

The Impact of the Maritime E-Business on the Tramp Shipping Industry*

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해운전자상거래가 부정기선 해운산업에 미치는 영향에 관한 연구

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Abstract

This paper examines the impact of the maritime e-business on the tramp shipping industry. In particular, the impact of the maritime e-commerce focuses on the transaction structure in the chartering market. According to prior research based on transaction cost theory, it is argued that intermediaries will be eliminated due to the reduction of transaction costs between consumers and producers with the advent of e-commerce. However, this cannot be generalized to all intermediation services. "Four Outcome Framework" developed by Sarkar et al.(1995) provides the theoretical basis for differential impacts on intermediaries. In order to clarify the issues, this paper attempts to apply the modified transaction cost theory to the chartering market. The analysis suggests that in chartering marketplace, shipbrokers will play an important role in chartering business even after the advent of e-commerce.

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I . Introduction

In recent years the shipping industry has witnessed the development of maritime electronic commerce. Various Websites have launched online services in fields as diverse as maritime portal services, freight auctions, maritime procurement, chartering, and maritime employment etc. In the chartering market, a large number of online shipbrokers have developed over the last few years. The electronic marketplaces in the chartering business created by the Internet provide new challenges, threats, and opportunities to everyone who chooses to embrace them. Also, the development of online chartering implies that there will be significant changes in transaction structure in chartering, particularly in the role of shipbrokers.

Early predictions for electronic commerce were relatively simplistic. Based on transaction cost theory, they predicted disintermediation for organizations that communicated between producers and consumers. The rationale was that lower transaction costs (Malone, Yates, and Benjamin, 1987) would enable producers to bypass intermediaries and deal directly with consumers.

However, Sarkar, Bulter, and Steifield(1995) argued that the advent of e-commerce will reinforce the position of traditional intermediaries and also promote the growth of a new generation of intermediaries. Based on modified transaction cost theory, they suggests four possible outcomes: Internet supplemented direct market, threatened intermediaries, Cybermediaries and Internet supplemented intermediaries. This paper attempts to investigate the impacts of e-commerce on transaction structure in the chartering market, by applying "Four Outcome Framework" developed by Sarkar et al.

II . Transaction Structure in the Chartering Market

1. Types of Transaction in Chartering

A market may be defined as a place where buyers and sellers meet in order to sell or buy products or services. The charter market is one of the shipping markets where shipping services are purchased and sold. In particular, a charter means that the owner or the disponent owner promises to put a vessel or a certain transportation capacity at the disposal of the charterer, who promises to pay the agreed hire or freight to the owner. In the chartering market there are four different types of transactions: the voyage charter, the contract of affreightment, the time charter, and the bareboat charter.

A shipper, who wants to move a specified amount of cargo between ports or geographical ranges, will normally prefer a voyage charter which requires the least involvement in the arrangement of a voyage. This charter form will normally cover shipments of a full cargo. In the

case of part cargoes, the shipowner normally has the right to fill in with other cargoes at the same or other ports for his own benefit.

A contract of affreightment(COA) is a long term agreement between a shipper and a ship owner to transport a certain amount of cargo on a particular route or routes over a given period of time. The choice of vessel will usually be at the ship owner's discretion. Shippers with large shipments in a specified trade, may use this form of charter instead of voyage charters because this will secure the required service at a fixed rate, as the freight rates in the charter market can fluctuate considerably over time.

The time charter is an agreement between a ship owner and a charterer to hire a ship for a set period of time which may vary from a couple of months up to several years. Under a time charter, the charterer is responsible for considerable portion of the expenses incurred during the transport. The cargo and the itinerary are basically at the charterer's discretion, although the ship owner may impose limitations in the contract.

Finally a bareboat or demise charter is a contract between a ship owner and a charterer to hire out the ship without crew or any operational responsibilities. Under this charter, the charterer takes over almost all of the owner's functions except for the payment of capital costs. A bareboat charter will normally cover a certain period of time, sometimes a long period.

