CHALLENGES
OF GLOBAL ECONOMY

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PROBLEMS OF THE GLOBAL ECONOMY

Janusz Dąbrowski
Hanna Klimek

PURCHASING RESEARCH OF ENTERPRISES

Abstract

In business practice purchasing research is carried out to a different extent. In a systematic way it is lead by large multinational corporations using global sourcing strategies. In medium and small enterprises research is conducted as occasional projects or it is the specialist's responsibility – the specialist responsible for the purchase of the specific product.

Not much information on purchasing research can be found in business literature. Publications on this subject are very limited. This can be explained by a great similarity of purchasing activity to marketing and the possibility of using marketing procedures and methods in purchasing.

The theory of marketing research, though, should not be applied to purchases in a direct way. Marketing and purchasing support actions of the opposing parties in the transaction. Product marketing strategy is dependent on the primary demand and external customers, in purchasing the strategy depends on production planning (secondary demand) and the requirements of internal customers. Purchasing research must therefore focus on the internal environment of the company to a greater extent than marketing. Pricing strategies in purchasing are mostly price and cost analysis and the application of the concept of total cost of ownership, rather than the pricing strategies. Channels of distribution (supply) or the promotion in purchasing do not play as important role as in marketing. The key strategies in purchasing are: sourcing strategy, strategy of integration and strategy of suppliers development, which are virtually not present in marketing.

To summarise, it must be stated that the growing importance of the purchasing function and the increasing complexity and variability of today's business environment justify the development of the theory of purchasing research.

Introduction

In recent years there has been an increased demand for systematic purchasing research in companies. Many corporations make worldwide purchases; they create commodity teams, sourcing teams, international purchasing offices and other organisational forms of coordination of global sourcing. These structures are formed to develop and purchase particularly important supplying products. However, maximum benefits from the purchasing activity can be obtained through regular supply market research and research on internal clients' needs.

Modern market is characterised by high dynamism. Bankruptcies, acquisition, the increase in production capacity, constant development of technology, variable macroeconomic conditions (exchange rates, inflation), political, legal and environmental constraints must be examined and analysed in order to formulate adequate purchasing strategy. It appears however, that the purchasing research is less frequently used in the modern economy than marketing research. The latter is commonly accepted in medium-sized and large companies, whereas purchase research relates rather to large corporations.

Purchasing and marketing in companies are characterised by many common features (Weele, 2010):

- the primary focus of both activities is on the exchange of values between two or more parties, resulting in the buy/sell transaction;
- both activities are externally oriented, i.e. aimed at outside parties;
- neither activity can be executed adequately without a thorough knowledge of markets, competition, prices, costs, technology and products;
- as a result of the amounts of money involved, both activities have a great impact on the company's bottom and top line.

The impact of marketing on gaining a competitive advantage by enterprises was observed much earlier than that of purchasing, hence many theoretical and practical case studies and wide range of instruments supporting the management of marketing activities can be found. Purchasing has been experiencing rapid growth only in the last two decades. The process of globalisation and modern management concepts have contributed to the change of the purchase activity: from the operational activity to the strategic one. Active purchasing management entails various methods and techniques, including purchasing research.

Definitions, kinds of research, processes, purchasing research methods presented in the article, show a certain analogy to marketing research due to the similarity between purchasing and marketing. However, there are significant differences between purchase research and marketing research deriving from a different purpose and object of research. This article is to systematise and expand the knowledge of purchase research conducted in enterprises.

1. Definition of purchasing research

In professional literature purchasing research is defined in various ways. The broadest and the simpliest definition says that „ Supply research is the systematic collection, classification, and analysis of data as the basis for better supply decisions" (Leenders, Johnson, Flynn, Fearon, 2006). Purchasing research understood in this way should focus on the external aspects – the micro-and macro-environment of the company and the internal aspects, the internal environment of the company. External research includes a supply market analysis, the analysis of its individual components (sellers, buyers, products, prices) and their correlation. Internal studies relate to the size and structure of the purchasing spend, the company's supply products portfolio, the purchasing process, purchasing staff productivity.

Some authors make a distinction between purchasing research and supply market research (Weele, 2010). Purchasing research refers to subjects concerning the internal organization (such as analysing the purchasing spend, transaction costs, individual buyer productivity, and internal efficiency). Supply market research includes analyses of macro-economic development in supplier countries, analyses of supply and demand of important raw materials and components, and financial assessment of individual suppliers.

A different approach can be noticed in marketing. Some authors treat marketing research as a broader concept, incorporating market research in its range. Other authors believe that market research and marketing research have different objectives and areas, although there is a correlation between them. From the perspective of the company, market research is used to recognise the market situation, while marketing research is to support active influence of the enterprise on the system of market relations. Market research is primary and objective while marketing research secondary and subjective (Klimek, 2009)[1]. However, regardless of the interpretation of these terms, the research is only connected with the market environment, hence has external character.

Contrary to marketing research, purchasing research focuses largely on the internal environment of the company. Purchasing departments provide services for internal customers, trying to fulfill the needs of the company in the most efficient and effective way. Thus, the size and structure of purchasing spend, supply needs, specification of the supply products, the efficiency of supply processes, stock levels, satisfaction of internal customers and a number of other aspects must be important factors in purchasing research.

[1] Relations between the concepts of market research and marketing research are discussed in detail in H. Klimek, *Badania rynkowe i badania marketingowe a badania rynku*, Studia i Materiały Instytutu Transportu i Handlu Morskiego, edited by O. Dębicka, H. Klimek, T Gutowski, Zeszyty Naukowe Uniwersytetu Gdańskiego, nr 6, Gdańsk 2009, pp. 97–116.

In relation to the external purchasing research the definition from marketing remains accurate. It is obvious that before starting active purchasing (marketing) activities, basic, objective supply (sales) market research is required. Therefore, in the further part of this article supply market research will be treated as part of the external purchasing research.

Figure 1 shows the place of purchasing research in the process of purchasing management.

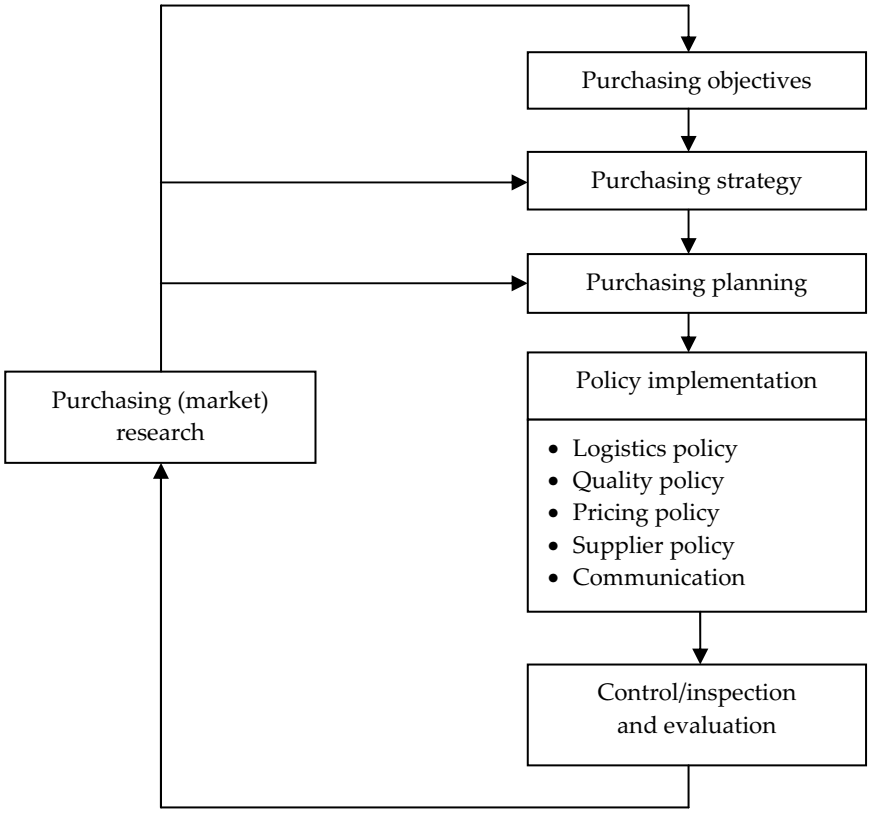

Figure 1. The purchasing management process

Source**:** Weele, 2010, p. 63.

The purchasing management process is a closed loop, in which each element plays an important role. The quality of the preceding stage influences the next stage as well as the whole process. Among the elements of purchasing management process purchasing research plays an important role. It supports purchasing decisions, both strategic and operational ones. In strategic planning, purchasing research affects simultaneously the external environment and the internal environment of purchasing (that is the internal environment of the company). The aims and strategies of purchasing function, outsourcing strategies

of individual purchasing products can be formulated on the basis of this research[2]. In operational planning (policy, procedures, programmes and purchasing projects) internal and/or external purchasing research is used, depending on the need.

Few types of purchasing research can be distinguished thanks to the achievements in the field of marketing research and classification and remembering the specifics of purchasing – see Table 1.

Table 1. Types of purchasing research

Criteria	Types of research	Examples
Type of the environment	Internal research (on the internal environment of the company)	Research on the size and structure of purchase expenses, the efficiency of purchasing processes, internal customer satisfaction
	External research (on the environment of the company)	Research on the market of a specific supply product, suppliers, the development of technology, selected sectors of the economy
The level of scrutiny	Microeconomics research (on specific suppliers and products)	Financial and quality audits of suppliers, supplier cost analysis, analysis of the capability of supply market of the specific product
	Mezoeconomics research (on the whole sector of the economy)	Research on the profitability of the sector, technological development, the degree of utilization of production capacity, supply and demand analysis
	Macroeconomics research (on the general economic environment)	Research on the unemployment and pay level, inflation, exchange rates, the level of orders and economic trend
Information needs	Regular research (conducted seasonally, occasionally)	Monitoring of market prices of selected strategic supply products, market research prior to developing a sourcing plan
	Occasional research (conducted intermittently, as a project)	Developing a cost model of a product, audits of suppliers, research on countries' economies in the global sourcing
Time horizons of the research	Historical research (concerning past events)	Research on historical prices of supply products, the development of the

[2] More about the strategic planning purchases in J. Dąbrowski, *Plan sourcingowy jako narzędzie strategicznego zarządzania zakupami w przedsiębiorstwie*, [in:] *Modelowanie procesów i systemów logistycznych*, edited by M. Chaberek, C. Mańkowski, Zeszyty Naukowe Uniwersytetu Gdańskiego „Ekonomika Transportu Lądowego", nr 39, Wyd. UG, Gdańsk 2010, pp. 201–216.

Criteria	Types of research	Examples
		purchasing function in the company, purchasing expenditure structure
	Current research (concerning current events)	Research on alternative suppliers due to current problems with supplies, research on the structure of offered prices, the profitability threshold, audits of suppliers
	Prospective research (concerning events prediction)	Forecasting supply, demand, prices for supply goods, macroeconomics indices
The purpose of the research	Exploratory research (identifying hidden problems and, finding unknown phenomenon, finding possible explanations)	Research on alternative demand products, alternative supply sources, new technology, supply products value (value analysis)
	Explanatory research (to verify hypothesis and it is also applied while choosing the right solution to the problem)	Cost research (cost analysis, total cost of ownership model, target costing), price research (price analysis, „should cost" analysis)
Character of acquired information	Quantitative research (based on figures)	Research on changes in supply and demand for supply goods, macroeconomic indicators research
	Quality research (based on opinion about trends and novelties)	Forecasting technology development, supply markets based on experts opinion, benchmarking of purchasing processes
Types of sources of information used	Desk research (based on secondary sources, data from earlier research)	Research conducted on the basis of statistical data, specialised publications, corporate purchasing database, the Internet.
	Field research (based on primary sources, new data is acquired specially for the research)	Research conducted on the basis of data acquired directly from the suppliers, during audits, visits, exhibitions and fairs, through observations, interviews, surveys.

Source: Authors compile.

One of the key purchasing research criteria for the classification is the subject of research.

2. The subject of purchasing research

Purchasing is the management of the company's external resources in such a way that the supply of all goods, services, capabilities and knowledge which are necessary for running, maintaining and managing the company's primary and support activities is secured at the most favourable conditions (Weel, 2010). Therefore a lot of various information is needed to make purchasing decisions. The number of examined problems (i.e. specific objects of research) is virtually unlimited. In order to systematise these problems subjects of purchasing research have been divided into three main areas:

- supply products,
- suppliers,
- purchasing processes[3].

Supply products research may relate to one of two aspects: the process of increasing the value or the process of sourcing. In order to increase the value of supply products research projects concentrate on:

- specification of the products to adjust them to the needs of their internal customers, eliminating unnecessary requirements, the possibility of replacing them with standard products, such as manufactured on the basis of the suppliers specifications;
- product standardization in order to determine clearly their size, shape, quality and other features and to reduce diversity;
- simplification of the range of supply products to get a better purchase offer and to reduce labour-consumption of their supply;
- product substitution, the possibility and deliberate change of the existing supply product into the other of a higher value (of a more profitable connection between functionality and price);
- product package substitution to reduce the cost of transport, storage and fulfill internal customers' expectations;
- recycling/disposal of products, such as the development of effective methods of disposal, sale of unnecessary products.

The second aspect of supply products research is connected with the sourcing process. It requires gathering information about a particular product supply market and precedes the decision: "make or buy", insourcing, outsourcing, "make or lease" and sourcing. The research covers the following areas:

- the supply market of the particular product to the extent essential to make a "make or buy" decision (in the case of a new product), insourcing (previously purchased product), outsourcing (previously made product);

[3] The classification of objects of research are based on: M. R. Leenders, P. F. Johnson, A. E. Flynn, H. E. Fearon, *op. cit.*, pp. 347–354; A. J. van Weele, *op.cit.*, p. 132.

- the market of leasing services to the extent essential to make „make or lease" decision;
- present and future company's status as a buyer (description of the product, present and future needs, suppliers, prices, conditions, current contracts);
- the manufacturing process of the product (the materials used and their prices, current and anticipated level of salaries, the level of other costs, time of production);
- the use of the particular product (basic, supplementary, the possibility of substitution);
- the demand for the particular product (present and future company needs, current and anticipated demand generated by individual companies, sector);
- the supply of the product (location, financial condition, quality, production capacity, distribution channels, strengths and weaknesses of each supplier, aggregated present and anticipated future supply, inventory levels);
- the price of the product (the market structure, historical and anticipated prices, diversification of prices in the market, factors determining the price, costs of transport, import regulations, estimating the profit margin of each supplier, price targets and suppliers potential minimum prices);
- macroenvironment (legal regulations, political situation, changes in technology, environmental and social aspects);
- supply market to the extent essential to develop commodity strategy.

Supply products are the key subject of research. The research, however, would be incomplete if it excluded the sources of supply of these products, or suppliers. Improper selection of suppliers can lead to serious problems of the purchasing company, it may also jeopardize the chances of its dynamic development. Best-in-class suppliers are a source of innovation and added value for the whole chain of supplies.

The aim of the **research on suppliers** is to evaluate the potential and existing suppliers as well as their behaviour in the market. The research covers the following areas:

- searching for new sources of supply,
- supplier's financial condition,
- supplier's production capacity,
- supplier's quality system,
- supplier's structure of costs,
- relationship between the buyer and the supplier,
- opportunities for cooperation with the supplier,
- supplier's perception of the buying firm,
- supplier's sales strategy.

The effectiveness and efficiency of the purchasing activity depends not only on complete, reliable and up-to-date information on supplying products and suppliers, but also on how the purchasing process is realized.

Purchasing process research plays an important role in reducing company's costs and shortening the delivery time. Improving purchasing procedures requires the analysis of: actions and activities that make up the purchasing process, involved resources, outcome, internal customers' satisfaction. Properly designed purchasing process must be adapted to the type of purchase, the type of supply product, the supplier's category, specification of organisational units of the company carrying out the process. Among the specific subjects of research lay:

- size and structure of the company's supply expenses;
- the share of specific departments, including the purchasing department, in the total expenditure;
- analysis of the portfolio of supply products;
- size and structure of the supply base;
- the structure of the purchasing process;
- information systems;
- efficiency and workload of purchasing professionals;
- qualifications of purchasing specialists;
- identification of good practices;
- internal customers' satisfaction.

It is difficult to mention all the subjects of purchasing research, as they are dependent on the specific needs of the company. Most research is focused on products with a high share in the costs of the enterprise, with a low value (defined as the inadequacy of the price to functionality of the product), the limited availability (a small number of suppliers), demonstrating a large fluctuation in prices or problems with quality.

Some types of supply products, such as strategic products, require more intensive research in all three areas mentioned before, because of their value and the need to create business relations with suppliers. Routine products of low-value and of a wide range, require a greater focus on aspects of the transaction (the study of the purchasing process). Leverage products of high value and low supply risk, require mainly supply market research. The main subject of research for bottleneck products are the suppliers and possibility of substitution.

3. The organisation and process of purchasing research

A firm could conduct supply research in one of three ways:

- full-time research positions;
- inclusion of research as part-time responsibility of supply personnel;

– cross-functional teams to bring an expanded knowledge base to the research process (Leenders, Johnson, Flynn and Fearon, 2006).

Conducting purchasing research usually takes a lot of time and requires specialized skills that differ from those of typical skills acquired by purchaser. Carrying out economic studies on the specific sector of the economy or country, value analysis or purchasing process analysis requires knowledge of procedures, methods, techniques and research tools and knowledge in the field of economics, management, finance, production technology and other fields. In large companies, especially those that lead global sourcing, creating separate positions and even sections within the purchasing department is fully justified. These job titles do not necessarily have to be purchasing researcher or supply research manager. Most commonly such positions are: purchase analyst, cost management specialist, value analyst or commodity specialist. With such organisation of purchasing research there should be good communication between purchasing specialists and employees working in research. While some prepare the necessary information, the latter, on the basis of this information, make decisions. Lack of cooperation can lead to unnecessary costs and solutions, which might not be optimal.

This kind of situation can be avoided when the sourcing manager conducts necessary research simultaneously. It is a quite commonly used method of connecting sourcing and purchasing research. Commodity teams or sourcing team very often conduct product research (its value, the value of the supply market), suppliers research, and even the purchasing process research which they are responsible for. It serves as the basis to prepare sourcing plans and purchase. However, this solution has one disadvantage, particularly the research is carried out only by purchase professionals, not so skilled in research techniques.

Another possibile solution is to set up a research team, consisting of experts in various fields to carry out specific research. An example of such a team can be value analysis team. Team approach has several advantages and therefore is more commonly used in purchasing research.

Each research has its own specific structure adjusted to the object and purpose of the research and opportunities the company has. Therefore, it is difficult to develop one specific module. By using the analogy to marketing research, the main stages of the purchasing research process can be distinguished (see Figure 2).

The first stage of each research is to determine the problem and objectives. Basic and detailed questions should be formulated; questions that the planned research is to answer. Also it should be stated when the results will be available.

Designing purchasing research should begin with the evaluation of its profitability, and in particular determining how much it will cost, and whether the expected benefits outweigh costs. Real possibilities of conducting the research should also be estimated independently (i.e, availability of specific data in the

enterprise, the possibility of obtaining these data from the statistics and other publications or independently conducted field research), or the services of specialized research agencies should be used. Researchers usually start searching from a review of secondary sources, to find out if the problem can not be partially or completely resolved without the costly process of primary data collection (Kotler, 2005). If primary data is needed, then the use of certain methods and research tools should be applied. Like in marketing research they include: observation, interviewing, surveys. Source data is provided by responses to inquiries, visiting and auditing suppliers, visiting exhibitions and fairs, meetings with internal clients.

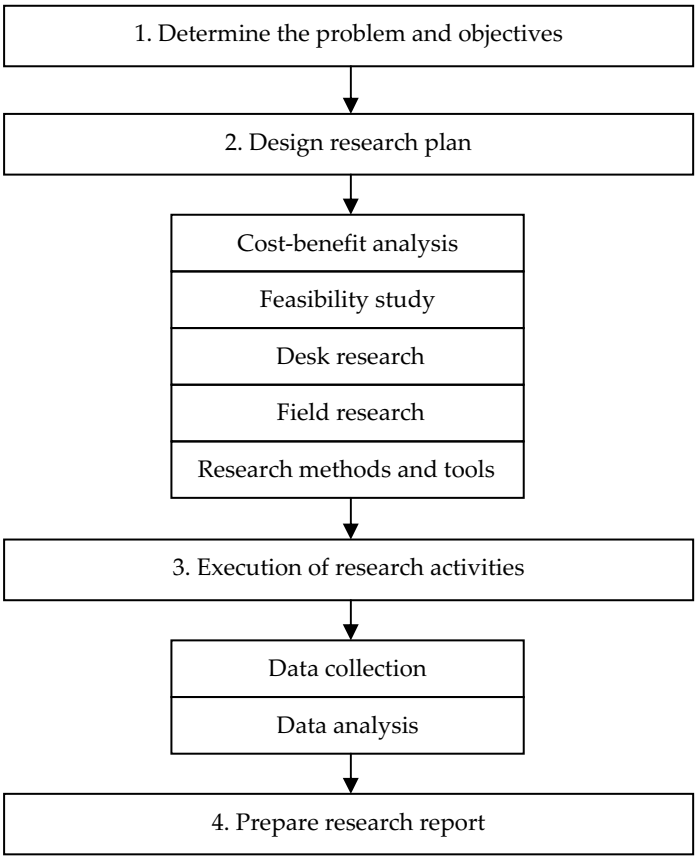

Figure 2. Stages of purchasing research

Source: Authors compile.

The realisation of the research should be consistent with a previously prepared plan. Data collection is the most time-consuming part of this stage. Data analysis requires the use of various analytical and forecasting methods. Data analysis should result in conclusions after the research.

The final stage of the research is the preparation and evaluation of the report. The researcher should present key findings in a logical and structured manner; should answer all previously stated questions. Before making final decisions the report should be evaluated in terms of the value of obtained information. Evaluation of the report can also be used for further improvements of the research process.

4. Methods and techniques of purchasing research

Purchasing research of enterprises differ significantly from consumer marketing research. Sampling methods, communication with the object of the study and the following statistical treatment of the data are not generally used in purchasing research. Marketing research on the enterprises market concentates mainly on the demand side rather than the supply side. This justifies less common use of survey methods in purchasing research. In purchasing studies mainly two groups of methods are used:

- methods of data collection,
- methods of data analysis.

Methods of data collection concern both the secondary and primary sources of information. The study is based mainly on the purchase of secondary sources because of the lower cost, immediate availability and are largely sufficient to solve the problem of the research completely. They can include all kinds of statistical studies, government reports, companies' reports, publications in professional journals, databases of suppliers available on the Internet (e.g. Yellow Pages, ABC, Kompass, Rev. Liefert you, Industrynet) and their financial condition (Dun & Bradstreet website), suppliers websites. Also, internal sources of global corporations are useful for research. Purchasing databases in the intranet contain data about products, suppliers, contracts of various branches.

Primary data can be collected through observation, interviewing and surveys. In the purchasing research these methods are directly related to the request for information sent to potential suppliers to complete the missing data, visiting and auditing suppliers, survey, visiting industry exhibitions and trades, internal customer satisfaction survey. While visiting and auditing suppliers observations, and numerous (standardized and non-standardized) interviewing on aspects of the production, quality, finance and personnel are conducted. Internal customer satisfaction survey is carried out in a form of a questionnaire.

For processing the collected data depending on the subject of the study, various methods of strategic, economic and financial analysis as well as specific purchasing methods are used. Purchasing methods include: value analysis, the total cost of ownership, analysis of the portfolio of supply products, analysis of suppliers preferences, analysis of the company's strength in relation to suppliers, portfolio analysis of supplier's involvement in the development, reverse pricing

analysis, and more. The list of sample methods of data analysis in purchasing research is shown in Table 2.

Table 2. Methods and techniques of data analysis in purchasing research

Types of purchasing research		Sample methods of data analysis
External research	Macroeconomic research	SWOT analysis, PEST analysis, scanning the environment
	Mezoeconomic research	SWOT analysis, scanning the environment, Porter's five forces model, price analysis
	Microeconomic research	SWOT analysis, product life cycle analysis, analysis of suppliers preferences, analysis of the company's strength in relation to suppliers, portfolio analysis of supplier's involvement in the development, cost analysis, reverse pricing analysis, break-even analysis, total cost of ownership, financial analysis of suppliers
Internal research	Microeconomic research	SWOT analysis, DuPonta analysis, ABC analysis of suppliers, ABC analysis of supply products, portfolio analysis of supply products, analysis of supply products, a group of products-suppliers analysis, analysis of the purchasing process, value analysis, total costs of ownership, target prices/costs, internal customer satisfaction survey

Source: Authors compile.

Forecasting methods are also used for data processing and identifying future trends.

In purchasing research different methods of results presentation and methods supporting the process of designing and execution of research are used.

Conclusions

In business practice purchasing research is carried out to a different extent. In a systematic way it is lead by large multinational corporations using global sourcing strategies. In medium and small enterprises research is conducted as occasional projects or it is the specialist's responsibility – the specialist responsible for the purchase of the specific product.

Not much information on purchasing research can be found in business literature. Publications on this subject are very limited. This can be explained by a great similarity of purchasing activity to marketing and the possibility of using marketing procedures and methods in purchasing.

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Tomasz Gutowski

TRANSNATIONAL COMPANIES. THEIR IMPACT ON FOREIGN DIRECT INVESTMENT AND THEIR INFLUENCE ON POLISH ECONOMY

Abstract

A worldwide expansion of foreign direct investment, which is one of the results of globalization, has an increasing impact on the economies of some countries. Heading towards the further development, global concerns set challenge for the economies. That is why to carry out tasks that will result in foreign direct investment is one of crucial importance to the country. Such tasks include law regulations, providing the right conditions to investors within infrastructure or creating tax regulations suitable for both parties. Considering the impact that foreign direct investment has on the local environment, one should estimate co-decision making regarding the development of a country as the most important benefit. This, in turn, will provide better conditions for that country to prepare for the rapidly changing economy conditions. Polish economy, just like all the others, and particularly the economies that function in this part of Europe, is vitally interested in the advantages of FDI. The actions taken so far have had measurable effects regarding both finance and assets. Nevertheless, it is necessary to search for the new ways of finding foreign direct investment in future.

1. Foreign direct investment in the modern economy

The modern market, which constantly influences the economy, differs a lot from the market where economic transactions used to be made not so long ago. A bigger number of clients, the changes of their preferences, the variety of business entities and their growing contribution to the world's market – these are just some of the features which make that difference. What is more, the observed process of globalization makes the modern economy develop faster and faster

itself. Nevertheless, since development is not steady, some limitations have occurred on many markets recently.

