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Opening the Black Box of Intermediation: an example of Service intermediaries in the Maritime Industry

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Abstract

Business model innovation and strategic use of relational capital: shipping intermediaries as an example

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This paper attempts to answer how external environmental factors affect intermediating firms within the maritime industry – the middlemen – that plays a very important role in the sector. The category encompasses firms such as liner and port agencies, freight forwarders and shipbrokers, who link shipping companies with customers, regulatory authorities and suppliers. So far only fragmented information is available on the general value creation strategies of these intermediaries and their behaviour towards the environmental pressures, with the main contributions stressing competitive pressures and demanding customers. The aim of this paper is to use empirical research to increase our knowledge of this topic.

The maritime industry is an example of a highly dynamic sector within which the premium for efficiency erodes fast. It is characterized by the complexity of its operations and its value chain, by its global character and by volatility. As such, the industry offers an interesting and generalizable environment for research. Moreover, the choice of the middleman, an intermediary in the value chain, as the object of study, offers additional insights into the complex industry and value chain dynamics.

This paper draws on qualitative data originating with interviews with industry representatives and can also be regarded as a preliminary approach to a broader project. The analysis distinguishes between relational capital at the intrafirm level (the network among the company's employees) and at the interfirm level (between partners and within alliances and associations). The tentative results show that both of these levels are important in defining the intermediating firms' business models and in answering their environmental threats and in building up competitive advantage. The paper ends with a short presentation of a quantitative industry survey that can be used to illuminate the research question further.

Jelcodes:L19,L99

Opening the Black Box of Market Intermediation: An example of Service Intermediaries in the Maritime Industry

In this paper I will address the differences in structure and activities between market intermediaries and, as a result, develop a classification of intermediaries based on these parameters of variance. The classification presented in this paper will be the first building block of my further PhD project aiming to assess the competitiveness and business model innovation of the intermediaries in this industry and exclusively focusing on the purest form of intermediating company, “the middleman”.

There are two main functions of intermediaries in a market: matching buyers and sellers and making new markets. Intermediaries also contribute to the reduction of market inefficiencies acting as experts where information is asymmetrical (Biglaiser, 1993, Cosimano, 1994, Spulber, 1999, Pettersen Strandenes, 2000)¹. Intermediaries also act as facilitators in foreign trade and internationalization process (Ellis, 2003, Ahn, Khandelwal, & Wei, 2011). Intermediaries vary in their mediating and economic structure (Schramm, 2012, Gould & Fernandez, 1989) and may be active in different markets: financial, labour market, real estate, transport or shipping (Pettersen Strandenes, 2000), and wholesale trade (Utar, 2012).

Considering that company’s structure affects its innovation opportunities and thus its general performance (Roberts, 2004), classifying companies may help understanding their different market performance. In this respect, several attempts have been made in general classification of service companies by: Kotabe & Murray, 2004 based on the criteria of tangibility of their assets, and Petersen (2014, unpublished) based on their activities and value proposition.

Given the importance of intermediaries’ functions in the market and the variance of their structure and activities, this paper will aim to fill in the existing research gap and to contribute to the literature on classification of companies by focusing on service intermediaries.

¹ Organizational economics add few more roles such as achieving economies of scale and scope, reducing bargaining asymmetries (Demsetz 1968, Williamson, 1979) or protecting buyers and sellers from the opportunistic behavior of other participants in a market by becoming an agent of trust (Williamson 1979, Williamson, 1985).

1. Background Intermediation

Historical importance of the phenomenon

Intermediation, understood as the process of matching buyers and sellers within a market provides an important function in the market and has been known for centuries. There is evidence that it can be traced back to the 16th century or even earlier in the British economy (Howells, 2006). Indeed, intermediaries were operating in the textile, wool and other industries not only bringing together buyers and sellers but also contributing to a better information flow. This contribution to efficiency has often been considered a reason for qualifying the intermediaries as innovators (Bessant, J, Rush, 1995, Provan, K, Human, 1999).

Intermediation and innovation

The relation between intermediaries and innovation has been studied by different scholars and in various contexts. Intermediaries have been referred to as bridges (Bessant, J, Rush, 1995), (knowledge) brokers (Provan, K, Human, 1999), boundary organizations and others. The main characteristics contributing to innovation, and shared by different types of intermediating firms, are their ability to reduce inefficiencies in the market by decreasing the asymmetry of information and by transferring information between contracting parties and contributing to organizational learning through the participation in the network. “Innovation intermediaries”, on the other hand, are intermediaries dedicated to specific quest for and facilitation of the adoption of innovative solutions between two parties (Lopez-Vega & Vanhaverbeke, 2009) and are divided into groups based on their function: collaboration, connection and technological service groups. The traditional notion of intermediary, defined as matching the parties in a transaction, is a part of the connection group. Lopez-Vega and Vanhaverbeke relate the matchmaking to gate-keeping and brokering or middleman functions.