2. Transaction Structure of Charter Business

In practice, charterers or ship owners in the chartering market have basically three alternatives to perform their charter businesses (see Fig. 1). One of the most common types of transaction structure is that charter business is handled through two intermediaries¹⁾, a charterer's broker

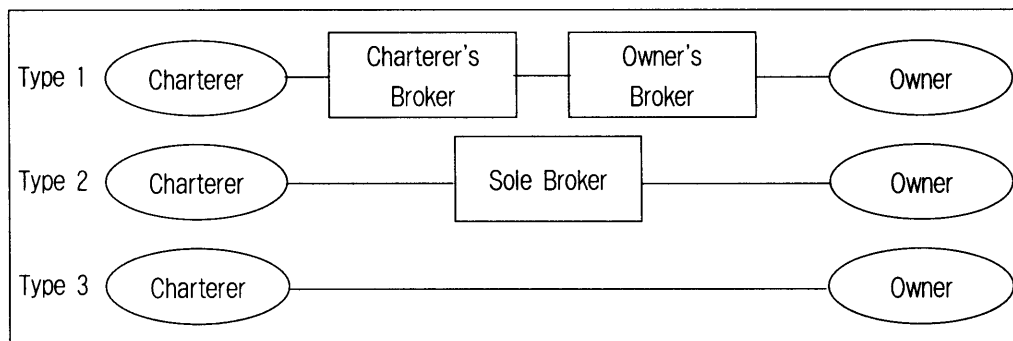


Fig. 1 Transaction Structure in Chartering

1) There is also another type of a broker in the charter market, called a cable broker, who mainly lists orders circulated in shipping centres such as for example London, and then distributes the lists to brokers in other shipping centres, for example Oslo or Tokyo. see Gorton, L. Ihre, R. and Sandevan, A. (1999), *Shipbroking and Chartering Practice*, LLP Limited: London, 39.

and an owner's broker, who acts for the charterer and the owner respectively. For example, a charterer's broker acts for the charterer seeking a suitable vessel in which to carry the cargo or obtaining the use of a ship for a given period of time. An owner's broker acts for the actual ship owner in finding cargo for the vessel or placing an operative ship at the charterer's disposal. The second type of a transaction pattern is that the sole broker is involved between the two contracting parties. Lastly the chartering work may be arranged directly by the charterer and ship owner.

3. Roles of Intermediaries in Chartering

In the chartering market, brokers play a crucial role in creating the contract of chartering between the owner and the charterer. The broker may be acting solely for one principal or perhaps is the sole broker between the two contracting parties.

The basic function of the shipbroker is to bring together the two parties concerned involving the ship and cargo owners. The broker's role in chartering activities is to discover what cargoes or ships are available, what the owners or charterers want to be paid, and what is reasonable given the state of the market.

With this information, the brokers present the business to potential clients, negotiate the main terms of the fixture, and finalize the details of the contract. In so doing, following negotiations, a charter party is ultimately concluded.

Brokers also provide other services including post fixture processing, dealing with disputes, and providing accounting services in respect to freight and demurrage.²⁾ Normally every broker involved in a charter contract will get an amount corresponding to 1.25% of the gross freight. Unless otherwise agreed the broker's commission is paid by the owner on completion and fulfilment of the contract.

As the broker represents his principal in charter negotiations, he has to work for and protect his principal's interests in the following ways³⁾:

- *The broker should keep his principal continuously informed about the market situation and development, available cargo proposals, and shipment possibilities.*
- *The broker should act strictly within given authorities in connection with the charter negotiations.*
- *The broker should in all respects work loyally for his principal and should carry out the negotiations and other work connected with the charter carefully and skilfully.*
- *The broker may not withhold any information from his principal nor give him wrong information. Neither may he reveal his principal's business "secrets" nor act to the advantage*

2) Stopford, M. (1997), *Maritime Economics*, Routledge: London, 83.

3) Gorton et al. (1999), *op. cit.*, 39.

of the counter party in the negotiations in order to reach an agreement.

III. Maritime E-Commerce in Charter Business

1. Evolution of Electronic Chartering Marketplace

The rapid growth of the Internet and the World Wide Web has led to a critical mass of consumers, companies, and government organisations participating in a global electronic marketplace. In 1991, the number of the Internet users was less than 3 million around the world and its application to e-commerce did not exist.⁴⁾ However, in 2000 the number of people who use the Internet was about 4 billion and approximately one quarter of them made purchases online from e-commerce sites.⁵⁾ A number of consulting groups anticipate continued rapid growth of e-commerce over the immediate future (see Table 1).