The unpredictable events connected with the financial crisis, which has been spreading at least since 2008, evoke various reactions among the governments, the financial institutions and the companies. It is due to the uncertain economy today that we perceive the world in a different way than we did in the beginning of this decade. However, it is foreign direct investment (FDI) that still makes the economy develop regardless of the conditions. The Organization for Economic Co-operation and Development, and the International Monetary Fund have defined the foreign direct investment as follows: It is foreign direct investment, if a resident of one country, called a direct investor, gains long-term profit from the money invested in the entity situated in a country other than his origins. One should focus on the profit described as "long-term" which indicates a long term relation between the investment's entity and the investor, who has influence on its management. What the definition mentions as well is the minimal share of 10% of equities or votes (OECD, 2006) which an investor should have in order to have such power. This amount is considered to be enough regarding the big spread of shares among individual investors. According to the book of Z. Madej, the directness of foreign investment is about putting one's money only into companies themselves, instead of into any other entities, like for example local self-governments or certain institutions which support companies and their development. Direct investment is, therefore, about owning shares which allow the investor to participate in the management, the ownership and in the financial results of a company (Madej, 2002). What supports this statement is the definition of FDI by W. Karaszewski. He claims that Foreign Direct Investment is made by an investor in a country other than his own, in order to establish business in that specific country or in order to gain property right to participate directly in the management of a company which already exists" (Karaszewski, 2001).

Becoming an investor applies not only to a natural person, but also to other bodies such as an incorporated or unincorporated enterprise which is either private or belongs to the government, a group of such enterprises, or a group of individuals (Hirshleifer, 1985). The foreign direct investment is, therefore, a long term deposit providing an investor with a profit which is bigger than any other method of investment can give.

There are many forms of FDI in economy. Fusion, takeover, and so called greenfield investment are the most important ones. A fusion is when companies from different countries become one, which very often results in creating a completely new enterprise, as the joined companies usually lose their individuality. It is a voluntary action of business partners who are usually of similar size. However, there are some examples of inequality between the companies taking part in fusion. A stronger individual's aim of fusion in such case may be the access to the market where a weaker individual has been active so far. What the

owners of the joined companies get in return for their former values are the shares of a newly formed enterprise (Frąckowiak, 2009).

A company's takeover by a foreign investor is another form of FDI. In this case an investor buys enough shares or assets of a company to be able to take control over its management, or he becomes the part of its equity capital. It may also happen that one of the owners withdraws from the company by redemption of shares. In such case the rest of the owners take control over the company, and they may as well take up a new venture based on the assets allocated by both of them, where one of them becomes a shareholder or a principal shareholder (Frąckowiak, 2009).

One of the less known, but probably most demanded types of FDI are the investments called greenfield. These are projects carried out by an investor from the very beginning which usually requires building the production mill, setting up a sales branch, a consulting office or a law office. According to OECD, some transactions between a direct investor and the company of foreign investment are also the part of FDI. Such transactions include buying more shares of the company, reinvestment of income in this company, as well as credits and loans(Oziewicz, 2006).

The influence of FDI on companies can be looked upon from two different perspectives. One of them is the impact that foreign investment has on the companies where it has been made. On the other hand, it is significant how strongly FDI can influence other business entities, which are on that specific market.

Regarding the first of the circumstances mentioned above, it is worth to consider the goal of an investor. Becoming the owner, or one of the owners, he invests his money in a business in order to extend it. An investing company benefits considerably not only from buying a company or joining it with companies active on foreign markets, but also from making greenfield investment. Not only does an investor gain access to new sources of raw materials, but the possibility to find new employees as well, and, most importantly, he gains access to a new market.

Foreign direct investment enables investor to avoid paying too much for transport of their own goods abroad, which in turn makes it possible to avoid customs duty or some other trade obstacles. It is not an insignificant fact that there will be no differences in exchange rates in such case of activity. The development of a company through FDI results in some significant changes in its structure, which in turn contributes to the changes within the company's management methods by choosing the one which will be the most profitable regarding the extended economic activity. Another advantage of FDI is so called a scale effect which enables companies to generate less costs than the competitors on the same market.

As it has been mentioned before the impact of foreign direct investment is also visible on the market where the investment is made. A new competitor

always makes the competition grow. This growth is significant due to the strength of investors who had already been predominant on their domestic markets before they started their FDI activity. Furthermore, when entering the market, a new competitor is a well developed enterprise able to use new technological solutions, which may be unknown to other entities, and, owing to this fact, it will be able to generate low production costs in the country where the investment is made. The investing company may have a competitive advantage over the local competitors often by decreasing their former meaning on the market. What the local companies may do in order to develop is to use their access to cheaper intermediate products of good quality, which then can be used for the further processing and distribution. The inflow of FDI, which is clearly noticeable in a local company being overtaken by a competitor "from outside", may result in joining that particular company with a much stronger international capital group which will result not only in using new, more effective methods of organization and management, but also in getting access to advanced technology and the know-how. Consequently, the overtaken local company will improve its competitive position on the market, and in some cases may even avoid a breakdown or a shutdown.

Table 1. The flow of FDI in the world in the years 2005-2010 (in billions of USD)

The flow of FDI						
	2005	**2006**	**2007**	**2008**	**2009**	**2010**
World	982,59	1 461,86	1 970,94	1 744,10	1 185,03	1 243,67

Source: http://www.unctad-docs.org/files/UNCTAD-WIR2011-Full-en.pdf (28.04.2012).

A brief survey of how strong impact foreign direct investment has on business entities would be enough to state that the results of such actions can be both positive and negative. This theory, however, is not very surprising regarding the simple fact that the results of any other influence that companies have on one another or on the surrounding economy, can also be either positive or negative. It is certain that each business entity, and especially the one that decides to invest its money in a foreign country, aims to achieve its goal. Foreign direct investment is one of the best ways to do it.

2. Transnational corporations and their involvement in foreign direct investment

The global market nowadays is a demanding field for all companies, but on the other hand it gives them a chance to develop in a way that has not been popular so far. It is, however, essential to prepare properly for such development.

A strategy, which is well chosen by the management or the owners, is the key for a company to be ready for the international market. As we know, not every company is suitable for a foreign market. Not every company is financially able to run business abroad successfully. However, there are some business entities which can deal with the market beyond their countries regarding their size, financial resources or the amount of employees. Transnational corporations are with no doubts the most powerful players on this market. According to UNCTAD they are the business entities consisting of a parent company and its foreign subsidiary (*Transnational Corporation*…, 1983). The parent company has control over the assets of the foreign company, usually by owning its shares, while the foreign subsidiary is an entity, headquartered in another country, in the management of which the investor is entitled to participate (Rozkwitalska, 2007).

By achieving their economic goals the transnational companies are becoming the main investors on the global market. They invest in companies all over the world basically through the foreign direct investment which has been mentioned before. The capacity of transnational corporations and their possibility to develop in future is determined by their involvement in other business entities.

However, considering the impact of corporations on today's economy, one should not forget the role that these corporations play on the market. What should also be mentioned here is the fact that being a pioneer of changes is both expensive and responsible. The resources like finance and organizational possibilities that corporations possess make it easier to overcome the main difficulty which is the expenditure. However, it is the corporation's responsibility for its domestic market and its clients which seems a more important issue. To be responsible for the market is to take care of the natural environment, to create convenient conditions of work and payment to the employees, and to keep clear and valuable relationship with the decision-makers regarding the local and world matters. If a corporation abandons any of these principles, its national image may decline. The responsibility for the clients is another important issue within corporations' activity. It is them who will show interest in the company's products, and the future development of the corporation depends on their tastes, preferences and financial possibilities. Being aware of this responsibility, the transnational corporations "support" the client's interest in their products in a more effective way than the other, smaller business entities. They bear a lot of expense in order to convince clients that it is just that specific product which is the best, and the most expected on the market, outrunning other corporations to carry out marketing campaigns. It is just one of many ways to obtain the goal, which is the above mentioned "support" of the clients' interest. However, the results of such activity are quite considerable. A positive image of a corporation among the clients may bring profit when the next products will be launched to the market, helping the company grow stronger at the same time.

There are also other ways to stimulate the growth of the transnational corporations. Giving them more possibilities to move within the global economy is one of the ways which in turn will stimulate the internationalization of the global business activity. An increase of internationalization may be the result of the general number of transnational corporations in the economy, as well as the successful network between the parent company and its subsidiary. This network first of all enables the entities, which are financially connected with a corporation, to share their finances and solutions regarding technology, materials and devices. The main factors which determine corporations' possibility to develop are first of all technological progress, structural changes of the global economy, an increasing input of the market to development, an increase in service, and a progressing local integration around the world.

The transnational corporations participate in many agreements concluded between their representatives and other players on the market. Corpotations' involvement in business activity beyond their country of origin can be dealt with in three main ways which include a joint venture enterprise, an agreement with subsuppliers, and a strategic alliance. The first one, which may be either production or trading enterprise, enables a corporation to use the foreign source of supply. Regarding an agreement with subsuppliers, a national company is obliged to share `its intangible assets with its foreign business partner. The last form of internationalization of the global business activity is a strategic alliance. It is an agreement between two or more enterprises in order to achieve a specific strategic objective which very often matches gaining a better competitive position on the market (Pierścionek, 2001).

Table 2. The biggest transnational corporations in the world within the non-financial sector (results of the year 2010)

Ranking	The name of a corporation	Country of origin	Assets		
			foreign (mio USD)	total (mio USD)	6/5 (%)
1	General Electric Co	USA	551 585	751 216	73,43
2	Royal Dutch Shell plc	Holland / Great Britain	271 672	322 560	84,22
3	BP plc	Great Britain	243 950	272 267	89,60
4	Vodafone Group Plc	Great Britain	224 449	242 417	92,59
5	Toyota Motor Corporation	Japan	211 153	359 862	58,68
6	Exxon Mobil Corporation	USA	193 743	302 510	64,05
7	Total SA	France	175 001	192 034	91,13
8	Volkswagen Group	Germany	167 773	266 426	62,97
9	EDF SA	France	165 413	321 431	51,46
10	GDF Suez	France	151 984	246 736	61,60

Source: Main study based on: http://www.unctad.org/sections/dite_dir/docs/WIR11_web%20tab%2029.pdf (4.04.2012).

The data presented annually by UNCTAD support the theory that transnational corporations strongly affect the global economy. The best picture of how strong they really are will be visible while considering their amount of assets and their involvement in countries other than their motherland (tab. 2).

Analysis of the data presented above proves the significant meaning of both the amount of assets and the corporations' involvement in countries other than their countries of origin. Comparing the data from year 2010 with the previous years it becomes clear that, in spite of the changes on the global market, those values have risen. It is also the corporations' profit that proves their strength (table 3).

Table 3. The biggest corporations regarding their profit (in 2010)

Ranking	The name of a corporation	Income (billion USD)	The financial result (billion USD)
1	Wal-Mart Stories	421,85	16,39
2	Royal Dutch Shell	378,15	20,13
3	Exxon Mobil	354,67	30,46
4	BP	308,93	–3,72
5	Sinopec Group	273,42	7,63
6	China National Petroleum	240,19	14,37
7	State Grid	226,29	4,56
8	Toyota Motors	221,76	4,77
9	Japan Post Holdings	203,96	4,89
10	Chevron	196,34	19,02

Source: http://money.cnn.com/magazines/fortune/global500/2011/full_list/ (17.04.2012).

Considering all the presented factors and the results of the analyses one can draw conclusion that the transnational corporations play a significant role in the economies of most countries by getting financially involved in foreign direct investment. Given their systematic growth we may assume that such trend should remain unchanged. What is more, we can only expect that in future there will be more corporations and more possibilities to influence the market.

3. Analysis of foreign direct investment in Poland – its size and meaning

Similarly to other countries foreign direct investment plays a significant role in polish economy. The positive image of Poland among foreign investors has contributed to the great amount of investments which came to Poland from different countries all over the world. However, since the year 2007, which was profitable regarding the size of foreign direct investment, it has been declining systematically. The inflow of FDI is cyclical. It means that its value depends on the

stage of the economic situation. In the years 2006–2007, which were good regarding prosperity, the value of FDI flowing in to Poland was 15,7–17,2 billion Euros each year. In the times of economic slowdown, in the years 2008–2009, the value of FDI remained around 10 billion Euros, while it amounted to „only" 7,3 billion Euros in 2010, which was 26% less than in the previous year (tab. 4).

What should be stressed here is the fact that the fall within FDI in the years 2008–2010 comparing with previous periods was a global result of the financial crisis, which hindered investors from risk. The global value of FDI in 2010 was 40% higher than its highest value in 2007. Consequently, the ratio of FDI in Poland to gross domestic product fell from 5,5% in 2007 to about 2,1% in 2010.

Over 85% of FDI's value located in Poland in 2010 came from European Union while only less than 15% came from other countries. The investors who invested most money were from Germany, Great Britain, Spain and France. The best investors from beyond EU were the nonresident investors from Switzerland, North Korea, Japan and The United States.

Table 4. The inflow of foreign direct investment to Poland between 2005–2010 (mio EURO)

Inflow of FDI to Poland						
year	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**
The value of FDI	8 330	15 741	17 242	10 128	9 896	7 319

Source: The Ministry of Regional Development, Report – Poland 2011. Economy – society– regions, June 2011, http://www.mrr.gov.pl/rozwoj_regionalny/Ewaluacja_i_analizy/Raporty_o_rozwoju/Raporty_krajowe/Documents/Raport_Polska_2011.pdf (21.04.2012).

As Ernst&Young reports, in 2010, after the investors had established 12,4 thousand vacancies, Poland was placed third in Europe regarding new vacancies as a result of foreign direct investment. It was also in 2010 when the highest, 40%, rise in the number of European investment projects was noted in Poland. Certainly, Poland has made a positive impact on the foreign investors, which is quite remarkable regarding the period of crisis in most European countries. The statement of Sławomir Majman, the CEO of the Polish Information and Foreign Investment Agency only proves the above opinion true. He namely claims: "The positive result of the report is not surprising to me. Poland, still regarded as the leader of its region, has a huge domestic market, well educated management, and a very impressing economic growth, on account of which we have made our way ahead of the Middle-European group in the investment race (Ernst&Young, 2012).

Conclusion

Foreign direct investment is usually a long term activity. From a corporate perspective it is a necessary process, the success of which determines a dynamic development of the world's economic giants. Foreign direct investment provides countries with possibilities to build and maintain a high concurrency level, which is why it is so demanded. However, from a country's perspective it is not the size of FDI, but its effectiveness which should matter the most. It is measured by an increasing level of qualification among employees, more vacancies, development of enterprises, and increasing impact on the gross domestic product.

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Beata Majecka

CHANGES IN QUALITIES OF ENTERPRISES DICTATED BY GLOBALISATION

Abstract

Globalisation through creating ever-complicated operating conditions induces modern companies to reinvent themselves to a certain extent. Changes to how they operate have to be preceded by evolution of those entities. Each economic entity has certain qualities which become apparent through market behaviour. Those qualities constitute the specific character of a given entity. One of areas where a business can adapt to the changing world is altering configuration or/and the intensity of its individual qualities, so that through adaptation it would be able to operate under new conditions. This paper aims to discuss the phenomenon of corporate character, and to set directions for necessary transformations a business has to undergo to succeed in the global market.

Introduction

Current economic climate, which fuels uncertainty in the markets and renders them ever-more demanding, pressurises businesses to reinvent themselves and compromise in a multifaceted manner. One of more prominent phenomena taking place in world markets (not only though) and exerting considerable influence on the economic outlook is globalisation. It is seen as a processes created by worldwide phenomena and actions. Slightly more comprehensive definition of the phenomenon in question – which is not homogeneous and attempts to define it evoked controversy on many occasions – includes a variety of elements. It reads "globalisation of economic activity is a worldwide, long-standing process of transgressional integration of ever-growing number of domestic economies, possible through expanding and tightening mutual relationships (investments, manufacturing, commerce, collaboration), resulting in a highly interdependent

global economic system where actions undertaken even by distant countries have considerable repercussions" (Zorska, 2002). The above-mentioned process is propelled further by expanding multinational corporations, which set novel and increasingly fast changing operating conditions for individual economic entities. Hence, those are not only global conglomerates, how are affected by globalisation. Individual entities of regional reach also have to take into account a broad spectrum of phenomena as indirectly, they regulate ever type of activity and their influence (to variable extent) is evident in every market. Thus every business has to think through their current practices and – if required – redress the balance in terms of their operating conditions. That is certainly a mountainous task. Nevertheless, individual companies have to make an effort at adaptation in order to survive. They must transform, because "employing the same tricks as before will not guarantee an equal success" (Nizard, 1998). Consequently, businesses need to look for new success factors. Hence, another interesting to study problem is how a contemporary economic entity should operate in order to survive and succeed in current economic climate. Which direction should planned changes take? Answer to that question is undoubtedly complex, however, it is worthwhile to point one's attention to one of its dimensions. It is definitively constructive to focus on determining qualities a business should display to address effectively variability fuelled by economy undergoing globalisation.

1. The purpose of the research

Based on the above, preliminary deliberations the following thesis statements can be made. Firstly, globalisation through creating ever-complicated operating conditions induces modern companies to reinvent themselves to a certain extent. Secondly, changes to how they operate have to be preceded by evolution of those entities. Each economic entity has certain qualities which become apparent through market behaviour. Those qualities constitute the specific character of a given entity. Thirdly, one of areas where a business can adapt to the changing world is altering configuration or/and the intensity of its individual qualities, so that through adaptation it would be able to operate under new conditions. Hence, this paper aims to discuss the phenomenon of corporate character, and to set directions for necessary transformations a business has to undergo to succeed in the global market.

It is worth pointing out that not all companies have to transform in order to enter the global market. Some of them are created with that concept in mind – consequently they are genetically programmed to operate within that environment and thus they have all the qualities required. A born global firm is an enterprise, which since it was "born" (or just after it was created) operates in foreign markets (Berliński, 2006). Such entity will most likely be predisposed from the outset to have necessary qualities, which would allow it to operate efficiently

when faced with globalisation. Nonetheless, the majority of economic entities aspiring to operate over long-term and to grow with adaptive development in mind, not necessarily have those required qualities in their genes. Hence, their corporate identity has to take account of globalisation requirements and adapt characteristic parameters to changing environment. Only then, they will be able to face challenges of the modern world.

How do businesses fare, how do they cope in demanding environment or how do they behave can be perceived in a variety of ways. One of angles one can take to analyse the aforementioned phenomena, is to look at organisations through the prism of what they are. A diverse group of factors having an undeniable impact on corporate behaviour and allowing to draw up its detailed description are individual business qualities, which can be collectivelly referred to as "corporate character" (More on the subject: Majecka, 2002, chapter 2.1).

Of course, discussing character in relation to an organisation is not accidental. In many aspects an organisation can show signs of bearing resemblance to a human being. Owing to that fact, in an attempt to determine qualities of an organisation one should turn for their definitions to psychology.

2. The qualities of enterprises – context of globalisation

2.1. Personality

What distinguishes an organisation from among all others is its personality i.e. a collection of genetically and socially moulded qualities. In other words, a personality is based on innate qualities (temper) and is shaped in the process of interacting with the environment. It is a system of relatively resilient properties characterising a unit, which manifest themselves through behavior (Paluchowski, 1981). Hence, the personality of a given economic entity, partly shaped by its environment is also influenced by the phenomenon of globalisation. Companies brushing shoulders with multinationals, by force of circumstances have to develop qualities which would take account of diversity of those entities. They have to be open to cultural differences, which are very important for inter-organisational contacts. A company which on an ongoing basis goes side by side with various entities will ultimately become more versatile, will hold greater knowledge about cultural diversity and its significance in doing business.

In a different take, the personality is described as identity i.e. characteristic logic shared by organisation members, which is created and revealed over time. It sustains the company's continuity and makes possible identifying it just as its employees can identify themselves with the company (Strategor, 1997). It can be said slightly metaphorically, that corporate identity while being produced by the business is also the air it breathes – indispensable to survival (Strategor, 1997). An

identity is being built on a continuous basis through certain behaviours. As the time goes by, companies develop their own so called behaviour patterns (Senge, 1998) concentrated on forecasting long-term trends and on evaluating their implications. M. Kostera makes even a remark, that corporate identity is a pattern for social actions (Kostera, 1996). It is one of the most important notions concerning business organisation. A kind of warranty allowing the entity to last. If a company endured in the long-term it means it was able to determine both the favourable and unfavourable factors. All the changes, across the board, made to adapt structures are a continuous process, which carries the corporate history and beyond doubt is an element of identity (Strategor, 1997). The notion in question is a multidimensional phenomenon, which can be described, managed and measured. It also produces a range of social interactions. In principle, that term refers to the expression "who/what is it" (a question important both for an individual human and an entire organisation). Defining identity in that fashion allows certain conformance between what an organisation aspires to be and how it is perceived by the environment (Zarębska, 2009).

Corporate identity is created around a given factor, which can be referred to as the focusing element (Zarębska, 2009). That element can be a product, core business the entire company is based on and professional skills of employed personnel. The identity can focus either around behaviour patterns or the leader (a senior group), provided he enjoys popularity and has the backing of employees. Presence in the global market can be a particularly important focusing element, which takes into account the required drive and commitment to internationalising a business (bearing in mind all aspects of diverse environment in which the entity operates).

2.2. Corporate culture

Another quality which characterises well a company is the corporate culture, which is crucial in face of looming globalisation. That phenomenon shapes the corporate image as well as identity (Penc, 2000) by determining behaviours within an environment.

Corporate culture is an interesting phenomenon, because it points towards the organisation as an assembly of units united under a common goal. Companies have their own culture (as one of its constituents) or are perceived as one. Considering the later, corporate culture is part culture innate to given areas and shared by their residents. An assumption can be made, however, that companies have two types of corporate culture at the same time. One being part of a whole and the other, which developed based on broader national culture, but still remaining an integral part of a given organisation. If a company operates within areas of diverse culture it has to blend in and mingle with that diversified culture mix. Hence a single entity (multinational corporation) can display features of different cultures or even cultivate entire different cultures all together, character-

istic for individual parts of a given vast organisation. It comes as no surprise that with multiple branches scattered across great distances they are often home to different varieties of culture. It is all the more evident, if those branches are operating in different cultural areas (e.g. different countries). Challenged with such situation, a company has no other choice than to use intercultural management. It can be referred to as a "culture surgery" involving taking prescriptive actions for social purposes within an organization (Koźmiński, 1999). If a company has not crossed beyond its local reach thus far and ignored cultural issues, then one of the fundamental qualities it has to acquire to compete in the globalised market is the ability to use the aforementioned intercultural management.

When defining a culture, one has to bear in mind, it is a collection of assumptions a given group had devised, discovered or created in the process of learning to unite internally and adapt to the environment (Strategor, 1997). Corporate culture gives the following elements which can serve to describe those organisations: ceremonies, rituals, uniforms, mottoes, anecdotes, customs, and company logo. The same culture points towards values, by which an organisation is guided. One can go even as far as to say that culture determines the pool of acceptable behaviours, an organisation should show. Also important is the fact that culture, by exerting influence over people shapes their behaviours, regardless of whether or not they are aware of its existence (Zbiegień-Maciąg, 1999). Some patterns of corporate culture being created within an organisation are formulated by repeatability of certain type behaviours (Sikorski, 1999). Thus, organisation members behave in accordance with the corporate culture, but the very same behaviour causes, at the same time, new patterns to form. Therefore it affects cultural variability.

One of phenomena, which reflect values embraced by an economic entity – ever-more often perceived as the way to go forward – is the already practised by multinationals concept of corporate social responsibility (Nakonieczna, 2004,). It substantially shifts company characteristics – from solely profit-oriented businesses to increasingly often socially responsible thereby able to have a sustainable activity combining money-making aspects with broadly defined activities to the benefit of its environment (stakeholders). This transition causes economic entities to change values their business are pointed towards. Ever-more often widely acceptable behaviour patterns emerge as well.

Corporate culture in tandem with structure and strategy, not only guides companies towards their strategic objectives (Penc, 2000), but also in an unequivocal manner allows to draw the line between different type organisations (McKenna, Beech, 1997):

– defence-oriented organisations - their primary objective is to secure and sustain a permanent position in the market (formalisation is the top priority);

- search-oriented organisations - their primary objective is to develop a new product and taking advantage of every market opportunity (creativity is the top priority);
- analysis-oriented organisations - their full attention is focused on research & development and continuous growth.

If one were to consider phenomena inextricably linked with globalisation i.e. the requirement of innovation and creativity (Krupski, 2005), it becomes apparent that modern organisations can no longer afford to be defence-oriented, as they will simply not survive in the long run.

2.3. Temper

Another important company quality, which undoubtedly impacts its behaviour in the market, is temper. It is perceived as a collection of relatively constant properties of an organism, expressed by the energy level and the temporal characteristics of behavior (Strelau, 1992).

Energy level consists of two quantities: reactivity and activity. Reactivity is a quality reflected by relatively constant and characteristic for a given unit magnitude (intensity) of reaction (Strelau, 1992). Activity on the other hand is reflected by the sheer quantity and scope of undertaken actions (Strelau, 1992).

Temporal characteristics of behaviour concern above all the repeatability and regularity of reaction, its time and pace. This quality is related to the so called sensitivity threshold (Gościński, 1989). It can be defined as the moment of reaction to disruptions originating both from the environment and the organisation itself. The moment a stimulus would induce a reaction differs across the board for organisations – it will depend on said temper of the organisation. Temper, as an innate quality of business organisations will always be related to their core activity underlying their existence – type of their target market to be more specific. Different markets for different products require different reaction times to changes to take place. When operating within a globalised environment, that concrete quality becomes particularly important – especially its modifications based on local determinants. It would be best, if a given organisation had different "resources" of temper and was able to hold its horses when necessary – and conversely, show more engagement in other situations.

2.4. Vitality

Another company quality related to time and intensity of reaction is ought to be referred to here. The quality in question is vitality i.e. an organisation's vital capacity or its stamina. Vitality, which is an organisation's ability to oppose negative impacts originating from its environment or plainly its ability to operate effectively under variable conditions, decides whether it will stand a chance to sur-

vive in the long run. Deficient vitality is ultimately reflected by company's struggle to stay afloat (Warnecke, 1999).

2.5. Intelligence

Another quality, which substantially influences how businesses operate and behave in the market, is intelligence. It is reflected by the ability to independently select a means to carry out the task in hand and achieve planned objectives (Pszczołowski, 1978). Hence, intelligence is the capacity to match means with objectives and to critically evaluate own actions (Hilgard, 1967). Intelligence increases considerably when a company has to reinvent itself, what normally involves coming up with, implementing and stimulating changes. In order for all those processes to succeed, they have to be implemented intelligently (Wawrzyniak, 1999). Considering the challenges with which companies are faced whilst competing in the global economy, intelligence seems particularly desirable.

In order to evaluate own actions and market conditions, an entity has to create its own hierarchy of values. That hierarchy is predominantly related to the aforementioned corporate culture – it derives from it. In economic activity, intelligence is reflected by the ability to analyse the company's internal situation (resources, needs and relevant values) and its environment. "An intelligent organisation should show the ability (...) to listen to its employees in order to motivate them" (Brdulak, Bachorski, 1999).

