCon (100%) and VTE (100%).

Table 5.10 -The Italian TOCs controlled by Gruppo Investimenti Portuali (GIP) SPA

	2011	**2015**
Shareholders (in-degree)	Finsea Group, Gastaldi Group, I.L Investimenti, Thos Carr & Son	Finsea Group, Gastaldi Group, I.L Investimenti, Thos Carr & Son
Participations (out-degree)	T.D.T. SRL 80% SEBER SRL 60%	T.D.T. SRL 80% SEBER SRL 60% Cons. Bettolo 35% Sinport SRL 40%

The network analysis performed at terminal-terminal level, has been furtherly enriched in order to discovered other potential relationships between the companies (nodes) belonging to the TOCs' egocentric networks. These data can be gathered through an in depth analysis of specialised journals, such as Ship-to-shore or JOC.com, TOC's and other actors' websites. Thus increasing the connections, the network structure is characterised by 127 actors/nodes in 2011, among which 25 are TOCs , and 124 in 2015, with 24 TOCs (Table 5.11). The relationships among these actors are 244 in total: 104 are dyads whose partner is at least a TOC while the others 140 are among the others actors of the network. These actors are: Financial Holdings (13), Logistics Operators (15), Warehousing (10) and others Transport-related activities (20) such as tourist agencies, consortium for the promotion of port activities, ICT providers and water supply. The evolution of the network structure in 2015 shows that the number of financial holdings and groups increased from 13 to 15 as well as the number of railways transport operators; the number of shipping companies decreased from 5 to 3.

Table 5.11: The Italian Container Terminal Network: actors and relationships

	Network (TOC)		**Other nodes (TOCs excluded)**									**Relationships among other nodes**		
	Nodes	Degree	RaT	FH	W	FV	TR	RoT	LO	SC	Others	Degree	In-degree	Out-degree
2011	127 **(25)**	244 **(104**)	2	13	10	4	20	2	15	5	31	**140**	67	73
2015	124 **(24)**	268 **(112)**	**5**	**15**	8	**5**	19	1	15	**3**	29	**156**	82	74

TOC = Terminal Container; Ra.T. = Railways Transport; FH= Financial Holdings/groups; W. = Warehousing; F.V. = Freight village /intermodal Hub; T.R. = other transport related activities; Ro.T. = Road Transport; L.O. = Logistic operators; S.C. = Shipping Company; Other = other activities or persons.

The representation of the whole relationships network structure of the Italian Container Terminal market is provided in Figure 5.4 where it is possible to visualize the evolution of the intricate network of relationships form 2011 to 2015. What emerges, it is the presence of an intricate network of relationships, that resin comparison to the one analysed in Figure 7.6, is more dense and it shows some power positions.

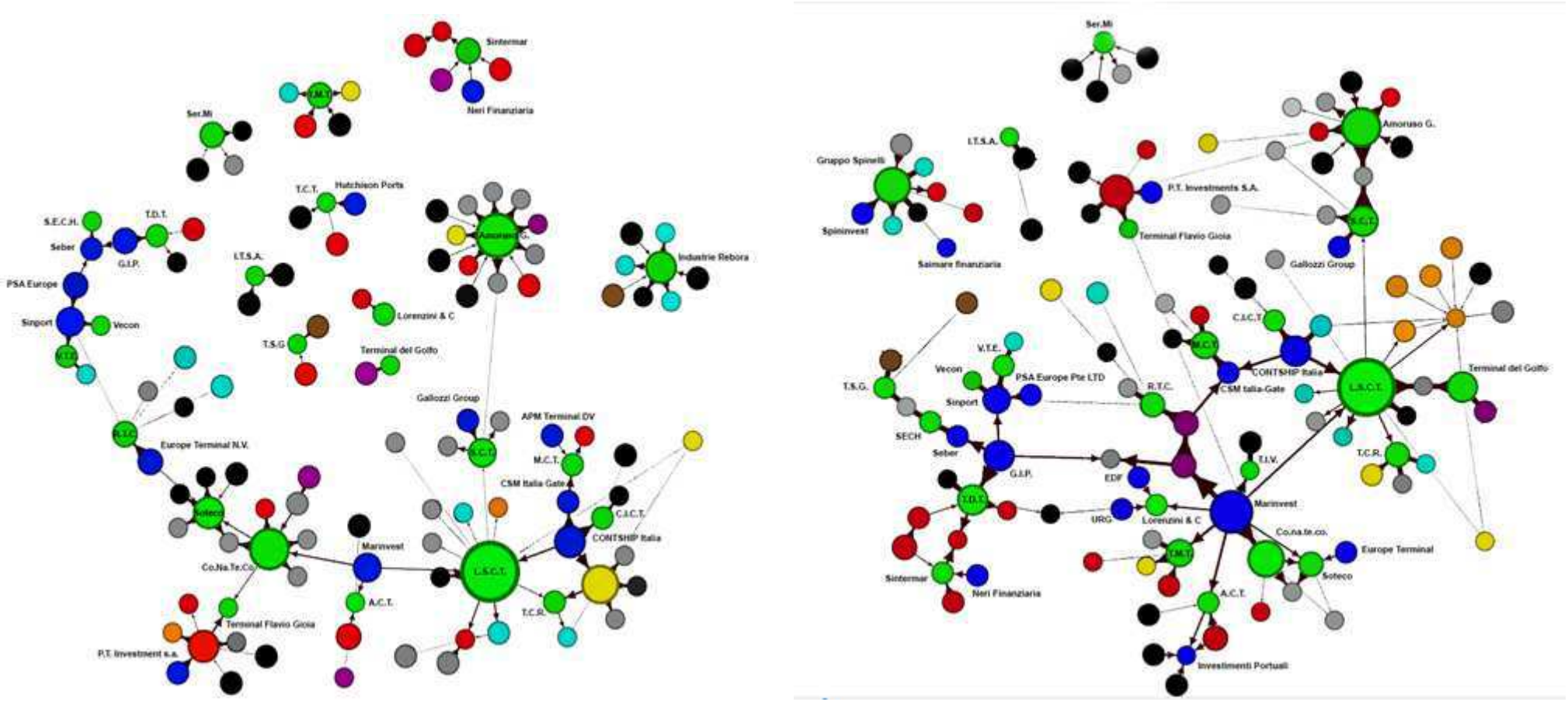


Figure 5.4 - The evolution of horizontal and vertical Equity agreements undertaken by TOCs in the Italian market 2011-2015

Green = Terminal Container; Orange = Railways Transport; Sky-blue = Warehousing; Yellow = Freight village /intermodal Hub; Grey = other transport related activities; Brown = Road Transport; Red = Logistic services; Violet = Shipping Company; Black = other activities or persons

In particular, the effect of the liberalization of the railways transport is more evident in 2015, as some operators decided to enter into the market with their own subsidiaries. These are La Spezia Container Terminal (LSCT) and Terminal del Golfo that jointly created La Spezia Shunting Railways services. LSCT, moreover, has relationship with Ocenagate (Contship Italia) that also performs railways services. The others railways services providers are part of groups, such as TO Delta that operates in Trieste. It is clear that the cases of vertical integration, especially in the intermodal railways, are available in Northern Italy given the presence of intermodal connections from the ports to the transport and logistics system. These two dynamic networks (La Spezia and Trieste) will be analysed in depth through the case study methodology in the next Chapter.

Thanks to the identification of further relationships (degrees) among network actors, the number of TOCs directly and indirectly by some nodes increased in an impressive way (Table 5.12). Marinvest has increased the number of TOCs directly controlled from 4 to 7, and those indirectly controlled from 4 to 5, in 2011 and 2015 respectively. The total number is 8 in 2011 and 12 in 2015. Marinvest has also relationship with Contship Italia group, as they has created in joint venture the La Spezia Container Terminal (40% and 60% respectively). Moreover, Marinvest has indirect relationship with Gruppo Investimenti Portuali (GIP), thanks to its direct participation to the consortium of new terminal, Calata Bettolo (65% MSC and 35% GIP) in the port of Genoa. In total, the number of TOCs that characterised this cluster is 17 over 25[6]. Contextually, the number of independent TOC-centric networks decreased from 11 (2011) to 4 (2015).

Table 5.12 - Financial Holding and group direct and indirect control of TOC (2011-2015)

	2011			2015		
	Direct control	*Indirect control*	**Total**	*Direct control*	*Indirect control*	**Total**
Marinvest SRL	4	4	**8**	7	5	**12**
CONTSHIP Italia SPA	2	2	**4**	2	3	**5**
Sinport SRL	3	0	**3**	3	0	**3**
Europe Terminal N.V.	2	0	**2**	1	0	**1**
G.I.P. SPA	1	1	**2**	1	**3**	**4**
CSM Italia Gate SPA	1	0	**1**	1	0	**1**
P.T. Investment s.a.	1	0	**1**	0	1	**1**
APM terminal DV	1	0	**1**	-	-	**-**
Gallozzi Group SPA	1	0	**1**	1	0	**1**
Neri Finanziaria SRL	1	0	**1**	1	0	**1**
Hutchison Ports Taranto	1	0	**1**	-	--	**-**

Source: TOCs and Financial Holdings balance sheets and websites; journals websites.

This intricate network of equity agreements is, thus, characterised by power positions exerted by two financial holdings and one logistics group: Marinvest, GIP, and Contship Italia. The implications on the Italian container market shares are evident by focusing on the volumes of TEUs handled by the top-10 Italian TOCs (Table 5.13). It results that Marinvest, Contship Italia and Gruppo Investimenti Portuali (GIP) control about 80% of the Italian container market in 2015.

Considering the typologies of actors that run the terminal (Olivier et al. 2007; Slack and Fremont, 2005), Marinvest manages the business in the interest of the Mediterranean Shipping Company, whose aim is to minimize the cost of maritime transport. TOCs directly controlled by the holding are mainly located in the North of Italy, with the exception of the two terminals located in the port of Naples. The relational network can be viewed as a expansion strategy to secure the vessels' capacity and, contextually, as an entry barrier to other competitors in the Italian market.

[6] The number of TOCs controlled are 17 and not 21 as some of them are Equity Joint Ventures.

Table 5.13: The intricate relationships networks of Italian TOCs: economic, financial performance and market shares in 2011 and 2015

	2011						2015					
TOC	**Shareholders**	***Revenue (.000 €)***	***EDITBA (.000 €)***	***ROI***	***TEUs***	***Market %***	**Shareholders**	***Revenue (.000 €)***	***EDITBA (.000 €)***	***ROI***	***TEUs***	***Market %***
Cagliari (CICT)	Contship (92%)	25.684	8.309	5.90%	557.730	5.85	Contship (92%)	33.885	10.664	29.07%	748.647	7.35
Genoa (VTE)	Sinport (100%)	120.540	40.474	16.07%	1.140.123	11.97	Sinport (100%)	126.339	23.525	15.84%	1.237.224	12.14
Gioia Tauro (MCT)	CSM Italia -Gate (66.7%) APM terminal (33.3%)	67.419	3.541	-14.95%	2.204.982	23.15	***CSM*** Italia -Gate (100%)	79.804	1.018	-10.69%	2.546.805	24.99
La Spezia (LSCT)	Contship (60%) Marinvest (40%)	103.320	32.118	17.71%	1.069.274	11.22	Contship (60%) **Marinvest** (40%)	133.234	36.992	13.39%	1.196.000	11.74
Leghron (TDT)	GIP (80%)	48.645	13.386	15.90%	471.188	4.95	GIP (80%)	50.472	7.293	6.70%	593.464	5.82
Napoli (CoNaTeCo)	Marinvest (50%) Fuskon M. C. 50%	42.934	6.838	7.09%	435.031	4.57	**Marinvest** (100%)	29.381	-1.679	-25.97%	363.772	3.57
Ravenna (T.C.R.)	Europe Terminal. 99%	18.489	4.779	na	198.419	2.08	***Gitaurco*** Cyprus Ltd (100%)	21.651	4.981	na	244.813	2.40
Trieste (TMT)	T.O. Delta (55%) Sirefid (45%)	33.264	1.632	0.15%	393.195	4.13	**Marinvest** (50%) T.O. Delta (50%)	36.294	2.027	2.77%	501.222	4.92
Venice (VeCon)	Sinport (100%)	24.380	8.179	16.89%	232.967	2.45	Sinport (100%)	27.620	11.919	32.32%	290.000	2.85
Venice (TIV)	Marinvest (50%) Mariner (50%)	10.266	511	-4.73%	225.396	2.36	**Marinvest** (50%) Mariner (50%)	15.960	3.596	11.45%	270.000	2.65
Subtotal (10)					**6.928.305**	**72.72**					**7.991.947**	**78.42**
Total (24)					**9.526.808**	**100**					**10.190.597**	**100**

Holding/Group	Shareholders (2011)	Shareholders (2015)
Marinvest SRL	Trading and Project Limited (100%). This company is controlled by Alexa Aponte Vago (99,826%) CFO of the MSC Group	Trading and Project Limited (100%) This company is controlled by Alexa Aponte Vago (99,826%) CFO of the MSC Group
Contship Italia SPA	Eurokai Kgaa (66,6%), Eurogate Int.GMBH (33,4%)	Eurokai Kgaa (66,6%), Eurogate Int.GMBH (33,4%)
Sinport SRL	PSA Europe (100%)	PSA Europe (60%), **GIP 40%**
GIP SPA	Finsea Group, Gastaldi Group,I.L Investimenti, Thos Carr & Son	Finsea Group, Gastaldi Group,I.L Investimenti, Thos Carr & Son
CSM Italia Gate SPA	Contship (100%)	**Contship** (50%), **Gitaurco Cyprus** Ltd (50%) (indirectly affiliated to **MSC**) [7]

Source: TOCs and Holding/Groups' balance sheets, 2012 and 2016

[7] The source of this information is Eurokai Annual Report 2015 www.eurokai.de/eurokai_en/.../3/.../Annual+Report+2015.pdf

Moreover, Contship Italia represents a logistics operator interested in boosting the integration along service supply chain, especially in the port of La Spezia. The main interested of the group is to control the total transport chain costs through vertical integration strategy, by controlling directly other logistics and transport activities.

GIP SPA, as a pure financial holding, manage the terminal business in order to increase the ROI. The interest in the Italian container market follows the financial values of the terminal operators, as it can be shown by the acquisition of 40% capital shares of Seber, that fully control VTE in the port of Genoa.

At this regard, LSCT and VTE registered the highest financial and economic performance in terms of revenue, EDITBA and ROI. On the contrary, MCT in Gioia Tauro, with a volume of TEUs double respect to LSCT and VTE, had unsatisfactory performance.[8] Considering the revenue per TEUs, LSCT registered an increase from 96.5 € (2011) to 111.4 € (2015), VTE a decrease from 105 € (2011) to 102.1 € (2015). Finally, MCT registered a revenue per TEUs very low, 30.5 € (2001) and 31.33 € (2015) as it is a pure transhipment port. Moreover, in May 2011, Maersk which accounted for about 25% of container traffic, excluded the port from its network. Maersk has re-distributed its transhipment traffic in favour of Port Said, also launching a mother vessel service calling at Genoa for Far East-Europe routes (Musso *et al*., 2013)

5.7 Intermediate conclusions

The container terminal industry has been deeply invested by a new consolidation process characterised by expansion strategies of Global players through the development of equity joint ventures. Equity Joint ventures (EJV) fall under broad concepts of strategic alliances and inter-organisational relationships, and they are formal cooperative arrangements between two or more legally independent organizations that achieve some common goals through a jointly owned business entity (Parkhe, 1991).

In the container terminal industry, research on EJV is an emerging topic and generally deals with the perspective of the conglomerate at corporate level (Parola *et al.*, 2014; Notteboom and Rodrigue, 2012; Satta *et al.*, 2014). In particular, these studies analyse the logics behind the expansion strategies of Global players – Stevedores, Ocean carriers and financial holdings – and highlight, from one side the great concentration of the market al international level, posing critical issues on further growth; from the other side, there is a great opportunity to differentiate and integrate along the supply chain at regional level. At this regard, Local Port Services Providers (de Langen and Chouly, 2009) can only survive in specialised supply chains where they are somewhat protected from competition through entry barriers such as legal and economic entry barriers (for example, the dominance of local TOCs in France ports is due to the presence of high entry barriers imposed by the Government).

This Chapter addresses specifically the equity agreements in the Italian container market by adopting the perspective of the Terminal Operating Companies (TOC). Respect to the other research, this study implements a bottom-up approach in the analysis of the structure and relational dynamics among Italian TOCs. In particular, the TOC's networks are built by using an egocentric approach that is constituted by the interplay between their individual social structures and their cooperative relationship with other actors. Then the whole container terminal structure is derived from the interplay among the 25 TOC's networks, by enriching the analysis with other sources of information.

Two main considerations can be highlighted. It is importance to have a complete picture of the container market as provided in this Chapter, in order to deepen the central role and, to some extent, power positions of the different typologies of the actors within the relationship network characterising the market. At this regard, the dominant position of Marinvest - controlling directly and indirectly 17

[8] First, the company is trying to face the financial debts with banks through Constship's cash pooling and by reducing the dividends to shareholders. Second, the terminal efficiency is affected by the lack of qualified staff and technological improvements (MCT balance sheet 2016).

TOCs over 24 in 2015 - and the increasing role of GIP could have important implications for port value creation. Until the Italian TOCs can produce value in financial and operational terms, the interests of these financial holdings will be high and there will be less risks of selling the capital shares of TOCs. Ports and terminals become, thus, sources of value generation for these actors and their contribution to the regional and national economic and social welfare seems more compromised.

The second refers to the understanding of the typologies of terminal operators, and thus their value propositions. Through the analysis of their shareholding companies, it would result that there are different typologies of financial holdings and groups that control terminal operators, while leaving the existing terminal operator managing the handling activity. However, by increasing the level of the analysis to the shareholding companies' relationships, this study shows the existence of few central positions.

These issues are of crucial importance and deserve attention from the Port Authority's with reference to the terminals' concession policy and competition in the market. The understanding of the multiple and, often, diverging interests linked to the terminal management should not be overlooked, thus preventing potential power positions in the port that could have repercussions on its social and economic value.

Finally, increasing the level of the analysis to the European level can offer more useful insight as it will be possible to find further links among the actors and, therefore, to better identify leading and power positions in the network. The identification of all the possible links among network's actors allows to quantify roles of centrality and power through a set indicators frequently used in the Social Network analysis such as betweeness centrality and closeness (Hanneman, R. A. and Riddle, M. 2005). This information is particularly important for policy makers, at national and European levels, in order to prevent dominant positions in the market.

6. The cooperative agreements in the Italian container liner shipping market

6.1. Introduction

Cooperative agreements have for a long time characterized the liner shipping market[1], originally in the form of conferences, and after the emergence of containerization, also in the form of consortia, vessel sharing agreements, strategic/global alliances, and capacity stabilization agreements (Heaver *et al.*, 2000; Parola *et al.*, 2014; Unctad, 2016).

Conferences, also called liner or shipping conferences, have had the most significant influence on competition in the liner shipping market compared to other organizational forms of operation. These are "formal or informal private arrangements between carriers or between shipping lines which enable them to utilize common freight rates and to engage in other cooperative activities on a particular route or routes" (OECD, 2002). However, the role of conferences has declined in the last decade, as a consequence of EU Council Regulation 1419/2006 that considered price fixing and capacity control anti-competitive practices. With the rise of the containerization during the 1960s, consortia started to be established and these cooperative agreements gradually replaced conferences, particularly in the United States and Europe. Consortia are agreements between liner shipping companies aimed primarily at supplying jointly organized services by means of various technical, operational or commercial arrangements, for instance joint use of vessels, port installations, marketing organizations (OECD, 2002). Thus, unlike conferences, consortia do not set common freight rates but they aim to improve the efficiency of the operations of their members through technical, operational and commercial arrangements.

A more flexible form of cooperation between liner shipping companies is the vessel sharing agreements. A vessel sharing agreement is usually reached between various container shipping lines who agree to operate a liner service along a specified route using a specified number of vessels. They regulate the commercial presence on a specified loop or maritime route, whilst withdrawing a ship and redeploying it by reserving space on the vessel of a partner company, the partner in turn proceeding in the same way on another loop.

From the 1990s, a new form of collaboration between liner shipping companies have been strategic/global alliances. They normally consist of a small group of carriers which have as their purpose to establish, on a global basis, cooperative agreements involving substantial asset sharing and operational cooperation, while maintaining individual marketing and commercial identities. These generally refer to at least two of the major East/West trade routes – Europe/Asia, Asia/United States, or United States/Europe.

This Chapter is focused on a short review of the main cooperative agreements, aimed at framing the analysis related to the evolution of the global alliances in an international context, showing their impact on the Italian shipping market. The Chapter is structured as follows: section 6.2 focuses on the current concentration of the shipping market, governed by three main alliances. In section 6.3 the analysis focuses on the Italian shipping market through a desk analysis of the maritime services provided by the liner shipping companies (as members of the specific alliance) in each Italian port. There are, at this regards, no statistics available on containers transported by each shipping company, with reference to the Italian ports. Finally, 6.4 is dedicated to the analysis of the main Italian shipping company, the Mediterranean Shipping Company (MSC). Conclusions are provided in section 6.5.

[1] The terms "liner shipping" and "container liner shipping" are often used interchangeably, but the container liner shipping is a major segment of the liner shipping industry (Sys, 2010)

6.2. Global alliances and concentration of the container liner shipping market

Global alliances have steadily increased in last years and nowadays the container liner shipping market is dominated by few of them (Alphaliner, 2017).

In 1992, the shipping market was characterized by fierce competition among thirty shipping companies which represented around 63% of the world fleet capacity. Since then, from a strategic vision, alliances, mergers and acquisitions have been adopted as tools to save cost, enhance economies of scale and protect themselves against the threats of the industry (Heaver *et al.*, 2000). In 1998, there were 6 alliances, which represented 50% of the world fleet (in TEUs).

Between 2000 and 2010, there were 3 main alliances, *Grand Alliance* (NYK, Hapag-Lloyd and OOCL), *CKYH Alliance* (Cosco, K Line, Yang Ming and Hanjin) and *New World Alliance* (APL, MOL and HMM) while the biggest actors in the sector, Maersk, MSC and CMA-CGM, were still on their own. The three alliances together represented almost 50% of the fleet capacity thanks to past acquisitions.

In June 2013, the three biggest shipping lines in the world, Maersk, MSC and CMA-CGM, announced that they intended to form a global alliance, called the P3 network, in order to make their activities more efficient and competitive. Thanks to this agreement, Maersk was intending to contribute 42%, MSC 34%, and CMA-CGM 24% of the total P3 capacity (Lloyd's List, 2013). The three participating member lines, however, continued to have separate identity and commercial departments for sales, marketing and customer services. Soon after the P3 alliance, there was a new global alliance called G6 composed of APL, Hapag-Lloyd, Hyundai Merchant Marine, MOL, NYK Line and OOCL, aimed at expanding their cooperation to trades between the Far East and the United States west coast as well as between northern Europe and the United States coasts.