Intermediation and internationalization

A special category of intermediating firms are the ones involved in internationalization process and acting either on behalf of companies willing to internationalize or facilitating transactions between two foreign trading partners (Ahn et al., 2011). Since the main aim of internationalization of a given company is to assure market growth and development, and given that the intermediaries facilitate that process, they add to the global competitiveness and growth in markets. As pointed out by Ellis (2003), market intermediaries reduce transaction costs for the

parties in a transaction and act as entrepreneurial market makers. International trade intermediaries (ITI) can be regarded as an example of intermediaries acting as facilitators in the internationalization process, who benefit from a privileged access to information at the initial stage of exchange.

Intermediation applied to services

Intermediaries, matching sellers and buyers, may also operate in the specific context of service sector. The share of services in the world economy is immense and continues to increase. According to figures from the World Development Indicators database, services have grown from 55 percent of global GDP in the middle of the 1970s to roughly 70 percent in 2007 (Hoekman & Francois, 2010).

Given the importance of services to the global economy, the role of intermediaries is not to be overseen. In recent studies, a lot of attention has been given to develop an overview of the financial intermediaries² and to analysing the role of brokerage in the financial sector (according to Schramm, 2012 among others: Maskin, Eric S, Laffont, 1990, Benveniste, Marcus, & Wilhelm, 1992, Pennacchi, G, Gorton, 1990). These intermediaries in the financial sector operate mainly act as market makers (Pettersen Strandenes, 2000), operating with publicly observable bids (Utar, 2012), contrarily to the match makers who keep the price information private.

The match makers are well represented in the labour or transport activities and, as such, remain rather under-researched.

Given the variety of definitions of market makers, matchers and brokers, it is my aim to understand and classify market intermediaries in services based on the parameters in which they vary: assets and mediating structure in order to refine the notion of “pure middleman”.

2. Theory

Taxonomies

Given the main role of intermediaries in matching the parties of transaction and their importance in knowledge creation and in reducing the asymmetry of information, I will relate firstly to (Gould & Fernandez, 1989) taxonomy of structures or mediation based on exchange and flow of resources to provide the input for the first part of my classification. It is a framework proceeding on a partition of three types of agents – sellers, buyers, and intermediaries – into groups.

Accordingly, the three types of agents in the mediation process might either be part of the same group (local brokerage) or of different groups (see Figure1). There are three different subsequent divisions of the latter: first, in one situation the intermediary is “isolated” while the buyer and seller share a group; in a second case the intermediary shares the group with either the seller or the buyer, while the third agent is excluded; and, lastly, there is the possibility of all of the three agents being in a different group. From these possibilities follow that the market intermediary can take on the role as coordinator, itinerant broker, gatekeeper (allowing access for one party to the other), representative or liaison.

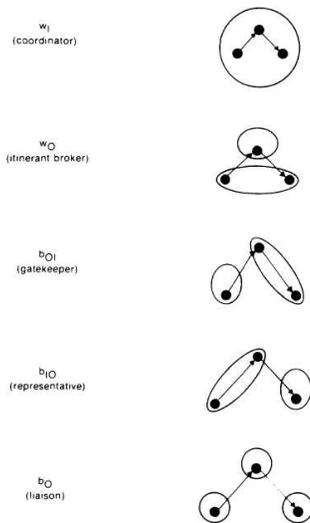


FIGURE 1 Graphic representation of the five types of brokerage relation. Solid points are actors; ellipses correspond to subgroup boundaries. The top point in each triad represents the broker.

Figure 1

Secondly, I will apply a framework developed by (Utar, 2012) that distinguishes between different forms of intermediaries based on the extent to which they engage physical assets in their transactions. The middleman, according to his taxonomy (see Figure 3), is not dealing with any physical assets and is purely matching two transaction parties, while the hybrid forms and service providers invest in physical assets in order to provide the service³. Schramm also

³ It is interesting to note that the function of middleman is also proposed by Cosimano, 1994, according to Wrinkler, 1989, as primary category of intermediating describing the intermediary as a matcher

analyses different economical layers and splits the intermediaries in the categories based on their activities: commercial, financial and transport and logistics.