Intelligence of organisation fosters company success by being crucial to how opportunities it is presented with are taken advantage of, novel situations are taken care of and how weaknesses and strengths are analysed. Moreover, the bottom line growth comes from organisation's intelligence as a whole as opposed to its single employees (Penc, 2000).

Another challenge for modern companies is the need to learn. Analytical skills of an organisation require an analytical apparatus, and what is probably even more important – creative ability to build that apparatus. For when an organisation expands it should expand with it. Furthermore it should be updated on a regular basis in line with changing operating conditions. It requires continuous improvement of used methods. Hence an organisation has to be able to learn. To that extent, intelligence inclines organisation to develop its parts responsible for learning skills. What is more, learning processes are employed to achieve among its personnel and structure the best possible knowledge about management and venture management techniques (Grudzewski, Hejduk, 1997). Especially, if the global economy is concerned, which often produces difficult operating conditions (best example is the crisis which – on and off – has been affecting all economic entities for the past few years).

Business intelligence consists of various elements which apply to individual areas of the business (Penc, 2000):

- information intelligence – the ability to quickly obtain required information (in a broadly defined market, including distant events), accumulate it, process and send to managers of appropriate level;
- technological intelligence – reflected by devising and using state-of-the-art technologies and their continuous improvement (obtaining them even from remote locations);
- innovative intelligence – the ability to create favourable financial, motivational and psychosocial conditions promoting innovation and creative behaviour among employees;
- financial intelligence – the ability to efficiently manage corporate finance, rationally distribute and spend financial resources on day-to-day and investment expenditure contributing to future improvement of operating conditions;
- marketing intelligence – reflected by analysing markets on an ongoing basis (global trends), recognising customer needs and ability to find niche markets and venturing to new ones;
- organisational intelligence – the ability of organisation to adapt to changing tasks;
- social intelligence – demonstrated by great concern for people, continuous improvement of working conditions, remuneration and promotion opportunities;
- ecological intelligence – the ability to see green issues as important part of public relations and to promote the concept of sustainable growth.

In order for an intelligent entity to properly and creatively use available information it has keep track of events in an appropriate fashion. The skill of recognising events lies in perception involving keeping records of economic events. "An event taking place in the environment is converted in a particular way into guidelines, which consequently affect behaviour" (Scott, Cummings, 1983). It is difficult to imagine the decision making process in any company without the economic records. "Globalisation, which takes place around commercial entities, determines their behaviour. It can have beneficial influence on how they operate, and pose tangible threats at the same time. It is therefore necessary, to diagnose how managers perceive globalisation and customers in an attempt to identify impact of globalisation on their behaviour" (Malinowska, Kucharska, 42). Studies of that type are only possible using highly developed perception skills.

2.6. Emotions

Recording a given event, however, does not necessarily lead to taking an action. In order to induce any particular action, the event recorded has to be capable of affecting the company. That impact has to be then evaluated by company emotions. Under the influence of emotions events are verified with respect to their

consequences for the entity. "Cognition enables an entity to analyse the world regardless of that entity, (...) emotional processes are sensitive to those features of reality, which have either positive or negative meaning for the entity" (Reykowski, 1992).

Company emotions are tightly linked to its needs i.e. the rationale behind its actions. When defining needs it is easiest to point one's attention to two aspects: first is lack of something, second is the aforementioned lack of preparation to respond (this need arises when such situation becomes too severe). It is worth noting that globalisation causes another, not mentioned thus far effect. It opens to companies the possibility to explore operating conditions and business opportunities in the most remote places on Earth. Moreover it creates additional opportunities for satisfying needs - consequently a company broadens its horizons.

Conclusion

Discussed qualities of corporate character and their modifications emerging as outcomes of globalisation processes, probably do not exhaust the subject of all relevant phenomena. Nonetheless, such angle on economic entities is worth bearing in mind. Since companies are fully aware of their own qualities and their impact on operating efficiency, they are capable of improving their processes and thereby blend better with globalisation.

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INNOVATING THE DEVELOPMENT CONCEPT TO ENHANCE THE COMPETITIVENESS OF PRIMORSKO-GORANSKA COUNTY TOURISM

Abstract

The tourism industry of Croatia, Primorsko-Goranska County (PGC) included, has failed to valorise the preconditions for its development despite positive trends in times of recession. While the numbers of tourist arrivals and overnights are highlighted, figures pertaining to financial performance are skated over. The advantages of the PGC tourism offering are based upon natural conditions, whereas weaknesses can be found in all segments of tourism superstructure, as well as in the non-differentiated mass tourism offering and in the lack of distinctiveness resulting in pronounced seasonal operations and low tourist spending.

An innovated concept of PGC tourism development has to turn comparative advantages (natural beauty) into competitive advantages based on innovation and quality in responding to globalisation challenges and turbulent market changes. This paper provides a situational analysis and sets qualitative and quantitative goals, as well as operational strategies (R/D strategy, marketing strategy, offer strategy, human resource strategy), at a level of three sub-regions (coastal area, island, mountains) with the aim of transforming the PGC into a competitive and appealing destination and positioning it on the market as such. The synergy of natural and geographic diversity in creating a unique product based on local and indigenous values, novel forms of the offering, events and a new value system based on knowledge, intellectual capital and a new relationship with tourists guarantee the qualitative transformation of PGC tourism and the ability to adapt to new trends in demand.

Introduction

The aim of this paper is to help innovate the tourism development concept of Primorsko-Goranska County (PGC), that is, to help identify new strategic orientations and establish a new value system for the PGC tourism industry that will enhance its competitive ability in addressing the challenges of the turbulent tourism market of the twenty-first century. To stand out from the stereotyped and uniform mass-tourism offering, the PGC tourism industry needs to segment its target market segmentation, (re)position itself on the market, and innovate its offering and promotional efforts innovation to be able to provide a unique experience to each individual tourist in the process of rejuvenating the destination and its transformation towards motivation tourism. The development concept should provide answers to two key questions: How can the PGC tourist industry identify, anticipate and meet tourist needs? How can it become qualitatively diversified relative to other Mediterranean destinations?

1. Analysing new global tourism trends

In a globalized marketplace of fierce competition, even the slightest nuances in the business operations of competing destinations are seen as great advantages that may result in considerable profit differentiation. Every destination seeks to gain a competitive advantage by satisfying tourist needs and wants as best as it can by using the resource base that it has. "Today, emphasis is shifting away from mass tourism towards improving quality, establishing an enabling and affirmative relationship with nature and the environment (sustainable development, green tourism) and augmenting the level of individualized services in an integrated destination product (destination rejuvenation process). In other words, it is shifting towards a personalized relationship with clients" (Stipanović, 2006). The new business culture involves a new relationship with employees (with people as the key to success) and a new relationship with tourists (CRM – a personalized relationship, with tourists treated as clients). The only things that cannot be copied are the relationship with employees and the employee-client relationship (Kobjoll, 2009). New criteria of tourism supply and demand are being set by imaginativeness and aspirations towards experiencing something new, different and previously unknown.

Dynamized by changes to supply and demand, the tourism market is characterized by the following key "forces" (*The Tourism Industry* …, 2011):

- changing consumer/tourist behaviour,
- growing product/service diversity (through an ever more complex development concept),
- the globalization process that has made competition global,
- global marketing using new distribution channels,
- greater demands regarding the level of staff education and skills.

Changing consumer/tourist behaviour is evident in the transition from production for mass consumption to production focused on individual consumers – mass customization or mass one-of-kind production – because:

- Tourists are increasingly unrestricted in individualizing their demands, and are becoming postmodern tourists.
- Differences between purposes of visit are becoming blurred (conferences, vacation etc.).
- The focus of management is being placed on that which is special/unique.
- Tour packages account for an increasingly declining share in sales.
- Product/service-based competition is being replaced by distribution channel-based competition.

The picture of tourism is being transformed in the following aspects:

- On the supply side, competition among destinations is becoming ever keener.
- On the demand side, new tourist preferences are evolving. Tourists are looking for back-to-nature experiences, adventure and activity holidays, and authentic experiences. There is a growing demand for special-interest holidays. Tourists seek to deepen their knowledge, and they have heightened expectations regarding real-life experiences of local cultures, including events, music, local culture and tradition.

Over the past decade, tourism has experienced rapid growth and undergone a variety of changes, including substantial transformations in tourist preferences and behaviour. Tourists are moving away from the sun-and-sea offering, and are focusing on new forms of the offering, such as business tourism, cultural tourism and devotional tourism. Changes in tourist behaviour have affected the design of offerings placed on the tourism market. Modern tourists are demonstrating growing interest in short breaks (weekends and holidays). Tourists are also showing a tendency towards last-minute trips that leave them little time for planning. Twenty-first century tourism is transforming tourists from passive observers into active players, who actively participate in designing, producing, servicing and consuming products and services based on the experience economy. The outcome is tourists as friends (as in family tourism), co-creators and promoters of a destination. The offering is customized to each tourist individually (today there are seven-star hotels that cater to each and every tourist need). The aim is to be ahead of demand, anticipate new tourist preferences, innovate the tourism product and attract demand through pro-active marketing.

A study concerning the development of EU tourism has identified eight megatrends (*Study on the competitiveness…*, 2009):

- **Globalization** – technological changes, on-going liberalization of trade in goods and services, and the growing mobility of individuals have brought the entire world closer together.

- **Demographic changes** - by 2020, almost 20 per cent of the European population will be older than 65. This population will often have considerable purchasing power and more leisure time for travelling. The number of one- and two-person households will increase, parallel to the aging of the population.
- **Access to information** – computer technology, in particular, the Internet, search engines, GPS and digital television will profoundly change the way in which the world communicates, collects information and distributes products and services...
- **Experience economy** – at a time when supply is differentiated and when it is not always easy to distinguish products and services based on quality, consumers are increasingly looking for other factors on which to ground their choices. "Soft characteristics, such as design and meaning, together with the creative combination of products and services into a "total experience" are increasingly gaining in importance.
- **Customisation** – the focus will increasingly be on the personality of consumers/guests, who seek tailor-made solutions that match their own personalities. Society can no longer be divided into homogenous target groups.
- **Sustainability** – concern for climate change, environmental pollution and social welfare translates into growing demand for environmentally, socially and economically responsible consumption. Legislation reinforces this megatrend to motivate both consumers and suppliers to act in a more sustainable way.
- **Health and wellness** – the increasingly sedentary lifestyle of many people in developed countries has led to growing focus on health and wellness as leisure activities. The boundaries between wellness and lifestyle on the one hand and health care on the other are becoming increasingly blurred.
- **Low-cost business models** – successful low-cost business models that reduce products and service to their elementary components are increasingly emerging in the marketplace. These low-cost models stand side by side with more conventional business models.

The twenty-first-century tourism market is changing ever more rapidly under the influence of, and through the interaction of, supply and demand, making it very difficult to determine which future changes are likely to foster the further development of a destination and enhance its competitiveness.

2. Situational analysis of the PGC tourism industry

The PGC tourism industry[1] is divided into five micro destinations – the Crikvenica-Vinodol Riviera, Rijeka and the Rijeka Ring, the Opatija Riviera, the

[1] Primorsko-Goranska County (PGC), located in the west of Croatia, covers a land area of 3,382 km² and has 305 thousand inhabitants. It comprises the territory of the town of Rijeka, the north-eastern part of the Istrian peninsula, the Kvarner Bay islands, the Croatian Littoral and Gorski Kotar. The

Kvarner Bay islands and Gorski Kotar – synthesized in three areas: the coastal area, the island area (Krk, Cres, Lošinj, Rab) and the highland area (Gorski Kotar).

Quantitative indicators (supply indicators, such as the number and types of accommodation, and other facilities and services, and demand indicators, such as tourist numbers, number of overnights, revenue and profit) and qualitative indicators (analysis and evaluation of supply elements, SWOT analysis, PEST analysis, benchmarking and QUALITEST that involves analysing the opinions and expectations of tourists, destination managers and residents, and analysing focus on sustainable development) illustrate the current state of PGC tourism.

Table 1. Number of tourists and overnights in the PGC 2006–2010

Year	Number of tourists	Index	Number of overnights	Index
2006	2,149,985		10,741,754	
2007	2,247,788	104.5	11,114,744	103.48
2008	2,214,026	98.50	11,263,659	101.34
2009	2,205,607	99.67	11,161,267	99.09
2010	2,151,118	97.55	10,938,291	98.00

Source: By the authors based on statistics of the Croatian Ministry of Tourism, Zagreb, 2011.

Table 1 shows that coastal towns account for 99 per cent of all overnights in the Kvarner region and that 85 per cent of all overnights are realized in the summer months, from June to September (2010). This indicates a strong prevalence of "sun-and-sea summer holidaymaking". That there are only minor oscillations in tourist flows in times of recession is due more to the ability to capitalize on opportunities (the economic crisis and unrest in Greece), than to a well thought-out concept of tourism development in Croatia and the PGC. The leisure offering in the Kvarner region is primarily based on the attractiveness of its sea and beaches, coastline and climate suited to swimming and sunbathing. This fact remains unaffected, despite a sharp, upward trend in enriching the offering, as well as an upward trend in the consumption of a variety of sports, health and cultural facilities and service, the quality of which is steadily improving. Accommodation facilities are mostly located in the county's coastal area and islands. The isolated family-run hotels found in Gorski Kotar are the result of entrepreneurial initiatives, rather than the result of a sound development concept. Accommodation facilities are geared to mass tourism, and the county's hotel offering – with the exception of Opatija (5-star hotels Ambasador and Milenium) – lags considerably behind that of Istrian County. The offering of the catering trade fails to fully valorise the indigenous, local cuisine and the Mediterranean surrounding, and it is

capital is Rijeka, the third largest Croatian town. PGC consists of 14 towns, 21 municipalities and 536 settlements within the framework of the towns. http://www.pgz.hr/ozupaniji.html , accessed 1 June 2011.

largely based on fast, low-quality food. The offering of special-interest facilities and services is poorly developed, and only serves to complement the primary sun-sea-sand tourism product. Awareness of the importance of events as key factors of the destination's attractiveness fosters the creation of an increasingly well-designed event offering that includes events such as the Rijeka Carnival, the Fiumanka Regatta, Days of Aproxiomen in Mali Lošinj, the Black Sheep Festival of Baška, Spring on Wheels, Frog-catchers' Night in Lokve, Rijeka Summer Nights Festival, Days of Cherries in Lovran, Trsat Castle Summer Festival, Summer in Fužine, Kastav Summer Festival, Vinodol Summer Evenings Festival and the Liburnia Jazz Festival Opatija. Based on the tradition and splendour of bygone days, the image of Opatija, Krk and Crikvenica, leading micro destinations, surpasses the quality of their tourism product. A SWOT analysis (an analysis of the internal and external environment) summarises the present state.

The PGC needs to see change as an opportunity, and set its development goals and strategies based on new tourist needs (which must be identified and incorporated into the offering to turn them into key advantages in the future) and on existing resources. To ensure a qualitative response to challenges from the globalized environment (the foremost challenge deals with client and customer behaviour, making it essential to gather vital information on the present and future behaviour of clients and rivals by applying Business Intelligence and CRM), the PGC needs to continuously innovate its development concept and its offering. An analysis of tourist opinions reveals that while tourists are satisfied with the PGC's natural preconditions, they are dissatisfied with its derived offering. The results of tourist surveys[2] indicate that tourism services in counties of the north Adriatic are superior to those in southern counties. The best services are provided in Istria County (70.46 per cent), followed by Zadar County (62.58), while the PGC is ranked third (59.3 per cent). The PGC does not have a target tourist segment (without a segmented offering, the chances of performing well on the twenty-first-century tourism market are slim). Hence, its current tourist pattern (undiscerning tourists who are aware that their financial means do not allow them to look for a better offering) is the result of an unappealing offering. Tourist segments (*Kvarner* …, 2009–2015) include the family-with-children segment (29 per cent of overnights), the mature-age (50–65) segment (18 per cent), the senior citizen (66+) segment (11 per cent), the young couples (25–35) segment (10 per cent) and the young people (18–24) segment (5 per cent). Benchmarking enables comparison with the closest PGC rivals (Istria County and Ličko-Senjska County). Istria County is superior to PGC coastal areas with regard to the quality and dif-

[2] Heraklea, a mystery shopping agency, conducted a survey from 15 July to 15 August 2011 in seven Croatian counties on the Adriatic. The agency's mystery shoppers visited 145 tourism and hospitality facilities. The survey focused on the basic elements of serving: the initial greeting, a warm smile, offering complementary products, expressing thanks and, finally, a sense of being welcome. http://www.mint.hr/default.aspx?id=5381, accessed 25 August 2011.

ferentiation of its offering, and it is setting new qualitative criteria by innovating its facilities and services. While Gorski Kotar is more appealing than Lika, there is no comparison between it and the micro destinations of Europe's mountain areas. The present, inadequate state of the PGC offering calls for new goals to be defined and strategies devised, to improve its competitiveness based on quality and innovation.

Table 2. SWOT analysis of PGC tourism

STRENGTHS	**WEAKNESSES**
• Favourable position in terms of transport • Scenery and landscapes • Cultural and historical heritage and tradition • Level of environmental preservation • Natural and geographical diversity • Development documents and concepts • Traffic links • Safety and security • Hospitable hosts, friendly atmosphere • Employees • Image of micro destinations (Opatija)	• Hotel offering • Special-interest tourism • Undeveloped offering • Event and experience offering • Animation • Insufficient investment in tourism • Business culture and value systems • Insufficient investment in the research and development of intellectual capital • Promotional activities • Seasonality of tourism operations • Insufficient offering innovation • Development management • Poorly connected and integrated offerings of micro destinations • Failing valorisation of Gorski Kotar • Lack of inventiveness and authenticity • Poor shopping opportunities
OPPORTUNITIES	**THREATS**
• Accession to the EU • Anticipating demand • The desires of tourists for activity holidays and novel facilities and services • Inclination of tourists towards events • Links between the economy and tourism • Covering new markets • Political situation in rival countries • Legislative changes	• Activities of rivals • Recession and crisis • Fiscal and monetary policy • Inadequate macro-economic framework • Failure to consider new trends in tourism • Unfavourable climate for investments • Non-stimulative legislation, bureaucracy and corruption • Unchecked housing construction, congested space • Conversion of tourism facilities for other uses • Risk of environmental incidents • Demographic changes • Turbulence of change

Source: by the authors.

3. Development goals and strategies of PGC tourism

The PGC tourism industry should endeavour to bring about quantitative and qualitative improvements in its business operations. Most studies and projects aimed at developing PGC tourism have failed to be implemented into practice. The only way to accomplish PGC tourism goals is by managing DMO development and ensuring the synergy of all supply providers, residents, local government and self-government, while enabling the ever-greater participation of tourists in creating new value. Quantitative indictors are expected to grow in the future: an increase in tourist numbers and overnights, and in the primary growth of revenue and profits. Enhanced operational performance will be correlatively linked with the process of resolving the world crisis and recession. Substantial growth and development can be achieved only as the result of a qualitative transformation of PGC tourism and a shift away from the spent and unappealing model of mass tourism. Competitive advantages need to be gained primarily through innovation (speed) and excellence, rather than through price policies (the PGC cannot compete price-wise with Turkey, Greece and some air-travel destinations). The qualitative goals of the PGC tourism industry can be summarised as two key goals (Stipanović, 2006):

- To innovate the tourism offering (by designing distinctive tourist experiences and developing novel tourism products) based on a high-quality entertainment industry, and special-interest facilities and services, as well as European market trends, while taking into consideration indigenous values and the socio-cultural dimension. The PGC tourism industry must identify a target segment and adjust to future tourist needs through proactive marketing to augment its competitive ability, create an integral product and achieve destination excellence.
- To build a distinctive identity that will connect, through synergy, all three parts of the county, draw attention to the destination's offering and help to reposition PGC as a prestigious and appealing destination in the minds of potential tourists.

To ensure growth and development, integrated destination management should be implemented, and the synergistic development of operational strategies fostered across all levels (R&D strategy, supply strategy, marketing strategy, human resource strategy and financial strategy).

The R&D strategy focuses on research and development. Knowledge managers must study new trends in tourism supply and demand, and use this research to generate future development trends in building competitiveness based on authentic and innovative facilities and services. The future belongs to those who are able to post opportunities before they become obvious.

The supply strategy defines novel facilities and services that will help to make PGC an appealing destination. As a precondition to development, PGC

needs to improve its accommodation offering by transforming non-competitive private accommodations into family-run and boutique hotels (through the implementation of the Kvarner Family Quality System, a pilot project, unique in Croatia, aimed at branding holiday flats and holiday homes run by private accommodation providers in the Kvarner region). The PGC cannot compete with an offering geared to uniform tastes and monoculture in tourism. Instead, it should highlight its local, indigenous values, while promoting special-interest tourism, including activity holidays, business tourism, health tourism, sports and adventure tourism, nautical tourism, cultural tourism and experience tourism. It should strive to develop as an environmentally aware and sustainable destination. This, in particular, includes encouraging activities in natural resource conservation, waste management, traffic regulation, green hospitality and education. Sustainable tourism involves refocusing and adjustment, especially with regard to economic, social and natural resource sustainability as the synthesis of interests of all stakeholders. The fundamental product, now and in the future, is wellbeing – the leisure, pleasure and joy of shared time, filled with numerous services and activities and the natural beauty of Kvarner. Wellbeing focuses on health-care prevention, fun and entertainment, and back-to-nature activities, and it valorises the diversity of natural preconditions (through the synergy of the county's coastal, island and mountain areas). It is crucial to design engaging events based on indigenous values in all parts of the destination, which should evolve into key travel motivations and help to prolong the stay of tourists and the tourist season. All barriers to designing the offering must be eliminated, and new ideas conceived to make it complete and more appealing. A diverse offering based on the local, indigenous cultures and imaginative animation will motivate tourists to spend more and will multiple their satisfaction.

The marketing strategy (segmentation, positioning, and the marketing mix) is based on market research. A precondition is identifying a target segment, whose needs can best be satisfied with regard to the resource base and competition within the market niche. It is crucial to establish a course of tourism development, which should focus on more active, younger tourists seeking action (especially during the summer season), events and experiences, while shifting away from the worn-out concept of mass tourism geared to senior tourists. The marketing mix should serve to improve the product, pricing policy, distribution and promotion through synergy. It is also vital to concurrently improve and qualitatively diversify the product (special-interest forms of tourism events; new forms of the offering, including theme tourism, sports parks, cruises and adventure tourism) and improve promotional activities (advertising, sales promotion, PR and publicity, and personal selling using the Internet, social networks and new scientific achievements) to make the destination distinctive and to reposition it. The PGC needs to be branded as a competitive destination based on diversity, activity holidays and local values that differ from those of rivals.

A human resource strategy is needed to define a new generation of managers whose task it will be to bring about change and establish a new knowledge-based value system. Lifelong learning is required to improve the knowledge, skills and competencies of all employees and to build employee motivation, empowerment (by involving all employees in the decision process) and loyalty as a way of enhancing competitiveness. Intellectual capital and information are evolving into key resources on which to centre an innovated development concept.

The financial strategy needs to define a financial policy in recession conditions. It should focus on attracting investors, obtaining EU funding and ensuring public and private partnership synergy in qualitatively transforming PGC tourism. In rethinking the development concept, all stakeholders at the destination level should create a complex network of relations and partnerships (public-public, public-private and private-private partnerships) that enables cooperative and competitive relations among supply providers (Magaš, 2006).

The destination's development will need to be managed. A Destination Management Organisation will be vital in bringing together all programmes and promotion activities within the destination and in helping to realize the vision of synergy and to foster development based on the synergy of all business, administrative, cultural and other actors and residents. The development concept should ensure the interrelatedness and interaction of all parts of the destination.

4. Innovating the offering of PGC micro destinations

To ensure its development, the PGC needs to leave behind the remnants of the command economy and mass tourism and focus on initiating and creating change. New ideas translated into original facilities and services should make a difference to tourists, motivating them to choose the PGC as a destination, as well as choosing an accommodation facility and tourism supply provider within the destination. Change is a reality, change is the future. Invention based on intellectual capital is evolving into the primary weapon of market competition. All segments of the offering need to be improved upon (accommodation offering, food-and-beverage offering, special interests offering, novel forms of tourism, animation and events). It is not enough to merely copy the trends of others. Instead, those trends should be combined with indigenous, distinctive ones to create new trends (for example, a novel way of furnishing accommodation units, new dietary trends focusing on indigenous cuisine, cave tourism, dive tourism, adrenalin tourism, Robinson Crusoe-type tourism, golf tourism, etc.). Local traditions, culture and values need to be incorporated into a competitive tourism product geared to the needs of modern tourists. In fostering their own development, all micro destinations should strive to accomplish the vision of PGC: to make it a competitive and appealing destination (bringing together all parts of the destination in efforts to diversify facilities and services).

Tourism development in the coastal area (the Rijeka Ring, the Crikvenica-Vinodol Riviera and the Opatija Riviera) is based on:

- providing protection to space and natural and cultural resources,
- qualitatively improving the structure of accommodation capacities,
- reinforcing the distinctiveness of the destination,
- valorising the destination's environmental, ethnographic, cultural and traditional heritage,
- taking into consideration the growing needs of tourists for culture and thematic forms of tourism – entertainment, excitement, experiences, education, health, sports, gastronomy, etc.,
- developing products: resort tourism, sports and recreation, health tourism, rural tourism, cultural tourism, nautical tourism, ecotourism, congress tourism, thematic programmes and urban tourism (Rijeka – a town of events and experiences),
- designing events and experiences.

Tourism development in the island region (Rab, Krk, Cres, Lošinj) is based on:

- improving the traffic accessibility of the islands,
- highlighting culture, local customs and gastronomy,
- promoting the distinctiveness of differentiated and environmentally preserved beaches,
- encouraging the synergy of agriculture and rural tourism,
- promoting cruises and nautical tourism,
- focusing on sustainable development and a return to nature,
- designing events based on tradition and indigenous values,
- improving and innovating facilities and services in terms of quality, and highlighting the special features of islands,
- developing products: nautical tourism, sports tourism, activity holidays (cycling, hiking), wellness tourism, Robinson Crusoe-type tourism, cultural tourism, rural tourism, event and experience tourism.

The development of tourism in Gorski Kotar is based on (*Master Plan*…, 2006):

- an integrated tourism concept of a Gorski Kotar brand, responsible for managing quality, sustainable development and social security,
- highland eco-trends and gastro-trends,
- a differentiated offerings for all seasons of the year,
- a strategy for improving the quality of the tourism product and enhancing guest satisfaction,
- a personal branding system for entrepreneurs, products and business systems in the destination,
- a strategic alliance of entrepreneurs with authentic and branded products,

- the development of winter sports tourism and sports centres for athletic training,
- product development: resort tourism, ecotourism, rural tourism, sports and recreational tourism, event tourism, gastronomy, educational tourism and ethno-tourism.

Improving, diversifying and qualitatively redesigning the offering should be done hand in hand with innovating the promotion strategy to reposition the PGC on the turbulent tourist market.