In recent years the shipping industry has witnessed the evolution of maritime e-commerce and various Websites have launched online services in fields as diverse as maritime portal services, freight auctions, maritime procurement, chartering, ship sale and purchase, container fleet management, ship-to-shore Internet services, and maritime employment etc. As an example, Asiaship.com is a maritime portal marketplace, offering thirty six different services under six broad categories: ship support service, container shipping, bulk shipping, port related service, offshore supply service, and shipbuilding and repair service. The portal will enable ship owners to

Table 1 : Consultant Estimates of World-Wide E-Commerce

Unit: Billions\$

	1999	2003	Average Annual Growth (%)
e-Marketer	98.4	1,244	89
IDC	111.4	1,317	85
ActivMedia	95	1,324	93
Forrester Low*	70	1,800	125
Forrester High*	170	3,200	108
Boston Consulting Group	1,000	4,600	46

Note: *includes Internet-based EDI.

Source: Coppel, J. (2000), "E-Commerce: Impacts and Policy Challenges", 7.

4) There is no widely accepted definition of e-commerce. In general it means doing business over networks. E-commerce includes any form of economic activity conducted via electronic connections. See Wigand, R. T. (1997), "Electronic commerce: definition, theory, and context" *The Information Society*, 13 (1), 1-16.

5) Coppel, J. (2000), "E-Commerce: Impacts and Policy Challenges", *OECD Economics Working Paper*, No. 252, 3.

buy, sell and charter ships and engage a ship surveyor. They will also be able to tender for ship repair and drydocking contracts and new ship construction contracts. Shipmanagers will be able to man their ships with a crewing service, obtain ship supplies and access other services, such as marine insurance.⁶⁾

Another type of online company is Tradiant.com, an electronic marketplace for the procurement of container shipments. Its service is expanding rapidly. In the early 2000, it had 400 buyers (shippers and freight forwarders) registered, and seventy per cent of them began posting and transacting business through Tradiant.com. Thirty vessel owning shipping lines were members of the company.⁷⁾

Oceanconnect.com offers an online maritime procurement service for sales of bunker fuels. A team of fuel and shipping experts in the company provides advice on when and where to buy bunker fuels, post-fixture support, or transaction assistance. It also offers daily bunker pricing, news stories, commentary, weekly market reports, and forward price indications.⁸⁾

Seamenbank.com provides an online service to match seafarers with jobs. Seafarers can make postings describing what training certificates they have, what their most recent posting was and what type of work they are seeking. Shipping companies can then peruse the database when recruiting personnel.⁹⁾

Table 2 : Selected Electronic Chartering Marketplace

Website	Main Service
Balticexchange.com	Online chartering, Freight market information
Charteringsolutions.com	Tanker and dry bulk chartering transactions, Tracking ship positions, Database of current and historical ship, Market information.
e4cargo.com	Freight auction, Chartering
Levelseas.com	Bulk online chartering, Pre and post fixture activities, Risk management, Voyage estimation
Marine-net.com	Virtual chartering, Ship auction, and S&P bulletin board.
Netshipbrokers.com	Cargo and Ship matching, Voyage estimation, Online negotiations, Online fixture reports, Vessel movement follow-up, Freight process management, Bunkering management
Shipbrokering.com	Online exchange for ships and cargoes
Shippingnet.net	Online chartering, Freight bidding, Maritime information, Port information, Maritime employment, Ship sales and purchasing information

6) Compuship (2000), "E-shipping in Singapore" June/July, 13-16.

7) Compuship (2000), "Tradiant is a hub" June/July, 20-21.

8) <http://www.oceanconnect.com/>

9) Compuship (2000), "Seamenbank.com for Online Crewing" June/July, 11.

In the chartering market, a large number of online shipbrokers have developed over the last few years. Ship chartering business is becoming electronically orientated. For example, one online shipbroking company, Netshipbrokers.com, has over 2,000 members, half of which are professional shipbrokers; the remainder are charterers, owners and others. It provides listings for 4,500 new cargoes and 3,000 vessel positions per month.¹⁰⁾ An online chartering marketplace allows charterers, ship owners and brokers to search and match in real time through cargo, vessel, and time charter requirement databases and to conduct a variety of different business transactions (see Table 2).

2. Electronic Shipbroking and Intermediaries in Chartering

E-commerce is widely expected to improve efficiency due to reduced transaction and search costs, increased competition and more streamlined business processes. The Web is a useful tool for sharing information. In fact, there is no easier way to distribute information to a wide audience and control exactly what each user can access. This means that news, market reports, and price information can be made readily available and easy to find.