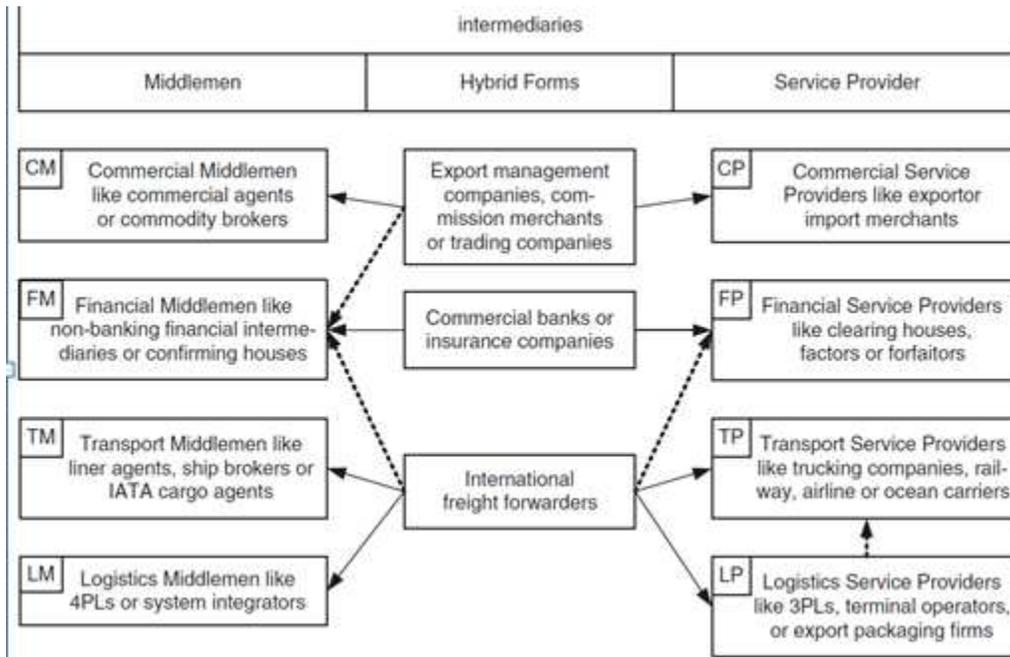


Figure 2

The two frameworks described here are complementary: the first one provides a description of intermediaries' social structure based on the partitioning within groups, and the other focuses on the economic importance of assets and activities.

I will distinguish the “pure middleman”, which is a category of market intermediation that involves both low assets and a liaison mediating structure, from more complex, hybrid forms involving medium or high level of assets as well as from other the company structure such as representative, itinerant broker or coordinator.

Kotabe & Murray, 2004 implemented a similar approach in terms of the use of intangibility of assets, chosen among Inseparability, Variability and Perishability, in order to distinguish between “pure” and less “pure companies. This seems to confirm the choice and validity of this parameter of variance in the services.

Consequently, in my approach, there are 15 possible ways to classify a given intermediary, as illustrated in the matrix below:

between buyer and seller. This definition of “middleman” would coincide with the matchmaker by Schramm.

	Liaison	Representative	Gatekeeper	Itinerant broker	Coordinator
Low Assets					
Medium Assets					
High Assets					

Given the importance of internationalization in the globalized market and the fact that market making function of intermediaries is understood as facilitating of foreign trade, this classification will be done taking into account the internationalization of a given company.

3. Research method

My main goal is to classify the intermediaries in the service industry, which requires an in-depth understanding of companies' structure and activities. In order to develop this understanding and gain the necessary knowledge of the companies of interest, I will apply a multiple case study method (Eisenhardt, 1989, Gibbert, Ruigrok, & Wicki, 2008, Bourgeois, L, Eisenhardt, 1988). The information provided by the case study will be applied in further classifying intermediaries in services.

To assess the importance of intermediation and also try to assess the variance of service companies on different parameters, I will use the Orbis database provided by Bureau Van Dijk, including information about 100 million companies worldwide and more than 760,000 Danish companies⁴ and often used by scholars in their empirical research. The main added value of Orbis benchmarked with Thompson ONE or other local databases such as Nahme & Numre Erherv is that, the latter may provide, respectively, information only on publicly listed companies or only on national (Danish) companies, while Orbis presents a full spectrum of public and private companies worldwide.

I first performed a search by use of different key words in the NACE nomenclature according to the main defined intermediaries' activities namely: financial, real estate, labour market and transport. I first searched for the key word "intermediation" (intermed*-iating, etc) in the NACE nomenclature⁵. I realize that it is mainly used with reference to the financial services. The research points out towards the code 64.1. Second, I used another common key word referring to market intermediation services, namely "broker"⁶. The results point toward the code 66, also

⁴ <http://www.bvdinfo.com/en-gb/our-products/company-information/international/orbis>

⁵ http://ec.europa.eu/competition/mergers/cases/index/nace_all.html

⁶ The research by keywords is motivated by existing typologies of intermediaries such as in Schramm (2013): market and match makers versus brokers and (Gould & Fernandez, 1989), Petersen (2014) provides with a

related with financial intermediation. Furthermore, I performed similar search including the word “maker” (looking for market and match makers), without any results. Last, based on the fact that the general categories of intermediaries in the transport (including maritime industry) are freight forwarder, ship manager, port/liner agent or broker (Gorton, L, Ihre, R, Hillenius, P, Sandevärn, 2009) (See Appendix 1 for description), I proceeded searching for key words referring to these categories: broker, agent, forwarder. I complemented the results with a search on “agency” from the labour market sector⁷. I gathered manually all given codes, refined at four level digits (the only exception is the code 642), which left me with the following result:

Description	Financial intermediation	Labour matching	Real estate	Transport and related
Monetary intermediation	641			
Security and commodity brokerage	6612			
Activities of insurance agents and brokers	6622			
Real estate agencies			6831	
Activities of employment placement agencies		7810		
Temporary employment agency activities		7820		
Other human resources provision		7830		
Freight transport by road				4941
Other transportation support activities				5229
Other reservation service and related services				7990
Service activities incidental to water transportation				5222
	4.653.587	1.112.117	494.942	752.907
	15.148	1.951	2.013	2.559
				8.625

8

Figure 3

Excluding the financial intermediation, labour market brokerage and real estate brokerage, there were still 2.293,621 companies active in other mediating activities worldwide and 15,148 of

framework of value configuration in servicing companies that I will be referring as well. A framework of the brokering and logistics services “using steel” by (Lorange & Fjeldstad, 2012).

⁷ <https://www.fonasba.com/ship-agents-and-brokers>

⁸ Since one company might operate under more than one NACE code, I decided to only include the primary codes. According to NACE rev2 there will be also core activities dedicated to each company which may vary from the primary code. General search strategy in Orbis is aiming to include non-overlapping observations and thus performing step-by-step search, modifying accordingly the default setting of the Boolean search. The data reported above was retrieved on December 16th 2014.

them operating in Denmark. More than half of the intermediaries operating in Denmark, namely 8,625, stem from the transport category.

The intermediating firms selected within the transport industry in Denmark in the Orbis database vary on a number of parameters, which may affect the prediction value of the research and should not be overseen in drawing up conclusions on the basis of the study.

First, the reported turnover of the firms ranges from 0 to 49 mio USD. Furthermore, the average turnover of 169,161 USD (see the descriptive statistics in Appendix 2) seems to be highly impacted by the skewedness of the data.

It is also important to mention that a majority of observations related to the revenue are not available (8,192 observations out of 8,625). The wide dispersion of the available observations of the revenue might be due to the productivity of the sector (Maroto-Sánchez, 2012). Indeed, in spite of difficulties in measuring the productivity in service sector, due mainly to the intangible character of its outputs, the industry displays generally lower figures as compared to the traditional primary and secondary sectors. The productivity of a service company relates its output to its input, the latter is understood as company's human capital. Contrary to other sectors, it is generally impossible for a service company to increase its production without increasing its human capital, and therefore its productivity figures may be stagnant over years (Maroto-Sánchez, 2012).

Second, the same variance in numbers persists in the company's size ranging from 0 to 88,909 employees (the latter number due to the Danish shipping conglomerate A. P. Moller-Maersk, captured by the code 7990). Dropping the biggest industry player still leaves me with a variance of 0-20,000 employees, the second biggest player being the multinational freight forwarder DSV. The mean, as reported in Appendix 2, is 243 and highly impacted by the right tail of the distribution. 77 out of the total sample are one person companies. Being self-employed is highly correlated with not reporting the revenue in my sample, since data is only available for 10 out of these 77 companies. The variance of the revenue is even more important for this subgroup: the max is 8,168 USD and lowest 0 USD. The proportion of the reporting of the revenue in the self-employed (1-person company) subsample (12%) is double if benchmarked with the overall revenue reporting in the complete sample (6%).

The same variation and skewedness applies when analysing companies' assets ranging from 75 mio USD to 0 (more than 5,537 companies didn't report this value) and mean of 35,599 USD. Last, an important fraction of the intermediaries within the transport sector (total of 8.625) intermediaries in Denmark stems from transportation category is related to the maritime industry.

Based on the findings described above, confirming the important variance in company's structure in terms of: size and assets, I decided to base my analysis on the under-researched maritime intermediaries sector, which is large part of the broader category of transport market intermediaries.

The maritime industry is one of the most important drivers of the national economy in Denmark. According to the Danish Maritime Authority, the value added in the maritime industries during the period 2004-2009 accounted for an average of 7.7 percent of the overall Danish economy, while the average employment in the same period accounted for three percent of the overall Danish economy⁹. Seen from a global perspective, Denmark is the world's 8th biggest shipping country. It is also one of the first movers in the global industry and hosts the headquarters of the world's largest container shipping company¹⁰, Maersk Line, which maintains 15 percent of the global market share (Panayides & Wiedmer, 2011).

Case selection

I am aware that the subcategories of transport intermediaries are not equally distributed in the Orbis population (see Figure 4). There are 5,919 road freight forwarders in Denmark; other intermediary companies are recruited from the services incidental to sea transport, other transportation support activities and other reservation service and related account for, respectively, 382 and 1,455 and 392.