5. Repositioning PGC tourism

Tourism demand views a destination as an integral product. Qualitative trends in tourism suggest a number of technological, social and political changes that are taking place in the world, changes that have brought about essential transformations to the attributes of modern tourism demand and, in turn, necessary adaptations to the supply side. While a destination can be a reason for travelling, the motivation for travelling is the destination's tourism offering. The general attributes of a tourist trip to a destination include the tourism offering and its heterogeneous elements. Modern market preferences imply elements of the offering, optimally combined and adjusted to the market, which will enable a destination to perform well in comparison with its rival. The positioning of the PGC as a destination is possible only if we have a clear understanding of what it has to offer today, the level of its quality, and who are, or who should be, the consumers of its tourism services. Repositioning must be accomplished by innovating the PGC offering to attract increasingly activity-oriented tourists who seek a variety of experiences tied to distinctive events within the Kvarner region.

Today, in the twenty-first century, almost every potential tourist who is contemplating a visit to a certain destination will first search the Internet to look for meaningful information from independent sources, such as reviews or forums. Based on this information, an opinion of the tourist product will be formed (stories are sold in the tourist trade, not tangible products). The future of marketing lies in its effectiveness, in its ability to successfully find the correct channel/media that will have the best possible effect on the targeted groups. Investing in the promotion of a destination will prove to be profitable up to a certain point: when revenue realized through promotion exceeds the cost of the promotion itself. The basic promotional message that is intended to attract potential tourists to the region is, "Come and experience the magic of small maritime villages, the hospitality of the islanders, the rich flora and fauna hidden in the forests of the highlands. So much diversity within such a small area: a blend of islands, coastline, green hinterland and snowy highland regions" (*Kvarner*…, 2009). It is essential to emphasize the diversity that exists within so small an area, its authenticity and indigenous characteristics, its rich tourist tradition and the synergy of natural and

built pull factors adjusted to the target market to create a unique experience for the tourist. As this message mostly highlights the natural prerequisites and the diversification of the region, it needs to be reinforced with new elements of a selective offering. Each micro destination needs to be distinguishable from others by emphasizing the special features that separate it from the competition. Its diversity needs to be expanded. All this is necessary in order to establish the destination as being distinctive, in order to achieve the desired synergy effect. The Kvarner Brand must become an umbrella brand that will automatically bring to mind a quality destination of active rest, special-interest offerings, events, experiences and animation that will unite the diverse and the indigenous, all for the benefit of the tourist. Stories must be used for branding, (for instance, the flight of the griffon vulture that unveils the beauty of the Kvarner region, or the oak tree from Opatija that reveals the history of the town). The key is for marketers combine the natural resource base, the scenery, tradition, and the new product by putting them all together and turning them into a fanciful story.

Repositioning of the coastal area synthesizes the visions of the individual micro destinations (*Master Plan…*, 2005):

- Rijeka and the Rijeka Ring is positioned as a destination experiences and events (urban tourism and town events) whose offering, geographic position, tradition and know-how are capable of providing a pleasant stay for consumers (tourists) of all ages and needs.
- The Crikvenica-Vinodol Riviera is positioned as a recreational and sports destination for the whole family, offering adequate value for money spent. Its development as a destination is based on a combination of the sea and the preserved green hinterland of Vinodol and high forests.
- The Opatija Riviera is positioned as a fashionable Riviera, building its future on its unique offering of natural resources, traditional values, top quality facilities services and skilled tourism professionals to restore this First Lady of Croatian tourism to her former glory.

The strategic repositioning of the islands is based on a vision of the islands as a destination with a top-quality environmental and cultural offering based on authenticity and distinctiveness. The islands must develop into a unique destination focused on natural attractions and a healthy lifestyle – providing, in particular, the experience of untouched, nature and the sea – as well as on new services and facilities for activity holidays.

The strategy for repositioning Gorski Kotar is based on creating an image of a destination with a distinctive, authentic way of life that provides for sports, winter and rural tourism. Its brand would be Risnjak National Park. The destination's nature park and preserved natural resources would be valorised in an indigenous and diversified offering.

Each destination needs to highlight and assert its own advantages, while at the same time strengthening, through synergy, the brand and the image of the

Primorsko-Goranska County as an appealing destination adapted to ever-more developed and discerning tourist preferences of positioning to ensure a leading position for PGC on the Adriatic.

Conclusion

Innovating its tourism development concept will enable the PGC to overcome all weaknesses by managing change, and innovating and valorising opportunities in generating new strengths based on a differentiated, innovated, improved and distinctive offering geared to tourists of today and tomorrow, and to improve the lives of residents, while fostering sustainable development. By implementing the development concept and continuous improvement, it will be able to ensure destination excellence (there is no optimum state, only a continuous drive for excellence). The market segment motivated by holiday-making, relaxation, business, health, culture, events, recreation and sports, education, ethnographic values, entertainment and adventure represents the target market of the Kvarner region based on existing natural preconditions and rival activities. The new product (more value added, with a heightened experience component congruent with the needs of the new tourist and market repositioning) must be able to bring about a symbiosis of localization and globalization, as well as the synergy of the coastal, island and highland areas (by creating an integrated destination product and integrated quality) to outperform the competition, valorise the entire county in terms of tourism, enable year-round operations and multiply profits, while repositioning PGC on the tourist market as a competitive destination based on natural diversity, a rich tourism offering, activity holidays, events and unique experience in achieving excellence.

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Aneta Oniszczuk-Jastrząbek

INNOVATION POLICY OF SELECTED COUNTRIES OF THE EUROPEAN UNION

Abstract

Functioning of enterprises in a constantly changing environment means that companies should make necessary transformations, confront challenges, therefore anticipate and shape reality. Each company should be the instigator of constant changes, in particular of innovative projects which success largely depends on the mobilisation of all employees for creative thinking, acting and learning.

Modern processes of globalisation create new conditions for flexible and rapid actions in the use of different forms of innovation. Globalisation can either promote or restrict innovation, especially this individual one. It is more often stated, however, that globalisation creates the most professional conditions for great inspirations in the field of innovation, it is a source of modern technologies and efficient management methods.

Introduction

Innovation – in the form of new or changed products, processes and organisations – is central to the competitiveness and growth of enterprises and industries. Innovation at the enterprise level occurs in the context of an innovation system, which is primarily made up of economic institutions, economic actors and a knowledge infrastructure. State policy is an important part of the innovation system. Aspects of state policy that affect the rate and directions of innovation are mainly: macroeconomic monetary policy (affecting levels of demand and interest rates), education policy (affecting the supply of skills), and regulatory policy (on environmental protection, or health and safety). All of the above mentioned affect whether and how firms can innovate (Georghiou, Smith, Toivanen, Ylä-Anttila, 2003).

Developing a dialogue on the shape of the innovation policy of the country should take place between the government authorities as one side and business, trade unions and institutions of knowledge as the second side. It is obligatory, as B. Lundvall, S. Borrás wrote, for the development of socially important and clear programmes that can be successfuly implemented (Lundvall, Borrás, 2005).

1. Innovation policy of Finland and Sweden

Finland is one of the fastest growing economies in the world in the last decade. The most striking feature of the Finnish development is the rapid growth of clusters in the information technology and telecommunication (ICT) sector. In the place of the existing industries – paper production, timber industry, metal industry, the focus has been put on the development of high technology products. One explanation for the rapid growth is the concentration of state efforts to increase expenditure on R&D, consistent innovation and industrial policy of the country focused on the development of clusters and building the national innovation system. A major role was played by rising expenditure on R&D (Kozioł, 2005).

Some key elements in the Finnish innovation system can be distinguished:

- structural changes towards a knowledge-based economy had been progressing for many decades, but the acceleration was in 1990,
- beneficial technology policy had contributed to the success in 1990, but this was only one of several factors, other were the business sector and decentralized,
- decision making,
- traditional industries remain the key ones for the Finnish economy capable of developing innovation and growth,
- liberalisation, reduction of macroeconomic policy and the increased importance of a policy based on the growth of innovative companies,
- historical perspectives suggest that policy needs to be closely linked with the development of industry and must respond flexibly to changes in the environment,
- assessments of individual parts of the innovation system ccontinually stress the need to improve the flow of human capital in order to enhance further,
- cooperation between agencies,
- globalisation and the increased popularity of research conducted by Finnish companies overseas was offset by foreign direct investments, mainly through
- mergers and acquisitions.

The idea of innovation policy was to support the cluster as a whole rather than of individual companies. Nokia is undoubtedly the main actor in the Finnish ICT cluster. The Finnish example shows that a small country, with limited public

funds for innovation, created its own, adjusted to the requirements and needs effective innovation policy, concentrated on the development of clusters and NSI. The effectiveness of this policy is proved by Finland's leading position in all rankings of competitiveness of world economies in recent years. In Finland, one of the most important elements of the innovation system is the National Technology Agency of Finland TEKES, which finances about 10% of expenditure on research and development in Finland (in 2004 the Agency issued 409 million euros for research and development). The Agency's main role is to stimulate innovation of the Finnish economy by raising the technological level (Żołnierski, 2006). But Finland also has a range of other organisations aimed directly at enhancing the performance of the Finnish Innovation System. These agencies focus on such tasks as research and development, invention, venture capital finance, and internationalisation of innovations (Georghiou, Smith, Toivanen, Ylä-Anttila, 2003).

State policy applies to spectrum of issues directly or indirectly related to the academic enterprise. The Finnish government allocates large funds to a wide range of actions supporting the research and development sector, especially strengthening relations with the economy. In addition, the emphasis is put on creating a network of individuals and institutions involved in this process. Starting from universities, which play a key role - as a generator of ideas, on the basis of which new knowledge-based (often high technology) spin-off companies can be created - research institutions, incubators, regional and lokal capital funds (seed capital and venture capital) to the science and technology parks. As G. Schienstock, T. Hämäläinen write, to be able to take full advantage of economic and social benefits there is a need for sustainable and dynamic development of Finnish society (Schienstock, Hämäläinen, 2001).

Swedish economy is based on the significant participation of public sector and the concentration of production in large international enterprises. Unlike Finland, Sweden did not put immediate emphasis on cluster development or construction of the National Innovation System. In 1967 the Ministry of Industry was founded, which launched a campaign encouraging companies to invest in R&D. The main incentive was the fiscal agent – companies undertakings R&D work could deduct the cost of these tests. Direct contracts between the government and enterprises played a significant role in improving innovation. Swedish policy was concentrated on the development of large innovative companies focused on the acquisition of foreign markets. In 1992 there was a fall of the Swedish model and the only way out of the crisis were far-reaching reforms in the labour, financial, tax, education and R & D market. The process of forming the innovation policy in Sweden was initiated in 2002 and is the result of the merger of research and industrial policy and the integration of the departments of the Ministry of Education and Science and Industry, Employment and Communications. In Sweden, one can observe a relatively low economic growth at constant and high expenditure on R&D, which may be a result of the

fact that research on the development of new products concentrates mainly on areas of low and medium low technology, such as paper and cellulose. Not much attention,was paid to the development of clusters. The most famous one, which was created without any top-down recommendations is Telecom City, based on telecommunications. The Swedish experience provides interesting basis for the development of the economy and innovation policy. Firstly, the Swedish policy for the 90s of the XXth century was aimed at the development of a small number of large companies. Secondly, the whole economic power was concentrated in the hands of the government, trade unions and large corporations. Globalization has brought the liberalization of trade and led to a greater reliance on external relations and forced the government to formulate the conception of innovative policy and the National System of Innovation (Kozioł, 2005).

2. Innovation policy of Great Britain and Ireland

Formulation and development of the National System of Innovation in the UK is of low priority in the innovation policy of the country. In the last decade of the twentieth century, the withdrawal of government's support for R&D was offset by the increase of importance of European Union initiatives. Local initiatives supporting iinnovation (regional enterprise agencies and science parks) were also important. However, this decentralization worsened, the lack of coordination at the National Innovative System. The Ministry of Trade and Industry is responsible for innovation policy and has introduced the so-called: Entrepreneurial initiative, which aimed at (Kozioł, 2005):

- forming a competitive market by encouraging competition and preventing the development of destructive monopolic practices,
- the improvement of the market by providing economic units with information on development opportunities,
- creating a wider market through privatization,
- an increase in the level of consumer and investor protection, and thus trust in the market.

It has been assumed in this document that companies can best assess the risk and the level of commercial risk. They can also determine benefits they can gain from funding R&D and innovation. The government should not take responsibility for the actions of companies. A similar approach was presented by the government in relation to the promotion of technological innovation. The program offered (Kozioł, 2005):

- joint enterprise research and support in building cooperation of higher education institutions and enterprises,
- encouraging and facilitating the transfer of technology within the country,

- closing programs of innovation assistance for enterprises while continuing to support small businesses based on high technology.

Currently a new trend can be observed in the UK policy, namely that regional networks can foster innovation in small enterprises of high technology. A dense network of regional Business Link (BL) is designed to provide easy access to business support services. Financial incentives are used to support links between business and the scientific base. Partnership for research collaboration between the industry of Great Britain (of various sizes) and the research base, makes 50% of pre-competitive research funding and further investments necessary for the successful commercialization of new technologies (Romijn, Albaladejo, 2002).

In the UK DTI - Department of Trade and Industry plays an important role in the National Innovation System and in the process of supporting innovation activities of enterprises, including SMEs. DTI's strategic objectives are:

- supporting prospective business ventures (through stimulating cooperative relations and cooperation between companies, the development of e-business, offering business advisory services, raising international competitiveness),
- promoting science, technology and innovation on the global level (eg by investing in research and development activities, help in the process of technology transfer),
- poviding clear rules for the economy (i.e providing the consumer protection, stimulation of competition).
- UK research sector is characterized by high efficiency but may not be sufficient in an increasingly competitive world. Research opportunities in the commercial sector are an essential element to strengthen the UK's innovation system. If enterprises in the UK invest in research and innovation, they are able to take advantage of the quality of UK research base for their innovative activities. Public investment in research can certainly complement private investment, but it cannot, however, act as a substitute for it. (Salter, D'Este, Martin, Geuna, Scott, Pavitt, Patel, Nightingale, 2000).

Omission of funding applied research, close to commercialization phase for basic research in the context of the cooperation of enterprises with research centres has become a rule.

In the mid-80s difficult macroeconomic situation highlighted the lack of competitiveness of domestic enterprises and the sensitivity of the **Irish** economy to external factors. Ireland changed orientation of innovation policy towards the strategy aiming at developing export capacity of domestic enterprises, while still trying to attract foreign investments (Roper, 2000). In 1983 National Committee of Science and Technology announced the National Programme for Science and Technology, in which the main emphasis was put on increasing the international competitiveness of Irish companies through technological development. Funds from the EU Structural Funds and Framework Programmes also provided

support for Irish innovation policy. It is commonly believed that the current economic success of Ireland is based on the efficient and full use of EU funds. However, country's fiscal policy, with a low tax rate, is a very important stimulus of FDI. In Ireland, the major role in providing financial support for R&D is played by the government, which in addition to the financial incentives, uses fiscal incentives. Investors pay a tax of 10% on profits, the rate was increased in 2003 to 12.5%. Enterprises have a chance to obtain high non-repayable grants allocated to cover costs connected with the commence of operations in the country. The effect of FDI is limited, because most investors do not set their R&D departments in Ireland. Ireland is a country that has the highest share of high-tech products in total export and is among countries with the highest level of fundings designed for R&D.

In Ireland, just like in the UK government's withdrawal from supporting industrial activities (research and development) in the last decade, has been offset by the increasing importance of EU initiatives, such as the Fourth Framework Programme and EUREKA.

The main types of policy instruments supporting business innovation of already existing businesses and start-ups set outside Ireland are:

- financial incentives that support research and development, product development or development of individual companies' processes,
- tax relief that could encourage companies to invest in research and development of a product and innovation process,
- tools to promote cooperation in the field of research and development of a product or a process, development between companies or between enterprises and other institutions, such as universities, etc.
- financial support for capital investment,
- tax relief to encourage capital investments or foreign investments (reduced rate of tax on profit).

Most of the direct foreign investments in Ireland come from the U.S. The Irish strategy was focused on acquiring companies in the high-tech sector, although it was not clear technology policy, but the response to the availability of relatively well-educated workforce; what was the advantage of Ireland among the countries seeking foreign investment (Collins, D. Pontikakis, 2006).

3. Innovation policy of Germany and the Netherlands

In Germany, the innovation policy, apart from the government, is managed by local authorities (lands), which know best how to support companies' innovative actions in their area. The regional authorities mainly concentrate on (Kozioł, 2005):

- stimulating the technical progress and the transfer of technique,

- entrepreneurship and the creation of small technology companies,
- the range and shape of competitiveness and of regional marketing,
- development and improvement of infrastructure,
- assessment and minimizion of the negative effects of European integration,
- development of regional modernization programs, restructurisation and the development of key economic sectors.

Innovation policy in Germany is strongly rooted in regional infrastructure, institutions and management mechanisms connected with them (Kuhlmann, 2001).

Innovation, science and technology policy are developed by two ministries: the Ministry of Economics and Technology and the Ministry of Education and Research. In Germany, the benefits that can be gained through collaboration of industry with scientific and research institutions and universities were quickly observed. One of the elements of the policy was supporting scientific parks, in which the development of companies in each field of industry is of equal importance. The German government aims at maintaining the basic conditions for economic innovation in research and development policy. Expenditure on R&D is at high level and is financed from the central budget, the budget of the federal states and municipalities, academic institutions and businesses. Up to the 90s of the twentieth century there was a traditional allocation of research between the public and private sector. Government institutions conducted basic research, remaining in close connection with the system of education and being a part of science policy. While the private sector led applied research. From the 90s this division has changed as a result of making basic research by a growing number of private companies. According to the government, the innovative activity of enterprises can take place in an open economy, on liberalized markets, in well-educated society, in the time of knowledge and technology transfer between universities, research institutions and the society. One of the major programs supporting innovation processes in companies is the program called "Knowledge creates markets" adopted in 2001, which main objective is to improve the transfer of knowledge and technology by strengthening the role of universities in the use of scientific inventions, forming the Intelectual Property Office branches in smaller cities and an increased awareness of the imporatance of patent applications among owners of small and medium-sized enterprises. German economy has a strong competitive position in the sector of modern technology, which the government seeks to strengthen further. The case of Germany shows that it is a country where innovation policy has always played an important role among other government policies (Kozioł, 2005).

German programs for research and development and implementation of innovation are largely coordinated by the Federal Ministry of Economics and Labour (BMWA) and the Federal Ministry for Education and Research (BMBF).

More than a third of all science and research in Germany is financed from public funds, and about two-thirds are financed by industrial enterprises (Kuhlmann, 2003). Various methods of financing education concern all the major German research organizations and universities (Kaiser, Prange, 2004).

The new approach in German innovation policy are so called Initiative ompetitions. In this new approach the granting of state aid is based on initiative competitions for collaboration in research and development organised individually. This type of program, as A. Eickelpasch and M. Fritsch write, can generate relatively strong effects of start-up innovation by stimulating the allocation of innovative work. This may encourage participants to make new contacts, extend existing relationships and create new innovation networks that have not existed before (Eickelpasch, Fritsch, 2005).

Dutch innovation policy is directed and implemented by the Ministry of Economic Affairs and the two subordinate government agencies (CBS and OPTA) and eight additional agencies. The mission of the Ministry is to promote sustainable economic growth of the Netherlands and the market, which corporate culture can develop on where every agent has equal chances, consumers maximum choice and important societal interests are protected. The Ministry of Economic Affairs aims for the Netherlands to become one of the most attractive economies based on the knowledge and concentrated on innovation development. In order to do this, despite the difficult budgetary situation, the Dutch government invests 800 million euros in education and knowledge. But money is not everything. What is needed is a close cooperation of many different institutions, which should make their own contribution to enhance the innovative capacity of the country's economy. In the late 90s of the last century, the Dutch government created a unique instrument to promote innovation called Leading Technology Institutes. Both in the Netherlands and in other countries, such a formula is treated as a model of best practice in the public-private partnership leading from knowledge to innovation. This formula is still in use and plays an important role in the Dutch innovation policy. This is in line with thinking in terms of Innovation Platforms, the growing role of the network, public-private cooperation, demand, and financial programs. It is said to be partnership for innovation between business, knowledge institutions and the government (Sosnowska, Łobejko, Kłopotek, Brdulak, Rutkowska-Brdulak, Żbikowska, 2005).

4. Innovation policy in the light of the Lisbon Strategy

Despite increased investment in research by most Members and the improved efficiency of research systems, the EU is still far from achieving the purpose of the Lisbon Strategy, which is to acquire 3% investment in R&D in GDP. In the context of globalization and the transition to a knowledge-based economy, innovation and technological change are becoming increasingly

important for competitiveness and economic growth. The ability of regions to support science and innovation has been identified, as M. Chang-Hong, DW Yehua and M. Haitao write, as the main source of technological change and the ability to compete on the global market (Chang-Hong, Yehua, Haitao, 2007).

High investment in research and development of countries such as Finland, Sweden, Denmark, Austria, Germany, Great Britain, the USA and Japan is characterized by a high level of private sector involvement in financing research and development. In these countries, however, the level of government involvement in financing R&D is the highest (*Towards*…, 2007). With the establishment of the European Research Area, the EU policy in the field of innovation is certainly more ambitious. The variety of research and innovation systems in different countries and regions of the EU is a serious obstacle to the adoption of the open method of co-ordination in relation to education policy, or even the transfer of this policy (Kaiser, Prange, 2004). The Lisbon Strategy (SL) is the basic document containing the Union's priorities as well as directions and prospects for change. The Lisbon Strategy is treated as a kind of specific system of measures for the overarching, strategic EU objective of becoming the most competitive and dynamic knowledge-based economy in the world capable of sustainable economic growth, providing more jobs and greater social cohesion (Bachnik, 2006). When after a few years after the launch of the Lisbon Strategy, (the beginning of 2000), the implementation of its basic objective was impossible, it was modified. In the renewed Lisbon Strategy, the main emphasis was put on the economic growth and employment and thus the increase of the importance of SMEs, as they provide two thirds of EU jobs and generate 65% of GDP, 99% of all companies (Rymarczyk, 2008).

The Lisbon Strategy aims at more efficient utilisation of available resources (labour, knowledge, capital, environment) and the active development of new competitive advantages for European economic area. To help achieve set objectives different types of actions in five complementary areas are used (Matusiak, Nowakowska, Zasiadły, 2005):

- the transition to a knowledge-based economy,
- liberalization and integration of markets and network trade,
- the development of entrepreneurship,
- the growth of employment and modernisation of the social model,
- implementation of the sustainable development principles and conservation of the natural environment.

Evaluation of the progress of the Strategy implementation at EU level and at national level, is included in annual reports prepared by the European Commission. Approximately 100 regulations, directives and programs were adopted in the area of implementation (in different areas). After 4 years of its implemetation the initial assessment shows huge differences in achievements of EU countries. Northern Europe countries: Finland, Sweden also Ireland and the

United Kingdom are by far the best. The problems are identified in relation to the so-called "hard core Europe" countries- Germany, France and Italy (Matusiak, Nowakowska, Zasiadły, 2005).

5. Challenges for the Polish innovation policy

The environment for innovation and entrepreneurship in Poland has improved compared to the 1990s, but there are still significant barriers for companies creation and entrepreneurship, for R&D investment and the exploitation of intellectual property rights in the public and private sectors as well as financing innovative companies. The quality of education and human capital are of concern, especially given the need to improve productivity in order to improve industrial competitiveness. The current polish economic situation and EU integration, provide an opportunity to shift or rather integrate a set of activities to promote innovation through strengthening research. EU Regional Development Fund (ERDF) is an opportunity to increase the contribution of innovation and entrepreneurship to regional economic development (*Policy…*, 2007).

In the context of the European integration of science and technology, politics in Poland should in this respect be conducted in parallel with both the internal and external integration (Jasiński, 2007):

- the internal (domestic) integration must be continued through market reforms in science and technology, leading to fully formed, integrated national innovation system,
- external (international) integration comprise of the national reforms, which should be adjusted to the course of actions that arise from the renewed Lisbon strategy and that will lead to a fully integrated European Research and Innovation Area.

Integration of Polish science and technology within the European Union should be through participation in (Jasiński, 2007):

- international research projects under the 7th Framework Programme,
- Competitiveness and Innovation Programme, parallel to the 7th Framework Programme, but addressed to companies/entrepreneurs,
- other ongoing European programs such as Eureka,
- institutions and actions of Joint Research Centre,
- European technology platforms,
- EU initiatives such as: Europe INNOVA, PRO INNO, ERA-NET Plus, Regions of Knowledge, Industry-Academia Partner-ships and Pathways,
- creating networks, including e-network, as the main instrument of communication and integration of the two parts of Europe,
- the full use of the structural funds to complete the reforms in the field of R&D, in particular, reallocation of Polish R&D capabilities is needed in order

to bring it closer to the industry / market, which seems to be the biggest challenge,

- the increase in domestic expenditure on R&D and changes in its structure - towards a much higher share of the business sector and applied research and development work. The government should not rely primarily on the EU funds, it is primarily designed to bring a significant increase in domestic financial effort, exchange of experience in the field of foresight between "Western" and "Eastern" EU member states.

Poland in terms of R&D is rather weak compared to other EU countries. Looking at individual innovation indicators showing the EU members, Poland is at a far end. There are obviously areas where our country does well (e.g., number of students, entrepreneurship, product innovation) however, most indicators are far below the EU average. Most worrying is a very low share of business expenditure on R&D in relation to GDP (1/5 of the EU average), low share of innovative SMEs (less than half the EU average) and dramatically low level of protection of industrial property measured by the number of EPO patents (only 4% of the EU average) (*Policy…,* 2007).

Innovation of the Polish **economy thus becomes increasingly dependent on imported patents, licenses and technology.**

Among the obstacles for SMEs in the field of change and innovation lay:

- the lack of qualified staff (small businesses are not able to offer specialized staff as favourable conditions as large ones, they often have worse working tools, prospects for professional growth and promotion are low),
- they do not invest in business development, scientific and research activity,
- the lack of sufficient funds and difficulties in obtaining them to implement innovative projects,
- difficulties in protecting intellectual property,
- complicated regulations that prevent the full use of their potential while the cost of adapting to constantly evolving requirements are very high.

The following features of SMEs, help achieve advantage in innovation:

- simple and clear organizational structures that can ensure a relatively easy adaptation to changes,
- the ability to react as a result of the flexibility and simplicity of the company's organizational structure,
- the ability to respond to internal and external factors and the ability to adapt to the requirements of changing conditions,
- close relations between employees, as a result of a small number of employees and thus more opportunity to make personal contacts and information flow,
- direct management - client contact.

In the recent publication - EIS 2009 - Poland has advanced from the group of catching-up countries to the group of moderate innovators. In this group, Poland was one before the last (Lithuania) and after the Czech Republic, Portugal, Norway, Spain, Greece, Italy, Malta, Slovakia and Hungary. According to the study, Poland has a lower than average for all the countries of the European Union level of Summary Innovation Index (SII), but higher than the EU average growth rate of this index (*Przedsiębiorczość*…, 2010).