In February 2014, it was announced that Evergreen formally joined the CKYH alliance, resulting in a new expanded alliance, called CKYHE (Lloyd's List, 2014). In July 2014, two of the P3 parties, Maersk and MSC, announced a new vessel sharing agreement and expressed the intention to establish a new alliance, called the 2M. Later on, in September 2014, the new "Ocean Three" (O3) alliance was announced by three carriers, the remaining P3 partner, CMA-CGM, United Arab Shipping Company (UASC) and Chinese CSCL, covering key trades such as East-West from Asia to Northern Europe, the Mediterranean and both North American coasts (Journal of Commerce, 2014; and ShippingWatch, 2014).

In 2015, Zim remained the only major carrier which had not joined any alliance; the company decided to manage its business through partnerships on various routes while managing to avoid the most important trades where the alliances operate, such as Asia-North Europe.

This continuous development resulted in three main alliances on April 2017 (Table 6.1): THE Alliance, Ocean Alliance and 2M (Alphaliner, 2017).

Maersk and MSC have a combined capacity of about 6 million TEUs, representing about 29.5% of the overall global market share in container capacity. At the end of 2016, Maersk announced its plan to acquire Hamburg Sud, subject to regulatory approval. The new merger would push 2M's container market share to 33.4% (Alphaliner, 2017).

The 2M alliance negotiated also with Hyundai Merchant Marine (HMM) a possible membership, but ultimately decided to opt for/subscribe a Vessel Sharing Agreement rather than a full membership. Under the agreement, HMM purchased slots on the 2M routes connecting Asia with North Europe, the Mediterranean and the US East Coast, while continuing to operate Asia – US West Coast services on its own, with Maersk and MSC taking slots. Maersk and MSC took control of a specific number of vessels currently operated by HMM on the Asia – Europe and Asia – USEC routes. These vessels operated and marketed by Maersk and MSC.

Table 6.1: Global alliances in the shipping market in 2017

Alliance	Members	Details
2M	MSC, Maersk	223 ships with a capacity of around 6 million TEUs operating 25 weekly services globally covering 1327 port pairs
Ocean Alliance	CMA-CGM, Cosco Group, OOCL and Evergreen	323 ships with a capacity of around 5.5 million TEUs operating 40 weekly services globally covering 1571 pair of ports
THE Alliance	Hapag Lloyd, NYK, Yang Ming, MOL, K-Line	241 ships with a capacity of around 3.3 million TEUs operating 32 weekly services globally covering 1152 pair of ports

Source: Alphaliner, 2017

The Ocean Alliance brings together four of the world's largest container lines and is seen as a direct attempt to counterbalance the dominance of the 2M alliance in the market. This follows CMA's takeover of Neptune Orient Lines in 2016 and the consolidation of its APL, USL, and ANL brands, as well as COSCO's giant merger with China Shipping. The Ocean alliance represents roughly 26% of global container capacity or about 5.5 million TEUs. The Ocean Alliance will own 41.43% market capacity on the Transpacific trade lane, and 34.86% in Asia-Europe, allowing for considerable strength across both major trade lanes.

THE is another alliance marked by the industry's recent moves towards greater consolidation. Hapag-Lloyd is looking to finalize its merger with UASC, while the three Japanese carriers in the alliance announced their intentions to merge, creating the sixth largest container operator in the world. THE will represent roughly 16% of global container capacity. THE Alliance will have 28.68% market capacity on the Transpacific trade lane and 23.41% in Asia-Europe.

The next Figure describes the market shares of the three alliances on East-West routes.

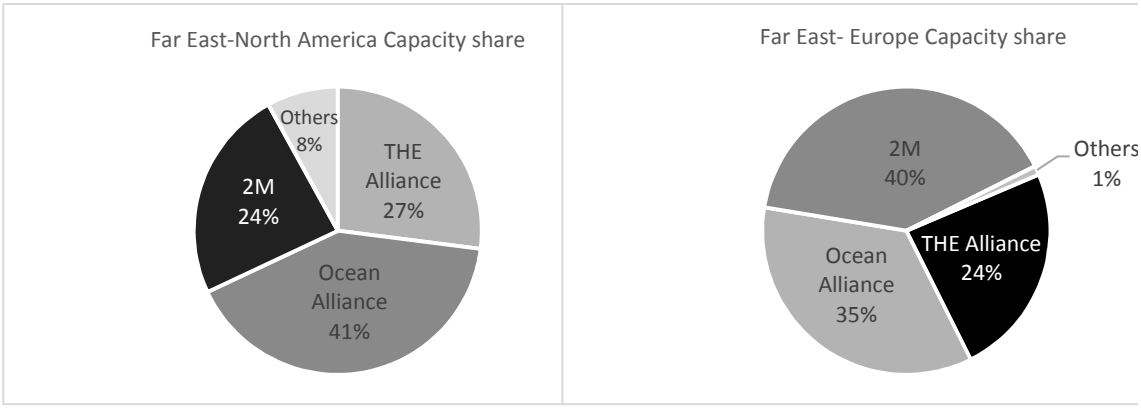


Figure 6.1: Market shares of the three alliances on the main East-West routes

Source: SRM 2017

In particular, on the Far East - North America route, the Ocean Alliance is the most important player with 41% of the market (Figure 6.1), while on the Far East - Europa route the 2M alliance holds 40% of the market. As it will be shown later, the strong position of 2M on the Far East - Europe route is also determined by the great investments undertaken by MSC in terminals in Europe and Italy.

6.3 The structure of the Italian container liner shipping market

The aim of this paragraph is to measure the impact of the global alliances on the Italian container liner shipping market. This analysis will specifically target the container liner services that have called at Italian ports when the three global alliances entered the global market. The analysis is purely descriptive and it is based on info and data provided by shipping companies and Italian ports websites as well as other sources of information such as publications and reports.
In 2016, the maritime transport represented 37% of the Italian production in value terms (billion euros), while road transport were main transport modality (50%). In detail, with reference to the Italian maritime import-export, the data confirm the importance of the United States for Italian maritime exports (Figure 6.2). The import flows from China represented 15.6% of the total Italian maritime imports. Turkey was the main Italian partner in the Mediterranean followed by Saudi Arabia, and Tunisia, Algeria and Egypt.

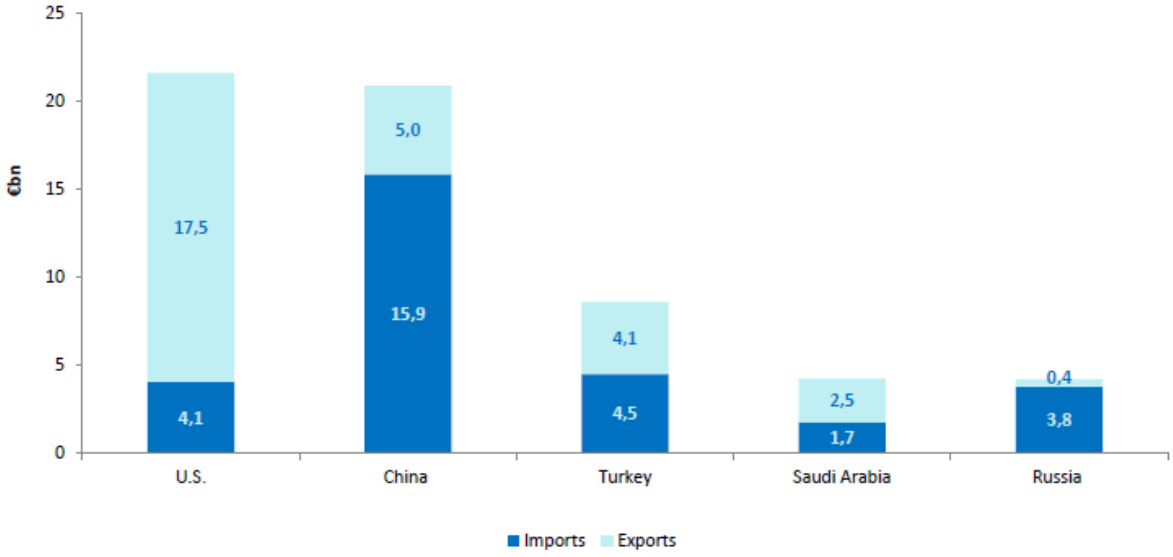


Figure 6.2. Maritime import – export flows in Italy, 2016

Source: SRM and ISTAT, 2017

Thanks to the enlargement of the Suez Canal, China has increased its strategic interest in the Mediterranean. The Chinese import - export to the South Mediterranean grew, indeed, from 5.5 billion euros in 2001 to 56 billion euros in 2015, doubling the value each year. Currently, China is the second commercial partner in the MED (after the USA) and is the one with the highest growth rate. Cosco - merged with the other Chinese CSCL operator (China Shipping Container Lines) – bought, at this regard, 67% of container terminals in the Port of Piraeus, thus placing a strong maritime base in the MED area.

The commercial flows between Italy and Mediterranean countries are also important and about 76% is managed through maritime transport. Italy is the European country that in 2015 recorded the largest volume of trade with the Mediterranean (around 57.9 million tonnes of goods). The figure grew by 10% compared to 2014, in line with the growth rate recorded for Germany and the Netherlands (SRM, 2017).

With reference to the container liner shipping services, the analysis focuses on the following Italian ports, sorted by geographical area (centre-north and south and island). Centre-North ports: Ancona, Civitavecchia, Genoa, La Spezia, Livorno, Ravenna, Trieste and Venice; Southern and Island ports: Cagliari, Gioia Tauro, Naples, Salerno. The analysis refers to the full container liner shipping services that link these ports to various destinations. On the basis of an extensive content analysis of available documents and container liner shipping companies, it has been

possible to describe, for each Italian port/terminals under investigation, the following indicators: number of services; weekly capacity; number of ships; main shipping company and/or alliance and service routes/connections (Table 6.2).

The analysis shows that there is a marked difference between the number of full container liner services that call at centre-north ports and at southern ports. Indeed, Genoa port is the first Italian container port in terms of number of services, number of ships, weekly capacity, number of companies/alliances and availability of connections. In general, the Northern Tyrrhenian Sea port system (Genoa, La Spezia and Livorno) is characterized by a high presence of the three main global alliances (2M, THE Alliance and Ocean Alliance), operating mainly on international routes to America and Far East. This is due, on one hand, to the port infrastructures and equipment of terminal containers, which enable them to use large container vessels, and, on the other hand, to the presence of freight villages and intermodal connections.

The port of Trieste, in the Northern Adriatic, has strategic position as an intermodal hub to central and east Europe, given the railways connections, and two global alliances call the port, the Ocean Alliance and 2M. As far as the ships calling in the Italian centre ports (Ancona and Civitavecchia) are concerned, an unbalanced distribution of traffic on the side of the Tyrrhenian ports is registered.

With reference to southern Italy, 2M serves regional ports of Naples while THE Alliance serves the port of Salerno. However, there are no direct services to the Far East. Interestingly, the only shipping company involved in the Italian terminal business is the Mediterranean Shipping Companies, with a wide portfolio of financial stakes in 12 TOCs, through a financial holding.

In relation to the South and Island port system, there are big differences between northern and southern ports in terms of services, capacity and connections. As clearly illustrated in Table 4, the only two southern Italian ports comparable to the ones in the Centre-North are the transshipment ports of Gioia Tauro and Cagliari. These ports are the most important ones in southern Italy in terms of number of services, number of ships, weekly capacity and availability of connections.

In particular, the port of Gioia Tauro is very close to those of the Northern Tyrrhenian ports. Similarly, the port of Cagliari has approximately the same values recorded by the Northern Adriatic ports, and is the second port of southern Italy for both number of services and weekly capacity. The high weekly capacity of these ports, compared to other Italian southern ports, is linked to the presence of services to the Far East and to the presence of at least two of the three major shipping alliances: Gioia Tauro (2M, Ocean Alliance, The Alliance) Cagliari (Ocean Alliance, The Alliance).

On the contrary, regional ports are characterized, on the one hand, by the presence of a single alliance (Naples -2M, Salerno - The Alliance) and, on the other hand, by the lack of services to the Far East. This negatively affects the regional ports, which have the lowest values in terms of services, weekly capacity and number of ships. The comparison between the data of the northern and southern Italy shows a clearly negative scenario for ports in the South. The only ports that show a growth of services and/or weekly capacity are Cagliari and Gioia Tauro, with a weekly capacity of 86.251 TEUs and 23.929 TEUs, respectively.

The ports of Naples and Salerno, traditionally the main final destinations of southern Italy, are experiencing a fall in overseas connections. As far as the port of Taranto is concerned, it is not present in the Table, due to a dramatic fall in containerized traffic, which was the result of the interruption of the only intercontinental service operated by Evergreen.

Table 6.2: The evolution of container liner services in the Italian ports (2011-2017)

Port	N° Services	Weekly capacity	N. Ships	Shipping lines 2011	Global alliances 2017	Connections 2017
Ancona	ND	ND	ND	ANL Container line, Cosco, CMA-CGM, Evergreen Lines, MSC, Hanjin Shipping, HDS Lines, Italia Marittima, LCM, NYK, others	**Ocean Alliance** (COSCO, CMA – CGM, Evergreen **2M** (MSC) **THE Alliance** (NYK) HDS Line, LCM, Tarros, ANL Container Line, Arkas line, others	ND
Leghron	12	47,511	79	Zim, MSC	**THE Alliance** (UASC, Hanjin, Hapag Lloyd) **Ocean Alliance** (CMA – CGM) **2M** (MSC, Maesk) Zim, Hamburg Sud	North America, South America, Middle East Africa, Mediterranean area
Civitavecchia	ND	ND	ND	MSC, Maersk	**2M** (Maersk)	ND
Venice	1	6,703	10	ND	**Ocean Alliance** (CMA – CGM) **The Alliance** (UASC)	Far East
Genoa	21	119,154	174	CMA-CGM, Hapag Lloyd, China Shipping Conteiner Lines, Cosco, Evergreen Lines, Hanjin Shipping, K Lines, Uasc, Yang Ming Lines, Ignazio Messina	**Ocean Alliance** (CMA – CGM, Cosco, Evergreen Line) **THE Alliance** (Hapag Lloyd, Hanjin, K Line, UASC, Yang Ming) **2M** (Maesk, MSC) SEAGO, Tarros APL, Zim, Others	Far East, North America South America, Mediterranean area, Middle East, Oceania, Africa
La Spezia	13	85,695	111	MSC, CMA-CGM, Tarros, Arkas	**2M** (Maesk, MSC) **The Alliance** (Hapag Lloyd UASC, K Line, Yang Ming, NYK) **Ocean Alliance** (COSCO, CMA – CGM, Evergreen Line, OOCL) HMM, SEAGO, Tarros	Far East, Mediterranean area, Europe, North America Middle East, Oceania, Africa
Trieste	3	21,589	41	Italia Marittima (gruppo Evergreen) Maersk, CMA-CGM, Hanjin, Hyundai UASC, Yang Ming	**Ocean Alliance** (COSCO, CMA- CGM, UASC, Evergreen Line, OOCL) **2M** (Maesk, MSC) **The Alliance** (Hapag Lloyd UASC, K Line, Yang Ming, NYK)	Far East, North America Mediterranean area
Gioia Tauro	10	86.251	99	MSC , Maersk Line, Hapag-Lloyd CMA-CGM, others	**2M** (Maesk, MSC) **The Alliance** (HMM, Hapag Lloyd, UASC) **Ocean Alliance**(CMA – CGM, COSCO) APL, ZIM, SEAGO, Hamburg Sud, Others	Far East, Europe, North America, South America Middle East, Oceania, Mediterranean area
Cagliari	5	23.929	42	Hanjin	**The Alliance** (Hapag Lloyd) **Ocean Alliance** (OOCL, CMA – CGM) **2M** (Maesk, MSC) Arkas line, Tarros, SEAGO, Hamburg Sud, Zim, Others	Far East North America Middle East Europe Mediterranean area
Napoli	3	20.235	25	MSC, Hanjin, COSCO, Pakistan National Shipping, Mediterranean Black Sea Shipping, Laso Shipping, Senator Lines, American President Line, others	**2M** (Maesk, MSC)	North America Oceania Middle East Mediterranean area
Salerno	3	5.046	14	Tarros, Grimaldi, Arkas, Seago Line Maersk, Hamburg Sud	**The Alliance** (Hapag Lloyd) **Ocean Alliance** (CMA-CGM), Tarros, Grimaldi	North America, South AmericaMediterranean area

Sources: Terminal Operating Company's websites; port websites; SRM (2015)

The Vessel Sharing Agreements are progressively modifying the global grid of global containerized services. The changes on the supply side of the market, in addition to the market concentration, have contributed to the fact that the majority of the market is directly in the hands of the top twenty shipping companies of the world. A reduced number of players on the supply side forces ports to take part in a continuous competition to attract the big shipping companies to their docks. This trend has determined a progressive selection of Italian ports, creating a divergence between ports with international objectives and ports more oriented towards regional traffic.

6.4 The Mediterranean Shipping Company: a focus on the Italian container market

The concentration of the container shipping market and the continuous competition between Italian ports to attract shipping alliances has stimulated some shipping companies to integrate their business by investing in Italian terminals. Since the end of the '90s, some shipping companies, such as Tarros, Gaetano D'Alessio shipping, Cosco and MSC have started to invest in the Italian container terminals by acquiring shares of the terminal companies.

An illustrative case of the phenomenon in Italy is represented by the integration strategy implemented by the MSC in the last years. The revenue generated by the container terminals on the one hand, and the improvement of the logistics services deriving from a vertical integration of the supply chain on the other hand, have led MSC to invest in the terminal and logistics sectors through the creation of financial holding companies: Marinvest, mainly for Italy, and Terminal Investment Limited for Europe. The financial holding company Marinvest, owned by the Aponte family through the Trading and Projects Limited Ltd., is a company with different majority shares in other important national and international companies, such as: the Mediterranean Shipping Company (MSC), Grandi Navi Veloci (GNV), MSC Cruises and Aprile SPA.

In addition to owning companies connected to the shipping and passenger transport, the holding has stakes in different terminals of Italian ports (Table 6.3): Trieste, Gioia Tauro, Venice, Ravenna, Ancona, Genoa, La Spezia, Livorno, Civitavecchia and Naples. MSC bought a 45% stake in TMT, which operates at the Molo Settimo Wharf container terminal in Trieste, and at the Venice Intermodal Terminal (TIV). In Ravenna, on the other hand, MSC's ships dock at the TRC, and in Ancona at the Adriatic Container Terminal (ACT).

In Genoa, the "Bettolo Consortium", which consists of Luigi Negri's GIP (the operator of the Sech Terminal) and Gianluigi Aponte's MSC, is waiting for the port authority of Genoa to grant the concession for the terminal of the same name that is currently under construction. Finally, there are also the terminals in La Spezia (LSCT), Livorno (Lorenzini & C.), Civitavecchia (RTC), Naples (Conateco) and Gioia Tauro (MCT).

Through another financial holding company connected to Marinvest, the Europe Terminal company has also acquired the majority of shares in the Rome Container Terminal (RTC).

Table 6.3: Terminal investment in Italy by MSC Group trough Marinvest holding (2015)

Country zone	Port	Terminal
Italy		
North Italy	La Spezia	La Spezia Container Terminal
North Italy	Livorno	Lorenzini & C. Terminal
North Italy	Trieste	Trieste Marine Terminal
North Italy	Venice	Terminal Intermodale Venezia
Centre Italy	Ancona	Adriatic Container Terminal
South Italy	Naples	Co.Na.Te.Co.
South Italy	Naples	Soteco

Sources: Our elaboration on Marinvest balance sheets

In 2012, Terminal Investment Limited (TIL), the other financial holding belonging to MSC, acquired 33% of Medcenter Container Terminal (Gioia Tauro) through the acquisition of 50% of CSM Italia-Gate SPA. Since 2015, Terminal Investment Limited has financial stakes in 34 terminals all over the world and 16 in Europe

(Table 6.4), including the main terminal in Valencia (Spain), Bremerhaven (Germany), and Antwerp (Belgium) ports. In 2015, TIL registered 15 million TEUs per year.

Table 6.4: Terminal investment in the world by MSC Group trough TIL (2015)

Country	Port	Terminal
Northern Europe		
Belgium	Port of Antwerp	MSC PSA European Terminal
France	Port of Le Havre	Terminaux de Normandie MSC
Germany	Port of Bremerhaven	MSC Gate
Lithuania	Port of Klaipeda	Klaipedos Smelte
Russia	Port of Saint Petersburg	Container Terminal Saint Petersburg
The Netherlands	Port of Rotterdam	Delta MSC Terminal
Southern Europe & Africa		
France	Port of Marseille	FOS2XL Terminal
Israel	Port of Ashdod	Hadarom Container Terminal
Italy	Port of Gioia Tauro	Medcenter Container Terminal
Portugal	Port of Sines	Sines Container Terminal
Spain	Port of Las Palmas	Operaciones Portuarias Canarias
Spain	Port of Valencia	MSC Terminal Valencia
Togo	Port of Lomé	Lomé Container Terminal
Turkey	Port of AsyaPort	AsyaPort
Turkey	Port of Iskenderun	Assan port
Turkey	Port of Istanbul	Marport
North America		
Canada	Port of Montreal	Termont Terminal
USA	Port Everglades	Port Everglades Terminal LLC
USA	Port Freeport	Freeport Terminal
USA	Port of Houston	Barbours Cut Terminal
USA	Port of Houston	Bayport Terminals
USA	Port of Long Beach	SSA Terminals Long Beach, Pier A
USA	Port of Long Beach	TTI Long Beach Terminal, Pier T
USA	Port of New Orleans	New Orleans Terminal, LLC
USA	Port of Newark	Port Newark Container Terminal
USA	Port of Seattle	TTI Seattle Terminal
Central & South America		
Argentina	Port of Buenos Aires	Exolgan Container Terminal
Bahamas	Port of Bahamas	Freeport Container Port
Brazil	Port of Navegantes	Portuarios de Navegantes
Brazil	Port of Santos	Brasil Terminal Portuario
Peru	Port of Callao	APM Terminals Callao
Asia		
China	Port of Ningbo	Ningbo Gangji Terminal
India	Port of Mundra	Adani International Container Terminal
Saudi Arabia	Port of Red Sea	King Abdullah Economic City
Singapore	Port of Singapore	MSC PSA Asia Terminal

Sources: Terminal Investment Limited website

These terminals are not run on an exclusivity basis, as they can be used by MSC and partners; in most cases, rival liners can use them, in order to maximize the terminal capacity and recover part of the managing costs. For example, in the Port of Long Beach (USA), MSC is not using a unique strategy. Of the four existing container terminals, it operates three of them as follows (Álvarez-SanJaime *et al*., 2013):

- ✓ Total Terminal International, LLC (TTI): owned by Stevedoring Services of America Marine (SSA) and Hanjin Shipping (Hanjin). The latter keeps an exclusive quay, while the remaining quays are indistinctly used by COSCO, PIL (Pacific International Lines), among others, and MSC.