⁹ http://www.dma.dk/sitecollectiondocuments/publikationer/sfs-samlet-maritim-strategi_3uk.pdf

¹⁰ <http://www.investindk.com/Clusters/Maritime-industry>,

<https://www.shipowners.dk/en/presse/nyheder/danish-shipping-statistics-november-2014/>

Description	Code	Number in Denmark	Worldwide
Freight transport by road	4941	5.919	1.544.679
Other transportation support activities	5229	1.455	393.747
Other reservation service and related services	7990	392	118.817
Service activities incidental to land transportation	5221	354	168.706
Service activities incidental to water transportation	5222	382	32.866
Service activities incidental to air transportation	5223	123	34.806
TOTAL		8.625	2.293.621

Figure 4

A relatively small proportion of the aggregated list provides an outcome related to the tourism industry. They are captured by the code 7990 with 392 companies included in this category. However, the same category also captures shipping companies (such as Maersk) and therefore it is impossible to automatically exclude it from my research.

The intermediaries in the maritime sector vary not only in terms of their NACE classification and activities, but also in terms of the cargo they operate with. According to (Gorton, L, Ihre, R, Hillenius, P, Sandevärn), 2009 and Stopford, (2009) the distinction can be formulated as follows: general cargo (container shipping), bulk, tanker and multipurpose (MPP) cargo. I decide not to include the passenger (cruise) intermediaries in my research, since these activities are very different from industrial operations of other transport intermediaries. The tourist and cruise companies operate on the consumer market (B2C), while the other companies operate on the business-to-business market (B2B). I consider the latter model more relevant for this research given that its general unit of analysis is firm-based.

Given the complexities and imprecisions of the NACE categorization, missing information in Orbis in terms of revenues and, moreover, the varied categories of maritime intermediaries and cargo specialization as described above, I decided to compute a matrix with some selected companies. As sources of the list, I use secondary data on shipping companies located mainly in the port of Aarhus, secondly Esbjerg and Copenhagen, complemented with companies listed and publicly available on the Danish Shipbrokers Association's website.

The decision to include the companies active in the port of Aarhus port is motivated by the fact that it is the largest and most important Danish port in terms of volume in container and bulk shipping and, as such, offers a good generalized setting for my research. These two types of cargo contribute the most to both, the volume and value of seaborne trade¹¹.

Given this cargo specialization of Aarhus, there is a need of complementing the sample with the other two locations, Copenhagen and Esbjerg, which will allow me to cover all categories in the matrix of actors and cargos, especially the very specialized one such as MPP.

There is a clear shortcoming of the sampling based on three port locations only as described above. It consists in selection of the companies that operate exclusively in a port. There are, indeed, some intermediary companies that are not necessarily bound by constraint of operating in a port and might have their headquarters elsewhere. This is the case of the biggest players in the brokerage operating in Denmark, Maersk Brokers (NACE code 5229) which is indeed missing in secondary data selected on the basis of port location. Maersk Brokers and other similar companies may choose the location in the capital city based on other criteria such as access to their main customers: shipowners. In the Maersk Broker case, another reason for opting for a central location may be the proximity of the corporate A. P. Moller-Maersk offices. The Danish Shipowners Association, sectorial representative and lobbying organization, and individual shipowners such as A. P. Moller–Maersk and Maersk Line, Lauritzen, Torm, Clipper Group or Nordic Tankers are all located in Copenhagen¹². I therefore complement the sample again with the representatives of the biggest players using the Orbis output.

The total number of the companies based on manual selection is 50 (see Figure 5), all of which, except two companies, are included in the Orbis database. A possible explanation of this missing information may be that the companies operating in Denmark are simply not registered in the Danish Trade Register.

¹¹ http://www.dma.dk/sitecollectiondocuments/publikationer/sfs-samlet-maritim-strategi_3uk.pdf. The dry bulk carriers is the first cargo ships category in terms of number of ships and volume of goods transported, container shipping is the third most important in both categories, following tanker.

¹² (Sornn-Friese, H, Hansen, 2012)