Just like B. Pysiak wrote: "The most important thing is the introduction of innovative solutions at the level of companies that are an excellent base for innovation" that acquire new technologies, using the conclusions from research and have the access to additional sources of financing, that provide modern, competitive products and services. Because Europe also is not the leader in innovation rankings, it is a serious challenge for the Polish economy. It requires careful analysis and systematic efforts to use opportunities and to recognize and deal with threats (Cichowski, 2007).

Conclusions

An important source of diversity in the innovation of the industrialized countries is the role of e.g., enterprises, universities and government and other research institutions in the process of knowledge production, knowledge-share and use. They can be influenced by many factors that point to the country's features, such as the industry structure, education and training, human resources and the labour market, the financial system, etc. (*Towards*…, 2007). The economic performance depends on macroeconomic policies and structural conditions, and thus vary greatly in different regions and countries. The stability of macroeconomic policy (e.g., inflation, fiscal policy), trade policy, financial policy and market conditions of the labour market institutions contribute significantly to the economic growth achieved in a sustainable way (*Towards*…, 2007).

Development trends of highly developed countries show that companies can ensure sustainable development in the short and medium term only by building competitive advantage based on knowledge and innovation. Therefore, the focus should be on building the Polish economy based on knowledge and the search for new sources of competitive advantage, such as innovation, including research and development, knowledge and education.

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PROBLEMS OF THE MARITIME ECONOMY

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MULTIMODAL TRANSPORT OF BULK CARGOES: A CASE STUDY ON FERTILIZER SHIPMENTS FROM SERBIA TO TURKEY

Abstract

The aim of this study is to analyze multimodal route variations for fertilizer shipments from Serbia to Turkey focusing on a major fertilizer manufacturer/trader. The paper is concentrated on a case study and uses established multimodal transport cost model as a research framework. Interviews with the industry practitioners and observation form the primary methods of data collection. Even if the use of multimodal transport cost model is common in the context of containerized cargoes, an assessment of high volume/low value cargoes such as bulk cargoes using the cost model is very limited. Hence this study provides an original analysis of such supply chains. The volumes of bulk fertilizer shipments are large, with a high weight-to-volume ratio. The research initially confirms that multimodal transport alternatives, modal combinations and handling methods may successfully be applied for bulk cargo transport. It is proved that cost model is not only useful in the unitized shipment; it is also a useful tool in analyzing the multimodal transport of bulk cargoes.

Introduction

Transportation integration within the supply chain is of great importance to minimize total costs and maximize customer value. The main role of transportation system is to assist the supply chain of goods and service. Goods must be produced and delivered to the market in the right quantity, quality and at competitive prices. Multimodal transport plays an important role in facilitating such a distribution process. Multimodal transport service can be described as consisting of up to five elements: Inland transport to the port; cargo handling in the port,

main carriage (usually maritime or rail transport), cargo handling in the port of destination, inland transport from the port of destination to the place of final destination. As mode-specific transport solutions have become increasingly less able to satisfy the needs of shippers and manufacturers, multimodalism has transformed the freight transport systems servicing international supply chains (OECD, 2001). Considering the main benefits that multimodal transport options may bring to the actors in the logistics chain, transport service providers and the countries where they operate have started to evaluate the alternatives which may emerge and the use of these alternatives in country's domestic and foreign trade (Denktas Sakar, 2010). Although recent literature on multimodal transport has mostly focused on developed economies with highly integrated supply chain systems (Islam et al., 2005), there is a need for the investigation of new emerging markets such as Turkey in terms of multimodal transport (Denktaş Şakar, 2010). Especially when the lack of academic studies regarding the multimodal transport alternatives and understanding of parties in terms of multimodal transport specifically between Turkey and landlocked countries is the case, there is a need for specific studies in order to reflect multimodal transport options.

The aim of this paper is to analyze various multimodal transport routes currently being used for fertilizer shipments from Serbia, landlocked to Turkey, focusing on a specific major fertilizer manufacturer/trader. The study is composed of three main parts. The next part focuses on the multimodal transport of bulk cargoes. Then, the research model and methodology are given. The third part analyses the case study of multimodal transport route alternatives between Serbia and Turkey focusing on the fertilizer shipments. In the final part, conclusions and suggestions are discussed.

1. Multimodal transport of bulk cargoes

Multimodal transport is well established in the general cargo and container shipping market, where cargo value, number of shippers and the different cargo mix allow for combinations of routes, modes and methods. Beside the general cargoes and containers some of the bulk cargoes such as iron ore, however, can present opportunities for multimodal transport although realistically it cannot be unitized (Beresford, Pettit, Liu, 2011). Nonetheless, some of the bulk cargo operations such as fertilizer transport operations share the same logistics imperatives as many other cargoes due to the pressure to reduce costs and seek opportunities to employ just in time strategy to supply their automated production sites.

Bulk cargoes are transported in large quantities, usually a shipload, to reduce the costs of transport. Stopford (2005) points out that the bulk cargoes have homogeneous physical characteristics and are carried in large quantities in order to reduce unit costs. The principle is that increasing the size of consignment on the shipping leg can reduce unit costs, which provides economies of scale. The

consequence is that dry and liquid bulk cargoes generally follow the "sea maximizing land minimizing" principle whereas general cargo potentially makes use of several modes in combination including "sea minimizing land maximizing" as logistics requirements and overall economics dictate (Beresford, Zhou, Pettit, 2007). In the case of fertilizer that is a high volume, low geared single commodity flow, the critical success factor is pipeline management. The volumes of bulk fertilizer moved are large, with a high weight-to-volume ratio, and shipments are regular. The transshipment process for vulk cargo is time consuming, labor and energy intensive and costly, forcing shippers and logistics service providers to concentrate their volume, and adopt economies of scale as far as possible (Beresford, Pettit, Liu, 2011).

The fertilizer helps ensure that farmers have the nutrients they need to grow enough crops to meet the world's requirements for food, feed and energy. Because of the level of crop production required for farmers to respond adequately to world market demand caused by rapid population growth, the use of organic manure alone is not sufficient. Fertilizers are also needed. Even in countries where a high proportion of organic waste is used as manure (and to supply other organic matter), fertilizer consumption has risen steadily.

2. Research model and methodology

Cost model of multimodal transport, which was originally proposed by Beresford and Dubey (1990) and developed by Beresford (1999) was used in this study. The model is stand-alone and flexible enough to be applied to any operational circumstances and to a supply chain of any length. The main elements of the model are costs, time, distance, transport mode and intermodal transfer. The cost model which is used here includes both transport (road, inland water, sea and rail) and intermodal transfer points (ports, rail freight terminals, ICDs) and it makes use of costs, time and distance components. The validity of this model is tested against a real case in international freight logistics, namely the export of goods from Vientiane in Lao PDR to Singapore, (Banomyong and Beresford, 2001), transport of whisky from Scotland to Greece (Beresford, 1999), flowers from Taiwan to China (Beresford et.al., 2006a), ATMs from Eire to China (Beresford et.al., 2006b), home textile from Turkey to UK (Denktaş Şakar, Beresford, 2009), foodstuff from Turkey to Germany (Önder, Deveci, Denktaş Şakar, 2010), and iron ore from Australia to China (Beresford, Pettit, Liu, 2011).

The main assumptions of the multimodal transport cost model are based on the premise that unit costs of carriage vary between transport modes and the steepness of the cost curves highlight that for volume movements, sea transport should be the cheapest per tone-km, road transport should normally be the most expensive (at least over a certain distance), and inland waterway and rail costs should be intermediate (Banomyong, Beresford, 2001, p. 665). A cargo handling

charge is levied at ports and inland terminals, without any progress being made along the overall chain and each vertical step in the cost curve represents the costs incurred (Beresford, 1999).

Even if the use of multimodal transport cost model is common in the context of containerized cargoes, an assessment of high volume/low value cargoes such as bulk cargoes using the cost model is very limited. Therefore this study analyzing the movements of fertilizers provides an original analysis of such supply chains of bulk cargo. The research focuses on the fertilizer transport chain of one major fertilizer producer/trader. The company, central concern to this study, is an international merchandising and trading company that markets, trades, distributes fertilizer and commodities (including petroleum coke and coal), ammonia, liquefied petroleum gas, and petrochemicals. The history of company spans more than 46 years. The company was formed in 1965 with the intention of specializing in the international trade of ammonia. Primarily data were collected through observation and a series of interviews with transport managers of a major fertilizer trader and with senior managers of shipping and logistic service providers. Original data were collected during spring 2012.

This study used a case study methodology to investigate the possible route combinations between Serbia and Turkey. Yin (2003:23) states that a case study is "an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident". It is a research approach that focuses on understanding the dynamics present within a single setting (Eisenhardt, 1989). It is argued that case study method is more suitable to answering “how” and “why” questions and where the researcher has little control or no control over events and subjects (Denktaş Şakar, 2010; Yin 2003). Case study was intended to obtain in-depth information in analyzing the multimodal transport alternatives for bulk cargo shipment between Serbia and Turkey. Import movement of fertilizers as bulk cargo from Serbia to Turkey was chosen for the case study.

3. The case of fertilizer shipments from Serbia to Turkey by multimodal transport

Turkey is one of the countries where the fertilizer consumption is very high (see Table 1). The production of fertilizer is not sufficient to meet the needs of growing, urbanized population in Turkey. Thus, Turkey imports fertilizer for mostly agricultural, chemical and energy related industries in order to ensure sustainable growth of related sectors. Growing fertilizer consumption in Turkey creates demand for fertilizer import.

Table 1. Fertilizer consumption in Turkey from 2002 to 2009

Year	Tones (per hectare of arable lands)
2002	72.79
2003	84.29
2004	85.62
2005	86.75
2006	91.83
2007	90.13
2008	71.95
2009	96,47

Source: World Bank, 2010. Annual Report.

Table 2. Fertilizer import in Turkey from 2005 to 2011

Year	Million tones
2005	755,397
2006	784,415
2007	997,460
2008	1,481,756
2009	1,057,507
2010	1,016,777
2011	1,374,434

Source: TURKSTAT, 2012a (http://www.tuik.gov.tr/PreIstatistikTablo.do?istab_id=623).

Growing fertilizer demand in Turkey increases the import fertilizer carriages from the fertilizer exporting countries. Turkey's trade partners in terms of fertilizer trade are given in Table 3. Serbia is one of the main trade partners in the fertilizer import of Turkey in 2011.

Table 3. Fertilizer imports of Turkey in 2011

No	Country	Imports (million Euro)
1	Russian Federation	254,176
2	Ukraine	222,947
3	Serbia	112,945
4	Tunus	79,985
5	Crotia	53,580

Source: TUIK, 2012b (http://tuikapp.tuik.gov.tr/disticaretapp/menu.zul).

Both Serbia and Turkey were defined at the Pan Europe Corridors (see Figure 1). Pan Europe Corridors ensure the efficiency of growing multimodal transport of European countries. Thus, Serbia is one of the good examples with its growing agricultural industry and has a capability to export its fertilizer to Turkey. Serbia is landlocked country in Central Europe. The country is surrounded

by five states: Romania, Macedonia, Bosnia-Herzegovina, Croatia, Hungary and Montenegro. Turkish national transport is mainly dominated by road transport. However, reliance on road transport in international context can create problems for Turkish companies. These problems are; delays occurring from the bureaucracy at the borders, the road restrictions on the way of crossing European countries, empty truck imbalances, interruptions in road transportation due to the weather conditions in the winter time and heavy traffic on the roads especially in the summer.

Figure 1. TEN-T Corridor "X" Branch C of the Ten Pan-European Transport Corridors

Source: Adopted from European Commission Web page (http://tentea.ec.europa.eu/en/ten-t_projects/map_library/overview_maps_02.htm).

Landlocked countries and emerging markets are good examples to show the efficient implementation of cost model of multimodal transport. Several studies (Banomyong, 1999; Banomyong, 2001) examined the transportation costs by focusing combination of modes and costs depending on route chosen at landlocked countries and their purpose is to find the most competitive route cost wise.

Table 4.Freight routing alternatives from Serbia to Turkey

Route	Origin	Mode	Transfer	Mode	Transfer	Mode	Destination
1	Packa Balanka	Inland Water	Constanta	Sea (in bulk)	Dikili	Road	Balikesir
2	Packa Balanka	Inland Water	Constanta	Sea (in container)	İzmir	Road	Balikesir
3	Packa Balanka	Road	Novi Sad	Rail	Halkali	Road	Balikesir

Source: Compiled from industry sources.

As it is given in Table 4, three main alternative routes currently being used by the logistics service providers and shippers are analyzed in the case study in terms of transport costs and transit times.

(1) All water in bulk via Dikili (Route 1)

Route 1 begins with Packa Balanka in Serbia and ends at the destination point of Balıkesir in Turkey (see Figure 2). Table 5 shows the main figures regarding the route, costs, distance and transit time. Inland water transportation is organized with barges in the first leg of the route. The distance of the first leg of the route is 935 km. Loading bulk fertilizers into the barges takes approximately 96 hours. The voyage by barges takes 3 days with the average speed. Using barges for inland water transportation is relatively cheaper mode compared to railway transportation especially in this region. It is taken into consideration that some time is spent for waiting the operation, causing the increase in transit time. Fertilizers must be stuffed in the port 2–12 hours before ship gives the notice of readiness (NOR). Fertilizer is very perishable cargo against humidity (70 % humidity is acceptable for the urea cargo). Loading operation of ship takes about 72 hours in Constanta Port. From Port of Constanta to Port of Dikili in Turkey, sea transportation is used. Discharging operations at the Port of Dikili takes approximately 72 hours and plus a 12-hour waiting time which is the average waiting time at the port, customs procedures and gate in. Then the cargo proceeds to the Balıkesir via road transportation which takes around 4 hours (average 70 km / hours) with costs of $ 31,670.

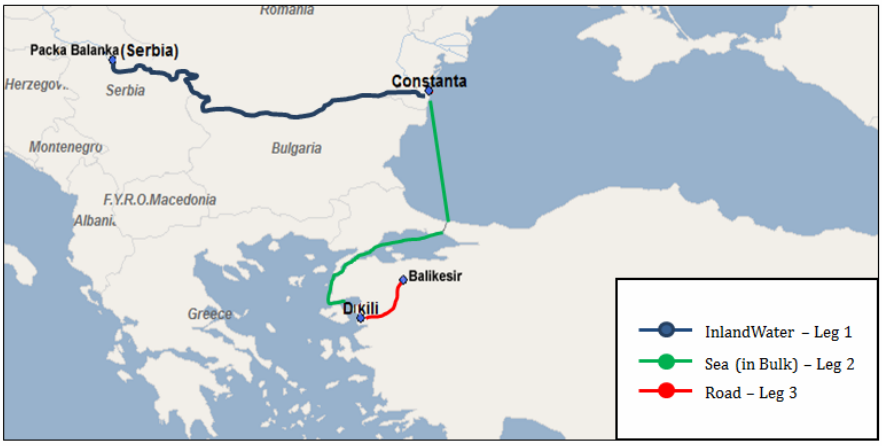

Figure 2. Map of Route 1

The total length of the route is 1,903 km. Overall transit time for the route 1 is 14 days 16 hours by all means of transportation and the cost is $ 188,769. Figure 3 shows the time distance and costs-distance graph of the route 1.

Table 5. All water in bulk option (Route 1)

Step	Legs	Mode	Transit time	Distance (km)	Cost ($)	Cost per distance
1	Packa Balanka (Serbia) –Constanta (Romania)	Inland Sea Transport	3 days 12 hrs	935	82026	89.82
	Pre-shipment formalities		1 day		453	
	Discharging to storage area from barges		3 days		1500	
2	Constanta (Romania) – Dikili (Turkey)	Sea Transport	3 days	804	71610	90.95
	Custom formalıtıes		1 day		510	
	Discharging cargo to road vehicles directly		3 days		1000	
3	Dikili (Turkey) – Balıkesır (Turkey)	Road Transport	4 hours	164	31670	193.11

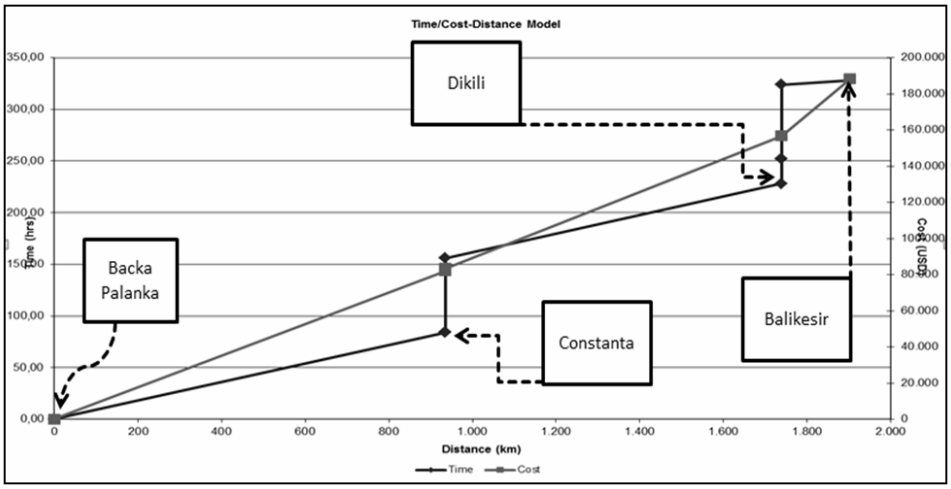

Figure 3. Time-distance and costs-distance for all water in bulk option (Route 1)

(2) All water in container (Route 2)

Second route option (as seen in Figure 5) is also dominated by sea transport but container shipping option is included in the Constanta-İzmir leg of the route. Fertilizers are packed in big bags, stuffed into the containers at the Port of Con-

stanta and then loaded on the container ships. Main leg of the route by container ship takes 3 days (see Table 6).

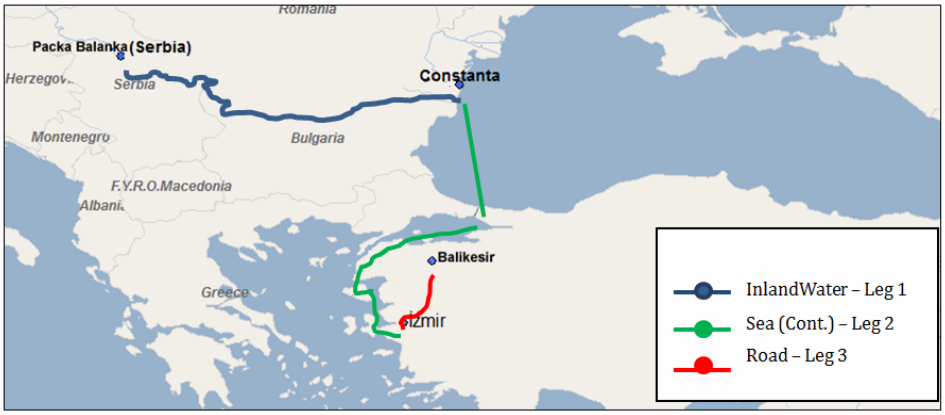

Figure 4. Map of Route 2

Total number of containers considered in this route is 130 FEU with 24 tones permissible load each. Total length of the second route is 1978 km. It takes 15 days 22 hours and the cost of the service is $ 229,372. Figure 5 shows the time distance and costs-distance graph of the route 2.

Table 6. All water in container option (Route 2)

Step	Legs	Mode	Transit time	Distance (km)	Cost ($)	Cost per distance
1	Packa Balanka (Serbia) – Constanta/ Romania	Inland Sea Transport	3 days 12 hrs	935	82026	91.49
	Pre-shipment formalities		1 day 6 hrs		453	
	Discharging to storage area from barges		3 days		1500	
	Packaging in big bags		2 days		2053	
	Terminal handling		1 day		1560	
2	Constanta (Romania) – İzmir (Turkey)	Sea Transport (Container ship)	3 days	804	104000	136.95
	Custom formalities		1 day		4160	
	Terminal handling		1 day		1950	
3	İzmir (Turkey) – Balikesir (Turkey)	Road Transportatıon	5 hrs	239	39585	165.62

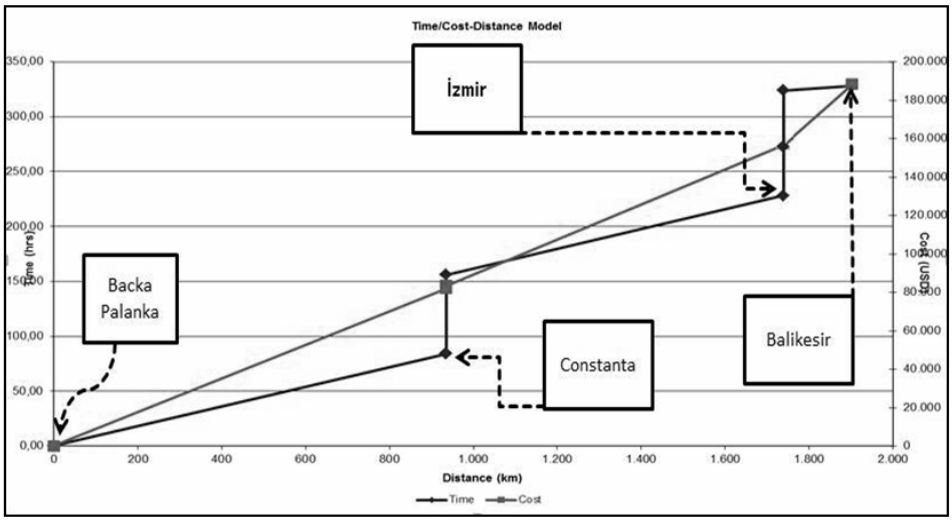

Figure 5. Time-distance and costs-distance for all water in container option (Route 1)

(2) Road-rail-road transport option (Route 3)

Route 3 (as seen in Figure 6) comprises combined road-rail-road transport between Packa Balanka (Serbia) and Balıkesir (Turkey). The main leg of the route 3 is railway.

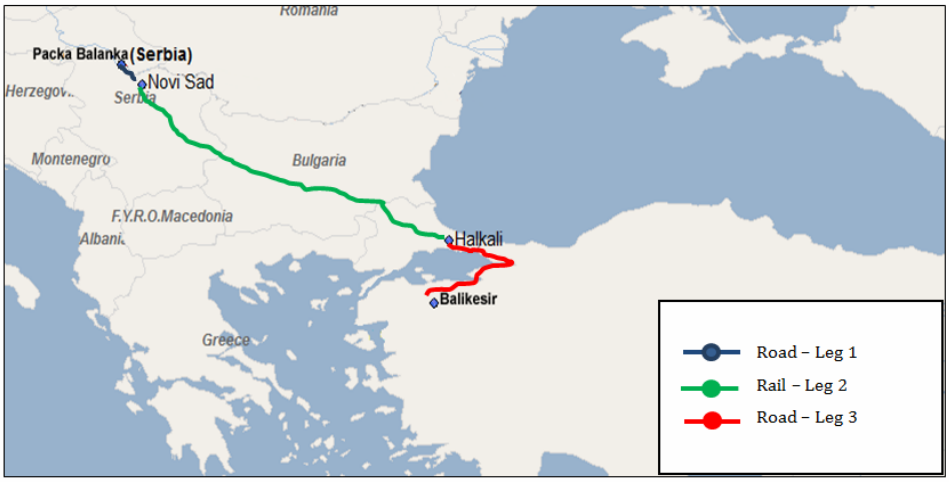

Figure 6. Map of Route 3

Cargo loaded on the trucks at the manufacturer's premises arrives at Novi Sad railway terminal in Serbia. Table 7 shows the main costs, distance and transit time data for route 3. There are 4 compositions used with 17 wagons and each

wagon has minimum 45 mt capacity. The distance is 1052 km from Novi Sad rail terminal to Halkalı (İstanbul) terminal and it takes 11 days 2 hours by rail. Five weekly trains are operated between Novi Sad and Halkalı terminal. Wagons are discharged at the Halkalı terminal. The cost of the discharging is $ 25 for each maneuvering. Transportation from Halkalı to Balıkesir takes 6 hours by trucks with the average speed of 70 km/hour. Figure 7 shows the time distance and costs-distance graph of the route 3.

Table 7. Road-rail-road option (Route 3)

Step	Legs	Mode	Transit time	Distan-ce (km)	Cost ($)	Cost per distance
1	Packa Balanka (Serbia) – Novi Sad (Serbia)	Road Transport	1 hour	40	2750	74.28
	Terminal handling		1 day 8 hours		221	
2	Novi Sad (Serbia) – Halkali (Turkey)	Rail Transport	7 days 2 hrs	1052	95000	92.58
	Custom formalities		1 day		950	
	Terminal handling		3 days		1440	
3	Dikili (Turkey) – Balikesir (Turkey)	Road Transport	6 hours	410	87420	213.22

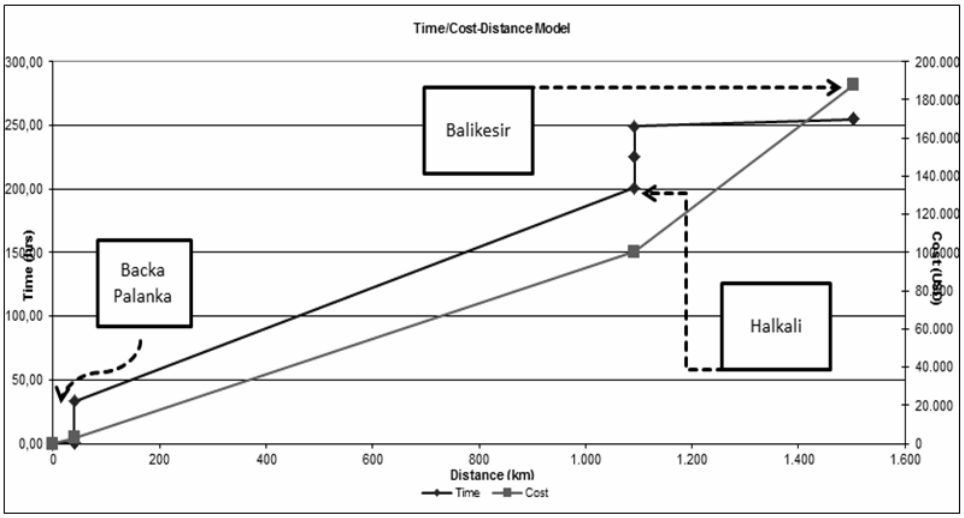

Figure 7. Time-distance and costs- distance for Route 3

Conclusions and suggestions

Multimodal transport can become more efficient by encouraging the development of alternative routes, not only within one transit country but also through different countries. Efficient multimodal transport is crucial for landlocked nations. This study analyzed possible route alternatives and mode combinations between Serbia (as a landlocked country) and Turkey by multimodal transport taking the bulk cargo shipment as a unit of analysis. Costs, transit time and distance-related data were considered. Beresford Cost Model assists countries to maintain aforementioned elements for effective operational performance in transit routes. It is suggested that cost model is not only useful in the unitized shipment; it is also a useful tool in analyzing the multimodal transport of bulk cargoes. Table 8 shows the comparison of the alternative routes analyzed in the study in terms of the costs, time, and distance.