In addition, the open structure of the Internet and low cost of using it permits the interconnection of new and existing information and communication technologies, and offers charterers, owners and brokers a new and powerful information system and a new form of communication. This makes it possible for charterers and owners to come together in more efficient ways and is creating new marketplaces and opportunities for the reorganisation of chartering business processes.¹¹⁾

Apparently, online chartering marketplaces are transforming the business landscape, connecting charterers and owners into seamless online communities that reduce costs, increase efficiencies, extend market reach and deliver bottom line savings to all market participants. Also they can quickly and fairly tie owners and charterer down to a price much more efficiently than they can by using the conventional model of offline shipbrokers. All of the necessary documentation can be produced and distributed automatically, with no need for the enormous administration costs and time requirements involved in putting together and distributing all of the paper.

These changes raise two important questions: "what is the impact of e-commerce on transaction structure in chartering business?" and "how will these changes affect the role of the shipbroker within the shipping industry?" In order to answer these questions, theoretical background in relation to the impacts of e-commerce on transaction structure and the role of intermediaries is reviewed in the next section.

10) Compuship (2000), "ShipDesk" June/July, 15.

11) Coppel, J. (2000), *op. cit.* 3.

IV. Impacts of E-Commerce on Transaction Structure: A Theoretical Approach

The notion that electronic commerce will lead to disintermediation¹²⁾ seems to be widely accepted in the academic community and well established in the popular debate.¹³⁾ It is frequently argued that online-consumers will interact directly with online-suppliers and, hence, prices will decrease due to the disappearance of margins calculated by intermediaries. E-commerce reduces transaction costs, therefore many intermediaries will become eliminated. The ability of electronic networks to reduce transaction costs is the theoretical cause of this supposed trend.

Transaction cost theory (TCT) is an often-employed framework in this debate, since it focuses on a firm's choice between internalised, vertically integrated structures, and the use of external market agents for carrying out activities that constitute its value system. According to TCT, a firm has two options for organizing its economic activities: an internal hierarchical structure where it integrates the activity into its management structure, or a market-like relationship with external firms.¹⁴⁾ When the market mechanism is at work, the flow of materials and services takes the form of external transactions and is coordinated by market forces.

Malone, Yates, and Benjamin (1987) were among the first to link TCT to electronic markets, illustrating how electronic networks could lower the costs of transactions and influence the formation of both electronic markets and electronic transaction structure.¹⁵⁾ Benjamin and Wigand (1995) argued that whether the transaction takes place directly between manufacturers and consumers, or through a channel intermediaries. The network's ability to support direct exchanges efficiently will increase both producer and consumer welfare. Thus, it is predicted that manufacturers will sell directly to consumers, and consumers will prefer to buy directly from manufacturers.¹⁶⁾ Barling and Stark (1998) described the disintermediation as follows:

"Prediction that the Internet's ability to deliver graphical storefronts, to anyone, anywhere, means that suppliers will be empowered to cut out their distribution channel, and go direct."

12) The term 'disintermediation' can be defined as follows: "Disintermediation is the displacement or elimination of market intermediaries, enabling direct trade with buyers and consumers without agents," (Benjamin & Wigand, 1995).

13) Benjamin & Wigand (1995, p. 68): "When appropriate information technology can reach the consumer directly ... the manufacturer can use the NII [National Information Infrastructure] to leap over all intermediaries." see Benjamin, R. and Wigand, R. (1995), "Electronic Markets and Virtual Value Chains on the Information Superhighway," *Sloan Management Review*, Winter, 62-72.

14) Williamson, O. E. (1975), *Markets and Hierarchies Analysis and Antitrust Implications*, The Free Press: New York.

15) Malone, T., Yates, J., and Benjamin, R. (1989), "The Logic of Electronic Markets" *Harvard Business Review*, May-June, 166-171.

16) Benjamin, R. and Wigand, R. (1995), "Electronic Markets and Virtual Value Chains on the Information Superhighway" *Sloan Management Review*, Winter, 62-72.