- ✓ Pacific Container Terminal (PPL): participated by MSC since 2001. Apart from MSC, the terminal is used by COSCO, Hanjin and PIL.
- ✓ SSA Terminals (SSAT): quay A is exclusive for MSC cargo, whereas quay C is employed both by MSC and Matson (Matson Navigation Company, Inc.), which is a stakeholder in SSAT.

With reference to the Port of Antwerp (Belgium), MSC, through the financial holding TIL, and PSA created in 2005 a joint venture for the management of the terminal called MSC PSA European Terminal (MPET). PSA also runs four more terminals in Antwerp, in addition to two managed by DPWorld (Dubai Port World), plus an independently owned one (Independent Maritime Terminal).

In the Port of Naples (Italy), there three terminals and the property of the largest one, CO.NA.TE.CO. (Consorzio Napoletano Terminal Containers, SPA) is fully controlled by MSC . The latter container terminal is used by Maersk and shipping lines that are partners with the 2M alliance. In the port of La Spezia, MSC controls the main terminal (LSCT) but services are provided also to the other alliances (The Alliance and The Ocean alliance).

Finally, in the Port of Valencia (Spain), MSC is the owner and manager of a terminal since 2007. It is for the exclusive use of MSC cargo but MSC also routes part of its cargo through one of the other two existing terminals, called NOATUM, owned by J.P. Morgan with which it has reached a collaboration agreement. MSC has been continuously and simultaneously using both these terminals ever since the opening of its dedicated terminal.

In conclusion, MSC is particularly involved in the use of dedicated terminals but it is not unusual that those terminals be simultaneously used by rival liners. This allows MSC to manage efficiently the terminal business, recover costs and increase their productivity.

6.5 Intermediate conclusions

The container liner shipping market has been long characterised by a variety of forms of cooperation, resulting in the last years in the domination by three global alliances. However, despite the existence of cooperation agreements, there is still a competitive environment where supply grows stronger than demand, resulting in declining freight rates (Meersman *et al.*, 2015). The pressure to lower rates is driving smaller operators out of the major routes, and the only chance that they have to survive is to specialise into niche markets. In this regard, some small Italian operators have developed logistics services and supply chain integration in order to remain competitive. For example, Grimaldi group has developed a range of complementary services related to the transport of vehicles; Coeclerici in the port of Salerno is specialised in fruits and reefer container transportation. Specialization and integration in supply chains represent an opportunity for small shipping companies to remain in the market at a profitable level.

The current situation, moreover, may lead to oligopolistic behaviour of the big players in the container liner shipping market with consequence on price and quality of the supply of services. Such an evolution would, most likely, impact on other players in the maritime logistics chain, including TOCs, port authorities and 3PLs. Regulation at international, European and national levels should prevent the formation of such oligopolistic situation. At this regard, terminal concession is an important strategic tool that port authorities can adopt to avoid dominant position in container market and favour intra and inter-port competition.

Finally, future research on the service network centred on the Italian ports could shed light on the power positions of each alliance in the market. At this regard, the Social Network Analysis could contribute in defining the role of centrality and connectivity of specific shipping companies in the maritime routes. The data required in order to quantify the relationships in the network analysis should be related to service connections and volumes.

Moreover, the analysis of small shipping companies in niche markets should get attention from scholars in order to identify internal and external factors that have contributed to the success of their niche strategy. At this regard, the study of best practices in the Italian and European context, with a focus on Short Sea Shipping, could offer useful insight for both practitioners and policy makers.

7. The analysis of Italian ports in the service supply chains

7.1. Introduction

The results of the analysis carried out in Chapter 4 about the institutional environment, show that the availability of freight villages and railways connections would prospect a more favourable institutional environment for the development of collaborative practices in the ports of Northern Italy Moreover, as shown in Chapter 5, Container Terminal Operating Companies have diversified their activities through the realization of collaborative strategies along the port service supply chains In the ports of La Spezia and Trieste.

La Spezia Container Terminal (LSCT), a joint venture between Marinvest (the MSC's financial holding) and Contship Group, shows a network structure characterised by direct and indirect control relationships (horizontal and vertical equity agreements) in transport and logistics business. In addition, the ports of Trieste and Venice experienced an extraordinary increase of TEUs between 2007 and 2016, about 83% and 84% respectively (Table 5.5, Chapter 5). However, the Trieste Marine Terminal (TMT), the only terminal in the port of Trieste, shows a more diversified relational network in comparison to Venezia Contenitori (VeCon) and Venezia Intermodal Terminal (VIT), the two terminals in the port of Venice, which are fully controlled by GIP (financial holding).

Based on these considerations, the analysis of ports located in Northern Italy may offer useful insights on the interactions and relational dynamics existing between the port authority and port business operators in the port service supply chains, related to intermodality and value added logistics. This consideration supports the choice to focus the analysis of the service supply chains in the North-East and North-West logistics systems centred on La Spezia and Trieste.

As port business operators recognize that competition is no longer limited to company versus company, but rather to supply chain versus supply chain, relationships with supply chain partners bridge the supply-demand gap in order to deliver customer value. Thus, the purpose of this Chapter is to investigate how port business coordinate their activities with those of their supply chain partners.

The chosen ports are representative for theoretical, not primarily statistical, reasons as they provide cases of collaborative relationships along different services supply chains. To this end, the analysis will focus on:

- ✓ Public and private relationships, with particular reference to: port authority's role and behaviour in the private business interactions for the accomplishment of port value proposition (vision in port development strategy);
- ✓ Services supply chain relationships, mainly concerning: port business operators' power struggle and interactions in managing key supply chain resources, such as terminals, railways connections and freight villages.

It is worth to mention that most research on service supply chain management is based on successful cases of collaboration and value co-creation, while cases of unfruitful value co-creation efforts (or value co-destruction) have received little attention (Pie and Chumpitaz Caceres, 2010). For this reason, the third case study is related to the port of Naples and explores the reasons that led to value co-destruction in the intermodality and the actions undertaken by the Naples Port System Authority (ASP) to overcome the current "port value destruction" in the supply chain. It is clear that the ASP's policy actions will have an impact in the long run.

The Chapter is structured as follows: section 7.2 justifies the choice of the case study methodology given the explorative nature of the research. Sections 7.3 and 7.4 are dedicated to the analysis of collaborative practices of the service supply chains of the ports of La Spezia and Trieste. These case studies provide insights in port value creation at different levels: port authority, port service supply chain and port business operators. Cross analysis on the collaborative relationships and public-private interactions is provided in section 7.5. In section 7.6, the analysis focuses on Naples ASP's policy actions for overcoming the current port-related supply chain disruption. Intermediate conclusions are given in section 7.7.

7.2 The case study methodology

The case study methodology is a qualitative research approach that can be applied to describe and explore new phenomena (Yin, 2014), through the identification of some representative cases suited to meet the requirements of answering "why" and "how" questions. Thus, cases of ports in the service supply chains will be chosen for theoretical reasons (Eisenhardt and Graebner, 2007) as these facilitate the understanding of collaborative practices along port service supply chains, as emerging phenomena in the Italian context. In particular, the aim is to explore the relational patterns of the port service supply chain, the rationale behind the development of the different form of collaboration with supply chain partners and the performance at firm and supply chain level[1].

At this regard, the focal firms for each port service supply chain have been identified on the basis of the results carried out in Chapter 4 and 5. These represent Terminal Operating Companies (TOCs) and the group they belong to. Additionally, some experts of the Italian port industry confirmed the importance to focus the attention on La Spezia Container Terminal and Contship group - as an example of port service supply chain extended to intermodality and logistics - and on Trieste Marine Terminal and T.O. Delta Group - as an example of port service supply chain extended to rail intermodality. The two Terminal Operating Companies have been then asked to identify some strategically key suppliers and key customers of their supply chain that would be willing to participate in the study. The service supply chains have been thus mapped through the so called Snowball technique (Salganik and Heckathorn, 2004) starting from the Terminal Operator Company and until the freight representative of final port customer: freight forwarders, maritime agency and manufacturing firms.

Different questionnaires have been structured in order to get information from the Port System Authority (ASP) and port business operators. With reference to the ASP, the questionnaire has been structured in open questions aimed at analysing (see Appendix A): the vision and port development strategy in the next few years; the key-resources (both physical and knowledge ones) and actions for achieving such strategy, with specific reference to container handling, intermodality and value added logistics; the relationships network and technologies for sustaining port development in the region; and finally performance indicators used in order to evaluate the efficacy of the policy actions and, thus, the social, economic and environmental impacts of port development.

The questionnaire for the analysis of TOC's service supply chain and the identified key-actors has been structured as follows (see Appendix B): the first section of the questionnaire refers to the supply chain strategy, and in particular to the understanding of the business areas of the firm (cargo handling, intermodality, forwarding and agency, warehousing, value added logistics service), the main clients and the competitive priority (cost, frequency, reliability, time, etc). The second section is aimed at exploring the relational patterns of port service supply chain, with

[1] The analysis of the competition with other Italian as well as Mediterranean ports, requires an ad-hoc quantitative methodology that the case study methodology doesn't allow to accomplish. This issue will be addressed in the concluding Chapter as future research.

particular reference to the services provided in-house and those provided through collaborative relationships. The collaborative relationships have been further analysed in order to define the legal form (joint ventures, minority equitable alliances, alliances based on bilateral contracts and alliances based on unilateral contracts) and the selection criteria of the suppliers (specialised know-how, geographical coverage, market knowledge, price, service quality, range of the services, and trust). The third section concerns the performance indicators related to the assessment of the services suppliers and firm's customers in terms of revenue and market share, split for each business area. The final section concerns a general evaluation of port competitiveness.

The measurement instrument used to maintain consistent focus and a rigorous approach has been the study protocol (Yin, 2014; Stuart *et al*., 2002). The protocol is more than just a list of questions to be asked during data collection. It is a tool to be used by the researchers to guide them through the entire research process of gathering data and information.

A protocol has been therefore defined, containing procedures and rules followed by the group of researchers while administering the questionnaire and carrying out the survey. Two researchers examined the data in order to compare possible divergent interpretations before achieving consensus. At this end, face-to-face interviews have been recorded. Whilst one researcher was conducting the interview, another one took extensive notes and literal quotes. These were sent to the informants who were in charge of confirming their accuracy and representativeness. Each researcher combined multiple data collection sources – interviews, balance sheets and website information – in order to achieve a stronger substantiation of constructs through triangulation.

In the next sections, the case of the ports of La Spezia (section 7.3) and Trieste (section 7.4) are presented. The case study has been structured as follows. The first part is dedicated to the description of the port as a bundle of resources, defined as the port value preparation. The second part is related to the empirical analysis of the port authority and port operators' interactions and relationships along the service supply chains.

7.3 The port of La Spezia

The port of La Spezia is located in the Liguria region and it is one of the main strategic nodes of the North - West port logistics system. Thanks to its geographical position and intermodal connections, La Spezia represents an important gateway for the production areas located in the Milan Logistics Region (RLM), which includes the freight villages of Novara, Verona and Piacenza. This area represents 79% of National Gross Domestic Product and it regroups 70% of the export-oriented Italian firms.

The port of La Spezia is also involved in the import and export flows of organised retailing and distribution industry (GDO) and their megastores, hypermarkets, supermarkets or discount stores located in Italy.

The port of La Spezia has been included in the TEN-T core network by the European Commission, the trans-European transport central network, and, specifically, in three main corridors: the Berlin-Palermo corridor, the Lisbon-Kiev corridor and the Genoa-Rotterdam corridor (Figure 7.1).

The aim of this inclusion is to foster the development of the trade within Europe, to strengthen the commercial relationships between state members, to sustain social and economic development of the regions and finally to increase the use of environmentally friendly modalities of transport, such as railways.

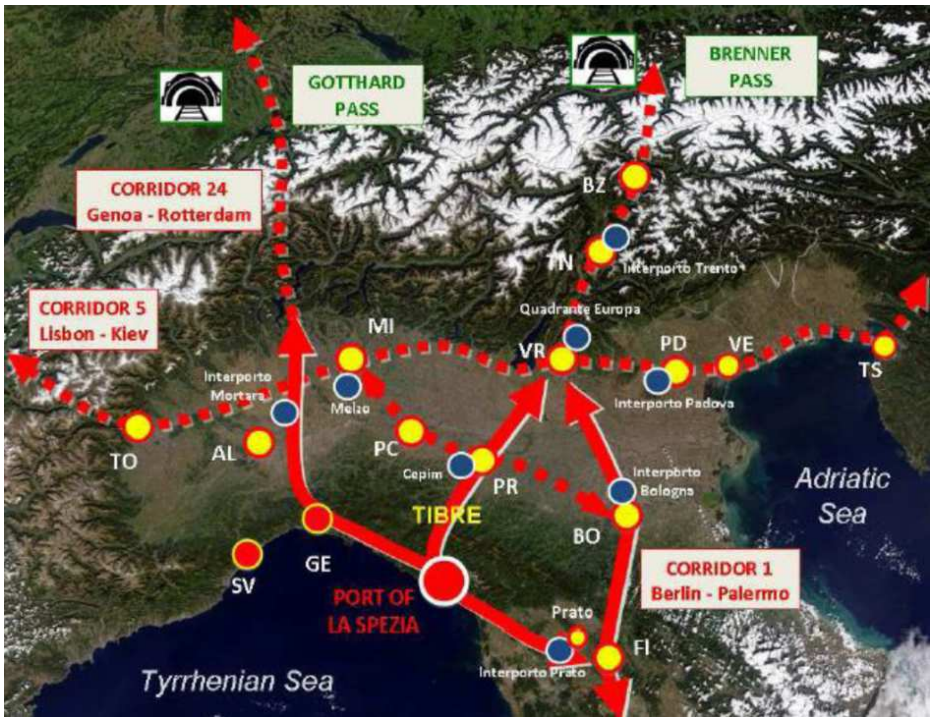


Figure 7.1: The port of La Spezia and the TEN-T corridors

Source: iFreightMED-DC Project

The port of La Spezia features two container terminals, a multipurpose terminal, one for coal and refined products, one for petroleum products and one for liquid gas. LSCT - La Spezia Container Terminal – owned by Contship Italia Group - is one of the most important container terminals in the Italian market. In 2015, LSCT handled 1.196.051 TEUs, showing a growth of 7.8% with respect to 2014 (Table 7.1). La Spezia Container Terminal also manages a complete multipurpose terminal dedicated to general cargoes with a handling surface area of over 100,000 square meters and 15,000 square meters of covered warehouses.

Table 7.1 - Container traffic flows: main Terminal operators and Rail traffic (TEUs)

	2010	2011	2012	2013	2014	2015
LSCT	1.041.000	1.096.000	990.000	1.031.000	1.109.000	1.196.051
TGF	164.000	211.000	257.000	269.000	194.000	103.949
Total	**1.205.000**	**1.307.000**	**1.247.00**	**1.300.00**	**1.303.000**	**1.300.000**
Rail Traffic	*221.073*	*272.000*	*247.000*	*270.000*	*330.000*	*311.000*

Sources: LSCT, Port of La Spezia website, La Spezia Shunting Railways, Contship Group.

Terminal del Golfo (TGF) is the other container port terminal owned by the Tarros Group. In 2015, the terminal handled 104,000 TEUs, covering the entire Mediterranean market. Tarros Group is an intermodal operator leader in Short Sea Shipping (SSS), both for local traffic and Mediterranean feeder service.

The main markets served in 2015 have been Asia (44%), followed by America (24,8%), Africa (19,5%), Europe (9,3%) and Oceania (2,4%). Moreover, the port has got well developed railway and highway connections, linking the port areas directly to the highway network and a railway station. In 2015, about 35% of container traffic has been transported by rail, which is one of the highest shares in Italy. Linked to the North Italian intermodal hub, La Spezia serves the domestic market and also reaches Central and Southern Europe via the main rail freight corridors.

In order to improve intermodal services and increase rail transport, a new company has been established by the port authority in 2013. It is called La Spezia Railways Shunting and it is responsible for the coordination of the operations and rail services within the port of La Spezia and to the area of S. Stefano di Magra.

The export and import flows to the main inland markets (regions of North Italy) are performed by different railways companies such as Fuorimuro, Oceangate, Crossrail Italia (see Chapter 4) on the Tyrrhenian-Brenner Corridor for Emilia Romagna and Veneto, the railway line La Spezia-Genoa-Milan for Lombardy and Piedmont, and the line La Spezia-Pisa-Florence-Bologna for Tuscany and Emilia Romagna (Table 7.2).

Table 7.2 Inland rail traffic flow distribution in 2015 (%)

Regions	Export (to the port)	Import (from the port)
Emilia Romagna	30 %	28%
Lombardia	17%	28%
Veneto	17%	11%
Liguria	12%	10%
Toscana	13%	14%
Piemonte	4%	2%
Umbria, Marche, Trentino, Lazio	7%	7%

Source: LSCT (2016)

Moreover, the port is linked to S. Stefano Magra, an intermodal platform equipped for loading and unloading of trains, with the aim to reduce truck traffic and environmental impact of the transport activities. Starting from 2018, the port authority has planned to concentrate all checking and inspection activities in this area, through the development of a customs control area integrated with the “customs corridor”, which allows the containers to be immediately transferred from the port of La Spezia to S. Stefano Magra.

7.3.1 The empirical analysis

The first actor involved in the empirical analysis has been La Spezia Port System Authority (ASP) with the aim to identify vision, actions in favouring the integration of the port with the hinterland. Based on ASP’s suggestion, the Harbour Master officer was also involved in the analysis, given the importance of the pre-clearing activity for the competitiveness of the port in the container market.

The sampling has been realised with the aim to analyse the relational patterns of the logistics and intermodal service supply chain of the port of La Spezia. Starting from the terminal operating company, LSCT, the actors involved in the services supply chain have been identified through the so-called snowball technique Railways shunting services, Contship Group and Mediterranean Shipping Company (MSC). The identification of the characteristics of the demand has been based on a meeting with the president of the maritime agent and representative of the Sistema Porto, the association regrouping the freight forwarder, maritime agents and port operators of La Spezia.

A semi-structured questionnaire (see appendix A and B) was administered to the different actors (Table 7.3). In order to complete the analysis, other available sources have been used, such as balance sheets, documents, publication and actor’s websites.

Table 7.3: The sample under investigation and the main sources of information

<table>
<tr><th>Actor</th><th>Questionnaire structure and info gathered</th><th>Other sources</th></tr>
<tr><td>Port Authority</td><td>(1) Port development strategy;
(2) Resources allocated and the relationships set up in order to achieve goals;
(3) Relationships with the main port business operators;
(4) Performance indicators.</td><td>Data on traffic flows.
All documents related to port development.</td></tr>
<tr><td>Harbour Master office</td><td colspan="2">Description of the Pre-clearing activity</td></tr>
<tr><td>Railways shunting services</td><td rowspan="4">(1) Transport and Logistics Business area;
(2) Collaboration with service providers;
(3) Performance indicators: customer satisfaction and service providers;
(4) Port competitiveness.</td><td rowspan="3">Company balance sheets; company websites</td></tr>
<tr><td>LSCT</td></tr>
<tr><td>Contship Group</td></tr>
<tr><td>MSC</td></tr>
<tr><td>Sistema Porto</td><td>Documents and publications</td></tr>
</table>

7.3.2 The Port System Authority's policy actions

The strategic vision of La Spezia Port System Authority (ASP) is to promote the concept of "Green Port" for the future development of the port as logistics network, through three main directions: the cold ironing project; the development of rail intermodality; environmental practices.

The main objectives of the cold ironing project is the development of a system to supply shore-side electrical power to vessels in their berths, during their port visits, eliminating the emissions produced by their on-board generators. Thanks to an agreement among ASP, Arpal, Harbour Master office, Enel, and La Spezia local administration, the electrification of the port should be completed by 2025 while the one related to Molo Garibaldi should be completed by the end of 2019. This project will contribute in reducing the pollution and vessel's emissions during the loading and unloading operations.

With reference to rail intermodality, the ASP aims at reducing the environmental impacts of the port activities development, by investing in new rail infrastructures. At this regard, in July 2017, a new tender for the extension of the Garibaldi dock in La Spezia Container Terminal – which will allow trains to be up to 650 meters long - was publicly opened. The new rail connection will increase the share of inland rail distribution to 50% of the total throughput, and it will allow to better face the requirements of port efficiency and sustainability from port users and regional community's perspectives. Finally, the acquisition of new technology for monitoring CO2 emissions is in line with the experience already realised in the main Northern European Ports, like Rotterdam, Antwerp, Barcelona, that have already implemented specific technologies in order to monitor the environmental impacts of all transport activities connected to the port.

The ASP is inspired by a profound collaborative approach in the interactions with the port business operators and local stakeholders. This can be witnessed by the number of organizations in which the ASP participates. In particular, Rail Shunting Company provides rail services within the port and to/from the logistic platform of the S. Stefano di Magra. In 2017, the shareholders of this company turned out being all the main port operators of La Spezia: ASP (20%), LSCT (25%), Speter (8%), Terminal del Golfo (3%), Trenitalia (10%), Serfer (10%), Oceanogate (10%), Sogemar (10%), Nora (2%) and Contrepair (2%). Figure 7.2 provides a representation of the port of La Spezia as a value constellation, based on the availability of physical and knowledge based resources provided by the port authority and by the port business operators.