Table 8. Evaluation of the Multimodal Route Alternatives from Serbia to Turkey for Fertilizer Shipments

Route	Mode	Distance (km)	Time	Cost ($)
Route 1 (Packa Balanka/ Serbia-Constanta/Romania-Dikili/Turkey-Balikesir Turkey)	Barge+Sea (in bulk)+Road	1903 km	14 days 16 hrs	188769
Route 2 (Packa Balanka/ Serbia-Constanta/Romania-İzmir/Turkey-Balikesir Turkey)	Barge+Sea (in container)+Road	1978 km	15 days 22 hrs.	237287
Route 3 (Packa Balanka/ Serbia-Novi Sad Ranzirna-Halkali/Turkey-Balikesir Turkey)	Road+Rail+Road	1502 km	12 days 16 hrs.	187781

Both route 1 and route 2 have around 14-15 days transit time. But route 2, which uses unitized transport by sea, has a longer transit time compared to other routes due to the time spent in packing of fertilizers in big bags and stuffing into the containers. Cost figures are also different in route 2 when compared to other routes due to the costs of the terminal operations for containers. While rail transportation in route 3 represents 70 % of the total distance, it accounts for 52 % of the total costs. Hinterland connection of ports by rail in Turkey is weak. Hence, railway leg of the multimodal transport to/from Turkey is limited. Considering the crucial importance of railways in multimodal transport Turkey has started to invest heavily in rail infrastructure recently. The landlocked countries should be

urged to initiate in close cooperation with other countries along the transit routes to develop multimodal transport routes for accessing the international markets.

Due to the customer requirements in the supply chain of some of the bulk cargo trade, cargoes have become containerized in emerging markets. For bulk cargoes such as fertilizer, several routes, modal combinations and handling methods may successfully be applied. Some of findings, such as the principle of "sea maximizing and land minimizing" for heavy cargoes fit comfortably with logistics theory for cost minimizing, but on the margins there can be room for alternative solutions for optimizing transit times. Sea transportation with general cargo vessel can be logical and cheaper when it is used in long distance as intermediate leg of the transportation. Using barge for inland transportation is the cheapest, hard to reach and also the long-timed when compared to other modes. Although there is a trend for the containerization of bulk cargoes in international trade and transport containerization of bulk commodity is still more expensive compared to bulk shipping. In contrast with container shipping, the carriage of bulk cargo has its own characteristics. The shipment volume of bulk cargo transport is large, transport chain is generally long, and holding this type of cargo in standard packing units, like container is difficult and costly. Hence the volume capacity of transport modes for such kind of cargo needs to be large.

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FUTURE CHALLENGES FOR BALTIC MARITIME TRANSPORT AFTER THE RECESSION

1. Structure and development of Baltic maritime transport

1.1. Baltic maritime transport

The Baltic Sea is very transport-intense. Its share in world sea-borne trade is in the range of 7 to 8 per cent (see Table 1). The reason for this extraordinary percentage is on the one hand the high internationalization of Baltic economies and on the other hand the pronounced logistics- intensity of leading industrial cluster in the Baltic Sea region and its hinterland, so of the oil and chemical sectors, coal mining, steel and metal industries, wood processing, the production of electric and electronic devices. Furthermore, foreign trade of several Baltic Sea countries to a high extend is realized by sea transport rather than other transport modes. In Finland, for instance, the share of sea transport in foreign trade is 80 per cent.

In the Baltic we find all the cargoes and transport technologies, which are known in world shipping (see Table 2), although in some sectors in a special expression reflecting the relative shorter sea distances and the limits for ship size, because of the maximal water depth of 17 m in the sea's entrance.

Table 1. Baltic Seas' position in world seaborne trade

Type of cargo	Year	World[1] (mill. Tons)	Baltic Sea[2] (mill. Tons)	Share of Baltic Sea (%)
Total	2007	7.882	625	7,9
	2008	8.168	620	7,6
	2009	7.843	580	7,4
Oil / Liquid bulk	2007	2.705	274	10,1
	2008	2.749	267	9,7
	2009	2.649	264	10,0
Main bulks / dry bulks	2007	2.013	144	7,2
	2008	2.097	153	7,3
	2009	2.113	139	6,6
Other dry cargoes	2007	3.164	208	6,6
	2008	3.322	201	6,1
	2009	3.081	177	5,7

Source: [1] UNCTAD; [2] own estimation based on EUROSTAT and Russian port statistics.

Table 2. Structure of Baltic Sea transport according to traffic relation and transport technology

Traffic relation	Transport technologies / operation modes		
	manufactured goods / general cargo	raw materials / bulk goods	passengers
Baltic external traffic	container feeder services (ro/ro services)	medium size tankers medium size bulk carriers system carriers	cruise ships
Baltic internal traffic	ferry lines ro/ro services	handyand medium size tankers and bulk carriers system carriers	ferry lines cruise shipping

Source: Structure of Baltic Sea transport according to traffic relation and transport technology.

1.2. Development of cargo handling in Baltic ports

In 2007 the total amount of cargo handling in all Baltic Sea ports amounted to 830 million tons. That was an increase to 192 per cent compared to the deepest point in 1992/93, which was caused by the transformation crisis in Eastern ports of the region (see Table 2).

Due to the recession starting in the last month of 2008, in that year 825 million tons were reached, but in 2009 a drastic drop to 744 mill. tons had to be registered followed by a recovery to 810 million tons in 2010.

Table 3. Development of cargo handling in Baltic Sea Ports by country (mill. tons)

	1988/89	**1992/93**	**1994/95**	**2000**	**2005**	**2007**	**2008**	**2009**	**2010**	**2010: precrisis maximum (%)**
Germany	53	40	50	53	52	58	58	50	54	93,1
Denmark*	93	93	99	97	100	110	106	91	87	79,1
Sweden	119	117	126	159	178	185	188	162	180	95,7
Finland	67	71	87	92	00	116	115	93	109	94,0
Rusia	30	12	15	38	141	174	175	171	177	101,1
Estonia	43	28	15	40	47	45	36	38	46	102,2
Latvia	43	28	39	52	60	61	61	60	59	96,7
Lithuania	21	15	13	23	26	29	36	34	38	105,6
Poland	52	44	52	48	55	52	49	45	60	15,4
Total	**487**	**432**	**496**	**601**	**758**	**830**	**825**	**744**	**810**	**97,6**

* including North Sea Ports; until 1995 national statistics

Source: Baltic Institute Rostock using EUROSTAT, national statistics, ports data.

2. Volume and development of Baltic maritime transport according to cargo groups

2.1. Structure and volume of Baltic maritime transport in 2010

In 2010 Baltic maritime transport amounted to about 610 million tons compared to 580 million tons in 2009 and 620 million tons in 2008. But only for ports with at least 1 million tons of cargo handling annually comparable statistics from EUROSTAT broken down to cargo groups and destinations are available.

Table 4, therefore, contains 584 million tons for 2010, 534 million tons for 2009 and 584 million tons for 2008. That means, that 7 to 8 per cent of the whole transport is going through smaller ports, especially in Finland, Sweden and Denmark.

According to cargo groups, liquid goods present the highest transport volumes, their share is summing up to more than 40 per cent. That mainly is raw oil and oil products, but also chemicals. Nearly 60 per cent of the tanker transport is Russian export going through the Russian ports of Primorsk, St. Petersburg, Kaliningrad and Vysotsk, but also in transit through Tallinn, Ventspils and Klaipeda.

Table 4. Structure of Baltic maritime transport according to type of cargo

Type of cargo	Year	Total		Baltic exernal transport		Baltic internal transport	
		mill. tons	share (%)	mill. tons	share (%)	mill. tons	share (%)
Liquids	2008	251	43,0	184	73,3	67	26,7
	2009	251	47,0	188	74,9	63	25,1
	2010	257	44,0	191	74,3	66	25,7
Dry bulk	2008	144	24,7	105	72,9	39	27,1
	2009	130	24,3	98	75,4	32	24,6
	2010	144	24,7	106	73,6	38	26,4
Ro-Ro	2008	71	12,2	13	18,3	58	81,7
	2009	59	11,1	10	16,9	49	83,1
	2010	65	11,1	10	15,4	55	84,6
Container	2008	59	10,1	54	91,5	5	8,5
	2009	48	9,0	43	89,6	5	10,4
	2010	58	9,9	52	89,7	6	10,3
Break bulk / other general cargo	2008	59	10,1	44	74,6	15	25,4
	2009	46	8,6	35	76,1	11	23,9
	2010	60	10,3	46	68,5	14	23,3
Total	2008	584	100	400	70,0	184	31,5
	2009	534	100	374	69,3	160	30,0
	2010	584	100	405		179	30,7

Source: own estimation using data of EUROSTAT and Baltic Ports.

The second largest group of cargoes is dry bulk with about 25 per cent of all transports. Here coal, iron ore and grain as well as fertilizers and respective raw materials and building materials like cement, stone and gravel can be mentioned.

From Table 3 it can be seen that more than 70 per cent of liquid and dry bulk cargoes are external transports, where either the outgoing or the ingoing port is outside the Baltic Sea region.

The other 3 cargo groups are much smaller with 12 to 10 per cent each. Higher value investment goods and consumer articles on the Baltic are handled by two technologies. In Baltic external trade container feeder services are dominating, but in Baltic internal transport this function is realized by ferries and ro-ro ships.

The final group, which Eurostat is calling "other cargo", includes break bulk and other general cargoes not included in the container and ro-ro segments. Here we find three sub-groups: Forestry products with about 50 per cent of the groups' volume, then iron and steel with 25 per cent and other general cargo also with nearly 25 per cent.

The geographic pattern of Baltic maritime transport is shown in Table 5. Taking the volume of ports' cargo handling, between 3 groups of countries can be distinguished: Russia and Sweden are in the lead, followed by Finland and the third group includes Denmark, Poland, Latvia, Germany (Baltic), Estonia and Lithuania.

The largest stream of goods runs between Russia and the Netherlands. Other cargo streams larger than 10 million tons are moving between Sweden and Denmark, inside Denmark, inside Sweden, between Sweden and Finland, between Germany (Baltic) and Sweden, Russia and Finland, Germany (North Sea) and Russia, between Sweden and United Kingdom, between Latvia and the Netherlands, as well as between Sweden and Norway.

Table 5. Origin and destination of main ports' maritime goods flows in the Baltic Sea 2010 (1000 t)

Partner countries	Reporting countries									
	Denmark (Baltic)	Estonia	Finland	Germany (Baltic)	Latvia	Lithuania	Poland	Sweden	Ryssia (Baltic)[2]	Sum
Baltic Sea ports	**48.611**	**14.406**	**59.282**	**41.818**	**17.173**	**17.299**	**20.573**	**94.340**	**43.558**	**357.060**
Denmark	18.846	1.697	1.758	6.414	1.502	789	2.278	17.761	1.947	52.992
Estonia	288	179	5.445	702	1.688	558	307	2.318	1.955	13.440
Finland	1.311	5.595	8.005	8.172	3.181	366	2.439	15.459	14.240	58.768
Germany (Baltic)	8.857	250	8.147	146	2.612	2.166	952	16.253	3.351	42.734
Latvia	934	1.500	3.332	2.286	205	337	1.197	4.719	445	14.955
Lithuania	809	438	285	2.074	260	–	1.774	2.420	8.472	16.532
Poland	1.366	432	2.442	1.108	1.417	2.450	568	7.112	3.265	20.160
Sweden	14.478	2.360	15.628	17.565	5.863	2.161	7.793	18.415	9.883	94.146
Ryssia (Baltic)	1.722	1.955	14.240	3.351	445	8.472	3.265	9.883	–	43.333
non Baltic ports	**24.774**	**29.215**	**39.297**	**9.457**	**39.936**	**20.569**	**38.375**	**66.746**	**133.372**	**401.741**
Belgium	657	239	4.924	165	2.131	1.304	2.515	8.844	8.903	29.682
France	627	534	1.322	817	1.540	835	1.823	1.856	4.410	13.764
Germany (North Sea)	3.397	1.387	6.329	446	3.566	1.596	4.938	5.888	17.170	44.717
Netherlands	2.537	8.339	7.758	798	12.258	3.604	7.360	7.555	31.209	81.454
Norway	5.328	917	2.564	2.221	1.044	906	3.487	10.757	1.464	28.688
Spain	572	436	1.280	385	883	563	1.642	1.576	6.046	13.383
United Kingdom	2.560	1.047	4.236	1.067	4.010	1.352	3.904	12.377	6.809	37.362
Others	9.096	16.316	10.884	3.558	14.504	10.373	12.706	17.893	57.361	152.691
Total	**73.385**	**43.621**	**98.579**	**51.275**	**57.109**	**37.868**	**58.948**	**161.086**	**176.990**	**758.801**

[1] Data as reported by partner countries, total according to Russian port statistics

Source: Baltic Institute Rostock according to EUROSTAT, Russian port statistic.

2.2. Baltic maritime transport in the recession

Baltic maritime transport and cargo handling of ports was severely hit by the financial and economic crisis in world economy and in economy and trade of

Baltic Sea countries. For more than a decade, the Baltic Sea Area was among the European regions with the highest economic growth. That was true for Finland, Sweden and Denmark from the developed market economies compared to the EU average and the new market economies showed very high growth rates. But now in the recession it was going the other way round. Especially the Baltic republics (Estonia, Latvia and Lithuania) saw GDP decreases of 14 to 18 per cent in 2009 and the rate in Russia was minus 8 per cent. Finland had the same downfall, whereas Germany, Denmark and Sweden came to about 5,0 per cent each. Only Poland was better off, reaching even a small increase in 2009.

The shrink in transport started in the second half of 2008, already. Then in the second quarter of 2009 the deepest point has been reached.

We see from the comparison of cargo handling amounts between the second quarter of 2009 and 2008, that all cargo types were affected (Figure1). But the strength of the slump was quite different: Liquid bulk minus 7 per cent only, dry bulk minus 18 per cent, ferry and ro-ro cargoes minus 24 per cent, container goods minus 22 per cent and break bulk even minus 31 per cent.

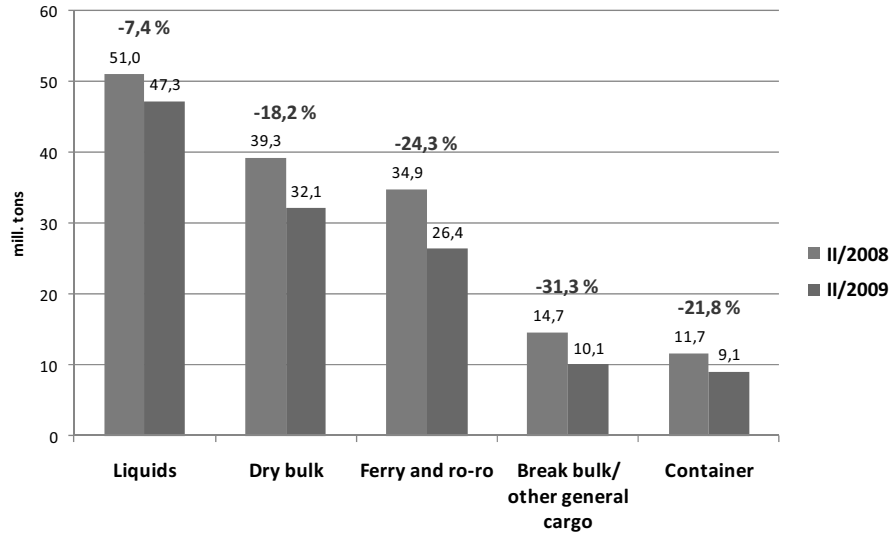

Figure 1. Cargo handling in Baltic Sea ports – Comparison of II/2009 to II/2008 according to type of cargo (without Russia)

Source: BIR using EUROSTAT data.

In the third and fourth quarter of 2009, a slight increase occurred already, so the whole figures for 2009 compared to 2008 were a little bit better than in the second quarter. The total cargo amount was down to 90 per cent with liquids and

dry bulk above this average and container, ro-ro goods and break bulk lower than the average.

As one of the results the structure according to cargo types changed in 2009. The share of liquids increased to 45 per cent, dry bulk was constant, but ferry and ro-ro cargoes as well as container went down.

In 2010 the recovery confirmed. Whereas in Poland, Lithuania, Estonia and Russia the pre-crisis maximum could be passed, already, in Denmark, Germany, Finland and Sweden the cargo handling amount remained under the level of 2007/2008 (see Table 2). According to cargo groups liquid goods were above the pre-crisis maximum, whereas ro/ro goods could not yet totally close the gap.

3. Overriding trends influencing the future of Baltic maritime transport

Trying to look into the future, it seems to be appropriate to start from over-riding tendencies and trends. In this connection it is quite interesting to realize, that not all global trends are likewise relevant in the Baltic Sea region.

1. **An important example can be found in the demographic development.** Whereas world population also in future is rapidly growing, the number of inhabitants in most countries of this region is decreasing or stagnating (see Table 6). According to the actual United Nations forecast world population will increase from actual 7 billion (October, 31st) billion to 9,3 billion in 2050, that means to 135%. In our Baltic Sea region, only Sweden will have a re-markable increase, Denmark and Finland grow in a smaller range. But the number of inhabitants in all the other countries will go down.

Table 6. Population development in Baltic Sea countries – long term szenarios *

Country	1990	2010	2030	2050	2050:2030 (%)
Sweden	8,7	9,4	10,4	10,9	116
Denmark	5,4	5,6	5,7	5,9	105
Finland	5,0	5,4	5,6	5,6	104
Estonia	1,6	1,3	1,3	1,2	92
Poland	38,2	38,3	37,8	34,9	91
Germany	79,1	82,3	79,5	74,8	90
Russia	148,2	143,0	136,4	126,2	88
Lithuania	3,7	3,3	3,1	2,8	85
Latvia	2,7	2,3	2,1	1,9	83
Europe total	**720,5**	**738,2**	**741,2**	**719,3**	**97**

Source: United Nations, Department of Economic and Social Affairs, Population Division.

So world seaborne trade will profit tremendously from population growth, but this factor will not have a positive effect in our region.

2. We think that **internationalization and globalization of production and trade will continue also in the coming years.**

In the newest technical press there were statements, that the trend of shifting of industries from Europe to Asia is turning around and is replaced by re-transfers. But if we look in the relevant statistics very carefully, this interpretation is not confirmed. What really can be seen is that the dynamic of transfers in the recession was going down and that production in China is increasingly complex more and more avoiding European deliveries of fabrication parts.

Growth of international transport will go on, for several reasons likely with lower growth rates.

3. **Structural changes in the energy sector** will have important effects on maritime transport.

The German decision to out-phase nuclear energy can be mentioned, the increasing use of alternative energies etc. All that will influence the demand side as well as the supply side of the transport market.

4. And of course the greening of economy and transport against the background of increasing fuel costs is a mega-trend. The fight to hold the earth-warming in the limit of two degrees needs substantial contributions also from sea transport. Here the special status of the Baltic Sea is reflected in a series of regulations in force and under way which is challenging the transport industry.

4. Some trends and challenges for Baltic maritime transport and ports

4.1. Future transport and cargo handling growth

With recovery in place, it is an interesting question, if Baltic maritime transport will come back to pre-crisis growth. On the one hand there are good conditions in the economy of Baltic Sea states for further growth. But on the other hand, severe uncertainties and risks must be seen. There is a danger that the crisis in the monetary and budgetary field may hamper the real economy again.

Since the middle of the 1990s Baltic maritime transport increased considerably (see Table 6) with a compound annual growth rate in cargo handling of 3,2 per cent from 1995 to 2010 and even 4,7 per cent in the period 2000 until 2007.

Container traffic had the strongest growth followed by ro/ro cargoes and liquids, dry bulk increased only slightly and break bulk / other general cargo even diminished (see Table 7).

Assuming that future growth rates may be a little bit slower than in the last 15 years, in TABLE 7 two scenarios are drafted, which cannot claim the quality of a forecast (see Table 8). The first scenario with an annual growth rate of 3,0 per cent is thought to reflect macroeconomic conditions without severe disturbances,

whereas the second with 1,5 per cent is less optimistic, for instance because of negative effects of the dept crisis.

Table 7. Dynamic of cargo handling in Baltic Sea ports according to type of cargo

Cargo group	Period	CAGR* (%)	Period	CAGR* (%)
Liquids	2004–2007	7.0	2004–2010	3.9
Dry bulk	2004–2007	1.7	2004–2010	1.7
Ro/ro	2000–2007	7.4	2000–2010	4.6
Break bulk / other general cargo	2004–2007	–3.1	2004–2010	–1.1
Container	2000–2007	13.8	2000–2010	9.2
Total	**2000–2007**	**4.7**	**2000–2010**	**2.8**

* compound annual growth rate

Source: Baltic Institute Rostock.

Table 8. Scenarios for future cargo handling in Baltic ports (million tons)

	2011	2025	
		Scenario I [1)]	Scenario II [2)]
Total	834	1.262	1.027
There of developed marked economies	431	495	647
New market economies	429	767	560

1) Annual growth rates – total 3,0%, developed market economies 1%, new market economies 4,4%

2) Annual growth rates – total 1,5%, developed market economies 0,6%, new market economies 2,1%

Source: Baltic Institute Rostock.

The result of more than 1,2 bill. tons respectively 1,0 bill. tons in 2025 would mean about 950 mio. tons respectively 770 mio. tons of maritime cargo transport.

That shows: Baltic maritime transport and ports is a growth sector. The conclusion is that also in future increase of efficiency as well as investments in additional port capacity and hinterland transport connections are necessary.

But it is not only the growth prospect what is of interest. We also have to look for structural changes as an outcome of the recession as well as new developments in economy and trade. A far reaching trend was mentioned, already – structural changes in the energy sector. That includes the increase of alternative energies. Off-shore wind parks are under development, for instance along the German Baltic coast. Several ports will have different functions, in the construction stage as well as the operating stage. The production of bio-diesel is followed by new transport demand, LNG is on the increase. Coal is the fossil source of energy with the highest reserves and its sea transport amount may increase, al-

though its role is very ambiguous, because of high emissions affecting the climate. Many challenges for maritime transport and ports will arise from such new developments.

4.2. Regional distribution of cargo streams

Considerable structural changes occurred in the regional distribution of cargo streams and in the countries` importance as origin or destination of goods.

The new market economies had a much stronger increase of maritime transport than the traditional market economies (see Figure 2).

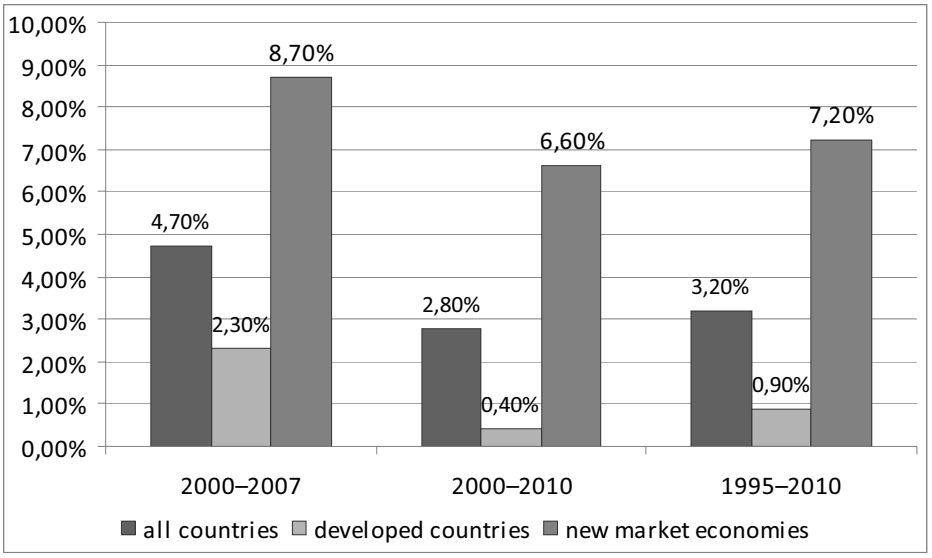

Figure 2. Annual growth rates of Baltic ports' cargo handling

If we take the period from 1995 to 2010, their compound annual growth rate in cargo handling was 7,2 per cent, compared to 0,9 per cent of the Nordic countries and Germany. The new market economies increased their share in Baltic cargo handling from 27 per cent in 1995 up to 48 per cent in 2010 (see Figure 3).

From the year 2000 onwards Russia had become the main driver of transport growth. On the one hand Russia extended port capacities and constructed new ports what allowed to increase cargo handling from 38 to 174 million tons between 2000 and 2008. Having furthermore in mind, that big parts of cargo handling in Estonia and Latvia is transit mainly for Russia and including transit through Finland, we come to the conclusion, that nearly one third of all cargoes handled in Baltic Sea ports is foreign trade from Russia, in 2000 that share was 20 per cent only.

And it is not only the shipment of oil, which brings Russia in the first position. But also in the container sector we had dramatic changes. In 2006 Russia passed Finland and Sweden in the number of container handled and now has the leading position with as much as 28 per cent of Russian ports (see Figure 4). Also Poland and the Baltic republics increased their shares constantly.

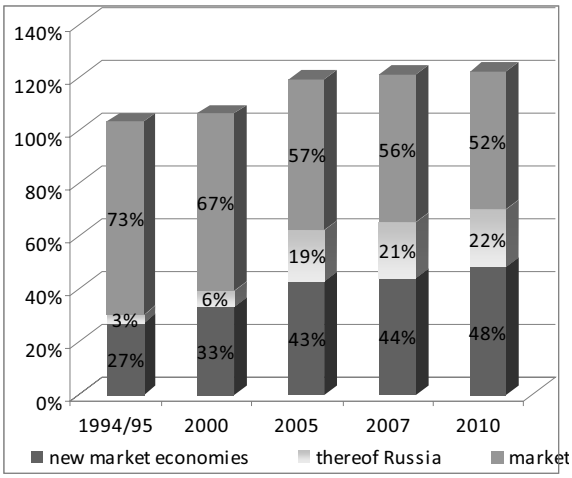

Figure 3. Dynamic of cargo handling in Baltic Sea ports according to groups of countries

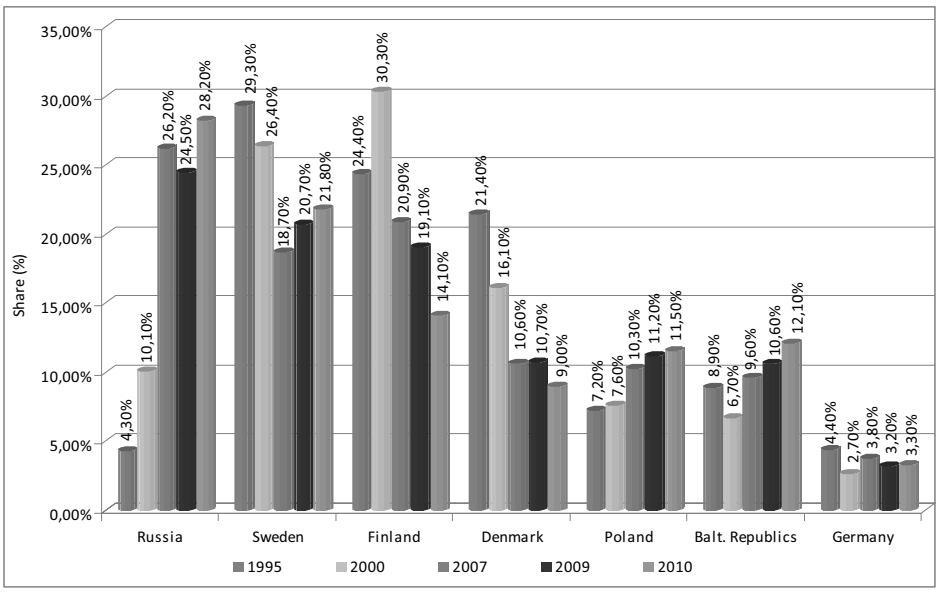

Figure 4. Changes in shares of container handling in BSR according to countries

Source: BIR according to Ocean Shipping Consultants; Eurostat; National Statistics Services; Port Authorities

These regional tendencies may continue in the future, although also in this respect the dynamic of the change can be expected to go down. The future scenarios mentioned in chapter 0, therefore, used higher growth rates for new market economies in comparison with the Scandinavian countries and Germany (see Table 8).