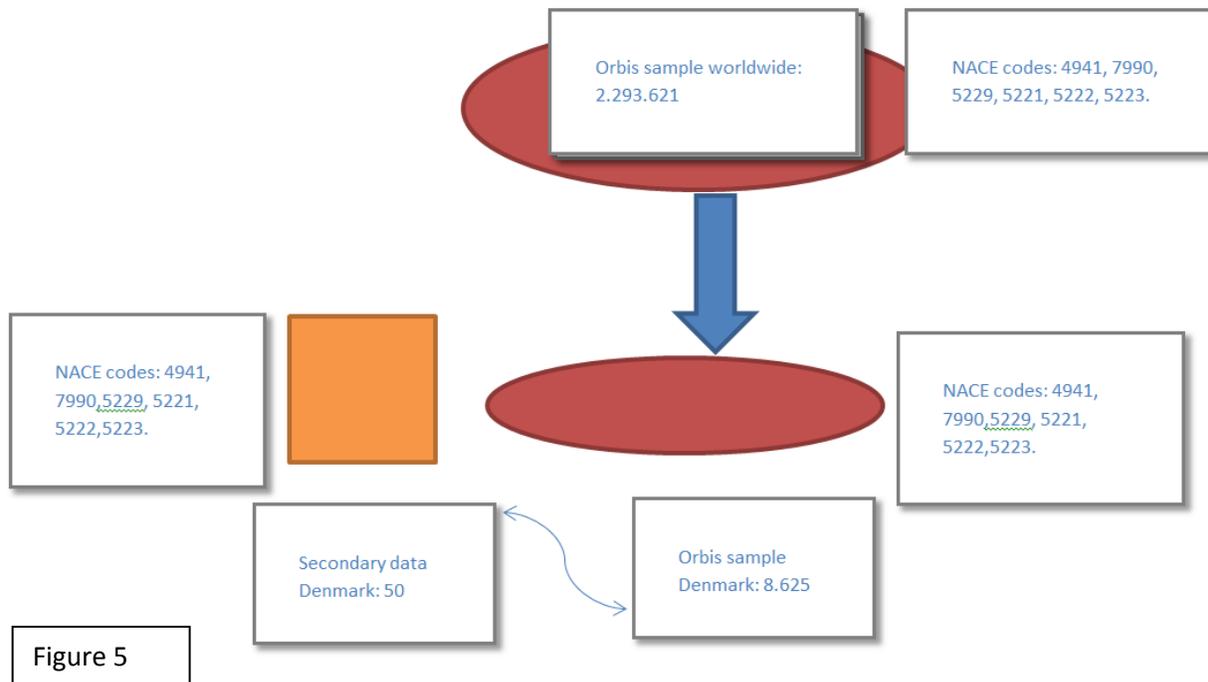


Figure 5

Since there might be some variations among firm categories, also depending on cargo type, I decided to proceed with a sample of two companies by each of the following category: agent (port and liner), shipbroker, freight forwarder and ship management company.

The sampling procedure based on secondary data, cross checked the Orbis population data as described above and shown in Figure 5, leaves me with 10 cases (Figure 6).

Intermediary category	Container	Bulk	Tanker	MPP
Port agent	X			
Liner agent				
Broker		X		
Ship manager		X		X
Freight forwarder	X			

Figure 6

Each company selected for service category should focus on possibly one kind of cargo. Thus, among two cases within the ship management we will find one specializing in tanker shipping and another one in multipurpose (MPP) operations. The two cases representing each category of intermediary and accounting for the cargo type should be considered as representative for the category.

This research design, which incorporates a multiple case study in terms of multiple cases per category of intermediary, but also multiple cases of cargo transportation allocated to intermediaries, aims to assure the external validity of this research¹³.

The sampling procedure above aims to comply with the theoretical sampling necessary for a proper case study design (Eisenhardt, 1989) and based on the 10 cases defined above, I develop a framework for classification of intermediaries based on their positioning towards the other parties in the transaction (structure of mediation), level of assets and also degree of internationalization.

Data collection

TO BE COMPLETED

Tandem Interviews, 24 h rule.

Rule of reliability and construct validity.

¹³ Multiple case design allows a "replication" logic (Yin 1984)-that is, the logic of treating a series of cases as a series of experiments-each case study serves to confirm or disconfirm the inferences drawn from previous ones. While a multiple case design is more demanding than a single case, it permits induction of more reliable models in (Bourgeois, L, Eisenhardt, 1988). The methodology also according to (Gibbert et al., 2008)

4. Presentation and Analysis

Category	Company name	Cargo	Classification Gould et al	Taxonomy Schramm	Internationalization
Freight forwarder	BWS	All	Liaison	Transport middleman	N
Agent	HL	Container	Representative	Middleman + representative	Y
Broker	LS	Bulk	Liaison	Transport Middleman	N
Ship manager	TH	Bulk	Representative	Middleman + representative	Y
	NT	MPP	Liaison	Middleman	N

5. Hypothesis testing

Based on five cases analyzed in qualitative interviews done so far and covering the categories of broker, agent, freight forwarder and ship management (two cases), it is possible to explore for existence of some patterns.

H1: Companies with a Representative mediating structure (IV) are likely to have a light Asset structure (DV). This relation is moderated by Internationalization (MOD).

Case of Agent

H2: Companies with a Liaison mediating structure (IV) are likely to have a light asset structure (DV).

Case of Broker and Freight Forwarder

There are two main candidates for the “pure middleman” based on the intangibility of assets criteria: The Agent and the Broker.

Agent is though not “pure” in terms of the mediating structure and acts as Representative of a shipping company. This relation is often mediated by the internationalization of his Principal.

Therefore, due to the fact that the internationalization drives the structure effect in a first time, the middleman role of an Agent in the maritime industry will be only considered as secondary.

The ship broker is not only complying with the intangibility of assets criteria, but he is also acting as “isolated” Liaison between the buyer and seller, not sharing a common group.