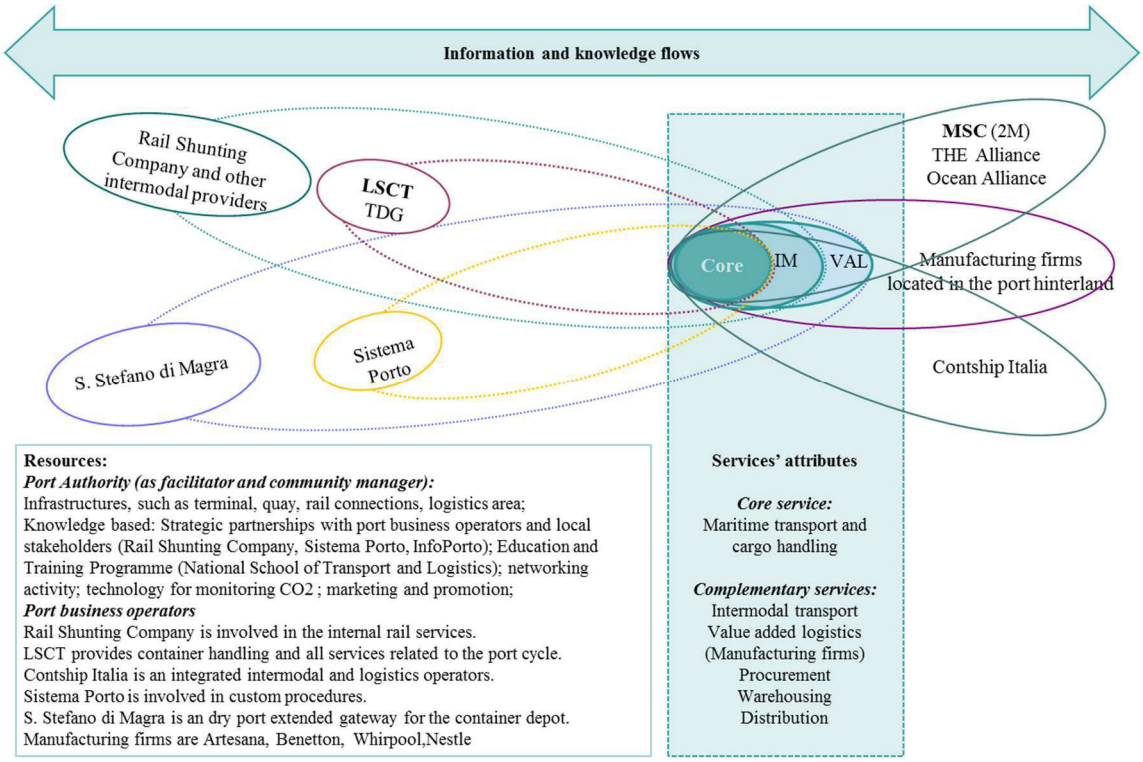


Figure 7.2: The La Spezia port value constellation: intermodality and value added logistics

Source: based on De Martino *et al.*, 2013.

Sistema Porto is a company founded in 1998 by ASP, freight forwarders, shipping agents and terminal operators. It manages the documental and customs procedures of the handling of goods. Sistema Porto also manages, after having developed it, the port IT platform for the processing of the telematic documents and for the exchange of information between the different actors of the port cluster.

The ASP also participates to Infoporto La Spezia, in collaboration with LSCT, Sistema Porto, Speter and Cassa di Risparmio della Spezia. The company is specialized in providing IT services to port operators, SMEs and public administration. Its main objective is to spread an innovation culture within the region by developing customised technological systems and identifying the correct relationship among local actors, in order to develop a collaborative network oriented to innovation.

Finally, it is important to mention the National School of Transport and Logistics founded in 1991 by ASP and port business operators with the aim of training the various port operators, from crane operators to customs operators. Over time, the activity of the school has also extended to the development of local logistics competences and to the participation to national and international research projects, becoming an important knowledge source for the whole port – logistics system of La Spezia.

7.3.3 The port service supply chains: from container handling to value added logistics

In this section, the analysis focuses on the organizational model of the port service supply chain centred on the main terminal operating company, La Spezia Container Terminal (LSCT)[2]. LSCT is a company owned by the Contship Group (60% of the capital share), one of the most important intermodal and logistics operators in the European context. The remaining 40% of the capital is hold by Marinvest, the financial holding of the Mediterranean Shipping Company (MSC)

LSCT manages directly two docks in the port:

- ✓ Molo Fornelli of 185.000 m², with a berth of 1.138 m and a depth of 14 m. This terminal can manage contemporary two vessels of 14.000 and 16.600 TEUs. It also has 5 rail tracks;
- ✓ Molo Ravano of 40.000 m², with covered depots on an area of 2.000 m², berth of 220 m and a depth of 12.5 m.

In 2015, LSCT handled about 1.2 million TEUs, 1000 vessels of more than 10.000 TEUs, 200 trains and 1200 trucks a week of which 80% managed within 1 hour. LSCT provides all the services related to the cargo handling trough companies directly controlled (Table 7.4).

Table 7.4 – Companies directly controlled by LSCT and main activities (2015)

Company	Capital share	Activity
Industriale Canaletto SRL	100%	Container storage at Santo Stefano di Magra area
Spe.de.mar SRL	42,50%	Custom agency and freight forwarder
La Spezia Shunting Railways SPA	33%	Railways services within the port area and to S. Stefano di Magra area
Contrepair SPA	20%	Container reparation and maintenance (Santo Stefano di Magra area)
Contrepair Manovre Ferroviarie Srl	20%	Rental of railroad car located in Santo Stefano Di Magra
Salerno Container Terminal SPA	15%	Container handling
Terminal Container Ravenna SPA	30%	Container handling

Source: LSCT balance sheet (2016)

With reference to the maritime transport, LSCT provides handling container services to all the three major shipping alliances, even though MSC represents the main client and shareholder of the company (40% of the capital share). The international maritime transport services in 2017, from and to Spezia are the following:

- √ USA and Central America (Mexico, Jamaica): 7 services/week;
- √ China and Far East (South Korea, Singapore, Malaysia): 6 services/week;
- √ Western Africa (Ghana, Ivory Coast, Nigeria e Cameroon); 2 services/week;
- √ Australia and Indian Ocean: 1 service/week;
- √ India and Arab countries: 2 services/week.

[2] LSCT has been voted as "Best Container Terminal – Europe" at the 2017 Asian Freight, Logistics and Supply Chain Awards (AFLAS) held in Singapore. The award recognizes leading service providers in the international transport and logistics industry, including ports and terminal operators, airports, shipping and airlines as well as 3PL's. The rating was based on criteria such as efficient container turnaround, rail and truck connectivity, investment in new terminal structure to meet future demands, effective IT systems, and a variety of product ranges.

The main container traffic flow in 2015 has been with China and Far East (about 400.000 TEUs), followed by USA and Canada. Europe represents just 9% of the maritime container segment given the wide use of railways connections. Thanks to the innovative custom procedure adopted by the port of La Spezia in 2014, the customs pre-clearing procedure, LSCT in collaboration with the shipping companies and the Harbour Master office, can reduce the transit time in the port enabling the immediate release of goods upon arrival and delivery on the same day[3].

LSCT highlighted that all the main global container alliances call at La Spezia thanks to faster transit-times via LSCT's fast-corridor and pre-clearing systems. LSCT also provides intermodal and logistics services thanks to the relationships network with Contship Italia Group's subsidiaries (Figure 7.3): Hannibal SPA, in charge of road transport operator; Rail Hub Milano SPA, the inland terminal in Milano – Melzo; Oceanogate Italia SPA, the railways transport operator, and finally, Sogemar SPA, the intermodal and logistics operator.

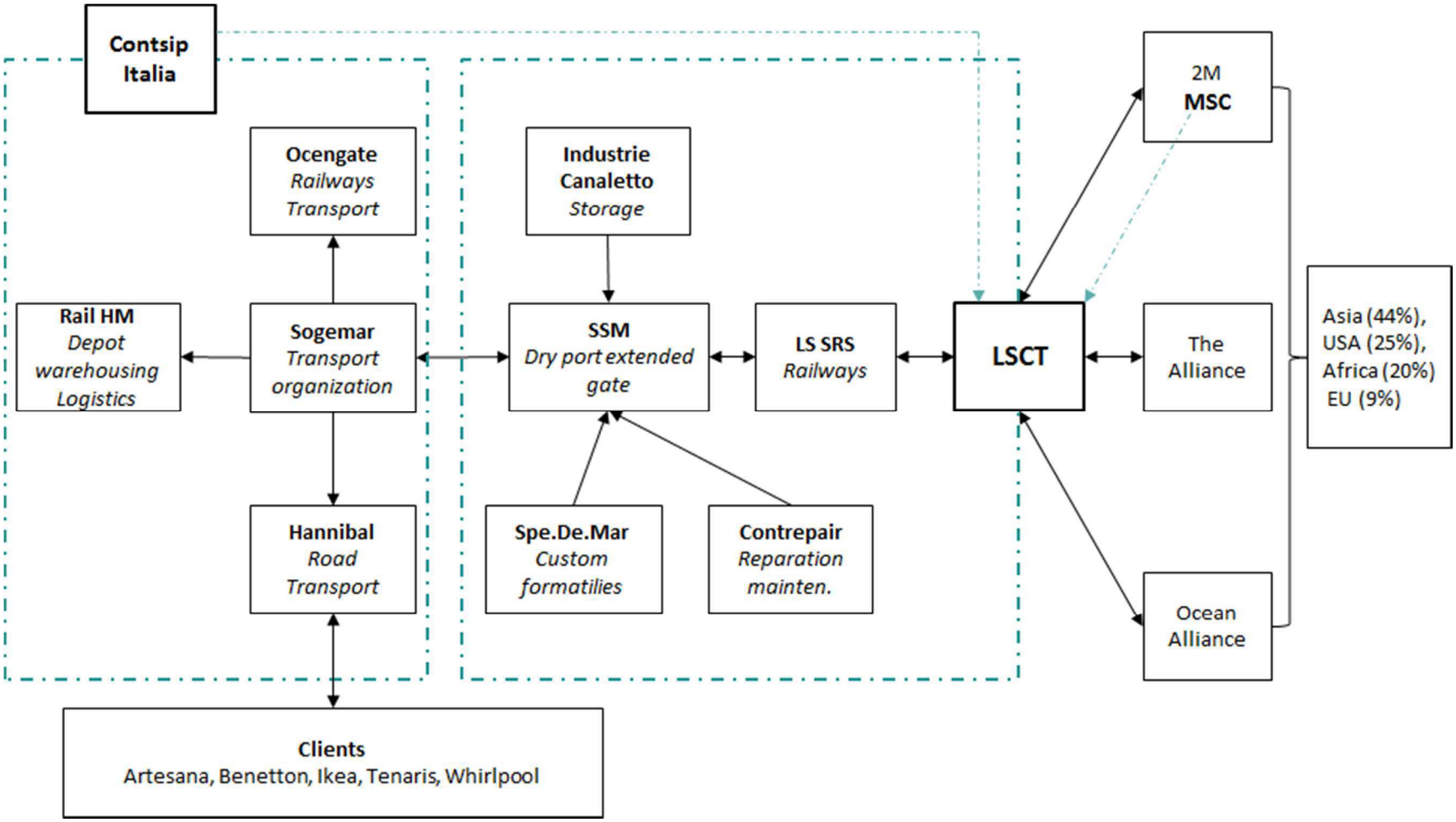
In particular, Contship Italia SPA, an holding company founded in 1969, is an integrated intermodal and logistics operators involved in the container terminals, intermodal transport and the supply of value-added logistics services. Contship Group's strategy is to:

- √ Minimize container handling costs through the direct control of terminal business in different Italian ports. In addition to La Spezia, the group controls two other transhipment ports: Medcenter Container Terminal – MCT (Gioia Tauro) and Porto Industriale Cagliari – CICT (Cagliari). The other terminals indirectly controlled through LSCT are Salerno Container Terminal and Terminal Container Ravenna.
- √ Differentiate in the intermodal and logistics businesses through the creation of specialised companies: Sogemar, Hannibal, Oceangate Italia and Melzo-Rho Logistic Platform.

Sogemar is the logistics operator involved in the organization of transport chain from and to the port of La Spezia and others ports of the North Italy, such as Genoa and Trieste. Railways services are provided mainly by Oceangate, even though Sogemar may involve other rail operators, depending on the final destinations; road transport is performed by another company of the group, called Hannibal. The rail Hub Milano – Melzo is a strategic node for developing European and national railways connections, as shown in Figure 7.4.

[3] This procedure is possible thanks to satellite monitoring of ships once it has crossed the Mediterranean straits until its arrival at the port. Two important innovations are to be added at the pre-clearing procedure: the customs single window and the new customs control area for goods in S. Stefano di Magra. These innovations will work together with two important projects to improve port efficiency: the APNet IT platform for data exchange within the port community and the corridor management platform that will be developed within the European project WiderMos (www.widermos.eu), funded in the TEN-T MOS programme and coordinated by La Spezia Port Authority.

Figure 7.3 - The LSCT supply chain: intermodality and logistics services from the port of La Spezia



Legend: LSCT (La Spezia Container Terminal); LS SRS (La Spezia Shunting Railways); SSM (Santo Stefano di Magra); Rail HM (Rail Hub Melzo). Black arrow = freight flows; Dotted line = collaborative relationships

Figure 7.4 – Railways connections from and to the port of La Spezia
Source: Contship website (2017)

With specific reference to the main domestic railways services, there has been a strong increase from 2011 to 2015 (Table 7.5), especially for the following connections: La Spezia – Melzo, La Spezia – Dinazzo, La Spezia – Rubiera and Genoa – Melzo. At this regard, the freight villages play a leading role in the development and concentration of container flows, in order to strengthen the competitiveness of rail services.

Table 7.5: Main domestic rail services (trains/week) provided by Oceangate.

	Ports - Freight villages	**2011**	**2015**
Lombardia	La Spezia-Melzo	19	27
	La Spezia - Vittuone	3	6
	La Spezia - Segrate	-	10
	La Spezia - Montichiari	2	-
	Genoa - Melzo	-	24
	Padua - Melzo	-	18
	Bari - Melzo	-	10
	Ravenna - Melzo	-	4
	Trieste - Melzo	-	4
Emilia Romagna	La Spezia - Rubiera	7	34
	La Spezia - Modena	3	-
	La Spezia - Dinazzano	11	27
	La Spezia - Bologna	14	16
Veneto	La Spezia - Padua	9	28
	La Spezia - Verona	3	10
Piemonte	La Spezia - Rivalta	-	10
Total		**71**	**228**

Source: Oceangate and Contship group

Melzo freight village also plays an important role in the European railways connections from and to the port of La Spezia (Table 7.6). These services are provided by Oceangate and others foreign rail services providers, whose contract relationships are managed by Sogemar in relation to specific customer needs. Here as well, the services have doubled, particularly the railways connections to/from the Port of Rotterdam.

Table 7.6 - Main Cross-boarder services Via Melzo-Rho Logistic Platform (trains/week)

	2011	**2015**
Rotterdam (Netherlands)	10	24
Herne (Germany)	5	-
Duisburg (Germany)	-	6
Frenkendorf (Basel) (Germany)	-	6
Venlo (Netherlands)	5	10
Paris (France)	3	-
Zeebrugge (Belgium)	2	-
Mannheim (Germany)	3	-
Budapest (Hungary)	-	4
Total	**28**	**50**

Source: Oceangate and Contship group

The products exported through the port of La Spezia are mainly electrical and electronic machinery and appliances, metals, furniture, textile and clothing, food and wine, and ceramic products. Agri-food products export is also important; in particular, Giorgio Gori logistics has 4 warehouses in the S. Stefano di Magra area, where wine and other agri-food products are consolidated for the North America market. The wine originates from the Italian regions of Piedmont, Veneto and Tuscany, where the port of La Spezia acts as a hub. In order to balance the export container flows from North America, Giorgio Gori imports lumber destined to furniture district of Venice.

Other clients of the port service supply chain are companies and groups located in the port hinterland. These express a number of advantages in terms of service performance (Table 7.7). In particular, efficiency of custom clearance procedure is, in almost all cases, of crucial importance.

Table 7.7. The main clients of LSCT service supply chain.

Clients	**Performance indicator (value at supply chain level)**
Artsana	1. Transit Time 2. Customs Clearance procedure efficiency
Benetton	1. Direct services frequency 2. Customs Clearance procedure efficiency
Ikea	1. Cost advantage of inland transport 2. Customs Clearance procedure efficiency
Nestlè	1. Reliability of service 2. Reduced carbon emissions of intermodal transport
Tenaris	1. Direct services frequency 2. Value added services in S. Stefano di Magra
Whirlpool	1. Dwell time at port 2. Rail Services
Giorgio Gori logistics	1. Reliability of service 2. Customs Clearance procedure efficiency

Other performance indicators are related to the specific features of the produced good: for Benetton and Tenaris, which manage international procurement at Trieste, the availability of frequent direct services abroad is of primary importance. For what concerns Ikea, which

distributes products unloaded in the port to all Italian subsidiaries, the cost of inland transport has been the determining factor (Curi and Dallari, 2015). Some considerations can be addressed, at this regard, on the value creation of the LSCT port service supply chain, as shown in Table 7.8. It is clear that the data reported should not be taken in absolute terms, as LSCT is part of Contship Group and therefore the company benefits from the relationships network of the Group. However, the "value" created by LSCT is the result of the strategy and the structure of the supply chain in the port of La Spezia.

Table 7.8: The value creation of the LSCT port service supply chain

Revenue (.000 euro)	**2011**	**2015**	**Var 2015-2011**
Container Handling	65.300 (63,2%)	80.167 (60%)	+18.5%
Other services (transport, depot, agency)	38.000 (36,8%)	53.067 (40%)	+28.4%
Total	***103.320***	***133.234***	***+22.4%***
EBIDTA	32.118	36.992	+13.2%
ROI	17,71%	13,39%	
Container	**2011**	**2015**	**Var 2015-2011**
TEUs	1.069.000 (899 vessels)	1.196.000 (773 vessels)	+ 10.6%
Market share	11.22%	11.74%	+ 0.52%
Rail share	27%	35%	+ 8%
Employment	**2011**	**2015**	**Var 2015-2011**
Staff	466	627	+25.7%

The LSCT's economic and financial performance showed a positive trend during the last 5 years, with an increase in revenue coming from others services higher than the core business: the container handling. The diversification strategy produced a total increase of the revenue of 22.4% from 2011 to 2015. This result mirrors the customer satisfaction in terms of supply chain performance (Table 7.7)

Moreover, while EBIDTA increased, ROI decreased as a consequence of a new investment plan in railways undertaken by the company that has required a reduction of the dividends and an increase of the risk capital.

Finally, while the volume of TEUs (+ 0.52 %) and the rail share (+ 8%) increased, the number of vessels decreased. The environmental impact of port activities, to some extent, has been reduced with important implications from the ASP and citizens.

7.4 The port of Trieste

The Port of Trieste is an international intermodal hub that provides maritime transportation services to China, the Far East, Singapore and Malaysia, with stops in several other ports in the Mediterranean Basin (Africa, Greece, Turkey, Egypt, Lebanon, Israel). An internal rail network allows all the docks to be served by national and international networks. More than 400 trains a month link Trieste to the manufacturing and industrial areas of North-East Italy and Central Europe, with different destinations, such as Germany, Austria, Czech Republic, Hungary, Switzerland and Luxembourg (Figure 7.5).

The multimodal Trieste freight village is situated close to the port and at the border with the Republic of Slovenia. It acts as a hub for the freight transport between the north- and east European markets and the Mediterranean area, thanks to 6 rail tracks, a parking area and storage facilities, thus supporting port terminals by managing the freight transport operations.

The Port of Triste is also part of an Advanced Managing System - SCC based in Venezia Mestre, which is able to control the railway traffic of both Italian regions Veneto and Friuli-Venezia Giulia.

The ICT system was developed to smooth the freight traffic along the railway network (e.g. remote controlled train stations, implementation of the rails, different mechanical and electronic train technologies).

The most important railways connection in terms of volumes is the so-called Pontebbana (Udine – Tarvisio). It has a capacity of 220 Trains/24 hours and is already suitable for the high speed and high capacity trains.

The port of Trieste is also part of two TEN-T corridors, not fully completed yet: the Baltic-Adriatic and the Mediterranean. The Baltic-Adriatic Corridor will reinforce and facilitate the commercial relationships and freight flows arriving from China through the Suez Canal to all of Central Europe.

The Baltic-Adriatic Corridor will run through 19 regions in 5 Member States (Poland, Czech Republic, Slovakia, Austria and Italy) and connect more than 40 million people in Europe by linking the two ports of Gdansk and Gdynia, the Corridor's Northern railheads, to the Port of Trieste, thereby stimulating economic growth.

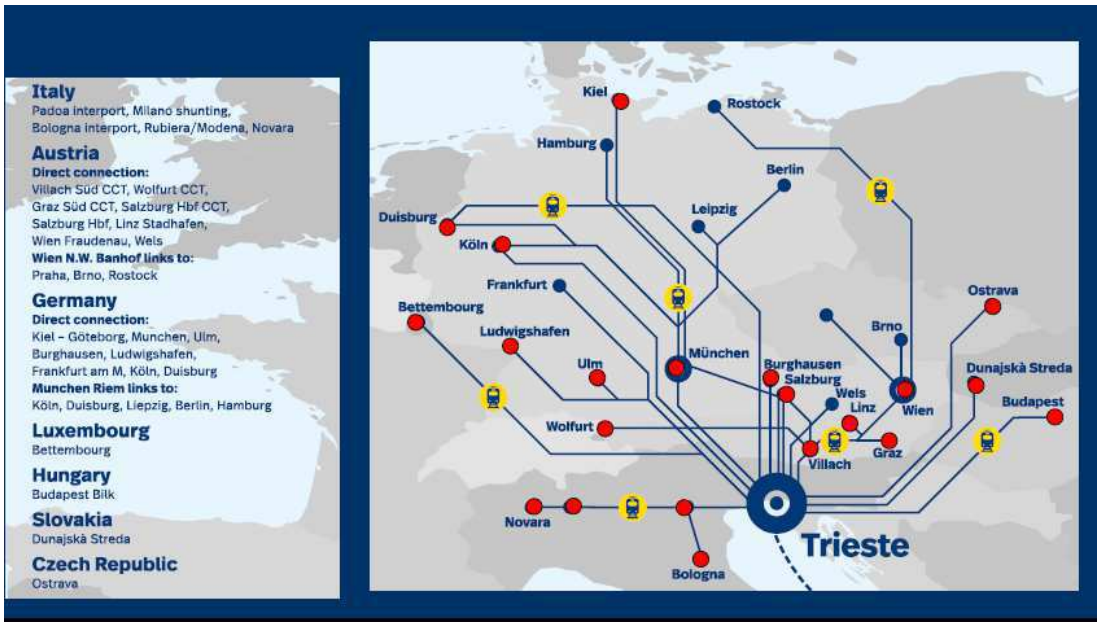


Figure 7.5 - The rail intermodal network of the port of Trieste

Source: ASP of Eastern Adriatic Sea, 2016

The Mediterranean Corridor is a project for rail freight transport along a line running about 3000 km, through five EU countries: Spain, France, Italy, Slovenia and Hungary. The Corridor originates in southern Spain, runs through southern France and across the north of Italy along the high-speed, high-capacity Turin-Trieste line to arrive in Slovenia and head towards Hungary until reaching the Ukraine border. The route is the result of a southwards extension of European Priority Project 6 (Lyon-Ukraine border railway axis). This new high-speed and high-capacity line will link Italy to France and Slovenia, while its Italian stretch will be joined to other European corridors, with particular reference to the Baltic-Adriatic Corridor.