4.3. Hinterland connections of ports

Ports are links in transport chains and in logistical chains, their position has to be seen from a supply-chain-management view. Very often these chains reach far in the hinterland. Efficient hinterland transport connections are of utmost relevance.

For ports in Mecklenburg-Vorpommern, for instance, liquid and bulk cargoes mainly are going to or coming from a hinterland in a radius of 300 km. But in the ferry and ro/ro segment for about 75 per cent of all cargoes the hinterland is in a distance of at least 700 km, for about 60 per cent the hinterland is in middle, south, southeast, east and west Europe.

In many other ports of the Baltic Sea also bulk and break-bulk cargoes have a far-distant hinterland, sometimes they are serving transit transports for different countries.

Therefore it can be generalized by formulating: Many Baltic ports are included in Europe-wide transport chains performing important functions not only for Baltic Sea countries, but for wider parts of Europe.

That really is a strong reason to adequately include Baltic ports in the Trans-European Core Network under preparation.

In its proposal the EU Commission included several Baltic ports as "core port" (see Table 9).

Table 9. Proposed "core ports" for the TEN-T core network

Country	Port
Denmark	Aarhus/Copenhagen
Sweden	Gothenburg, Luleå; Malmö, Stockholm, Trelleborg
Finland	Helsinki, Kotka/Hamina, Turku
Estonia	Tallinn
Latvia	Riga, Ventspils
Lithuania	Klaipeda
Poland	Gdansk, Gdynia, Szczecin
Germany (Baltic)	Rostock, Lübeck

Source: European Commission: COM (2011) 650; SEC (2011) 1212; SEC (2011) 1213.

These ports are included in the suggested core network of international transport infrastructure:

1. **Baltic Adriatic Corridor**
   - Helsinki – Tallinn – Riga – Kaunas – Warszawa – Katowice
   - Gdynia – Katowice – Ostrava – Brno – Wien
   - Wien – Graz – Udine – Venezia
   - Graz – Maribor – Ljublana – Triest/Koper – Venezia – Ravena
2. **Warszawa – Berlin – Amsterdam Corridor**
3. **Hamburg – Rostock – Constanta – Burgas – Piraeus – Lefcosia Corridor**
   - Hamburg – Berlin
   - Rostock – Berlin
   - Berlin – Praha – Brno –Bratislava –Budapest – Bucuresti – Constanta – Sofia – Thersaloniki – Priraeus - Lefkosia
4. **Helsinki – Valetta Corridor**
   - Helsinki – Stockholm – Malmö – Copenhagen – Hamburg (incl. Fehmarn)
   - Hamburg – Hannover – Nürnberg – München – Verona (incl. Brenner Base Tunnel) – Rom – Napoli – Valetta

The revision of the TEN-T guidelines has to be decided on by the European Parliament and the Council. Hopefully in this process strong position of ports and hinterland connections will be confirmed. At the same time, it is necessary to strengthen the position of railway transport in port hinterland connections with the aim to reach a higher share of multimodal transport of container, swap bodies and trailers, especially in Eastern European countries.

In the Baltic Sea Region it is likewise important to improve the hinterland connection to Russia and other non-EU countries. As political instruments for a coordinated development, the Northern Dimension Partnership on Transport and Logistics can be used.

4.4. Baltic maritime transport and the environment

In its first holistic assessment of the environmental status of the Baltic Sea the Helsinki Commission found that it is generally impaired[1]. There are only some positive exemptions in the Gulf and the Bay of Bothnia. HELCOM agreed upon the ambitions aim to reach a healthy Baltic Sea until 2021.

Main threats today are eutrophication caused by nutrient pollution from agriculture, hazardous substances affecting living organisms and bottom sediments and unsatisfactory status of biodiversity. That means, sea transport and ports are not among the most important polluters. But nevertheless, they also are challenged to improve their sustainability. The main negative effects of shipping include air emissions, illegal and accidental discharges of oil, hazardous substances and other waste and the introduction of alien organism via ships' ballast water

[1] Helsinki Commission: Ecosystem Health of the Baltic Sea. HELCOM Initial Holistic Assessment, Baltic sea Environment Proceeding no. 122, Finland.

and hulls. Therefore, the EU Baltic Sea strategy in priority 4 formulates the aim for the Baltic Sea area "to become a model region for clean shipping".

World shipping as well as ports today are confronted by the demand to contribute to the reduction of CO_2 emission, in order to hold the global warming in the order of plus two degrees; Baltic maritime industry, of course, is included. But because of the special conditions, for our Baltic Sea in other fields of environment protection stricter rules are implemented already and will be considered.

In the framework of the International Maritime Organization (IMO) and the MARPOL International Convention for the Prevention of Pollution from Ships our Baltic Sea got the status as a Emission Control Area (ECA). According to Annex VI of MARPOL 73/78 the sulphur content of marine fuel oil in designated SO_x Emission Control Areas (SECA) has to be limited to 1,0 % by 2010 going further down to 0,1% by 2015 (see Figure 5).

- **SECA/ECA**
  - 1,5% until 1 July 2010.
  - 1,0% from 1 July 2010
  - 0,1% from 1 January 2015
- **Global**
  - 4,5% until 1 January 2012
  - 3,5% from 1 January 2012
  - 0,5% from 1 January 2020 (possible postponement until 2025)

Figure 5. Sulphur content of marine fuels
(according to MARPOL Annex VI, Regulation 14)

That has raised strong concern among shipping lines. They argue, that they have to switch to marine gas oil with much higher fuel and operating costs. In several studies prepared in Sweden, Denmark, Belgium and Germany (see Figure6) it was demonstrated, that this 0,1% limit will burden not only maritime transport, but also the export and import industries. And more than that: Increasing costs for maritime transport will weaken its competitive position compared with road transport and that will result in a modal back shift from sea to road with higher negative effects for climate and environment.

- **Consequences of the IMO`s new marine fuel sulphur regulations**
  Swedish Maritime Administration
  Consequences of the IMO`s new marine fuel sulphur regulations
  Norrköping, 15 April 2009

- **Sulphur content in ships bunker fuel in 2015. A study on the impacts of the new IMO regulations on transportation costs**
  Ministry of Transport and Communication Finland
  Juha Kalli, Tapio Karvonen, Teemu Makkonen, Centre for Maritime Studies, University of Turku
  Helsinki, 09 April 2009
- **Analysis of the Consequences of Low Sulphur Fuel Requirements**
  European Community Shipowners` Association
  Report drafted by Prof. Dr. Theo Nottebom, University of Antwerp and Dr. Eef Delhaye, Kris Vanherle, Transport and Mobility
  Leuven, 29 January 2010
- **Reducing the sulphur content of shipping fuels further to 0,1% in the North Sea and Baltic Sea: Consequences for shipping in this shipping area**
  Prof. Dr. Burghard Lemper et al.
  Institute of Shipping Econimics and Logistics
  Bremen, September 2011

Figure 6. Studies on impact of new IMO regulations for sulphur content in ships bunker fuel

That means, the prospects for future growth of Baltic maritime transport mentioned in chapter 0 would be seriously hampered.

Up to now (January, 2012) it is unclear, what the outcome of the on-going discussions will be. In any case, it has to be learnt, that possible impacts of environmental regulations have to be studied carefully, before decisions are taken.

So it is clear, that future Baltic maritime transport is not only determined by the development of economy and trade, but also from regulations in the field of environment and climate.

Gül Denktas Sakar
D. Ali Deveci

INTERMODAL TRANSPORT-ORIENTATION OF PORTS: A FOCUS GROUP STUDY?[1]

Abstract

Ports as interchange points in the intermodal transport have an increasing effects on the success of the overall logistics and supply chain performances. Although supply chain orientation of ports has been widely studied in the literature, a very limited research has been based on the intermodal transport-orientation of ports. The level of port integration with supply chains is assumed to be at different levels depending on the development levels of the countries and there is a need for detailed investigation of ports' intermodal transport-orientation in the emerging countries such as Turkey. Therefore this research focuses on the ports in Turkey in terms of intermodal transport. Turkey has a great potential in intermodal transport but lacks efficient intermodal transport infrastructure and facilities such as ports and logistics centers hinders the utilization of this potential. Developments which took place recently in Turkish port environment have driven Turkish ports to intermodal transport-orientation. This study primarily aims to contribute to the relevant literature by considering the intermodal transport-orientation of ports and exploring the main characteristics that an intermodal transport-oriented port should have in general and to assess the extent of intermodal transport-orientation of ports in the Aegean region of Turkey in particular. Following the introduction, Section 2 of the study reviews the relevant literature and explores the relationship between the intermodality and ports. Section 3 and 4 presents the developments in intermodal transport in Turkey and factors driving Turkish ports to intermodal transport-orientation respectively. Section 5 outlines

[1] This study was presented at World Conference on Transport Research Society (WCTR)-Special Interest Group 2 Conference titled "Key Developments in the Port and Maritime Sector" held in Antwerp, 21-22 May 2012.

the focus group methodology employed in the research. The results of the study are discussed in Section 6 and the final section presents the conclusion with strategic policy implications and further research.

Introduction

Ports are integral parts of the logistics chains and their level of integration with intermodal transport and hinterland can be suggested as a new field in transportation research. As the role and context of ports have changed due to increasing globalization, international trade and advances in transportation, new dimensions of ports' integration with supply chain systems have emerged. Intermodal transport orientation or capabilities of ports as an interim stage of the supply chain integration of ports have become one of the important dynamics of port environment in newly emerging countries such as Turkey. Due to high share of hinterland transport costs within total logistics costs, intensive competition in the port industry and emergence of new inland structures such as inland container depots, distribution centers, intermodal terminals, dry ports and logistics centers, there is an increasing awareness of intermodal transport-oriented evaluation of ports. Despite an increasing awareness regarding the recent developments taking place at ports, the level of ports adaptation to these developments may be different depending on the regions and the countries. Hence, there is a need for focusing on a specific country, even a specific region when evaluating the intermodal transport-orientation of certain ports. Within the scope of this study, Turkey and specifically Aegean region was selected as the main focus of evaluation and analysis.

Turkey naturally has the potential to maintain a more balanced and diversified transport system by integrating road, rail and maritime transport coherently owing to its privileged geographical position at the crossroads of three continents: Europe-Asia-Africa. The growth of transport demand between Europe and Turkey and the policy of EU for better integration with the new EU member states and neighboring countries via intermodal transport services, point out that there is a big potential for a sustainable growth of intermodal transport services. Recent trends indicate a 20% annual increase in container traffic handled by Turkish ports. In order to support the growth of the intermodal transport, and meet the increasing demand, the efforts concentrate on the investments on the potential intermodal corridors, especially on ports and railway links. Turkey has adapted the intermodal transport as part of its transportation policy and recognized the need to establish a more balanced transport system, and made significant infrastructure investments, regulations and efforts to promote intermodal transport system.

This paper focuses on the intermodal transport-oriented ports by exploring the main components of such a port system. It documents the main stages of

changes that ports have been passing through by indicating the importance of intermodality and ports' adaption for this specific process. In particular, the study investigates the current situation of container ports/terminals located in Aegean region by considering the main components of the intermodal transport-oriented port concept. The study is organized as follows. The first section reviews the literature on ports as an integral part of the intermodal transport system from the theoretical and empirical perspective and discusses the determinants of intermodal transport-orientation of ports. The second section focuses on the developments in intermodal transport and port industry in Turkey. The third part lays out the theoretical framework that the study is based on. The next section focuses on the research methodology, and the last section presents the findings followed by discussions and conclusions as well as suggestions for further research.

2. Literature review

Much of the literature reviews on ports supports the increasing importance of ports as a strategic nodal point in the logistics and supply chains systems (Robinson 2002; Carbone, Martino, 2003; Bichou, Gray, 2004; Panayides, 2006). Despite an increasing focus on such roles of the ports, current literature overlooks capability of ports to integrate successfully with the intermodal transport systems, namely intermodal transport-oriented port concept. Although there are many studies focusing on the relationship between the port systems and the hinterland concept, (Zondag et al., 2004; Notteboom, Rodrigue, 2005; Rodrigue, Notteboom, 2009; Panayides, Song, 2008), only a few concentrated on the intermodal port or intermodal transport-oriented port concept (Gray, Kim, 2002; Bichou, 2009). These studies mainly highlighted the advantages that the ports could obtain by adapting themselves to intermodal transport related operations. Intermodal transport is considered a very important alternative providing advantages such as; more secure transport with less damage, lower costs and transit times for good quality services, reliable, frequent and competitively priced solutions, tailor-made service according to the requirements of the customers and trade and more environment-friendly solutions due to the use of cleaner transport modes which are relatively sea, inland waterways and rail transport (Branch 1996; Slack 2001). In the context of this study, intermodal transport is defined as being the process of transporting goods by more than one mode of transport in a single loading unit such as containers. Also ports/terminals are considered as the ones which are mainly involved in container operations.

Since ports are considered as bi-directional logistics systems which receive goods from ships to be distributed to land (road/rail) and inland waterways and also which receive cargo from hinterland of the port (road/rail) and inland waterway to ships for sea transport (Panayides, Song, 2007), high level of coordination and connectivity within the logistics system are required. Intermodal trans-

port's capabilities are important in this case that two main capabilities should be considered as interoperability and interconnectivity. Interoperability means that the operating equipment (trucks, trains, ships etc.) can operate on the other side of the border equally efficiently (Button et al., 2001). It requires that "the equipment must be available, independent of country, infrastructure manager and owner, to do the planned job with maximum efficiency and productivity, without outside or arbitrary interference and without contradictory or intrusive certification or maintenance regimes" (Stone, 2008). Interoperability also refers to the use of standardized and compatible infrastructure, technology, facilities and equipment, and characteristics of vehicles (dimensions) (Floroiu, 2010). Common technical specifications, or at least sufficient flexibility in specifications are needed in an interoperable system as well as common institutions such as licenses, insurance, documents, computer and information systems, safety standards, and labor law and practices (Button et al., 2001). Harmonisation for interoperability must also not just be technical, but must be system-relevant (Stone, 2008).

Interconnectivity is also closely related to the intermodal transport and ports as interchange points in the intermodal system should provide interconnectivity in order to obtain seamless operations. According to Gray and Kim (2002), "ports are just one form of interchange point where the transfer function of a node or the connectivity dominates". Interconnectivity is mainly related to the infrastructure. The same gauge system with electric locomotion is required by the railways on either side of the border to be efficient and, so is same power system. Also, the quality of a cross-border air service is only as good as the worst air traffic control system on either side of the boundary. However, Button et al. (2001) argues that intermodal transport is not only limited to a transborder issue but it also involves the capability of being able to switch between transport modes at minimal generalized cost by focusing on efficient interchange between modes. As airports and seaports are the main interchange points in a transportation system and intermodal transport system specifically, connectivity issue should be considered as an important factor during these interchanges. Parties in the intermodal system and port environment may face cost-related problems due to lack of interconnectivity in three levels as (EC 1997); infrastructure and transport means; operations and the use of the infrastructure, especially terminals, and modal-based services and regulations.

Interconnectivity is a horizontal coordination of transport modes for obtaining integrated `door-to-door' transport service and access to the network from different geographical areas. A precondition for establishing such coordination is the existence of transshipment/transfer technologies, facilities and equipment, sophisticated surveillance and guidance systems as well as trained and educated personnel (Floroiu, 2010). This also requires being connected to dry ports and distribution centres as well as main transport modes used in accordance with the location of the port. Application of interoperability and interconnectivity at ports

depends on such factors as location, infrastructure, appropriate hinterland and existence of different transport mode alternatives and inland terminals (Denktas Sakar et al., 2009).

Interconnectivity concept regarding ports could be discussed under two main factors as foreland and hinterland connectivity and the same approach was used in the analysis of the findings of the focus group research. Although the main focus is on the hinterland connections with regards to intermodal transport, the impact of foreland connections on the intermodal transport-oriented port concept should not be neglected. As a very early definition from Weigend (1958), foreland is the land area which lies on the seaward side of a port, beyond maritime space, and with which the port is connected by ocean carriers. According to Rodrigue and Notteboom (2010), there is a strong interdependency between a port's foreland and hinterland when considering the rise of containerization and intermodality. Both the limits of the hinterland and the characteristics of the foreland are closely integrated. Foreland connectivity can be discussed by considering Liner Shipping Connectivity Index (LSCI) established by UNCTAD. Although LSCI has basically been constructed according to the countries' liner shipping connectivity, this can also be applied to the ports and their connectivity as well. The LSCI consists of five components: (a) the number of ships, (b) their container carrying capacity, (c) the number of companies, (d) the number of services provided and (e) the size of the largest vessels that provide services from and to each country's seaports (UNCTAD 2011). Since the number of shipping lines and specifically the ships calling the ports, the services provided, TEU capacity and the maximum ship sizes related to the port directly impacts the volume of the cargo handled at the port as well as the cargo amount distributed to the specific locations at the hinterland, maritime or foreland connectivity should also be considered. Both interoperability and interconnectivity factors, generally known as intermodal-related factors, have close relationship with the ports. Since there should be an efficient integration between the hinterland and the foreland of the ports, main integrators as interoperability and interconnectivity should be managed successfully in the whole port system.

Ports are places of contact between land and maritime areas, nodes where ocean and inland transport lines meet and intertwine, intermodal places of convergence (Hayuth, 1985). A study by Panayides and Song (2008) indicated that the most important factors that affect port/terminal integration in supply chains are; technology, value added services, the relationship with customers and liner operators, the facilitation of intermodal transport and channel integration practices. This shows that intermodal transportation or port's capability to be intermodal transport-oriented is one of the success factors for achieving supply chain integration. Inland component of the port systems has gained an increasing importance in shaping the performance and competitive strategies of seaports (Notteboom, Rodrigue, 2005). As Notteboom (2004) indicated, the main reason for

increasing importance of hinterland developments is that the costs for inland transport are generally higher than maritime transport costs and many delays can occur on the in¬land side of the chain due to congestion, limited in¬frastructure, etc. According to Graham (1998), the sea leg for intermodal movements provides 70-80 % of total revenue, whereas the land side creates at least two-thirds of total intermodal costs for both land and the sea. Moreover, main inefficiencies in ports show that landside logistics operations are below optimum efficiency levels as a result of unproductive moves, congestions, delays etc. currently taking place at the inland and intermodal port interfaces (Bichou, 2009). This clearly shows the need for the orientation of ports' themselves to the recent developments taking place at the hinterland side. This is also triggered by the stages where ports are positioned in terms of the developments and the service provided. In the light of this, an overview of ports' development process towards intermodal transport-orientation is needed.

While ports' role was considered as for only import and export cargo before, this role has changed in accordance with the changes occurring in international trade and logistics operations, and the traditional role of ports has evolved to include transshipment cargo and the provision of logistics centres (UNESCAP 2005). UNCTAD (1999) suggested a classification of ports according to generations. While the first and the second generation ports are related to ship/shore interface with mainly bulk cargo operations, the third generation ports are focused on containerization together with their transformation into logistics and intermodal centres offering value-added services. Lastly the fourth generation ports emerged as a result of vertical and horizontal integration strategies with common operators or administration (UNCTAD 1999). However, little interest was given to the shore/land-side expansion rather than sea/shore interface developments (Bichou & Gray 2004) and "black and white" approach to the concept of port development was shown to be unrealistic and inaccurate (Beresford et al. 2004). In the light of the recent developments taken place at ports towards supply chain integration and increasing focus on hinterland side improvements and intermodal transport, evolution of port systems adapted from UNESCAP (2005) is provided. Figure 1 shows the evolution of port concept beginning from traditional service port to supply chain oriented port. Traditional service port is the one where cargo handling activities, cargo storage and services to the ships are conducted. Together with the developments in trade and transport environment and increasing competition between ports, more services have been added to the ports agenda and ports have started to notice the needs of customers and started to form close relations with their customers in order to understand their needs in the development of their services and infrastructure. This stage can be considered as customer-oriented port system and needs of customers have been truly recognized at this stage with the port marketing efforts. Service function has been enlarged to include logistics and distribution services. As customers' demands

regarding a greater variety of services increase, providing value-added services has become a powerful way for ports to build a sustainable competitive advantage. In order to provide differentiated services to their customers, value added services such as inventory management, inspection, labeling, packing, bar coding, receiving goods, breaking shipments, preparing for shipment, returning empty packaging, quality control, assembly, repair, reverse logistics have been offered to their customers by ports. As Bichou and Gray (2004) indicated, adopting a logistics approach to the performance measurement of ports is important for port efficiency since it directs port strategy towards value-added activities. As value-added services have been provided to the customers, ports became more involved in the landside operations including intermodal systems. Intermodal port is defined as the place combining the sea/waterways interface with other forms of transport operations (road, rail, and/or air) (Bichou, Gray 2004). The final stage is considered as the supply chain orientation as discussed in many studies. Ports have been involved in the supply chains of their customers and customers have started to select ports which provide these services depending on their performance.

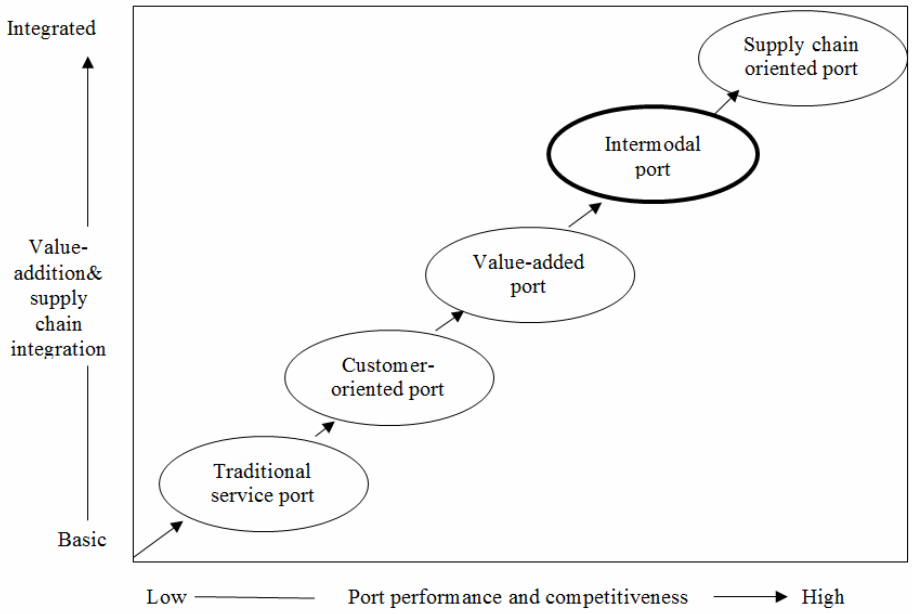

Figure 1. Evolution of port systems

Source: Adapted from UNCTAD 1999; Denktas Sakar et al., 2009.

It should be noted that phases of providing value added services, being customer-oriented or intermodal-transport-oriented port may sometimes overlap or

the evolution of these steps may take place at the same time or vice versa depending on the functions, activities and performance of the ports. Accordingly, Beresford et al. (2004) shows WORKPORT model which confirms the view that ports evolve continuously, adapting to new technologies, legislation and revised working practices and since each port is unique, any improvement activity followed by a port is unlikely to be conducted in any other port.

Apart from UNCTAD's (1999) classification of port systems, Notteboom and Rodrigue (2005) developed a model on port system development including six phases. While the first four phases are explained by traditional port growth theories, the subsequent two phases focus on port-hinterland relationships (Rodrigue, Notteboom 2010). The fifth phase focuses on decentralization and off-shore hubs and the sixth phase as the regionalization phase, is related to the integration of inland freight distribution centres and terminals with gateway ports. This last phase requires a regional load centre network with an improved inland freight distribution. As another characteristic of this phase, development of a specific load centre and intermodal logistics centres in the hinterland area is needed in order to meet the requirements of global logistics and production networks (Notteboom, Rodrigue 2005). This port system development model also concentrated on the increasing importance of inland freight distribution and its connection with intermodal terminals. After this introductory session regarding the development of ports, the next session provides an overview of the current intermodal transport and port system in Turkey as the main focus of this study.

3. Intermodal transport developments in Turkey

Turkey has a great potential for intermodal transport due to its geographic location and the degree of containerisation, however it lacks the necessary systems to facilitate intermodal traffic in terms of intermodal facilities. Therefore revitalisation seaports are on the political agenda for the Turkish government. Strategic location of Turkey as a natural bridge offers tremendous intermodal transport opportunities on the basis of transport requirements of the Europe-Asia axis and there have been very crucial international unimodal and multimodal transport networks in which Turkey is involved. These networks are listed below (Karatas et al.,. 2005):

- International transport networks supported by the United Nations System; E-road network (AGR), E-rail network (AGC), E-Combined Transport network (AGTC), UNESCAP Asian Highway (AH), UNESCAP Trans-Asian Railway (TAR), UNECE Trans-European Motorway (TEM) Network, and UNECE Trans-European Railway (TER) Network;
- International transport networks supported by EU; Pan-European Transport Corridors and Areas (PETrC) and (PETrAs) – (Black Sea PETrA) and European Union, Transport Corridor Europe-Caucasus-Asia (TRACECA);

– Other related international transport networks; Black Sea Economic Cooperation (BSEC) and Economic Cooperation Organization (ECO).

The lack of infrastructure and lower quality in rail and domestic shipping places road transport as an attractive solution for the users of transport services in Turkey. Thus the road transport is the dominant mode of freight and passenger transportation in Turkey: at present 90 % of goods are carried by road transport. This situation contributes to the unbalanced development in modal split and creates vulnerabilities for Turkey in terms of congestion, environmental issues, border crossing problems, road taxation, restrictions on road traffic, permit shortages and customs constraints. The network of road transport has been developed significantly and the relative importance of highways has increased in Turkey in recent years (Deloitte, 2009).