In contrast, the Internet provides opportunities for intermediaries to be market match-makers, bringing together buyers and sellers in the industry. The Economist (1999) argues that such 'Infomediaries' provide three new business-to-business market models. Infomediary models are: (1) aggregators, which help buyers in fragmented markets select products by providing up-to-the minute price and product information and a single contact point for service; (2) online auctioneers, which offer a reliable channel for sellers to dispose of perishable or surplus goods or services at the best possible prices, and for buyers to get bargain prices without taking a leap into the unknown; and (3) exchanges, that create liquidity in otherwise fragmented markets, lower average stock levels by matching bid/ask offers and act as neutral third parties, enforcing market rules and settlement terms.¹⁷⁾

Saker et al. (1995), argued that not only is it likely that widely available information infrastructures will reinforce the position of traditional intermediaries, but that networks will also promote the growth of a new generation of intermediaries. These new players, termed "Cybermediaries", are organizations that perform the mediating tasks in the world of electronic commerce. Also, they defined functions of intermediaries that are not easily absorbed by producers and briefly highlight several social and institutional factors that also may mitigate against the elimination of intermediaries.¹⁸⁾

Although they agree that direct producer-consumer linkages will proliferate over the NII (National Information Infrastructure), they disagree that this will cause intermediaries to disappear. Analysis of the nature of consumer needs, particularly in a computer-mediated environment, suggests that there will be a role for both traditional and new types of intermediaries that broker the relationship between producers and consumers. In their research, they modified the assumptions of the transaction costs theory which provide the theoretical basis for differential impact on intermediaries. In results, they suggest four possible outcomes: Internet supplemented direct market, threatened intermediaries, Cybermediaries and Internet supplemented intermediaries.

Scott (2000) extended the "Four Outcome Framework" developed by Sarkar et al. (1995), by integrating it with research on dynamic capabilities which is based on research by Teece, Pisano and Shuen (1997).¹⁹⁾ This new framework explains emerging patterns of response from threatened intermediaries in the personal computer industry. This dynamic capabilities framework explains that threatened intermediaries can transform themselves and move into Internet supplemented direct market, Cybermediaries, or Internet supplemented intermediaries.

17) The Economist (1999), *The heyday of the auction*, July 24, 72.

18) Sarkar, M. B., Bulter, B., and Steifield, C. (1998), "Cybermediaries in Electronic Marketplace: Toward Theory Building" *Journal of Business Research*, 41 (3), 215-221.

19) Teece, D. J., Pisano, G., and Shuen, A. (1997), "Dynamic capabilities and strategic management" *Strategic Management Journal*, 18 (7), 509-533.

V. Implication for Transaction Structure in Chartering Business

There have been few studies on how maritime electronic commerce will change the transaction structure of the maritime industry. Previous studies about maritime e-commerce only examined the importance of e-commerce in the maritime industry or how to promote it for enhancing the competitiveness of the shipping industry. In the meantime, the electronic marketplace in the chartering business created by the Internet represents a new territory of limitless potential. The development of electronic chartering marketplaces implies that there will be significant changes in transaction structure in the chartering market, particularly in the role of shipbrokers.²⁰⁾

According to the theoretical background reviewed in the previous section, arguments for the impacts of electronic commerce on transaction structure are divided into two groups. Prior research agrees that e-commerce can reduce transaction cost and this will eliminate traditional intermediaries in the move to create direct producer-consumer links.

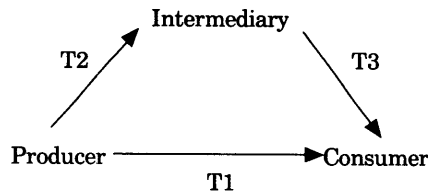
Although a trend towards disintermediation seems obvious to many commentators on e-commerce, it seems clear that disintermediation theory cannot be generalized to all intermediation services. Furthermore, the impacts of the Internet will vary industry by industry according to their transaction structure.

This section attempts to apply the "Four Outcome Framework" developed by Sarkar et al. (1995) to the chartering market for predicting the transaction structure changes as e-commerce emerges in the market. Several studies concerning the impacts of emerging electronic markets discuss the issue of the reduction of transaction costs.²¹⁾ Fig. 2 shows the simplified model of transaction costs.

In a market situation with an intermediary, T_1 is bigger than $T_2 + T_3$. If e-commerce reduces transaction costs to a non-zero minimum, T_1 becomes smaller than $T_2 + T_3$. This will allow producers to cut out intermediaries. However, these implications are based on two theoretical assumptions, namely that the availability of the Internet will reduce transaction costs to a non-zero minimum and transactions are atomic. Sarkar et al.(1995), who modified the assumptions of the transaction cost theory, provide the theoretical basis for differential impact on intermediaries. They assumed that the implementation of a National Information Infrastructure will differentially impact upon the costs of transactions between producers, intermediaries, and consumers, and not reduce transaction cost to zero or the same minimum.