The port of Trieste has also a special regime of free zones. This currently includes five distinct Free Zones, three of which reserved for commercial activities (Old Free Zone, New Free Zone, Timber Terminal) and two used for industrial activities (Mineral Oils Free Zone, Zaule Channel

Free Zone)[4]. In addition to customs type of incentives (exemption from customs formalities and controls, as well as from customs duties on raw materials used in industrial production), the most frequent incentives offered by the free zones include exemption from taxes and duties, flexible labour regulations (for recruitment of staff and granting of temporary work) and finally simplification of administrative procedures (concessions and licences).

7.4.1 The empirical analysis

The aim of following section is to analyse the relational patterns of the intermodal service supply chain of the port of Trieste as well as the investments and actions of the port authority in favouring the integration of the port with its hinterland. .In combination with desk research, a semi-structured questionnaire was administered to the port authority, to Trieste Port Labour Agency (ALP), to managers of Mediterranean Shipping Company (MSC), Adraifer, Alpe Adria, Trieste Marine Terminal (TMT) and T.O. Delta (Table 7.9). The following sample mirrors the role of the port of Trieste in the Italian and European scenario, as international railways intermodal node.

Table 7.9: The sample under investigation and the main sources of information

Actor	Questionnaire structure and info gathered	Other sources
Port Authority	(1) Port development strategy; (2) Resources allocated and the relationships set up in order to achieve goals. (3) Relationships with the main port business operators; (4) Performance indicators.	Data on traffic flows. All documents related to port development.
Port Labour Agency (ALP)	Description of choice related to the creation of the agency	
MSC	Strategy concerning the port as node logistics and distribution network	
Adriafer	(1) Transport and Logistics Business (TLB) areas; (2) Collaboration with service providers; (3) Performance indicators: customer satisfaction and service providers; (4) Port competitiveness.	Company balance sheets; company websites
TMT		
TO Delta		
Alpe Adria		

7.4.2 The Port System Authority policy actions

The vision of the Port System Authority is to further develop the role of the port of Trieste as an international rail-intermodal node while increasing at the same time its social and economic value for the local system. Figure 7.6 shows the port of Trieste as a value constellation whose potential contribution to port business operators and local development is given by the investments of the port authority for the development of rail intermodal services.

[4] The Port Authority introduced in 2009 the so called Black Box, an online computer system that allows goods entering the Free Zones by sea or by land, traced in compliance with EU security regulations, while respecting the special rules of the Trieste Free Zones and so maintaining the privileged regime of customs clearance exemption.

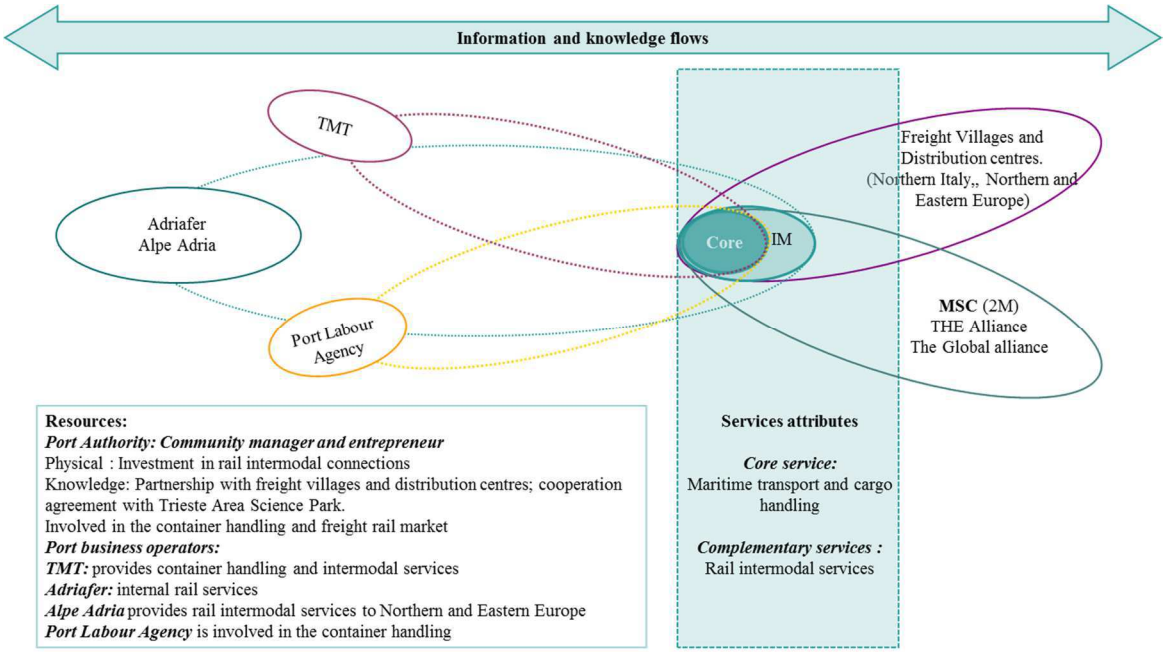


Figure 7.6: The Trieste port value constellation: intermodality

Source: based on De Martino *et al.*, 2013.

Adriafer S.r.l. is a company set up and fully owned by the Trieste ASP. It started its activities in 2004 and it is the sole operator allowed to move rail wagons and trains within the port. One of the primary objectives of Adriafer is to respect lead times and to support the plans and operating needs of the various terminal operators, concerning the loading and unloading of ships and the storing the cargo being transported. In 2015, the Adriafer received the licence as railways company from the National Agency of Railways Security, and starting from 2016, according to a commercial agreement with local freight villages, the company began being also involved in the rail services connecting the port with the Trieste Freight village in Ferretti and Villa Opicina, and also to Monfalcone. This process has generated an important increase of the trains moved by Adriafer, as shown in Figure 7.7.

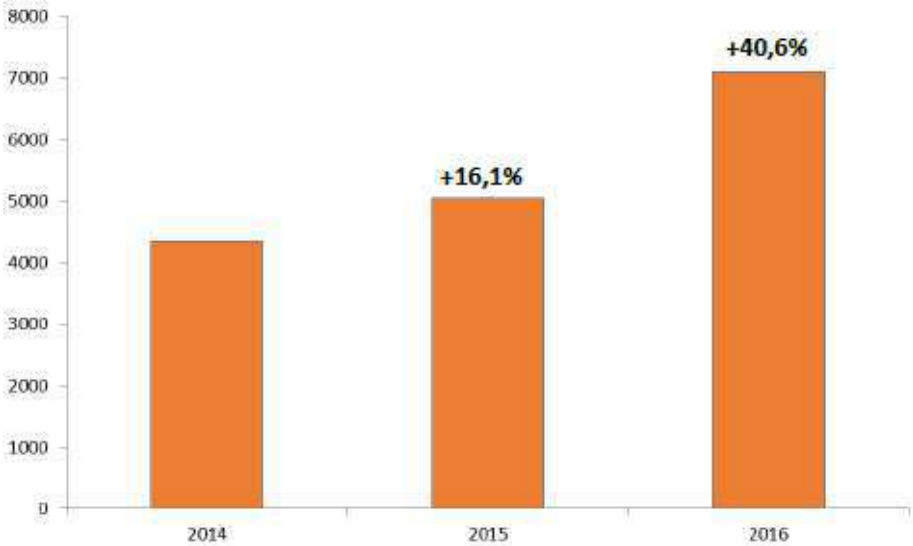


Figure 7.7 – Number of trains moved by Adriafer from 2014 to 2016

Source: Adrifer, 2017

In this regards, Trieste ASP aims at developing a set of relationships with freight villages in the Northern Italy for the creation of a wider integrated logistics system centred on the port of Trieste. Alpe Adria SRL is another company set up by the Trieste ASP in charge of the organization of rail and road transport within the region, and specifically, among the freight villages of Cervignano, Gorizia and Podernone, and also to central and east European markets. The shareholders of Alpe Adria are: Trieste ASP (33.3%), Friulia SPA (a financial holding of Fiuli Veneizia Giulia Region, 33.3%) and finally Trenitali (33.3%). Alpe Adria's mission is, indeed, to develop intermodal transport form the main ports of the region, Trieste, Monfalcone and Nogaro, to national and international destinations. Alpe Adria is also committed to the promotion of rail transport as an alternative to road, particularly dealing with routes towards North-Eastern Italy and Central and Eastern Europe.

In 2016, after the approval of the Ministry of Transport and Infrastructure (MIT), Trieste ASP has also created the Agency for the Port Labour (APL) that is responsible of all port services, as well as the container handling. Trieste ASP has a shareholder of 51% for the next 12 months, while the remaining capital shares has been equally distributed by the main Trieste port business operators, in order to represent and respect all interested parties. The company has been constituted with the main purpose of keeping the local employment, with a view to preventing workers from changing ~~of~~ port business operators' strategy. The agency has been hiring workers coming from Delta Uno, a company belonging to the T.O. Delta Group. Currently, it has 115 workers and the Agency aims at hiring new personnel given the investment in new terminal and railways connections made by the Trieste ASP in the coming years. Moreover, in 2017, Trieste ASP has signed a new cooperation agreement with Trieste Area Science Park. The purpose is to attract new business in the region related to innovation in textile, logistics and circular economy, with a strong concern to the environmental issue. This agreement will last three years and it aims at having social and economic impact on the entire region.

7.4.3 The port service supply chains: from container handling to intermodality

Trieste Marine Terminal, the only container terminal in Trieste, is a company controlled by T.O. Delta (50%) and Mediterranean Shipping Company (50%), through the Marinvest financial holding. In 2016, the company invested a 3% equity into Trieste Agency for the Port Labour (APL).

During 2015, the total amount of TEUs handled by TMT was 443.882, with a decrease of 6.8% compared with the year 2014 (Table 7.10). However, the share of inland railways services increased from 31% (2014) to 33% (2015). This reduction has been mainly a consequence of the reduction of Italian import and export, and a change in the distribution network of some shipping companies, in particular Evergreen (Ocean Alliance), after its decision to invest in the port of Venice.

Maersk, in collaboration with Saego Line, represents the main client of the TMT. The container volume in 2015 has registered a small reduction too. With the creation of 2M alliance with MSC, the shipping aims at developing further the commercial relations with Central and East Europe markets.

MSC, on the other side, increased its container flow in 2015, + 59% respect to 2014, thanks to the partnership with Maersk. This follows MSC's strategy to diversify ports portfolio by investing in strategic gateways for the productive areas of Northern Italy. The company is considering the possibility to leave the port of Venice and concentrate container flows in Trieste, given the shared vision with TMT to increase intermodal rail traffic on specific routes (central and East Europe).

Table 7.10: The main shipping companies and container volumes (TEUs)

Alliances	Shipping company	2015	2014	Variation (%)
2 M	Maersk	177.386	179.994	-1.4%
	MSC	95.130	59.939	+58.7%
Maersk's partner	Seago Lines	15.557	12.919	+20.6%
Ocean Alliance	Evergreen	60.870	73.298	-17%
	CMA-CGM	39.046	95.384	-59%
	Cosco	2.980		
The Alliance	Hanjin Shipping	16.622	24.017	-30.8%
	Yang Ming M.T.	12.791	13.816	-7.4%
	Mitsui O.S.K.	7.689	7.758	-0.9%
	K-Line	3.860		
	UASC	2.951		
Cosco's partner	China Ship. Cont. lines	6.258	3.067	+104%
	ZIM Israel	953	3.345	-71.5%
	Others	1.769	2.970	-40.4%
	Total	**443.882**	**476.507**	**-6.8%**

In 2014, CMA-CGM joined the Ocean Alliance and this has caused a drastic reduction of the container flows (39.046 in 2015 and 95.384 in 2014) in Trieste, given the choice of the alliance to call the port of Venice. Evergreen also registered a reduction of the container traffic in 2015 (-17%) given the change of transhipment services from/to the port of Rijeka (via Trieste), currently managed through a feeder service from the port of Pireo. Cosco, on the other hand, has recently chosen TMT soon after the merger with China shipping container lines, in 2016. In particular, the port of Trieste offers more reliable terminal infrastructures compared to those provided by the port of Venice.

Finally, in 2015, K-Line and Uasc decided to call the port of Trieste given the wide and international intermodal railways network. In fact, K-lines imports and exports cargo from/to the Padua and Milan freight Villages, as well as Austria, through railway services (40% of the total container flows).

T.O. Delta group, a multimodal transport operator, controls TMT with a capital share of 50%. Starting from 2015, the group decided to modernize TMT equipment, to train and skill its personnel and to develop intermodal rail connections. In 2016, the company decided to sustain Trieste ASP strategy to increase local employment through the creation of the Agency for Port Labour (APL); the cargo handling activity performed by Delta Uno, a company of the group, stopped with the agreement to hire its own staff. The overall evaluation of the services performed by APL is good. The structure of the TMT services supply chain is provided in Figure 7.8.

T.O. Delta is involved in the organization of the intermodal transport chains centred on TMT. In this respect, the internal railways operations are managed exclusively by Adriafer. Before 2015, there were other two companies involved in this activity but the presence of one operator increased the frequency of the services based on the TMT and T.O. Delta requirements. In 2015, T.O. Delta signed a 2-years joint service agreement with Rail Cargo Austria (RCA) for railways services to and from Austria, Germany and Hungary. This choice was related to the need to find a more efficient and competitive service provider, given the increase in costs imposed by Trenitalia, during the renewal of the contract. T.O. Delta and RCA share a common development strategy both for new markets penetration and for the frequency of the rail services. T.O. Delta also has a yearly based contract with Alpe Adria, for Italian and other central and east European destinations. Figure 7.9 shows the main rail services organised by T.O. Delta from the port of Trieste.

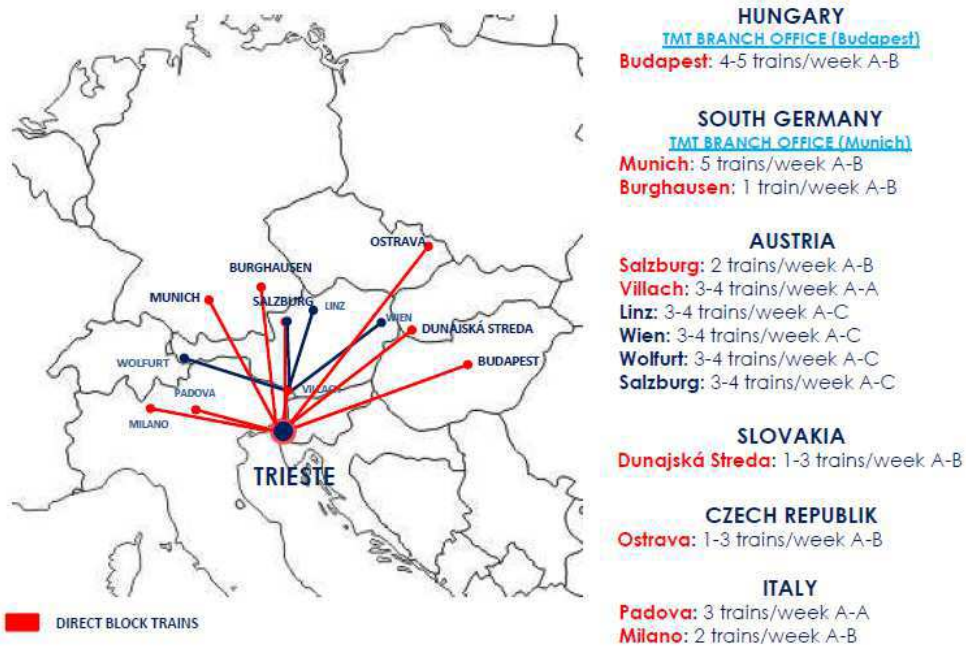


Figure 7.9 Intermodal railways services organised by T.O. Delta from TMT

Source: To Delta 2017

The structure of TMT supply chain is linear and few operators are involved, including Trieste ASP with its participations in APL Trieste, Adriafer and Alpe Adria. From TMT's perspective the presence of a public body in the "business" activities is, to some extent, supportive of local development: from the other side, it ensures the efficiency of the supply chain by keeping the services competitive in terms of costs and frequency.

Trieste ASP, moreover, showed the intention to increase rail services from and to the port of Trieste through Adriafer, as the company received from the Ministry of Transport and Infrastructure the license to operate on the rail national network. This new market entrance will clearly affect the competition and the service supply chain's structure, too.

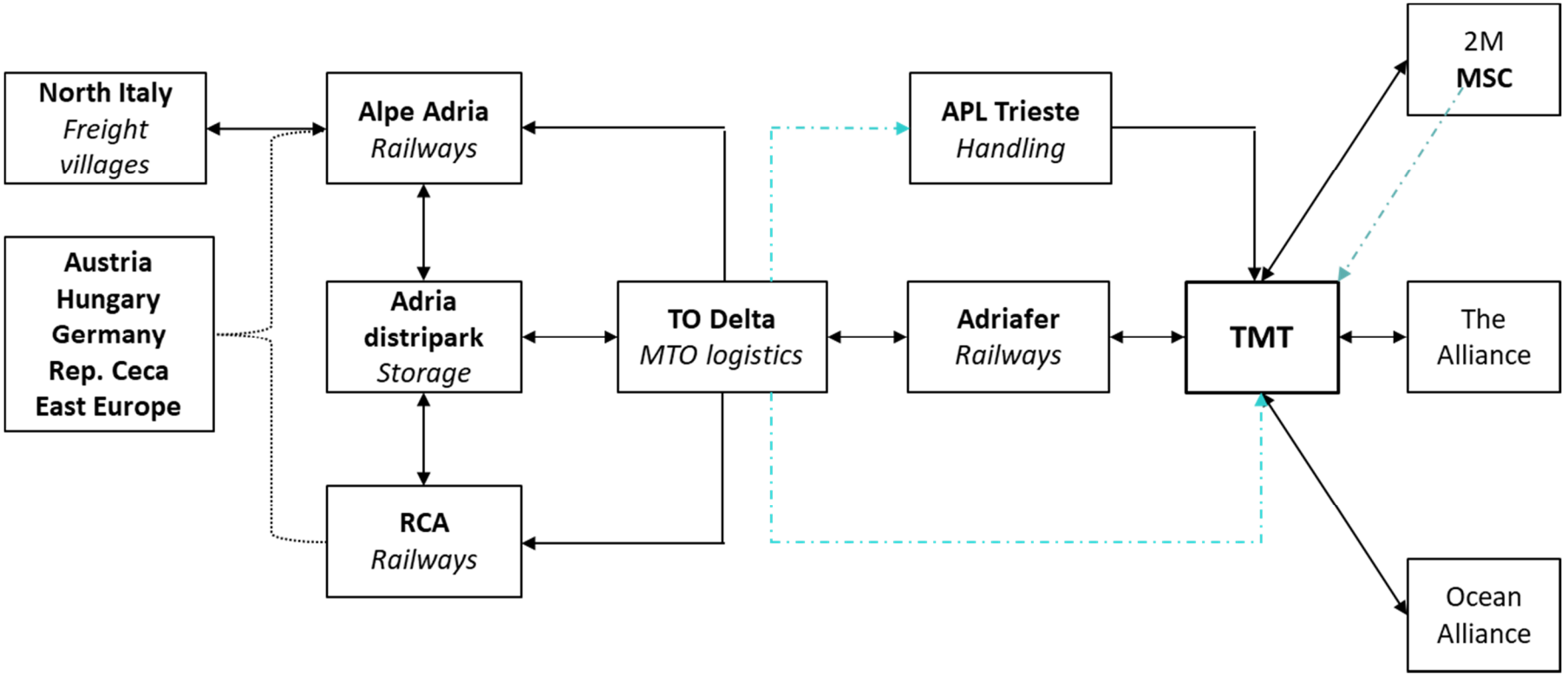


Figure 7.8: The TMT service supply chain: the development of rail intermodality

Legend: TMT (Trieste Marine Terminal); APL Trieste (Agency for Port Labour; RCA (Rail Cargo Austria).
Black arrow = freight flows; Dotted line = collaborative relationships.

From the clients perspective (shipping companies and freight forwarders MTO) railways connections and services are the main success factor of TMT. These contribute in reducing time and cost for final clients. With reference to the value creation of the TMT port service supply chain, the data reported in Table 7.11 show a general increase of the economic and financial performance.

Table 7.11: The value creation of the TMT port service supply chain

Revenue (.000 euro)	**2011**	**2015**	**Var 2015-2011**
Container Handling	33.264	36.294	8.3%
EBIDTA	1.632	2.027	19.5%
ROI	0.15%	2.77%	
Container	**2011**	**2015**	**Var 2015-2011**
TEUs	393.195 (561 vessels)	443.882 (611 vessels)	11.4%
Market share	4.13%	4.80 %	+0.67%
Rail share	**28 %**	**35%**	**+8%**
Employment	**2011**	**2015**	**Var 2015-2011**
Staff	157	162	3%

With the new investment in terminal and railways, TEUs handled by year will increase as well as the share of the rail traffic, most probably up to 50%. The environmental impact of the port development will be, in this regard, reduced and, at the same time, the local employment will benefit through the hiring in the port and railways companies managed by the ASP.

7.5 Collaborative relationships and public-private interactions: the cross-analysis

The case studies offer some insights on relational patterns of port service supply chains and on the possible contribution of shared and combined resources to the process of value creation in the port and its own hinterland. In Table 7.12, the main results coming from the analysis of the services supply chains are summarized and compared in order to highlight strategies, relational patterns and performance at firm and supply chain levels.

With reference to the intermodality, the strategy of TMT is related to the reduction of container handling costs and to the increase of efficiency through a smooth interaction with rail intermodal services. The synchronization among the container handling with the inland distribution allows to overcome the space limit in the port and to ensure a high productivity at terminal level. The organizational structure is marked by different relationships (contractual agreements) among the port business operators, specialised in each stage of the supply chain. With reference to rail intermodality, the biannual contract between TMT and RCA shows a mutual sharing of strategic objectives and problem solving. Efficiency related capabilities refer to the ability of the TMT and T.O. Delta to take advantage of the available resources in order to get operational excellence. Indeed, companies seek ways to reduce costs, to eliminate intermediate production steps and to reduce transactional and other friction costs. Suppliers are selected based primarily on cost and reliability, and the main output of the services supply chain are standardized services.

The port service supply chain related to value added logistics, combines both efficient and effective-related capabilities, with the aim to fulfil customer's requirements. Effectiveness includes external aspects of port operations such as service quality (reliability, timeliness, information provision) and customer orientation (e.g. responsiveness, flexibility). LSCT, involved in the port activities, is oriented to cost minimization, while Contship group is able to satisfy different customer requirements through service differentiation. The supply chain governance model is based on the development of a cooperative network that allows to combine specific resources on demand.