In spite of the fact that the freight forwarder, would, by broad definition (see Appendix 1), own assets in his company, my case proves otherwise. I am therefore able to qualify the FF out in my sample as Liaison and transport middleman, which contradicts the definition the company chose for herself. Since the freight forwarder category is by definition either within the hybrid or service provider, in our sample the denomination of the firm that doesn't own any asset is misleading.

Furthermore, the ship manager might be considered as both: middleman and representative, depending on the internationalization of the company.

Based on the above, it can be concluded that the Broker category is the one that seems to be the more likely considered as “pure middleman” based on his assets and mediating structure.

Indeed, the Liaison describes the intermediary as matching the parties in transaction who stem from different subgroups, and the pure middleman matches a buyer and a seller that do not necessarily belong to the same market. A shipbroker matches a ship-owner (maritime industry) with a shipper or a charterer (Gorton, L, Ihre, R, Hillenius, P, Sandevärn, 2009) (any given industry of the market). I can conclude, from the case matrix and analysis above that the Liaison categorization coincides with the “pure middleman” and it's complemented with light assets.

6. Conclusion

My general remark is that internationalization guides the classification in a first stage for all the categories analyzed. The internationalized companies will act mainly as Representatives and have a light asset structure, confirming the H1 (case of Agent).

Furthermore, companies acting as Liaising structures and not internationalized are likely to have light assets as well, falling therefore in the category of pure middleman (H2). These cases are Broker and Freight Forwarder.

My further research on innovation of intermediating firms will be based on the above results and will restrict my interest to the “pure middleman” which seems to be the best represented by the shipbroker.

1. Appendix 1.

Nomenclature of maritime intermediaries and cargo types used for the matrix.

I consider SHIPBROKER¹⁴ an intermediary active in matchmaking in the chartering market between shipowners and shippers or shipping lines (Pettersen Strandenes, 2000). I decided to drop out the category of sales and purchase broker.

The FREIGHT FORWARDER category encompasses all logistics providers (a term that is widely used on the company's website) that usually don't own their own sea or air fleet, they usually provide hinterland transportation with use of their own fleet (trucks).

SHIP MANAGEMENT, idem, as above in terms of input condition. This category is broadly divided into two main categories: Technical management & crew management. The activities include technical support, ship supplies & operation, maintenance and repair, safety and quality assurance, store and purchase, crew selection and training, crew certification, evaluation and assessment and administrative tasks.

PORT AGENT is only input when explicitly stated on company's website. The difference between Port and Liner Agent might sometimes be blurry, but usually it is possible to distinguish between them (see below).

LINER AGENT is an Agent by definition. The companies usually mention their Principal on their website (Greencareer liner, agent of Evergreen). See comment on Port Agent vs Liner Agent above.

Use and distinction of cargo type:

Container: possibly the most represented category. I assume most of the liner agencies (based on the analysis of their Principals) are in the container business. If any other, specialized cargo is mentioned (which I assume every company wouldn't omit since a specialization could be an added value), we use the container category to fit the liners. Same applies to some extent probably with shipping companies and freight forwarders using sea borne trade.

Bulk: input only if explicitly stated on company's website.

Tanker: See the comment above.

¹⁴ According to (Gorton, L, Ihre, R, Hillenius, P, Sandevärn, 2009), (Mitroussi, 2003) and (Lyridis et al., 2005), (Pettersen Strandenes, 2000)

MPP (multipurpose) encompasses mainly special cargos such as oversized ones but also project cargos.

2. Appendix 2: Descriptive statistics.

Operating income.

Variable	Obs	Mean	Std. Dev.	Min	Max
-----+-----					
Operatingr~h	439	169161.1	2396551	0	4.95e+07

Number of employees

Variable	Obs	Mean	Std. Dev.	Min	Max
-----+-----					
Numberofem~y	594	243.5791	3758.567	0	88909

Assets.

Variable	Obs	Mean	Std. Dev.	Min	Max
-----+-----					
Totalasset~y	3390	35599.28	1289621	-14.66664	7.45e+07