20) Ryoo, D. K. and Moon, S. H. (2001), "The Proliferation of Maritime e-Business and the Challenges of Shipping Companies" *Journal of the Korean Institute of Port Research*, 15 (2), 137-146.

21) Malone et al. (1989), *op. cit.*



Note : T1, T2, and T3 = Transaction costs
 Source : Sarkar et al., 1995

Fig. 2 Transaction costs and the interactions between producer, consumer and intermediary

If transaction costs approach a different minimum, four generic Scenarios are possible based on their "Four Outcome Framework" theory (see Fig. 3).

Scenario 1: Internet-supplemented direct market

The assumption of Scenario 1 is:

- Pre-electronic commerce: *Direct costs < Intermediary costs*
- Post-electronic commerce: *Direct costs < Intermediary costs*

Scenario 1 represents the Internet supplemented direct markets. Within existing direct markets, owners and charterers are empowered by the Internet. In this Scenario, e-commerce has the impact of reinforcing the existing direct market. Thus, owners are dealing directly with charterers.

		Pre-electronic commerce	
		Direct costs < Intermediary costs	Direct costs > Intermediary costs
Post-electronic commerce	<i>Direct costs < Intermediary costs</i>	Scenario 1 <i>Internet-supplemented direct market between owners and charterers</i>	Scenario 2 <i>Elimination of Shipbrokers Threatened Shipbrokers</i>
	<i>Direct costs > Intermediary costs</i>	Scenario 3 <i>Extra-intermediation Online Shipbrokers (Cybermediaries)</i>	Scenario 4 <i>Re-intermediation Internet-supplemented Shipbrokers</i>

Source: Adapted from Sarkar, et al., 1995.

Fig. 3 Four Possible Impacts of the E-commerce with Differential Impacts on the Costs of Transaction

However, in the chartering market it can be seen that there are many obstacles for charterers and owners to conduct their chartering businesses directly. In particular, bulk shipping is extremely complex and to get or keep extensive maritime database of vessel and cargo information requires a staff and management structure. This is only possible for very large companies. The reason why chartering business needs intermediaries will be further discussed in Scenario 4.

Scenario 2: Threatened shipbrokers

The assumption of Scenario 2 is:

Pre-electronic commerce: *Direct costs > Intermediary costs*

Post-electronic commerce: *Direct costs < Intermediary costs*

When Direct costs (post-internet) decreased more than Intermediary costs (post- internet) as the result of e-commerce, traditional intermediaries will be eliminated and internet supplemented direct market will substitute existing transaction structure. According to this Scenario, hypothetically, intermediaries will be eliminated. However, Sevaldsen (2000), president of SeaLogistics.com, argues as follows:²²⁾

"Like all online shipbroking sites, SeaLogistics is very keen to stress that it is a tool to help shipbrokers. We are not out to eliminate shipbrokers, we want to see how they can fit in with this system. People thought when online stocktrading was coming that was the end of the stockbroker. We are now looking at the reintermediation of the stockbroker. They are looking at roles for value add."

If this is true, applying the "Dynamic Capabilities Framework", threatened intermediaries in the chartering market can transform themselves to (1) compete in the Internet Supplemented Direct Market; (2) become Cybermediaries; or (3) become Internet Supplemented Intermediaries (see Fig. 4). Each quadrant in Fig. 4 shows which assets and capabilities are critical for transforming themselves and moving into one of the other quadrants.

22) Compuship (2000), "Safe waters for SeaLogistics" August/September, 39.

		Pre-Internet	
		<i>Direct costs < Intermediary costs</i>	<i>Direct costs > Intermediary costs</i>
Post-Internet	Direct costs < Intermediary costs	<p>I</p> <p>Internet-supplemented direct market between owners and charterers</p> <p>(Shipbrokers with holistic capabilities)</p>	<p>II</p> <p>Elimination of Shipbrokers Threatened Shipbrokers</p>
	Direct costs > Intermediary costs	<p>III</p> <p>Extra-intermediation Online Shipbrokers</p> <p>(Perceptual Innovative capabilities)</p>	<p>IV</p> <p>Re-intermediation Internet-enabled Shipbrokers</p> <p>(Collaborative supply chain capabilities)</p>

Source: Adapted from Teece et al., 1997.