Table 7.12: Port service supply chains: strategy, relationships and performance

	Supply chain Strategy	Actors involved in the analysis	Supply chain relationships	Performance indicators
LSCT supply chain	**Strategy**: cost minimization and service differentiation	**LSCT (as focal firm), Contship Group, Railways shunting services, MSC, Sistema Porto**	**Complementary resources** and specialization of each actor in the supply chain: cargo handling and maritime transport (LSCT): intermodality and logistics services (Contship Group). **Efficient and effective** related competencies: cost efficiency and service differentiation. **Governance**: cooperative network (strategic alliances).	**FIRM LEVEL:** Increase of the revenue and market share **SUPPLY CHAIN LEVEL:** Customs Clearance procedure efficiency; Direct services frequency; transit time; inland costs; environment impact.
TMT supply chain	**Strategy**: cost minimization and time delivery	**TMT (as focal firm) To Delta, APL, Adriafer, Alpe Adria, RCS**	**Complementary resources** for cargo handling, maritime transport (TMT) and rail intermodality (Adriafer, Ale Adria, RCA). **Efficient** related competences: cost efficiency and service reliability. **Governance**: contractual relationships among the specialised port business operators.	**FIRM LEVEL:** Increase of the revenue and market share. **SUPPLY CHAIN LEVEL:** Frequency, reliability and time delivery

Each of these supply chains is also characterised by Public-Private interactions for owing and controlling key resources and, consequently, value appropriation and distribution.

In general, both Port System Authorities aimed at expanding their hinterland by setting up different strategies and collaborative relationships.

In the port of La Spezia, the ASP can be defined as a facilitator and community manager (Verhoeven, 2010), essentially oriented to supporting port business operator strategies and the social and economic development of the port and its hinterland (Figure 7.10).

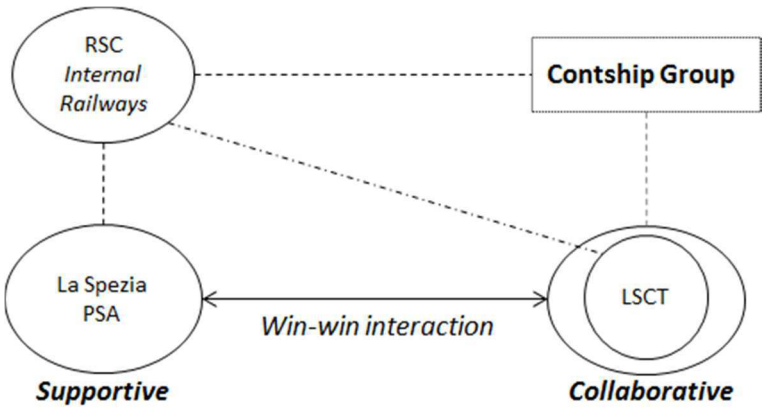


Figure 7.10: Interactions between the ASP and port business operators in La Spezia

Legend: Black arrows = Public-Private interaction; dotted line = collaborative relationships.

Source: own elaboration based on Morash and Lynch, 2002.

The only involvement in "business activities" is through the Railway Shunting Company (RSC) that provides rail services within the port perimeter. All main port business operators have capital shares in RSC and the perceived quality of services is high in terms of cost and reliability. The future investments of ASP in port terminal expansion, as well as railways connections, will support Contship group strategic objective to increase the rail intermodality share, thus reducing the environmental impact of the port development.

Moreover, the port authority is actively involved in the logistics development of the port, building regional port networks, sustaining the environmental development and thus creating an equilibrium between the private interest of LSCT and Contship Group and those of the local community. In the definition of port strategic planning, the ASP always interacts with key port business actors (LSCT and Contship group), Infoporto and local stakeholders such citizens representatives and local administration. The future Triannual Operational Planning (POT) 2018-2020 will be published as soon as the approval of all parties will be received. Environmental issues and social inclusion are mutually shared with port business operators, thus creating a context characterized by trust, common strategic vision and win-win interactions.

On the contrary, ASP performs a peculiar role in the Italian context, combining the main features of the facilitator with a commercial attitude as investor, service provider and consultant (Verhoeven, 2010). In particular, the ASP is the main shareholder of different port service providers: Adriafer, Alpe Adria and APL (Figure 7.11).

Trieste ASP believes that it is important to be directly involved in port activities in order to increase rail intermodal traffic, employment and welfare at regional level. The inter-relationship with the local and national government has allowed the extension of ASP's influence over the port perimeter; port management, in this regard, has developed leadership at regional level, extending its competencies beyond the pure maritime dimension and including skills and know-how in rail intermodality, logistic integration, international business and environmental management.

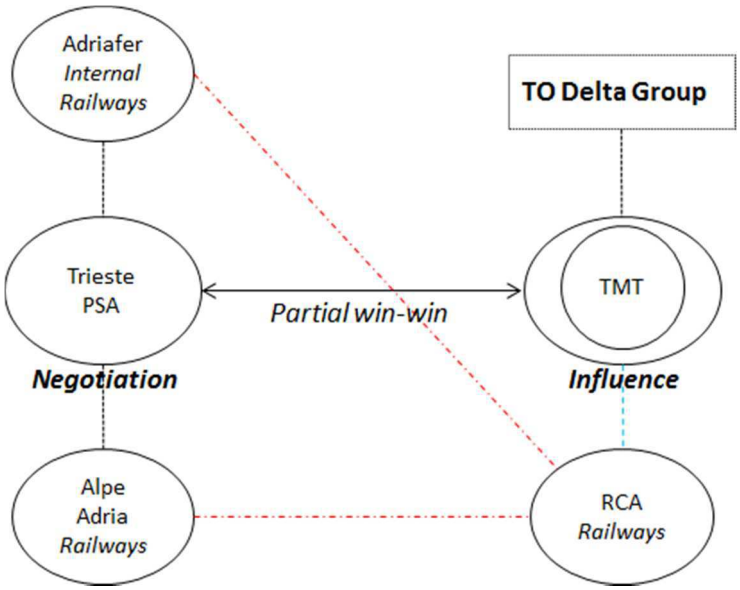


Figure 7.11: Interactions between the ASP and port business operators in Trieste

Legend: Black arrows = Public-Private interaction; dotted line = collaborative relationships; blue dotted line = joint service agreement: red dotted line = competition.

Source: own elaboration based on Morash and Lynch, 2002.

Adriafer has recently received the license to operate on the national and European railway network thus increasing the competition in the market. Form one side, the competition among Adriafer, Alpe Adria, RCA and other companies will increase the level of service by keeping prices low. However, the presence of a public body in the market could create a distortion of the competition due to subsidies received by companies managed by the ASP in order to keep the service competitive. Rail market is very capital-intensive, and financial support should be limited to help for rail operators to introduce additional services. Public and private interactions are, therefore, featured by a more business attitude (negotiation) of ASP compared with the port business operators. The relationships are partially win-win as there is strong competitive struggle in the railways market.

7.6 The evolution of the port of Naples as port logistics network

With the institution of the Port System Authority (ASP) in 2016, the ports of Naples, Salerno and other small ports, are managed by one public governing body, which is responsible for their development in a systemic logic. According to the current National Strategic Plan of Port and Logistics (2016), two factors can play a key role for the creation of a Southern Italian port logistic system. First, the Naples-Salerno port system can be seen as a multipurpose system, which can satisfy different logistics and transport needs of the demand. Second, this area is characterised by a large demographic basin with a high population density, and by the presence of some important production areas, constituted by of some large companies as well as small and medium-sized enterprises located in Campania, Basilicata, Apulia and lower Lazio.

In this paragraph, the analysis focuses on policy actions planned in 2017 by the Port System Authority aimed at overcoming the inefficiency registered in the previous years that has caused port value destruction along the service supply chain. In particular, the analysis starts with the main findings of a research carried out in 2012, which show the presence of an intermodal supply chain managed by CoNaTeCo, the main container terminal operator, linking the port with the Nola and Bari freight villages. However, the lack of systemic vision of the port authority in port development planning, exclusively oriented to the shipping companies and thus not supporting the local economic development, led to a loss of potential value creation of the port of Naples for its hinterland. Based on these findings, the aim is to investigate the Port System Authority's vision for the future development of the port of Naples.

7.6.1 The container traffic in the port of Naples

After the good performance registered during 2010-2012, the containers traffic in the port of Naples recorded a decrease in the three-year period 2013-2015, as shown in Table 7.13. This has been caused, from one side, by the reduction of the import and export flows registered at national level (MAAF, 2016) and, from the other side, by the commissioning of the port during this time, which created an instable environment for port business operators.

Table 7.13: Container traffic in the port of Naples (TEUs)

	2009	2010	2011	2012	2013	2014	2015	2016
Total TEUs	515.868	534.4694	526.768	546.818	477.020	431.682	438.280	483.481

Source: Port of Naples website

In 2016, there was an increase of 10.3% compared to the previous year but, at the same time, Cosco decided to leave the port of Naples and to sell its 50% capital share of CoNaTeCo to Marinvest (a financial company of MSC) thus becoming fully controlled by MSC. After having

waited for many years for the planned dredging activities in the port of Naples, Cosco has decided to invest in the transshipment port of Piraeus.

In 2016, import-export flows from the port of Naples (Figure 7.12) show the importance of the Far-East for the entire region accounting about 2.2 billion euros (23% of the total import and export flows). Follow EU28 about 1.7 billion euros (17,3% of the total import and export flows) and North America, 1.3 billion euros (13,2% of the total). These flows concern: metals and metal products (for the automotive and aeronautic sectors) which represent 21.6% of the total value (80% in import), followed by agri-food products with a share of 19.7% (79% of which is exported) and, finally, textile products, which represent 16.2% of the total value (85% in import).

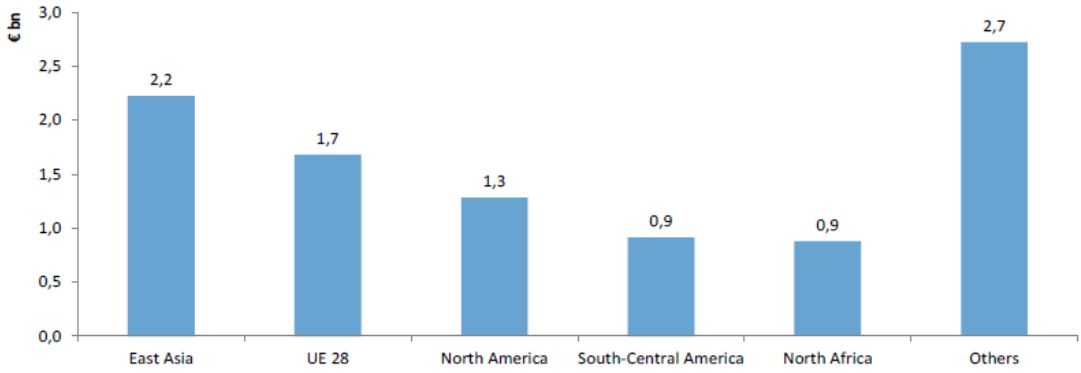


Figure 7.12: Import and export flows from the port of Naples in 2016 (billion euros)

Source: SRM, 2017

The loss of COSCO as port client may impact on maritime services that calls the port of Naples, especially with reference to the Far-East services (Table 7.14).

In particular, with specific reference to the textile products imported from China, there could be alternative transport chains involving other ports, leading to a loss of value for the port of Naples. Currently, the port of Naples doesn't provide any direct service to and from the Far East.

Finally, in 2017, the inland distribution has been characterized by the predominance of road transport (100%) with clear repercussions on the city's traffic congestion and air pollution.

Table 7.14: Container services from the port of Naples in 2017

Shipping comanies	Service	Frequency	Ports
2M (Maersk and MSC)	Med/UESC	Weekly	Napoli - Livorno - Valencia - Algeciras - Boston - New York - Baltimora - Norfolk -Charleston - Gioia Tauro
2M (Maersk and MSC)	Med/Gulf	Weekly	Napoli - La Spezia - Valencia – Barcellona - Algeciras - Freeport - Altamira - Por Everglade - Houston - Vera Cruz – Sines - Gioia Tauro
MSC	Australia	Weekly	La Spezia- Napoli - Gioia Tauro - Pointe Des Galettes - Por Luis - Sydney – Melbourne - Fremantle
MSC	Nord Europa	Weekly	Ashdod - Napoli - Valencia - Anversa - Felixstowe - Rotterdam - Hamburg
MSC	Tyrrenian line	Weekly	Pireo - Gioia Tauro - Genova - Napoli – Alexandria - Mersin
COSCO, YMLINE, KLINE	Napoli Express	Weekly	Pireo - Napoli
COSCO + ZIM	Cosmed	Weekly	Ashdod - Haifa - Fos - Genova - Napoli

Hapag Lloyd, APL, ZIM, Hamburg Sud	Levante express	Weekly	Napoli - Salerno - Cagliari - Alexandria - Damietta - Port Said-- Mersin - Izmir - Cagliari - Genova - Livorno - Civitavecchia - Napoli
Hapag Lloyd, APL, ZIM, Seago, Uasc, Cma-Cgm, Hamburg Sud, MELFI	Malta Tyrrhenian	Weekly	Malta - Catania - Salerno - Napoli - Genova - Livorno - Civitavecchia - Napoli - Malta
Seago, Maersk	Tyrrhenian Line		Napoli - Valencia - Algeciras - Vado Ligure - Civitavecchia - Napoli

7.6.2 The port-value destruction in the intermodal supply chain (2011)[5]

The analysis presented in this section refers to the research activity carried out in 2011. The aim is to show port value destruction given the lack of a common and share development strategy between the port authority and the main port business operators towards specific target of customers. At this regard, the main customer involved in the intermodal supply chain's analysis was a manufacturing firm located in the hinterland, specifically the pasta maker Garofalo, an export-oriented firm. In combination with desk research, semi-structured questionnaires were administered to the port authority of Naples, the top logistics manager of Garofalo and the port business operators with whom Garofalo shared business processes and relationships: CoNaTeCo, (terminal operator), CGA-CGM (shipping company) and Comag (maritime agent).

During the empirical analysis, the inland distribution of container from/to the port of Naples was dominated by the road transport while the rail transport represented less than 2%. A company called Ferport Naples – whose capital was controlled by Naples port authority (34%), Serfer Servizi Ferroviari (51%) and Nola freight village (15%) – provided port-rail shunting services within the port perimeter.

The intermodal services were supplied by Roberto Bucci Group, Intermodal System Organization (ISO) and Interporto Servizi Cargo (ISC). Thanks to a contract with Trenitalia, Roberto Bucci Group managed railway container service, running three times a week from Gioia Tauro to Naples and vice versa. ISO, founded in Naples in 1995, operated as COSCO's intermodal carrier and logistics operator in Southern Italy through its maritime agency Fratelli Cosulich Group. ISC, a joint venture between Nola freight village and Trenitalia, provided rail connections between from the port of Naples and the freight village. Until 2010, CMA-CGM had been providing intermodal services too, but due to the economic crisis, the company disinvested in intermodality and logistics, by focusing on its traditional core business: maritime transport.

In 2012, the port of Naples was involved in Garofalo's international and European distribution (about 30% of total production). In particular, Garofalo's Department of Maritime Transport and Logistics (MTL) directly contracted shipping companies or maritime agents. Containers were stuffed at the company's warehouse, and custom clearance was carried out by the maritime agent or shipping company. MTL department defined the best freight rate and scheduled time according to each destination. The average containers per month were about 500.

CMA-CGM was involved in the maritime transport to France and northern Europe. Once a shipment reached the port of destination, such as the port of Marseille, the final distribution was organized by Garofalo through local distributors. The choice to have spot contracts with shipping companies was intended to keep high the competition among shipping companies in

[5] This section is based on De Martino *et al*., 2015

order to lower freight rates. Annual contracts with local distributors abroad ensured the high quality of services, especially concerning delivery time. From Garofalo's perspective, the port of Naples represented a transit point for cargoes while other competing Italian ports, such as Leghorn, were more advanced on the provision of valued added logistics services.

The lack of specialization and market orientation of CoNaTeCo highlighted a structure of service supply chain mainly oriented to the optimization of container flows in the interest of the shipping company (Figure 7.13).

In particular, ISO was involved in the export of pasta produced not only by Garofalo but also by Divella (located in Apulia) and other producers. Garofalo's containers arrived at the terminal by road transport, while Divella's containers arrived by rail. ISO had a spot contract with ASCO Bari – the freight forwarder for Divella – for intermodal services between the Bari freight village and the port of Naples. The pasta was then exported to North America and other destinations by Cosco. In 2011, ISO transported 210 containers of pasta, but the increased price imposed by Trenitalia had a negative impact on this figure. CoNaTeCo, on the other side, used the Nola freight village as a dry port for its own container storage and clearance.

One of the main finding of the research was related to the role of Naples port authority in the process of value creation. Its value proposition to become an international distribution platform for Southern Italy, was not supported by strong networking activities with freight villages and key local stakeholders. The case study shows that the effects of these choices are limited to CoNaTeCo's advantages in managing containers inside and outside the port. Indeed, CoNaTeCo mainly used the rail connection between the port of Naples and the Nola freight village for storing containers and customs clearance.

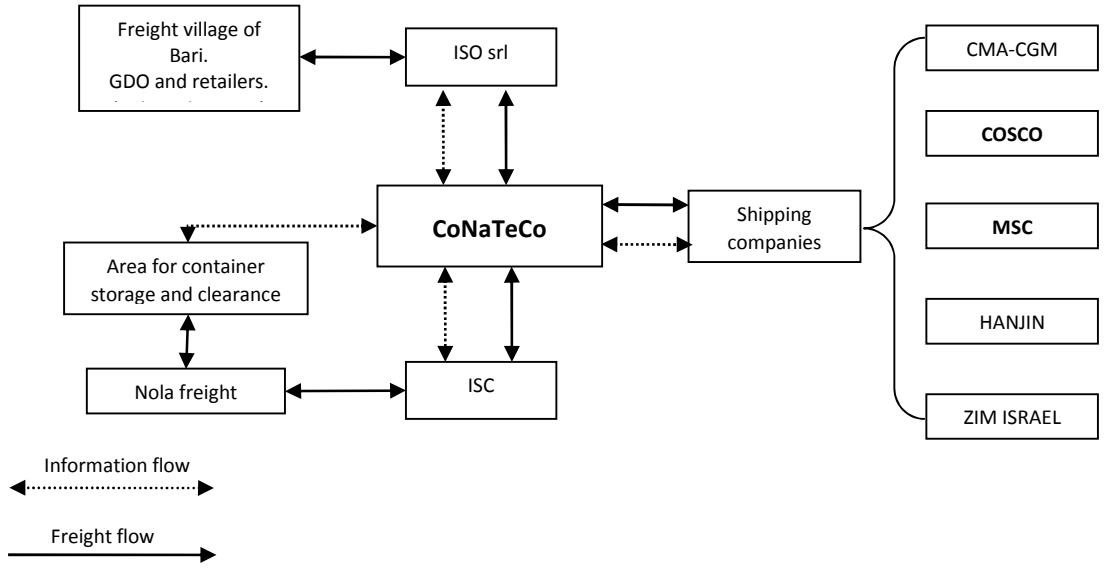


Figure 7.13: The CoNaTeCo intermodal service supply chain in 2011

Source: De Martino *et al*., 2015

Moreover, according to Garofalo, the port of Naples' contribution to its value creation process was mainly in terms of transport costs and maritime services. In particular, Garofalo's manager considered the port of Naples as a 'transit point' and expressed, on the other side, great interest in using the port of Leghorn as a logistics and distribution centre. Finally, the increase in the price of intermodal services provided by ISO between Bari and Napoli pushed the pasta-maker Divella

to export its products from other ports: Taranto for the Far East and Salerno for North Africa. From 2012 to 2015, the port of Naples has registered a decrease in container flow from 546.818 TEUs to 432.208 TEUs (Table 7.12) and the complete stop of the intermodal rail traffic.

7.6.3 The System Port Authority's actions for the development of a port logistics system

The analysis provided in this section is based on conducting intensive individual interviews with the president of the port of Naples and a representative of the Managing Committee to explore their perspectives on planned interventions and actions for the future development of the port as logistics system.

The establishment of special economic zones (ZES[6]) involving the ports of the Campania region (Castellamare, Naples, Salerno) may constitute, in this regard, a first important tool of industrial policy for the economic development of the port, as it would allow to consolidate the regional production thus attracting new logistics businesses. Special economic zones have been conceived as tools for increasing investments in ports and industrial areas, through incentives and fiscal advantages, for firms that will invest in the Campania region. The tender will be published during 2018, and the President of the ASP will be the managing authority responsible for the development of ZES in the region.

Further growth opportunities could be arise by strengthening collaborations with the business associations and regional production areas. The intense use of port infrastructures should be promoted to serve the production and logistics needs of regional manufacturing firms, in particular those operating in the "three A" driving sectors: aerospace, automotive and agri-food.

The Campania Region actually hosts the second most important Italian aerospace district with an impact on the total national turnover of about 23% (SRM, 2012). The Campania aerospace sector consists of about 30 core companies, which are characterized by a high specialization in the design and production of different components and vehicles. The cluster is characterised by the localization of two large multinational companies and their first tier suppliers: AgustaWestland (currently, Leonardo-Finmeccanica, Helicopters Division) and Alenia Aermacchi (currently, Leonardo-Finmeccanica, Aircraft and Aero-structures Division). The largest enterprises of this cluster employ about 8 thousand employees and develop a turnover of about 1.3 billion euro. At a regional level, there are a hundred small and medium-sized enterprises working for the core aerospace companies as second and third level subcontractors (mechanical workshops, design, electronics, IT, etc.) employing about 2 thousand people and developing a turnover of just under 800 million euros.

With reference to the automotive industry, the employment in the province of Naples – in the Pomigliano production plant plus the first and second tiers suppliers – amounted to about 9 thousand employees in July 2015, representing 60% of the sector's employment at the regional level (Pirone *et al*., 2016). The activation of the production of New FIAT Panda has had a significant impact on the entire production of cars in Italy since 2012. Observing the data on the national production of motor vehicles, it should be noted that the New Panda model covered 35% of the total cars built in Italy in 2012. The percentage share of the New Panda on the total produced in Italy decreased in the first months of 2015 (31%), in consequence of rapid growth of the SATA factory in Melfi, that produced two new mini-SUV models: Jeep Renegade and Fiat 500x. Nevertheless, the New Panda is the best-selling car model in Europe, second only to the Fiat 500.

[6] In Italy, ZES was established in 2017 by Law 123/2017, with the main purpose to support the competitiveness of the Southern Italy regions with a maritime and port vocation.