- Ahn, J., Khandelwal, A. K., & Wei, S.-J. (2011). The role of intermediaries in facilitating trade. *Journal of International Economics*, 84(1), 73–85. doi:10.1016/j.jinteco.2010.12.003
- Benveniste, L. M., Marcus, A. J., & Wilhelm, W. J. (1992). What's special about the specialist? *Journal of Financial Economics*, 32(1), 61–86. doi:10.1016/0304-405X(92)90025-S
- Bessant, J, Rush, H. (1995). Building bridges for innovation: the role of consultants in technology transfer. *Research Policy*, 24, 97–114.
- Biglaiser, G. (1993). Middleman as Experts. *The RAND Journal of Economics*, 24.
- Bourgeois, L, Eisenhardt, K. (1988). STRATEGIC DECISION PROCESSES IN HIGH VELOCITY ENVIRONMENTS : FOUR CASES IN THE MICROCOMPUTER INDUSTRY. *Management Science*, 34(7), 816–835.
- Cosimano, T. (1994). Intermediation. *Economica*, 63(249), 131–143.
- Eisenhardt, K. M. (1989). Building Theories from Case Study Research. *The Academy of Management Review*, 14(4), 532. doi:10.2307/258557
- Ellis, P. D. (2003). Social Structure and Intermediation : Market-making Strategies in International Exchange *. *Journal of Management Studies*, 40:7(November).
- Gibbert, M., Ruigrok, W., & Wicki, B. (2008). RESEARCH NOTES AND COMMENTARIES WHAT PASSES AS A RIGOROUS CASE STUDY ? *Strategic Management Journal*, 1474(July 2005), 1465–1474. doi:10.1002/smj
- Gorton, L, Ihre, R, Hillenius, P, Sandevärn, A. (2009). Shipbroking and chartering practice. Retrieved November 15, 2014, from <http://www.nlb.gov.sg/newarrivals/itemdetail.aspx?bid=13362612>
- Gould, R., & Fernandez, R. (1989). Structures of Mediation : A Formal Approach to Brokerage in Transaction Networks. *Sociological Methodology*, 19(1989), 89–126.
- Hoekman, B., & Francois, J. (2010). Services Trade and Policy. *Journal of Economic Literature*, 48(3), 642–692.
- Howells, J. (2006). Intermediation and the role of intermediaries in innovation. *Research Policy*, 35(5), 715–728. doi:10.1016/j.respol.2006.03.005
- Kotabe, M., & Murray, J. Y. (2004). Global procurement of service activities by service firms. *International Marketing Review*, 21(6), 615–633. doi:10.1108/02651330410568042
- Laffont, J-J, Maskin, E. (1990). The Efficient Market Hypothesis and Insider Trading on the Stock Market. *Journal of Political Economy*, 98(1), 70–93.

- Lopez-vega, H., & Vanhaverbeke, W. (2009). Connecting open and closed innovation markets: A typology of intermediaries, (27017).
- Lorange, P., & Fjeldstad, Ø. (2012). New business models and strategies in shipping. In K. Talley (Ed.), *The Blackwell Companion to Maritime economics* (pp. 269–280). London: Blackwell. Retrieved from [http://www.google.com/books?hl=da&lr=&id=I_Uu4_VRDXUC&oi=fnd&pg=PA263&dq="ship+brokering"&ots=SlZTZUacfl&sig=Ipb3emt9RKWFJu3abijHFSuL3OU](http://www.google.com/books?hl=da&lr=&id=I_Uu4_VRDXUC&oi=fnd&pg=PA263&dq=)
- Lyridis, D. V., Fyrvik, T., Kapetanis, G. N., Ventikos, N., Anaxagorou, P., Uthaug, E., & Psaraftis, H. N. (2005). Optimizing shipping company operations using business process modelling. *Maritime Policy & Management*, 32(4), 403–420. doi:10.1080/03088830500300636
- Maroto-Sánchez, A. (2012). Productivity in the services sector: conventional and current explanations. *The Service Industries Journal*, 32(5), 719–746. doi:10.1080/02642069.2010.531266
- Mitroussi, K. (2003). Third party ship management: the case of separation of ownership and management in the shipping context. *Maritime Policy & Management*, 30(1), 77–90. doi:10.1080/0308883032000051649
- Panayides, P. M., & Wiedmer, R. (2011). Strategic alliances in container liner shipping. *Research in Transportation Economics*, 32(1), 25–38. doi:10.1016/j.retrec.2011.06.008
- Pennacchi, G, Gorton, G. (1990). Financial Intermediaries and Liquidity creation. *Journal of Finance*, 45(1), 49–71.
- Pettersen Strandenes, S. (2000). The shipbroking function and market efficiency. *IJME*, II.
- Provan, K, Human, S. (1999). Organizational learning and the role of the network broker in small-size manufacturing firm networks. In *Interfirm Networks: Organization and Industrial Competitiveness* (pp. 185–207).
- Roberts, J. (2004). *The Modern Firm: Organizational Design for Performance and Growth*. Oxford University Press.
- Sornn-Friese, H, Hansen, C. (2012). *Landlubbers and Sea dogs*. (C. B. S. Press, Ed.).
- Spulber, D. (1999). Market Microstructure Intermediaries and the Theory of the Firm. Retrieved November 15, 2014, from <http://www.cambridge.org/us/academic/subjects/economics/microeconomics/market-microstructure-intermediaries-and-theory-firm>
- Stopford, M. (2009). *Maritime Economics*.

Utar, T. (2012). Characteristics of International Trade Intermediaries and Their Location in the Supply Chain.

Williamson, O. E. (1979). The University of Chicago The Booth Transaction-Cost Economics : The Governance of Contractual Relations. *Journal of Law and Economics*, 22, 233–261.

Williamson, O. E. (1985). *The Economic Institutions of Capitalism*.