Fig. 4 : Dynamic Capabilities of Internet Intermediaries Integrated Framework

Scenario 3: Cybermediaries (Electronic Shipbrokers)

The assumption of Scenario 3 is:

Pre-electronic commerce: *Direct costs < Intermediary costs*

Post-electronic commerce: *Direct costs > Intermediary costs*

As intermediary costs decrease more than direct costs with the emergence of e-commerce, the existing direct markets will need extra-intermediation. The Web enables the rise of Cybermediaries, who perform new roles in the virtual value chain, described as extra-intermediation.

In reality, Cybermediaries do exist in chartering markets. At present most online brokers provide limited chartering services because there are functions of offline shipbrokers that are not easily absorbed by Cybermediaries such as post fixture processing, dealing with disputes, and providing accounting services in respect of freight and demurrage.

Online shipbrokers can work very closely with offline shipbrokers, providing them with tools to reach and do business with charterers and owners. They enable offline brokers to conduct their shipbroking services more efficiently and impactively. This will lead to further reduction of intermediary costs. In this case, they support offline shipbrokers, not disintermediate them.

Scenario 4: Internet-supplemented shipbrokers

The assumption of Scenario 4 is:

Pre-electronic commerce: *Direct costs* > *Intermediary costs*

Post-electronic commerce: *Direct costs* > *Intermediary costs*

In this Scenario, e-commerce has the impact of reinforcing an existing channel structure by reducing intermediary costs more than direct costs. This is the most realistic outcome considering characteristics of chartering business.

Although electronic shipbrokers do threaten to replace part of the work of offline shipbrokers, offline shipbrokers can be empowered by the Internet and will continue to play an important role in chartering market for the following reasons. Firstly, many of the services they provide cannot be automated. In particular, sound advice and good personal service must continue to be an important part of the shipbroking service. Secondly, the importance of social interaction associated with offline shipbrokers may inhibit owners or charterers from abandoning traditional offline intermediaries who can better serve these needs. Thirdly, e-commerce could be a massive benefit to offline shipbrokers, allowing them to share information and communicate much more efficiently than they can by fax and phone. Finally, fixing a ship is a complex matter and the human skills of the broker are essential. Electronic commerce cannot replace the skills of human shipbrokers, who know exactly what a vessel is worth and how the market is expected to change.²³⁾

VI. Conclusion

This paper has applied "Four Outcome Framework" based on transaction cost theory for predicting the impacts of e-commerce on chartering transaction structure. Four generic Scenarios are possible based on the framework as follows:

- Scenario 1: e-commerce has the impact of reinforcing the existing direct market.
- Scenario 2: *Direct costs* (post-internet) decreased more than *Intermediary costs* (post-internet) as the result of e-commerce. In this case, traditional intermediaries will be eliminated and internet supplemented direct market will substitute existing transaction structure.
- Scenario 3: intermediary costs decrease more than direct costs with the emergence of e-commerce. In this Scenario, the existing direct markets will need extra- intermediation.
- Scenario 4: e-commerce has the impact of reinforcing an existing channel structure by reducing intermediary costs more than direct costs.

23) Compuship (2000), "Defining the future of shipping," March, <http://www.compuship.net/>

As analysed in previous section, Scenario 4 is the most realistic outcome considering characteristics of chartering business. In practice the electronic shipbroking does replace part of the work of offline shipbrokers. However, offline shipbrokers will play an important role in chartering even after the advent of e-commerce. From the research, the following reasons can be drawn. First of all in the chartering market, there are many services which cannot be provided by online shipbrokers. In particular, sound advice and good personal service can be only offered by offline shipbrokers. In addition, social interaction associated with offline shipbrokers and the human skills of the broker cannot be absorbed by online shipbrokers.

In the meantime, e-commerce can reduce direct costs as well as intermediary costs, which can empower the existing intermediaries. In the chartering market, Cybermediaries will work very closely with offline shipbrokers. In case of traditional shipbrokers, they can conduct their shipbroking services more efficiently and effectively by using online chartering marketplace. Therefore, even after the advent of maritime e-commerce, they will continue to play an important role in the chartering market.

This research is descriptive and qualitative by nature, but provides a general framework for analysing the influence of e-commerce on transaction structure. More empirical research is clearly needed to validate the research findings.

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