Finally, with reference to the agri-food, Campania boasts by a strong tradition thanks to the high quality raw material and products of excellence, which express the “Made in Italy” abroad. These features have led to a great number of products certification, about 12 % of the total received at national level (Pirone *et al.*, 2016). It is possible to identify three clusters: coffee, pasta and buffalo mozzarella. The exports (in value) of coffee and pasta grew at a rate of more than 20% during 2015. The growth of the export of Campanian buffalo mozzarella was extraordinary, about 402.5%, thanks to the increase of commercial relationships with Spain, France, Germany and the United Kingdom. However, compared with the other two clusters, this sector shows a great fragmentation and dispersion of the production within the region, characterized by 95% of micro and small enterprises.

The three identified clusters represent 80% of the Campania region’s overall export, 50% of which by sea. The ZES, according to some experts, could generate an additional value of 40% to the current export. In particular, the companies that will invest in the ZES may take advantage of: 1) simplified bureaucratic procedures and access to transport and logistics infrastructures; 2) tax credit in relation to the investments made in the ZES, but with the obligation to remain at least 7 years; 3) and, finally, financial support from bank sector. In this regard, in 2017 the Banco di Napoli signed a protocol with the Central Tyrrhenian System Authority in order to make 1.5 billion euros available for those companies who will submit an investment project in the ZES.

The ASP, moreover, aims at enhancing railway transport, with infrastructural investments for modernizing the intermodal connections from the port to the freight villages and to national rail network. To this end, in 2017, the ASP strengthened its collaboration with the Italian Railway Network for the development of a new project related to Napoli-Traccia and its link to the freight villages and the new container terminal in the Darsena di Levante. This project will be supported by the Italian Minister of Infrastructure and Transport with a fund of 90 million euros and it has foreseen the creation of an underground tunnel to avoid city congestion. The infrastructural work should start in 2018. Soon after its completion, the ASP will open the provision of the rail services to the market through a public tender. The completion of the new container terminal in the Darsena di Levante is aimed at attracting new liner shipping, through the increase of the length of the quay and the depth of the dock (18 meters). The new terminal will allow the arrival of 11.000 TEUs vessel or the contextual handling of 6.000 TEUs vessels. The terminal provides rail connections to freight villages and the national railway network (Figure 7.14).

Figure 7.14: The new container terminal Darsena di Levante

Source: Port Authority

Finally, for the realization of the single window, the ASP has created a Single Administrative Help Desk in order to proceed with the definition of procedures at local level that streamline the controlling goods at various interconnections. Moreover, the organization of traffic systems to and from the terminals – in order to monitor the environmental impacts of the port activities as well as to smooth the flow of cargoes in the whole port logistic system, from and to the motorways – is being implemented in parallel with new control actions directly performed on board.

The ASP has activated an effective coordination with the Campania Region for the definition of a regulatory framework in order to manage the public funds related to development of the port of Naples, as well Salerno, into and integrated logistics system.

All the analysed actions lead to the conclusion that the ASP can be considered as a community manager (Verhoeven, 2010) oriented to solving bottlenecks and building of a cohesive and collaborative environment between key local stakeholders (Figure 7.15). The strategic vision of ASP is to develop an integrated port logistics system starting from the analysis of the production and specialization areas that characterised the Campania Region, to subsequently improve the intermodal railway connections and, therefore, linking port activities – with particular reference to the investment in the new container capacity – to local economic development.

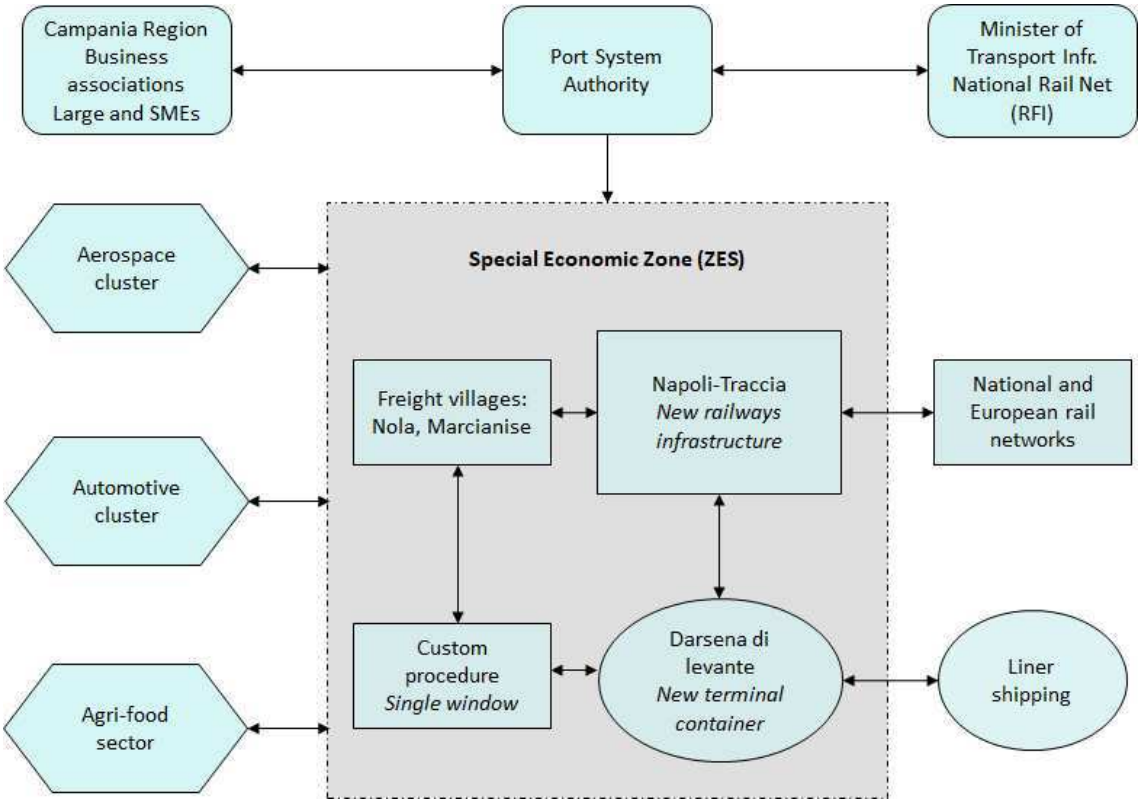


Figure 7.15: The Central Tyrrhenian Sea Port system Authority's (ASP): community manager role

Source: own elaboration

At regional level, the ASP is actively working in stimulating the dialogue and the development of strategic partnerships with freight villages, business associations, large as well as small and medium enterprises (SMEs). This networking activity will support the development of the regional production clusters, and more in general, the internationalization strategies of SMEs through the realization of the Special Economic Zone. The implementation of such an important

project will be the result of close interaction and consensus building among all local Institutions and the Government.

At national level, one of the main priorities listed in ASP's development policy is to reactivate rail intermodal connections through a set of actions that would desirably create a regional intermodality culture, a necessary condition to address the environmental issue and, at the same time, to improve the social and economic impacts of the port. In this regard, ASP's actions are directed to support the diffusion of a "green culture" in the port community, avoiding the increase of negative externalities linked to the economic development of the port activates. Its regulatory function should hamper and correct any less environmentally responsible behaviour through the application of incentives and penalty schemes either within lease contract or as voluntary actions, either at a port specific level or among various ports (Acciaro *et al*., 2014).

Finally, at international level, the fierce competition between liners shipping, has required adequate resources for ensuring the smooth and efficient container flows. The ASP has invested in new terminal capacity, railway connections and in the simplification of custom procedures in order to increase the attractiveness of the port choice from the shipping company perspective (Martínez-Moya & Feo-Valero, 2017). The concession of the new container terminal Darsena di Levante represents a very important tool for the ASP to retain some control over shipping companies' expansion strategies and, at same time, for ensuring the development of service supply chains that will impact on the social and economic development of the region.

7.7 Intermediate conclusions

The analysis carried out in this Chapter is explorative and it allows understanding the effects of Port System Authorities (ASP) and port business actors' interactions on the service supply chain value creation. In this regard, three Italian ports were chosen: La Spezia and Trieste as successful cases of collaborative practices and Naples as port value destruction.

The analysis carried out in this Chapter is explorative and it allows understanding the strategic choices of both Port System Authorities (ASP) and main port business actors involved in the service supply chains.

Although the case study methodology and the snowball technique may present some limits for the generalization of the results concerned, it is possible to highlight some important considerations.

With reference to the ports of La Spezia and Trieste, the analysis supports the notion that there is a positive relationship between collaborative practice and performance in terms of "customer satisfaction" and "quality". LSCT's service supply chain is more structured and involves different transport and logistics operators, thus directly benefiting from the strategic choices and investments made by La Spezia ASP. In this regard, the strategies performed by LSCT and Contship Group have favoured a further integration of the port toward the hinterland, through the supply of efficient and effective transport and logistics services to different clients such as Ikea, Artsana, Benetton, Nestlé. The understanding of customers' requirements in terms of reliability, transit time, frequency, is of crucial importance for keeping the supply chain performance high.

TMT's service supply chain is, on the other side, lean and oriented to the continuous improvement of rail intermodal services to central and east European markets. From the ASP's perspective, the urge to create higher economic and social impacts of the port investments in the region has required a more active role in the form of investor and entrepreneur, involved in the handling and rail intermodal activities. However, this scenario is likely to change in the future as well as the current structure of the service supply chains, both with the entrance of Adriafer

in the national railway market and with the sale of the Agency for the Port Labour (APL) capital shares.

Finally, the case of the port of Naples shows that the lack of a common value proposition between the port authority and the port business operators created, in 2011, a loss a value in the intermodal service supply chain. Value destruction, in particular, has been caused by inefficient and costly rail intermodal services, and therefore by unsatisfied customers, such as Garofalo and other pasta makers. However, the new Port System Authority's policy actions are aimed at overcoming such value destruction events by considering, as priority, the logistics needs of the main production clusters located in the Campania Region.

Another result has been the quantification of value at port services supply chains, using a set of operational, economic and financial performance indicators. The results show that the service supply chains in ports of La Spezia and Trieste have contributed to generate value to the focal firm, and to some extent to the corporate, which is in charge of their management. However, for a correct understanding of the contribution of "public resources" to value creation and distribution, it will be necessary to carry out such an analysis for all supply chain's actors.

Overall, the findings confirm the importance of including a plurality of actors and their mutual relationships in the analysis of port value creation. In particular, the focus placed on the relationships between actors belonging to the port service supply chain or served by the port community, allow to broaden the port authority perspective of its role in creating the proper conditions for a port to develop and serve its hinterland. A variety of roles, from the more community manager and facilitator, to the more advanced as entrepreneur, can be identified for the port authority, according to the different configurations of resources and interactions. This approach is intended to complement macro-economic studies on port competitiveness as it unpacks the 'port' unit of analysis and yields a variety of stakeholders and related expectations that may be differently impacted by port authority policies and decisions.

From a methodological point of view, the case studies carried out in this Chapter present some limitations that additional research could overcome. The empirical analysis has been limited to one port service supply chain for each port. A more extensive analysis of the port network, especially in the longitudinal dimension, could provide interesting and dynamic results, particularly referring to any potential evolution of the port network and its relative power structure. In this regard, the delimitation of network boundaries, frequently stressed within network literature, appears to be somehow problematic in relation to the high complexity of the port community in terms of number of actors, resources, activities and relationships.

In this respect, focusing on a limited set of port actors makes model implementation easier, as well as more efficient in terms of cost and time, but reduces its effectiveness as it overlooks the potential contribution of other actors in the value creation process.

Future research should be directed to the analysis of the efficacy of these policy actions, also in terms of port supply chains services' evolution toward intermodality and value added logistics. This research activity would complement the study related to the quantification of the economic impact of port activities (Coppens *et al.*, 2007), by shedding light on the relational dynamic between port operators in the extended service supply chain, and consequently, on port value creation and appropriation.

8. Conclusions and future research

The study aimed at exploring the nature of relational dynamics shaping value creation and port competitiveness. Port actors, that are fully aware of the crucial role of resources for value creation in the supply chains, will interact and develop inter-organizational relationships in order to control and manage these resources. Resources and activities are completely intertwined, because resources are necessary for the undertaking of activities and have no value unless they are activated. The way in which resources are "activated" and activities performed depends largely on the inter-organizational relationships among port operators and other actors of the supply chains. On the other side, value appropriation depends on the bargaining power that port actors can exert over other operators in the inter-organizational relationships. In this respect, the port authority can play an active role as community manager and facilitator and, under certain circumstances, as entrepreneur (Verhoeven, 2010), thus sustaining port value creation at regional level.

From the relational perspective, port value creation is thus not exogenously determined as an impact of the port activities on the social and economic development of the region, but it is endogenously co-created by port operators along the service supply chains. This perspective completes the macroeconomic or regional economic study and it contributes to feed the service supply chain research stream in the port management and maritime economics.

The work has been structured in order to advance the knowledge on the service supply chains and networks, drawing on Resource Based View theory, which allows to unbundle complex processes in the port management and catch the specificities of the value propositions from the different actors' perspectives (port authority and port business operators). The context of the analysis has been the Italian ports system in the container industry.

The first contribution of this study has been to offer a new perspective of analysis of port value creation. Building on an extensive literature review, the study proposes a model of analysis of port value creation, drawing on RBV theory and value constellation, that takes into account the nature of the port authority's and port business operators' interactions in shaping the service supply chain. By opening the port boundaries to the market, the nature of the relational dynamics changes and this can be inspired by win-win and synergic interactions between the port authority and port business operators. At this regard, the study supports the view of considering a variety of port authority's roles with reference to the different levels of port competitiveness (Comtois and Slack, 2003; Verhoeven, 2010). At regional level, the port authority should act as an agent and coordinator in logistics development, creating regional port networks and sustaining the environmental development of the port. At global level, the port authority commercializes its expertise in logistics services and environmental management worldwide in order to attract private investments. Somehow, the entrepreneur role of Port Authority, with a more strong commercial attitude as investor and service provider, should represent a temporary position for facing the bargaining power of global players, thus ensuring the sustainable development of port at regional level.

Moreover, the network approach offers an important contribution in understanding the collaborative strategies of the port business operators. In particular, the application of the Ego-centric social network analysis to Terminal Operating Companies (TOCs) in a specific transport segment contributes to shedding light on their behaviors and power positions that other approaches of analysis, already applied in the port studies, have partially addressed. Investigating the relationship networks centered on the container TOCs in the Italian port system has allowed to interpret in a different way the data and trends offered at national level on the container throughput and market shares.

The read of the statistics provided by each Italian port, indeed, acquires a different meaning if linked to the analysis of the typologies of actors running the terminal and equity agreements that these actors have developed in the years. While data show a supply fragmented in a plurality of ports involved in the container traffics, in reality the Italian container port systems is characterized by leading positions of a few players that control the market. This oligopolistic situation deserves attention from Port Authorities and Policy makers that are called to ensure free competition and to sustain local and national socio-economic development.

Another contribution has been the definition of a set of performance indicators at supply chain level combined with those generally used at firm level. These indicators represent important tools for the quantification of the benefits deriving from the different service supply chains. From the managerial point of view, these can contribute to spreading a collaborative culture among port business operators, through the promotion and dissemination of some best practices. At port authority's levels, these indicators can provide indications on the resources and capabilities to develop in order to foster port value creation, at regional level.

These general considerations are followed by the answers to the specific research questions (Table 8.1). Then, in the last part, a series of suggestions for future research are provided.

Table 8.1: Principal and additional research questions

Principal research questions	Additional research questions
1. How can port value creation be measured from the management perspective?	1.1 What are the features of value creation in the management literature? 1.2 What is the state of the art of the port literature? 1.3 Which factors determine the convergence of port authority's and port business operators' value propositions?
2. Under what conditions, do port operators develop collaborative relationships?	2.1 What are the collaborative strategies of Terminal Operators? 2.2 What are the collaborative strategies of Shipping companies? 2.3 What are the relational patterns of the port service supply chains?
3. What is the role of the port authority in boosting collaborative relationships?	

8.1 How can port value creation be measured from the management perspective?

Value creation and competitiveness are two concepts closely interlinked as the purpose of any business organization is to create value, sell or trade it to customers, and capture part of this value, in the form of profit, in order to be competitive. The management literature offers different approaches and models of analysis, and there is an increasing number of researches that apply the Resource Based View (RBV) to the study of strategic alliances (Das and Teng, 2000; Dyer and Sing, 2008). According to this perspective, firms create value by combining their resources with those of other firms interconnected through relationship networks.

Thus reinterpreting the port value creation from the network approach requires the review and the replacement of the traditional conceptual categories, such as the Porter value chain, with new bodies of theory, such as value constellation and network.

In a business network, value acquires a different meaning at the level of firm, supply chain and system/network. At firm level, value means the ability to generate profit, increase the market share, improve cash flow, return on investment and revenue. At supply chain level, it is the customer satisfaction that matters in terms of efficiency and effectiveness. Different indicators can be used such as cost, quality, flexibility time, reliability and security. Finally, at system level, value may assume a meaning related to the local socio-economic development, the number of new business activity and, more in general, the performance indicators of sustainable development. However, these three levels of analysis are closely interrelated as a competitive system, able to ensure economic and social welfare, is characterized by efficient and effective supply chain activities and services, leading to customer satisfaction. This contributes to increasing market shares and generating revenue and profit at firm level.

This perspective of analysis, applied in the port context, offers useful insight in the port management and contributes to defining specific solutions in order to increase customer satisfaction in the supply chains' context.

8.1.1 What are the features of value creation in the management literature?

In the management literature, the understanding of customer's needs - in terms of cost, quality flexibility, reliability, time – represents a key stage in the process of strategy formulation which affects the management of inter-firm relationships along the supply chain, in order to get the desired level of performance.

Value creation has been approached in this study from the Resource-Based View (RBV) theory (Wernerfelt, 1984) and, drawing on the service literature (Gronross, 2011), this originates in the firm-customers' interactions. Firm provides their customers with resources (the so-called value facilitation process); value creation, on the other hand, takes place when the customer interacts with the firm and uses its resources.

Value preparation is seen in terms of the amount of resources as a medium of exchange where resources are meant to be not only market inputs and assets, but also knowledge and capabilities (competencies) (Barney, 1991; Olavarietta *et al*., 1997). In this respect, value preparation depends on the ability of the firm to develop competences and distinctive capabilities, and collaboration is a vehicle that firms use to come together in a joint effort to co-produce services through the effective sharing of assets and resources (Dyer and Singh, 1998).

By developing distinctive capabilities, a firm can establish a competitive advantage, which is reflected in its performance (Barney 1991). Measures such as revenues, sale volumes, return on investment (ROI) can be used to evaluate a firm's economic and financial performance. Firm develops distinctive capabilities through supply chain coordination in order to get operational excellence and customer closeness (Morash and Lynch, 2002). Operational excellence can support the cost leadership's business strategy of cost through the minimization of costs and the elimination of wastes and intermediation; customer closeness allows service differentiation through high levels of service customization and collaborative communications and interactions with customers. Thus, supply chain performance measures the firm's ability to attract, satisfy, and retain customers by creating customer value.

8.1.2 What is the state of the art of the port management literature?

The issue of "who is the real actor of port competitiveness" is still debated in the port literature and the different interpretations of "port" have led to different results for what the port competitiveness and value creation are concerned. The port's interpretation of Robinson (2002) as a third party logistics provider represents a fundamental contribution to the

definition of port value creation. However, the framework, drawing on Porter's (1985) value chain system concept, dealt with value exclusively from the perspective of the shipping companies. Although shipping companies have a fundamental role in determining competitiveness, port can represent a value constellation when resources and competencies available at regional level become interacting parts of its strategic development process.

It is acknowledged the importance of adopting a bottom-up approach in the port authority's decision making process, based on the understanding of relational dynamics characterising the port environment, in order to define an active role in the supply chains, thus creating distinctive capabilities hard to imitate. Relationships are vehicles for value creation as they allow to share knowledge, develop distinctive competencies, favor local interactions and mutual trust.

A nascent group of scholars has started to address port development from the Supply Chain Management (SCM) approach, acknowledging relationship networks as leading factor for port value creation and competitiveness. According to these studies, the SCM approach determines the differential competencies and services' features that the port should foster in order to promote the economic and international development of its own hinterland.

Despite these suggestions, limited empirical research has been carried out on the role of port in supply chains. This lack originates from the difficulty in addressing the multi-firms dimension of port, namely the wide range of actors involved in and across port supply chains such as terminal operators, ocean carries, freight forwarders, multimodal transport operators, logistics operators (Bichou and Gray, 2005). At this regard, models based on the network perspective, adopting the concept of value chain constellation, can offer a useful contribution in tackling the multi-firms dimension of port in supply chains (De Martino and Morvillo, 2008). In particular, these models take into consideration all the potential interaction modalities among a multiplicity of network actors in the process of creating value for clients.

8.1.3 How port authority and port business operators interact in the value creation process?

Based on the literature review, the first theoretical contribution has been the conceptualization of port as a network of actors, resources and activities, which co-produce value by developing different inter-organizational relationships. This interpretation underpins a system view of port competitiveness that overcomes the traditional value chain model (Porter, 1985), to embrace the value constellation concept (Normann and Ramirez, 1994).

In this value constellation, three ideal types of port service supply chains can be conceptualised with reference to specific targets of port's customers: shipping company, multimodal transport operator/freight forwarder and shipper/manufacturing firm. Each of this port service supply chain identifies different bundles of resources and competencies that can be fostered and developed through relationship networks. The conceptualization of the port service supply chains allows to define the units of analysis of the port value creation that, in addition to key actors of port competitiveness (port authority, terminal operator, shipping company), can involve other local stakeholders such as intermodal and logistics service providers, and business operators.

The other theoretical contribution has been the definition of the model of analysis of port value creation, which takes into account the nature of relational dynamics between port authority and private port operators in the port service supply chains.

This allows to frame the convergence of the value propositions of both port authority and port business operators towards a common and shared vision of sustainable port development. The proposed model explores the contribution of public and private resources to the development

of relationship networks. The availability of such resources determines horizontal competition between actors who compete to own and control a similar supply chain resource and, at the same time, vertical struggle over value appropriation among port business operators at each stage of the service supply chain. The nature of actors' interactions shapes different power configurations within the port service supply chain, thus leading to diverse value creation patterns at levels of firm, supply chain and port authority.

8.2. Under what conditions, do port business operators develop collaborative relationships?

Port regulatory framework, freight villages and railway market's structures are contextual factors that support or restrict the development of collaborative practices in the port service supply chains. The institutional environment in which Italian ports operate is experiencing a profound change derived from the new port reform in 2016 and the liberalization of the railway market started in 2011.

The availability of logistics and transport infrastructures would prospect a more favourable institutional environment for the development of collaborative practices in the ports located in northern Italy. Some northern Italian Port Authorities, at this regard, have stimulated the development of intermodal railway services through different business initiatives, in partnership with local administration, railway companies and port business operators.

Moreover, the Italian port reform, launched in 2016, would support a more systemic and sustainable approach - the port logistics system - in the definition of port development strategies. The new Port System Authority (ASP) has major possibility to define effective policy actions for the creation of a port logistics network, thus supporting cohesion, mutual trust and shared values for the sustainable port development.

8.2.1 What are the collaborative strategies of terminal operators?

In the last years the Italian container terminal industry has experienced an extraordinary rise of equity agreements, which have determined, to some extent, an intricate network of inter-firm relationships. This network is, however, characterised by the power and control positions of some typologies of terminal operators, which have deeply affected port competitiveness and value creation. The dominant position of Marinvest - a MSC's financial holding controlling directly and indirectly 17 Terminal Operating Companies (TOCs) over 24 in 2015 - and the increasing role of another financial holding, called GIP, have important implications as far as port value creation is concerned. It is clear that Marinvest, representing the interests of MSC, sustains the shipping company strategies to minimize the handling cost and protect the market from competitors. However, until the Italian TOCs can produce value in financial and operational terms, the interests of these financial holdings will be high and there will be less risks of selling their capital. Ports and terminals become, thus, sources of value creation for these actors and their contribution to the regional and national economic and social welfare seems more compromised.

Some vertical relationship networks involve the ports located in the northern Italy, among which the Contship Italia group in the port of La Spezia.

The relationships characterizing this network highlight an equity agreement with Marinvest, for what concerned the container handling activities (La Spezia Container Terminal is controlled 60% by Contship and 40% by Marinvest), and different partnerships for the management of intermodal and logistics activities. This relationship network, from the port's perspective, contributes to a different value creation configuration.

These issues are of crucial importance and deserve attention from port authority, especially with reference to the terminals' concession policy. The understanding of the multiple and, often, diverging interests linked to container terminal management should not be overlooked. From one side, terminal concession is a tool to secure the interest of the liner shipping in the port, especially in the light of the new global shipping alliances. However, with reference to ports performing the gateways functions, terminal concession can represent a tool for increasing the social and economic value of the port at regional level.

8.2.2 What are the collaborative strategies of shipping companies?

The three global alliances – 2M (Maersk and MSC), THE Alliance and the Ocean Alliance - call mainly ports located in the northern Italy and few ports in the South. The number and frequency of services to America and Far East are higher in the Northern Tyrrhenian Sea port system (Genoa, La Spezia and Livorno) than in other Italian ports. The port of Gioia Tauro in southern Italy represents the main Italian transhipment hub. In spite of this, in May 2011, Maersk excluded this port from its network and re-distributed its transhipment traffic in favour of Port Said, also launching a mother vessel service calling at Genoa for Far East-Europe routes.

Interestingly, the only shipping company indirectly involved in the terminal business is the Mediterranean Shipping companies, through its financial holding Marinvest. The emergence of these global alliances has led to less interest to liner ownership in terminals, at least in transhipment port, as the new shipping alliances set up their port networks.

The pressure to lower freight rates, on the other side, is driving smaller operators out of the major routes, and the only chance that they have to survive is to specialise into niche markets. At this regard, some small Italian operators have developed logistics services and supply chain integration in order to keep the competition high. For example, Grimaldi group has developed a range of complementary services related to the transport of vehicle. Specialization and integration in supply chains represent an opportunity for small shipping companies to remain in the market at a profitable level.

8.2.3 What are the relational patterns of the port service supply chains?

Different relational patterns can be identified through the analysis of the port service supply chains extended to logistics and rail intermodality.

In port of La Spezia, La Spezia Container Terminal (LSCT) and Contship Italia Group manage the supply of logistics and rail intermodality services. Efficiency-related capabilities focus on handling and transport costs reduction, while effectiveness-related capabilities such as frequency, timeliness, and quality positively affect customers' value perception. The service supply chain is thus structured: LSCT is in charge of managing all the stages composing the container handling process while different companies belonging to Contship Italia supply a set of services, which favour the integration of the port cycle with procurement and distribution activities of their main clients (Atrsena, Ikea, Wirpool, Benetton). Customer orientation, efficiency and effectiveness- related capabilities developed through collaborative relationships network, have ensured to LSCT an increase of the economic, financial and market performance from 2011 to 2015.

With reference to the port of Trieste, Trieste Marine Terminal (TMT) service supply chain is lean and oriented to the continuous improvement of container handling and rail intermodal services. Efficiency-related capabilities have been developed in order to minimize the intermodal transport chain costs. Contractual agreements are set up with few railway operators, such as Rail Cargo Austis (RCS) and, Adriafer and Alpe Adria, two companies controlled by the Trieste ASP. From TMT's perspective, the presence of a public body in the

"business" activities can be supportive of local development, until it ensures the efficiency of the supplied services. From the client's perspective (shipping companies and freight forwarders), railways connections and services are the main success factor of TMT. These contribute to reducing time and cost for final clients. From 2011 to 2015, the company shows a general increase of the economic, financial and market performance.

Overall, these findings confirm the importance of including a plurality of actors and their mutual relationships in the analysis of port value creation. In particular, the focus on the relationships between actors belonging to the port service supply chain allow to broaden the port authority's perspective in creating the proper conditions for the port to develop and serve its hinterland. A variety of port authority's roles, from the community manager and facilitator, to the more advanced role as entrepreneur, can be identified according to the different configurations of resources and interactions. This approach is intended to complement macro-economic studies on port competitiveness as it unpacks the "port" unit of analysis and yields a variety of stakeholders and related expectations that may be differently impacted by port authority policies and decisions.

8.3 What is the role of port authority in boosting collaborative relationships?

The case studies show an active role of Port Authorities in favoring the development of collaborative and proactive relationships along the service supply chains.

In the port of La Spezia, the ASP performs as facilitator and community manager (Verhoeven, 2010), mainly oriented to create synergies and interplay between port service supply chains and the local economic system. The port authority is actively involved in the development of port logistics network at regional level, setting up win-win interactions with different local stakeholders, thus creating an equilibrium between the private interests of LSCT and Contship Group and those of the local community. Moreover, the future investments of ASP in port terminal expansion as well as railways connections will support Contship group strategic objective to increase the rail intermodality share, thus reducing the environmental impact of the port development. Environmental issues and social inclusion are mutually shared with port business operators, in the port development strategies.

With reference to Trieste, the ASP performs a peculiar role in the Italian context, combining the main features of the facilitator with a more commercial attitude as investor, service provider and consultant (Verhoeven, 2010). In particular, the ASP is the main shareholder of different port service providers: Adriafer, Alpe Adria and APL. The ASP believes that it is important to be directly involved in port activities in order to increase rail intermodal traffic, employment and welfare at regional level. The inter-relationship with the local and national government has allowed the extension of ASP's influence over the port perimeter. However, the presence of a public body in the market could create a distortion of the competition due to subsidies received by companies managed by the ASP in order to keep the service competitive. Rail market is very capital-intensive, and financial support should be limited in supporting rail operators to introduce additional services. Public and private interactions are inspired by a more business attitude (negotiation) of ASP compared to the port business operators. The relationships are partially win-win as there is strong competitive struggle in the railways market.

Finally, the case of the port of Naples offers interesting insights in the role of the ASP in overcoming the current port-related disruptive events. The strategic vision of the ASP is to develop an integrated port logistics system, starting from the analysis of the production and specialization areas that characterize the Campania Region, to subsequently improve the intermodal railway connections and link port activities, and specifically the investment in the new container capacity, to local economic development.

The ASP governance model to enhance port competitiveness - at regional, national and global levels - can be referred to the community manager role (Verhoeven, 2010) oriented to build cohesion and collaborative relationships with key local stakeholders.

8.4 Future research

Future research should address some issues that the present study has overcome, given the lack of adequate data.

The analysis carried out on the institutional environment of the Italian port system addressed the port authority's regulatory framework and the structure of freight rail services supply in the Italian market. Data were gathered through a content analysis of the information available mainly on websites and publications by business associations such as UIR (Italian freight villages) and FerCargo (association of the main railway operators). A more in-depth analysis is necessary in order to provide a quantification of the freight flows that characterize the port logistics network at local and Italian levels. This contributes to defining effective policy actions aimed at overcoming the current inefficiency of the port logistics system, characterizing the North-South duality.

A more in-depth analysis of the liner container shipping services network could shed light on the power positions of each alliance in the Italian industry. At this regard, the Social Network Analysis can contribute to defining the role of centrality and connectivity of specific shipping companies in the maritime routes. Moreover, the analysis of small shipping companies should deserve more attention from scholars in order to identify internal and external factors that have contributed to the success of their niche strategy. At this regard, the study of best practices in the Italian and European context, especially in the Short Sea Shipping, could offer useful insight for both practitioners and policy makers.

Finally, in order to generalize the findings of this study, the model of analysis of port value creation should be tested in different port contexts. The typologies of port governance models and their interplay in influencing the value creation, can support port authority in defining the priorities of policy agenda in connection to the relational dynamics shaping port context.

In conclusion, each port presents a unique network of actors, resources and activities, which interact and change dynamically its value creation configurations in order to be competitive. Collaborative spirit and mutual trust are fundamental to create reciprocal benefits and promote sustainable approach to port development. Only by making port business operators aware of the importance of collaboration as lever to improve performance in the competitive scenario, port authority can concretely play a crucial role as the main governance actor of port development.

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International Terminal Service of Augusta SRL (ITSA)

La Spezia Container Terminal SPA (LSCT)

Lorenzini & C. SRL

Marinvest SRL

Medcenter Container Terminal SPA (MCT)

Roma Terminal Container (RTC)

Salerno Container Terminal SPA (SCT)

Ser.M.I. SRL

SINTERMAR SPA

Soteco SRL

Taranto Container Terminal SPA (TCT)

Terminal Container Ravenna SPA (TCR)

Terminal Contenitori porto di Genova (SECH)

Terminal Darsena Toscana SRL (TDT)

Terminal del Golfo SPA

Terminal Flavio Gioia SPA (TFG)

Terminal Intermodale Venezia SPA (TIV)

Terminal San Giorgio SRL (TSG)

Trieste Marine Terminal SPA (TMT)

Venezia Contenitori SPA (VeCon)

Voltri Terminal Europa SPA (VTE)

APPENDIX A

PORT SYSTEM AUTHORITY

QUESTIONNAIRE

With the approval and implementation of the new Port decree (2016), the Port System Authority (ASP) is called to play a dynamic role for the relaunch the port, the logistic system and the local economic. The main challenge is to ensure port sustainable development through a series of actions consistent with port competition at international level and its integrative role in the supply chains. Just to mention few examples, some port authorities in northern Europe have activated a series of actions and partnerships in order to determine the sustainable development of the port in the region.

- ✓ From 2000, in order to strengthen the role of the port of Le Havre in the service supply chains, the Port Authority has invested in the construction of three logistics platforms: the Parc Logistique du Pont de Normandie, the Parc de Port in 2000 and Hode. Objective is to encourage the establishment of specialized operators such as Gefco, Zanussi, Daher, Buffard, Danzas for the provision of a wide range of value-added logistics services such as labelling, stock management, conditioning and pricing.
- ✓ In 2011, the Amsterdam Port Authority has led the development of new ship-to-grid solutions that allow inland ships in the harbor to use green energy from the grid instead of their own stationary diesel generators. The project has been possible thanks to development of an effective collaborative network promoted by the Port Authority allowing the combination of different specialized competencies and resources, the sharing of risks, the increased awareness for sustainability issues, and the spread of a culture of collaboration.
- ✓ From 2014, the Barcelona Port Authority performs systematic controls of all activities and promotes actions to minimize their environmental impacts. The environmental data are shared with the Barcelona City Council and the Government of Catalonia with the aim to draw up a map of emissions and to define different actions respect to the levels of pollution. The huge importance attached to environmental issues is visible in an online tool, called the Ecocalculadora, developed for calculating CO2 emissions and for quantifying the carbon footprint generated by logistics activities, both inside and outside the Port.

1. **What is the port development Vision (Smart Port, green port, logistics hub, springboard for local economy) and what are the main strategic objectives that the Port Authority intend to pursue in the coming years?**

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2. **What are the investments in physical and knowledge resources made to achieve the objectives identified above? And what are the relational and technological tools adopted in order to effectively implement them?**
(please relate them to the different functions and services that the port may provide in relation to the local economic system)

	Terminal and container handling
Infrastructure Terminal, container depot,	
Knowledge Acquisition of new knowledge for terminal and container management; Specialized training courses Research projects	
Networking Strategic partnerships for the development of new and improved services PPP for infrastructure development.	
Technology Monitoring port activities Security Custom	

	Intermodality
Infrastructures Railway and road connections	
Knowledge Competences and intermodal chain learning; Education and Training programs. Partnership with University Research proiects	
Networking Shareholder in private business (for ex. Railway) for the development of intermodal service market; - PPP for infrastructure development (interoperability) for port integration in the transport systems at local, national and European levels - For mitigating local conflicts (union, industry associations, Non-Governmental Organization-NGO	
Technology Oriented to the custom and transport chain integration; Electronic Data Interchange (EDI).	

	Logistics
Infrastructure Freight village, logistics platform, Special Economic Area.	
Knowledge New knowledge generation and acquisition through developing value added logistics services; Education and Training programs.	
Networking Strategic partnerships for the development of logistics services with: -Freight villages, also thanks shareholder in private business -With local business areas or industrial districts; -Universities, Knowledge centers, and other key-local stakeholders PPP for infrastructure development (logistics parks and platforms)	
Technology Oriented to supply chain integration Highly specialized and customized; Port community information system (PCS).	

3. What factors/drivers determined the choice of operating the investments outlined above?

		Terminal and Container handling	Intermodality	Logistics
Factors/Drivers	**Economic** Requests of port operators such as shipping companies, terminal operators Demand for services from companies located in the hinterland Market opportunities not to be left to foreign operators or to be offered to foreign operators			
	Social To increase employment and social welfare in the region			
	Environmental Reduce the congestion, pollution,....			

4. What are the performance indicators used to assess the effectiveness of policy actions?

Economic *Diversification of the existing economic activity and rise in new productions; Growth in the turnover and/or profitability of freight forwarder and manufacturing firms; Increase of social cohesion sense; Increase in the employment in the regional economic system; Growth in the number of creative businesses in the regional economic system; Improved image of the port city/region such as the title of Smart Port.*
Environmental *Improved visibility of environmental information; Air pollution reduction; Water pollution reduction; Noise pollution reduction*
Social *Increase in the employment in the port-related activities; Perception of belonging to a specific community; Increase of social cohesion sense, Increase in the employment in the regional economic system, Improved image of the port city/region such as the title of Smart Port*

Istituto di Ricerca su Innovazione e Servizi per lo Sviluppo

Consiglio Nazionale delle Ricerche

APPENDIX B

PORT BUSINESS OPERATOR

QUESTIONNAIRE

Corporate Name			
Legal status			
Address			
Person interviewed			
Position in the company			
Telephone		Fax:	
E-mail		Web-site	

All the answers to the following questions will be confidentially used.
In any case, all the data and the information provided will be submitted to the interviewee before any publication.

A) SUPPLY CHAIN STRATEGY: INTERMODALITY AND LOGISTICS

A.1) What are the business areas and their impacts on the total turnover of the company, how it has changed in the last 3 years and how do you think it will evolve in the next 3 years?

Transport and Logistics Business (TLB) areas	%	Trend in last 3 years*	Trend in next 3 years*
1. Container handling			
2. Intermodal transport			
3. Freight forwarding and maritime agency			
4. Warehousing			
5. Value added logistics			
	100		

** indicate : "+" in case of increase; "=" in case of stability; "-" in case of decrease*

A.2) Please, specify which of the elementary services related to each TLB areas currently offers your company and which intends to offer in the next 3 years?

Transport and Logistics Business (TLB) areas	Currently supplied	In the next 3 years
Container handling services		
Handling containers	❑	❑
Reefer services	❑	❑
Pre-Trip Inspection	❑	❑
Intermodal Transport Services		
Road Transport	❑	❑
Rail Transport	❑	❑
Inland waterway	❑	❑
Short sea shipping	❑	❑
Freight forwarding and maritime agency		
Maritime agency	❑	❑
Custom services	❑	❑
Freight forwarding	❑	❑
Other (specify)		
Warehousing/Distribution		
Storage	❑	❑
Load consolidation	❑	❑
Order processing	❑	❑
Stock control	❑	❑
Pick and pack	❑	❑
Cross-Docking	❑	❑
Value added logistics Services		
Pre-delivery inspection	❑	❑
Quality control/product testing	❑	❑
After-sales services	❑	❑
Reverse Logistics	❑	❑
Assembling	❑	❑
Other (specify)		

A.3) For each type of elementary services, indicate which are provided in-house and which, instead, through collaborative relationships with other suppliers?

	In-house	Collaborative relationship*			
Logistics and transport services		***JV***	***CA***	***ME***	***SC***
Container handling services					
Handling containers	❑	❑	❑	❑	❑
Reefer services	❑	❑	❑	❑	❑
Pre-Trip Inspection	❑	❑	❑	❑	❑
Intermodal Transport Services					
Road Transport	❑	❑	❑	❑	❑
Rail Transport	❑	❑	❑	❑	❑
Inland waterway	❑	❑	❑	❑	❑
Short sea shipping	❑	❑	❑	❑	❑
Freight forwarding and maritime agency					
Maritime agency	❑	❑	❑	❑	❑
Custom services	❑	❑	❑	❑	❑
Freight forwarding	❑	❑	❑	❑	❑
Other (specify)					
Warehousing/Distribution					
Storage	❑	❑	❑	❑	❑
Load consolidation	❑	❑	❑	❑	❑
Order processing	❑	❑	❑	❑	❑
Stock control	❑	❑	❑	❑	❑
Pick and pack	❑	❑	❑	❑	❑
Cross-Docking	❑	❑	❑	❑	❑
Value added logistics Services					
Pre-delivery inspection	❑	❑	❑	❑	❑
Quality control/product testing	❑	❑	❑	❑	❑
After-sales services	❑	❑	❑	❑	❑
Reverse Logistics	❑	❑	❑	❑	❑
Assembling	❑	❑	❑	❑	❑
Other (specify)					

***** JV= Joint venture; CA= bilateral contractual alliance; ME=minority equity shareholder; SC= supply contract.

A.4) What is the relevance of the following factors in driving the company to expand its range of services?

(Please, range the factors from 1 to 8, assigning 1 to the less important and 8 to the most important)

Factors	**Service***	**Service***	**Service***	**Service***	**Service***
Availability of new transport and logistics infrastructures connected to the port					
Availability of new transport and logistics competences in the region					
Increase of transport and logistics demand					
Partnership with the Port Authority					
Diversification strategy at Corporate level					
Control of the market					
Risk diversification					
Increase of the transport capacity					
Other (specify)					

**Specify the elementary services described in table A.2*

B) Collaboration with service providers

B.1) With reference to the services provided through collaboration with suppliers, please specify which of the following criteria your company attributes as the most importance in their selection?

(Range the criteria from 1 to 8, assigning 1 to the less important and 8 to the most important, avoiding to assign the same score to different criteria)

Partner selection criteria	Service*	Service*	Service*	Service*	Service*
Competences and expertise					
Company brand/Image					
Knowledge of the market					
Competitive price					
Sustainable practices					
Flexibility					
Efficiency					
Lack of others suppliers					
Other (specify)					

**Specify the elementary services described in table A.2*

B.2) Please specify the importance of the features that characterize the collaboration with your suppliers, for each of the elementary services.

(use the following legend: 1 = null, 2 = marginal, 3 = medium, 4 = high, 5 very high

Features of the collaboration	Service*	Service*	Service*	Service*	Service*
Formalization degree					
Shared problem solving decisions					
Mutual trust					
Complementary of competences					
Service customerization					
ICT					
Periodic performance assessment					
Dedicated staff					
Information sharing					
Investment sharing					
Sharing of new market penetration					

**Specify the elementary services described in table A.2*

3) Please, specify the name of the company and the person to contact with reference to each of the elementary services provided in collaboration.

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C) Performance indicators

C.1) What factors do you consider more important in responding to the customer requirements?

(Range the criteria from 1 to 7, assigning 1 to the less important and 7 to the most important, avoiding to assign the same score to different criteria)

Customer Satisfaction	Importance	
	Present	Future
Transportation and handling cost		
Transit time		
Consignment security		
Reliability		
Comprehensiveness*		
Flexibility		
Availability of real time information		
Others		

* It refers to the extent to which a single operator will arrange and accept responsibility for all components of the transportation chain between ultimate origin and destination

C.2) With reference to services supplied through collaboration, do you use any performance indicators system?

YES NO

C.3) What are the performance indicators used for each of the services provided by your suppliers?

(Range the criteria from 1 to 7, assigning 1 to the less important and 7 to the most important, avoiding to assign the same score to different criteria)

Performance indicators	Service*	Service*	Service*	Service*	Service*
Costs					
Delivery time					
Geographical coverage					
Flexibility					
Reliability					
Availability of real time information					
Consignment security					
Other (specify)					

**Specify the elementary services described in table A.2*

C.4) What is the contribution of the (TLB) areas to the firm's revenue (in percentage) and how do you think it will change in the next three years?

Transport and Logistics Business (TLB) areas	%	Next 3 years*
1. Container handling		
2. Intermodal transport		
3. Freight forwarding and maritime agency		
4. Warehousing		
5. Value added logistics services		

** indicate : "+" in case of increase; "=" in case of stability; "-" in case of decrease*

D) PORT COMPETITIVENESS

D.1) What is the importance of the factors listed below for port competitiveness?
(Use the following legend: 1 = poor, 2 = insufficient 3 = sufficient 4 = adequate 5 = satisfactory)

Port competitiveness factors	Importance
Railways connections	
Road connections	
Connection with freight villages and other intermodal nodes	
Competences of the Port Authority staff	
Real time information	
Availability of container handling areas	
Port Security	
Dredging services	
Customs services	
Quality and costs the intermodal services	
Quality and costs of the nautical services	
Quality and costs of the warehousing services	
Control services	
Quality and costs of the environmental services	

D.2) What were the most important actions and investments undertaken by the Port Authority carry in the last three years?

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D.3) How do you consider the current unification of ports in port logistics systems identified and approved by the last Port Decree?

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D.4) What are the actions and interventions that the Port Authority should undertake to increase the competitiveness of the port logistics system in the next years?

(1 less important and 7 more important)

Critical factors of the competitiveness	Importance
Private and Public Partnership for the infrastructure development	
Management of the railway services	
Partnership with other competing ports	
Partnership con other public bodies responsible for the development of logistic and transport nodes (freight villages, intermodal platforms…)	
Agreements with industrial districts, commercial area and distribution centres	
Interaction with local stakeholder	
Promotion of specialised training courses	
Participation to Research Projects such as H2020	
Custom informatization	
Port community information system	
Technologies for monitoring the environmental impacts of the port activities	
Other (specify)	