The railway network lacks sufficient capacity and any investment in many parts of the railway infrastructure has not been made for a long time. Partly due to the competitive position of long-haul domestic road transport in Turkey, there does not seem to be a market for rail intermodal services, even though distances between main economic centres within Turkey are often more than 500–600 km (Deloitte, 2009). Containerized intermodal transport by rail is undertaken by the Turkish State Railways (TSR), which also operates regular container block trains to and from Europe and Central Asia. The Turkish government aims to modernize the railways through a range of projects, for which a budget of US$ 23.5 billion has been allocated up to 2023 (Deloitte, 2010). Development of logistics centers (freight villages) and intermodal terminals as part of the transportation strategy in Turkey have accelerated recently. In order to establish logistics centers and intermodal terminal system in Turkey, TSR has included in its priorities the transformation of six locations into freight villages as a first step. Although the Turkish State Railways initiated the construction of freight villages, private initiatives have also started to offer intermodal rail services between the seaports and inland terminals (Pekin, 2009) .The decision about the location of these new intermodal terminals is of primary concern for the private investor and for the government as it involves large amounts of capital to be invested and has the vital importance in the long run.

4. Major developments driving Turkish ports to intermodal transport-orientation

There are approximately 160 ports and piers along the coastline of Turkey. Ports are divided into three categories in Turkey in terms of institutional structures (Oral et al., 2007) as public ports, private ports and piers, and ports owned and operated by the municipalities. Public sector ports are categorised as ports owned by TSR and ports owned by the Turkish Maritime Organisation (TMO).

13 ports of TMO have been privatised through transfer of operating rights for 30 years. There are 7 container ports owned by TSR and 4 of them were privatised. Private ports in Turkey can be categorized as private enterprise ports and privatized ports (Oral et al., 2007). Figure 2 shows the main container ports in Turkey.

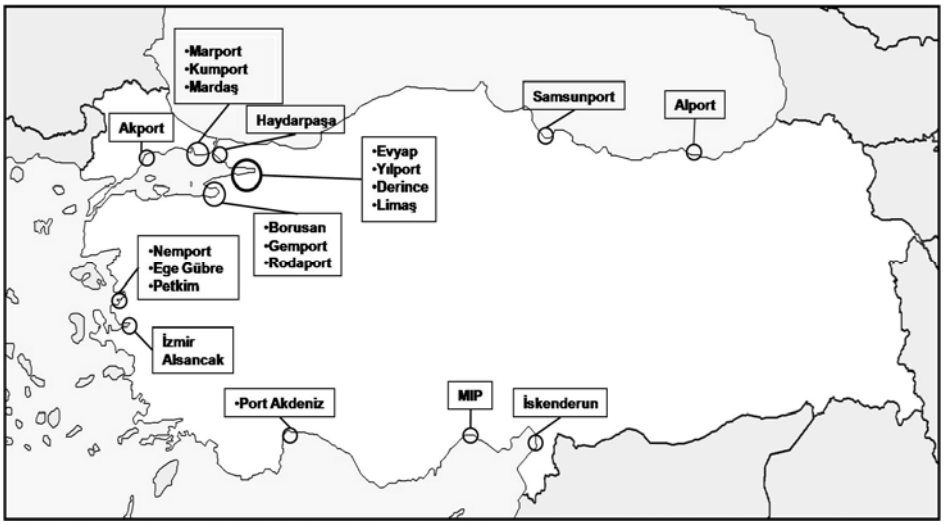

Figure 2. Main container ports in Turkey

Source: TURKLIM 2011.

Turkish ports have a strategic position in East Mediterranean and Black Sea shipping market as being intersection points between the transportation corridors of North-South and East-West. The rail and road connections between the Mediterranean and Black Sea ports in Turkey provide the most economic choice for transport of goods originating from the Black Sea Basin towards India and Far East via Red Sea through Suez Channel, and vice versa. The route of main container shipping lines passing through Mediterranean is in considerably acceptable deviation distances from the Turkish coastline, which ensures the fact that Turkish ports, which serve the hinterlands, possess the potential of introducing of hub-port activities. Accessibility of countries to world markets depends largely on their transport connectivity, especially with regards to regular shipping services for the foreign trade of manufactured goods. As seen in Table 1, Turkey is in the 25th rank in the UNCTAD's Liner Shipping Connectivity Index (LSCI) which aims at capturing a country's level of integration into global liner shipping networks. This situation implies the growth of intermodal traffic to/from Turkey. It shows that containerisation of foreign trade and transport chain has enabled Turkey to develop its connectivity to the world markets through its ports.

Table 1. The place of Turkey in Annual Liner Shipping Connectivity Index (2004–2011)

	Countries/ Years	2005	2006	2007	2008	2009	2010	2011
1	China	108,2859	113,1038	127,8497	137,3755	132,4675	143,5653	152,06
2	China/ Hong Kong	96,77883	99,31343	106,2036	108,7754	104,4733	113,5968	115,27
3	Singapore	83,87433	86,11007	87,52983	94,46792	99,4744	103,7619	105,02
4	Germany	78,40565	80,66392	88,948	89,26176	84,30158	90,87755	93,32
5	Netherlands	79,95352	80,966	84,78618	87,57018	88,65929	89,95627	92,1
6	Republic of Korea	73,03463	71,92256	77,19256	76,39638	86,67192	82,61386	92,02
7	Malaysia	64,97003	69,20278	81,58188	77,6001	81,21435	88,14343	90,96
8	Belgium	74,16798	76,14789	73,93463	77,98121	82,79767	84,0019	88,47
9	United Kingdom	79,58085	81,53004	76,76643	77,98813	84,82226	87,53209	87,46
10	United States	87,61872	85,79561	83,67644	82,45043	82,43116	83,79522	81,63
25	**Turkey**	**27,09141**	**27,08544**	**32,59898**	**35,64282**	**31,98284**	**36,10147**	**39,4**

Source: UNCTAD 2012.

Most of the Turkish ports are "multi purpose" ports and it is not easy for an individual operator to integrate diversity of services, namely value-added services. One of the priorities of Turkey is to increase its port capacities, to transform its ports into logistics centres where intermodal transport can be realized and to provide customer-oriented value-added services. Among 32 priority projects listed by TINA (2007), six railway projects support the development of transport via seaports. The projects cover seaports in the Mediterranean (including Aegean and Marmara) and the Black Sea regions. Additionally, six intermodal terminals are planned. Furthermore, in addition to the seaports in Mersin and Samsun, five seaports are planned to integrate Turkey in the Motorways of the Sea (MoS) (Pekin, 2009). A series of developments that have taken place in the Turkey's transportation and port industry since the beginning of 2000s have triggered Turkish ports to be more intermodal transport-oriented. These developments are stated in the following sections.

4.1. Development of container traffic in Turkish ports

Containerization of foreign trade cargoes has led to the development of intermodalism in Turkey. The number of containers handled in Turkish ports has increased since 2002 as a result of the favorable developments such as industrialization and internationalization of the Turkish economy. Table 2 presents the development of container traffic at Turkish ports. It shows that the losses registered in 2009 were compensated for within one year and re-attained their normal growth rates.

Table 2. Development of container traffic at Turkish ports

Years	Loading TEU			Unloading (TEU)			Total trade (TEU)	Transit (TEU)	Grand total (TEU)
	Cabotage	Export	Total	Cabotage	Import	Total			
2000	27,2	547,315	574,515	29,606	534,406	564,012	1.138.527	88	1.138.615
2001	30,586	491,806	522,392	32,909	368,819	401,728	924,12	36	924,156
2002	46,33	942,643	988,973	35,984	928,257	964,241	1.953.214	0	1.953.214
2003	58,766	1.174.016	1.232.782	39,072	1.110.670	1.149.742	2.382.524	110,226	2.492.750
2004	20,682	1.490.066	1.510.748	13,334	1.409.945	1.423.279	2.934.027	176,271	3.110.298
2005	6,579	1.598.450	1.605.029	8,167	1.577.932	1.586.099	3.191.128	173,138	3.364.266
2006	14,008	1.809.433	1.823.441	6,913	1.840.649	1.847.562	3.671.003	184,921	3.855.924
2007	34,005	2.152.014	2.186.019	27,128	2.224.653	2.251.781	4.437.800	120,427	4.558.227
2008	86,867	2.429.820	2.516.687	82,934	2.474.773	2.557.707	5.074.394	117,353	5.191.747
2009	70,329	2.131.948	2.202.277	71,696	2.117.764	2.189.460	4.391.737	12,542	4.404.279
2010	104,278	2.306.587	2.410.865	104,047	2.354.304	2.458.351	4.869.216	874,239	5.743.455

Source: UMA 2011.

4.2. Investments in container port industry in Turkey

Developments of container port infrastructures in Turkey can be analyzed as completely greenfield port projects and enlargement/development of existing port projects (see Table 3). Regarding the greenfield projects Turkish government's major (hub) port projects concern Mersin, Çandarlı, and Filyos ports. Filyos Port Project is intended to decrease the number of vessel passages through the Turkish Straits and to provide access for potential cargo between the Black Sea countries, where high cargo traffic is expected. Connected to the railway, the facility will accommodate bulk and container vessels, provide deep berths, and serve the free trade industrial area that will be established behind the port facility. Çandarlı Port Project is planned as an alternative new hub port of the West Anatolian hinterland and as a transshipment centre for traffic between Europe, the Middle East and the Black Sea countries. It will be operated as a container terminal with other terminal facilities. Çandarlı Port Project is an important component of the international intermodal transport system thanks to its railway connection. The Mersin Container Port Project is planned to act as a gateway facility between Mediterranean container shipping lines and Central Asian landlocked countries. This port is planned as a hub port and provides a sufficient number of berths to accommodate post-panamax container vessels of 16 meter depth. Mersin Container Port will comprise an important component of the international intermodal transportation system and due to railway connection; it will present a gateway position not only between Euro-Med and Black Sea countries but also Caucasian, landlocked Asian and CIS countries.

Table 3. Container port development and new container port projects in Turkey

Port Projects	Existing Capacity (TEU)	Projected Final Capacity (TEU)	Remarks
Borusan	400,000	650,000 (2015)	Port development
TCE Ege Port	400,000	600,000 (2009)	Construction completed
Evyap	600,000	1,200,000 (2015)	Port development
Gemport	350,000	600,000 (2011)	Port development
MIP	1,400,000	4,400,000	According to the terms of concession agreement 1,700,000 TEU at the first phase
Mersin New Cont. Port	–	11,4000	Greenfield project
Yılport	450,000	2,500,000 (2015)	Port development
Asya Port	–	1,900,000 (2013)	Greenfield project
DP World	–	1,300,000	Greenfield project
Nemrut 2	–	550,000	Greenfield project
İsdemir	–	2,200,000 (2015)	Brownfield project
Nemport	350,000	350,000	Construction completed
Petlim	–	2,000,000	Brownfield project
Batıçim	–	300,000 (2015)	Brownfield project
Derince	–	250,000	Construction will start after the privatization
Port of Izmir	930,000	2,500,000 (2020)	Construction will start after the privatization
Belde Port		2,000,000	Greenfield project
Roda Port		200,000 (2012)	Brownfield project
Denbirport		1,500,000	Brownfield project
Çandarlı Port		4,8000,000	Greenfield project 2,600,000 TEU at the first phase
Filyos Port		600,000	Greenfield project

Source: TURKLIM 2011; UMA 2011.

High demand is the direct stimulus behind the development of private ports. In parallel with the deregulation policies in port industry and port reform in Turkey, presence of global shipping lines and global port operators are increasing in Turkey; such as first PSA in Mersin, MSC in Ambarli; DP World in Yarimca, APMT in Petkim in Izmir (Zeybek, Kaynak, 2008).

4.3. Privatization trends in Turkish container port industry

Turkey is pursuing a port privatization process with the aim of increasing efficiency and infrastructure capacity. Privatization started in the Turkish econ-

omy as a part of the economic reforms in 1984. The primary goal was to minimize the involvement of the state in industrial and commercial activities, and develop a competitive environment in a free market economy. The privatization of ports started in 1995 through the transfer of operational rights of ports under the TMO and the process continues for the TSR ports. Small ports under the control of TMO were privatized between 1998 and 2003. Privatization Higher Council has decided to include in the privatization portfolio six ports (Izmir, Mersin, Iskenderun, Derince, Bandırma and Samsun) under the control of the TSR in 2004 (see Table 4). The six ports within the portfolio are the most important ports in Turkey in terms of location, size of investments, infrastructure and superstructure, and connection to railways, highways and hinterland. The main reason for privatisation of TSR ports is the need to make the necessary infrastructure and superstructure investments, since the container traffic at these ports increases at about 20% per year (ITF 2009).

Table 4. Privatization process of container ports in Turkey

Ports	Date of tender	Date of transfer	Period (Year)	Concession granted	Sales ($ 000)	Results
Mersin	August 12, 2005	May 11, 2007	36	PSA-Akfen Group	755,000	Transferred
Izmir	May 3, 2007	-	49	Global-Hutchison-Aegean Exporters Assembly JV	1,275,000	Cancelled, August 15, 2011
Derince	May 12, 2007	-	36	Türkerler JV Group	195,250	Cancelled, August 15, 2011
Bandırma	May 16 ,2008	May 18, 2010	36	Çelebi JV Group	175,500	Transferred
Samsun	May 16 ,2008	March 31, 2010	36	Ceynak Logistics Inc.	125,200	Transferred
Iskenderun	September 28, 2010	January, 23, 2012	36	Limak Holding	372,000	Transferred

Source: Privatisation High Council of Turkey, 2011.

The privatization strategy has been organized as a transfer of operational rights, in which the ownership of the ports, port assets and land will remain as public property. The operational rights are based on the transfer to the private sector for a period of 36 years for the ports. TSR will be further responsible for post-privatization performance and monitoring of the private sector performance of the port operations.

Since intermodal transport in Turkey is in the growth stage there have been efforts to integrate short sea shipping with the logistics chain seamlessly and to offer door-to-door transport solutions to shipper. Therefore the complexities of

documentary and administrative procedures have to be simplified and the efficiency of the Turkish ports needs to be enhanced. Furthermore, the port hinterland connections are preconditions for maritime based intermodal transport. Currently, specific intermodal short sea shipping measures are not yet on the political agenda in Turkey but there are developments in its promotion. Establishment of the port authority system is in the agenda of Turkish government to lessen the administrative burdens and bureaucracy in port operations and management. Logistics industry is growing rapidly in Turkey due to mainly outsourcing of logistics activities and foreign direct investments into the industry and shippers are demanding more and more logistics center services from the ports. Privatization of ports enabled port managers to invest in ICT, handling equipment, and to offer value added services. Private ports are now more flexible and sensitive to the needs and wants of port users; namely shippers, forwarders and ocean carriers. There have been efforts by port managers to increase the connectivity of ports which will facilitate the seamless flow of the intermodal traffic.

5. Research methodology

Focus group research is used as a methodology in the study in order to explore the main determinants of an intermodal transport oriented port concept and to understand the main components of such concept by focusing on the ports located in Aegean region. Focus group is considered as a method of collecting qualitative data, which involves engaging a small number of people in an informal group discussion (or discussions) (Wilkinson, 2004). These studies are called as focus group since moderator aims to focus on the main topic particularly and tries to attract the attention of the group to the topic by preventing the group members from focusing on different and unrelated subjects (Burns, Bush, 1998).

Many benefits can be obtained through the use of focus groups. They provide economic, fast and efficient solutions for obtaining data from multiple participants by allowing the researcher to increase the size of the sample of the qualitative studies (Kruger, Casey, 2000). Focus groups also increase the participants' sense of cohesiveness (Peters, 1993) and help them to feel safe to share information (Vaughn et al., 1996). Moreover, the interactions that occur among the participants can yield important data (Morgan, 1988). Morgan and Spanish (1984) suggested focus groups are unique and independent sources of qualitative data and they could be integrated to other qualitative and quantitative data collection strategies. In addition to all advantages listed, the main motivation for the implementation of a focus group study in this research was the originality of the subject of under investigation. Since there is no specific literature on the orientation of ports in intermodal transport and Turkey is at the development stage in terms of intermodal services, asking open ended questions to a group of experts

involved in the different stages of an intermodal-port system through the employment of a focus group study was considered appropriate.

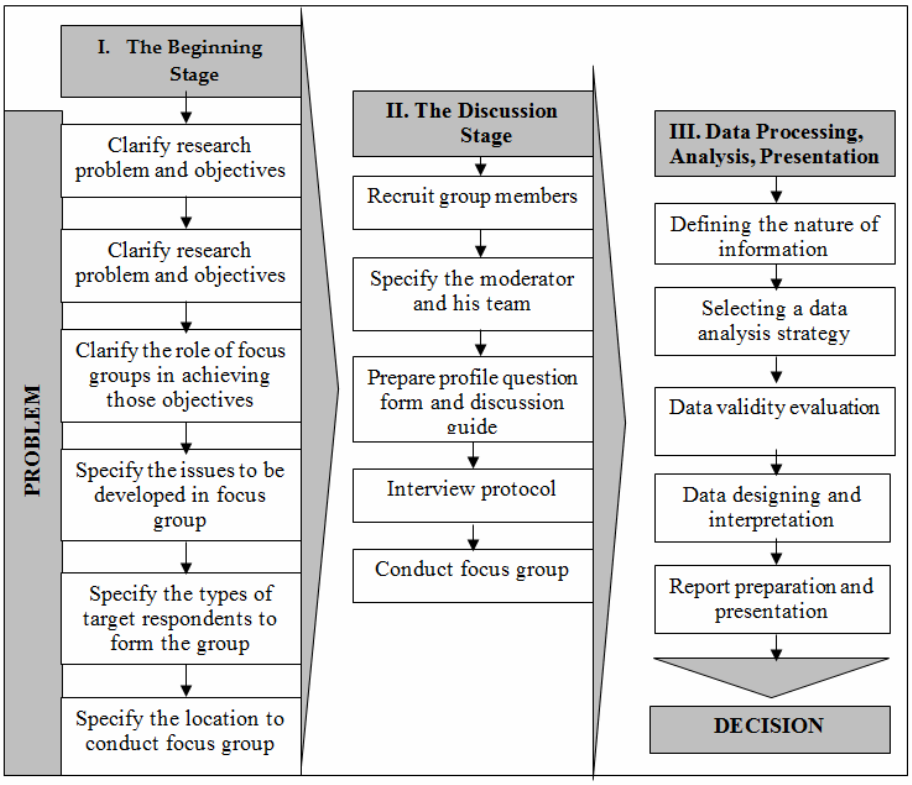

Figure 2. Main stages in focus group discussion

Source: Turauskas & Vaitkuniene 2004; Kinnear & Taylor 1996.

Figure 2 summarizes the focus group discussion procedures. The main steps in the procedure are divided into three stages as problem identification (decision on the main problem and the aim of the study), discussion (constitution of focus group research profile questions, preparation of discussion guide, group composition and recruitment, moderator selection, interview protocol and logistics) and data processing, analysis and reporting.

5.1. Group composition and recruitment

Number of participants in a well-designed focus group discussion is 6–12 participants (Kruger, Casey, 2000). The main logic behind the range of focus group size can be related to the goal that focus group should include enough participants to yield diversity in information provided (Onwuegbuzie et al., 2009). Since the main focus of the study is the intermodal transport orientation of ports and

intermodality concept includes many actors in its composition together with the port system, 12 experts from various segments of both port and intermodal transport industry were selected. The profiles of the respondents are given in Table 5.

Table 5. Profile of focus group participants

Industry	**n**	**Position**	**n**	**Duration of work in the industry**	**n**
Port operator	2 (16.6%)	Manager	4 (33.3%)	5-10 years	2 (16.6%)
Shipper	2 (16.6%)	Deputy manager	2 (16.6%)	11-15 years	4 (33.3%)
Road transport operator	2 (16.6%)	Marketing manager	1 (8.3%)	16-20 years	4 (33.3%)
Railway transport operator	1 (8.3%)	Export-import manager	1 (8.3%)	21-25 years	1 (8.3%)
Container shipping line	1 (8.3%)	Purchasing manager	1 (8.3%)	26-30 years	1 (8.3%)
Port agency	1 (8.3%)	Logistics manager	2 (16.6%)		
Freight Forwarder	1 (8.3%)	Assistant professor/ port consultant	1 (8.3%)		
Academician/ port consultant	1 (8.3%)				
Stevedoring company	1 (8.3%)				
Duration of work in current position	**n**	**Age**	**n**	**Education**	**n**
Less than a year	1 (8.3%)	25–35 years old	3 (25%)	Graduate	8 (66.6%)
1-5 years	4 (33.3%)	36–45 years old	6 (50%)	Post graduate	4 (33.4%)
6-10 years	5 (41.7%)	46 years old and over	3 (25%)		
11-16 years	2 (16.6%)				

Source: Authors.

According to Morgan (1988), the sample of the focus group can be selected using either random or convenience strategies. Convenience sampling was em-

ployed in this research and it was aimed that the participants represented a cross-section of the parties involved in port operations as well as intermodal transport side of the business. The group mainly included representatives from ports, container shipping line, port agency, forwarding company, road and railway transport operators and stevedoring company. Suggestions and comments of the people who are expert at the sector were also considered in the decision-making process regarding the experts. Selection of participants who may be active and broad-minded was also an important criterion. In order to avoid any dominant effect during focus group research, a great importance is given to the diversity of the participants. As seen from Table 5, most of the experts are in senior management level and around 42% of the participants have been working in their current position for around 6-10 years. With regards to the experiences of the participants in the transportation industry, around 50% of the group has been working in the industry for more than 16 years.

5.2. Focus group discussion guide

In the focus group research two separate forms were used. The first form aimed to collect information on the demographic profile of the participants and the second one was the moderator's discussion guide with blanks under each question to record key ideas. The form about the demographic profile of the participants included main questions such as the age, education, occupation of the experts as well as their experience in their current occupation and in the transportation industry. Then the moderator's discussion guide including seven open ended questions used for this research was prepared.

When developing the questions for focus group discussion guide, a detailed literature review on ports' hinterland connections and intermodal transport related determinants was conducted. Since the study aimed to explore the main components of an intermodal transport-oriented port system and evaluate the current situation of ports in Aegean region by considering intermodal transport determinants, a detailed investigation of the specific questions to be included was conducted. The content of the questions in the discussion guide mainly included one opening question, five key questions and one closing question with a total seven. Opening question was about the impact of development in intermodal transport on ports. Key questions firstly aimed to explore the main characteristics/components that an intermodal transport-oriented port should have. Then, evaluation of interoperability and interconnectivity of ports/terminals in Aegean region, evaluation of infrastructural and superstructural conditions of these ports as well as their location from the view point of intermodality were underlined. Suggestions for increasing the competitive advantage of the ports in terms of intermodal transport orientation were the main topic for the closing question.

5.3. Implementing the focus group discussion

The location for the interview was chosen as a place that is easy for the participants to find and to access. The participants were contacted 15 days before the session, the structure of the study was explained and they were invited to the meeting at the specified day and hour. All of the participants reached the meeting place by their own means. 4 assistant moderators joined the meeting to assist the moderator in handling the operational or environmental conditions and 3 people joined the discussion as observer.

Kruger and Casey (2000) suggested that an ideal focus group should have a moderator team including a moderator and assistant moderators. The focus group was conducted by a moderator and four assistant moderators. The moderator in the focus group discussion facilitated the discussion by encouraging the participants to speak, requesting overly talkative experts to let other members of the group talk and making explanations regarding the content of each question. The moderator in the focus group study also took some notes for any questions that may emerge during the discussion. Assistant moderators were involved in the tasks of recording the meeting by voice recorder and a camera, taking notes, dealing with latecomers, arranging refreshments, assisting the moderator regarding any issues that may occur during the discussions and helping the researchers to analyze the focus group results.

The meeting room was organized in a manner that the moderator's table stood in the middle and the assistant moderators sat behind the moderator, and around the moderator the participants' seats were designed in an oval shape. Refreshments were served during the focus group discussion. Name plates were prepared for each participant and the moderator. Questionnaires and discussion guides were prepared in necessary numbers beforehand. The focus group discussion was recorded by audio taping, videotaping and also by written notes. Before starting the discussion the objective of the meeting was briefly explained to the participants and the questionnaires related to the participants' demographic profile were distributed and asked to be completed. Afterwards the focus group discussion guide is taken into account and every question in the guide was asked to each participant. The assistant moderators took part in assisting the moderator with these operations and also warned the moderator by written notes where necessary. After the completion of the structured questions a period of 15 minutes was maintained for a free discussion among the participants and this discussion was also recorded. Completion of the participants' questionnaires, the discussion guide and the free discussion period lasted in a total of 2 hours and 16 minutes.

5.4. Data analysis

After the discussion, the moderator and the assistant moderators came together to analyze the discussion briefly and to find out the common and conflict-

ing points indicated by the participants. As Wilkinson (2004) indicated, there is a very limited literature on how to analyze the data obtained as a result of focus group discussion compared to the suggestions regarding the implementation of the focus group. Kruger and Casey (2000) stated that different types of data can be collected during a focus group including audiotapes of the participants, notes taken by the moderator and assistant moderator and the items recalled by the moderator and the assistant moderators. Records of videotape as well as the notes from both the moderator and the assistant moderators were used as the main data of this study in the analysis process. Onwuegbuzie et al. (2009) listed three types of analyses as transcript-based, tape-based and note-based. Since transcript-based analysis was considered as a time-sensitive and rigorous approach, tape-based and note-based analysis were preferred by the researchers. Tape was considered as a useful tool to verify the main points that the experts highlighted during the discussion. The researchers created a summarized transcript by listening to the tape and watching the video of the focus group. According to Onwuegbuzie et al. (2009), this type of analysis is helpful since the researchers can focus on the research question and only transcribe the portions that assist in better understanding of the main phenomenon of interest.

Classical content analysis method was employed in a specific part of the study where the participants listed the main components of an intermodal transport-oriented port. A small bit of data is created and a specific code is placed on each bit in content analysis (Leech, Onwuegbuzie, 2007). Onwuegbuzie et al. (2009) suggested that providing information regarding the frequency of each code is not always enough so that the data with a rich description of each code should be supplemented which would create a mixed methods content analysis. The same approach was employed in this study for a specific question (main components of an intermodal transport-oriented port) where in firstly a small chunk of data was created by assigning a specific code for the data group. Then, the frequency of each data group was calculated and they were supplemented with the findings from the recent literature in order to obtain a detailed understanding of the concepts.

6. Findings

6.1. Impact of the Main Developments in the Intermodal Transport Industry on Ports

Most of the participants in the focus group discussion considered ports as the most important component of an intermodal system which connects many different related parties. There are main factors related to the developments in intermodal transport that have an important impact on the ports. These can be classified under four headings as; increasing use of railway services and increasing connections of

railways with the ports, main technological developments in the types of vehicles and equipment used and information/communication technologies, the emergence of new inland operational areas such as logistics villages, dryports or distribution centers and lastly increasing volume of shipments (see Figure 3).

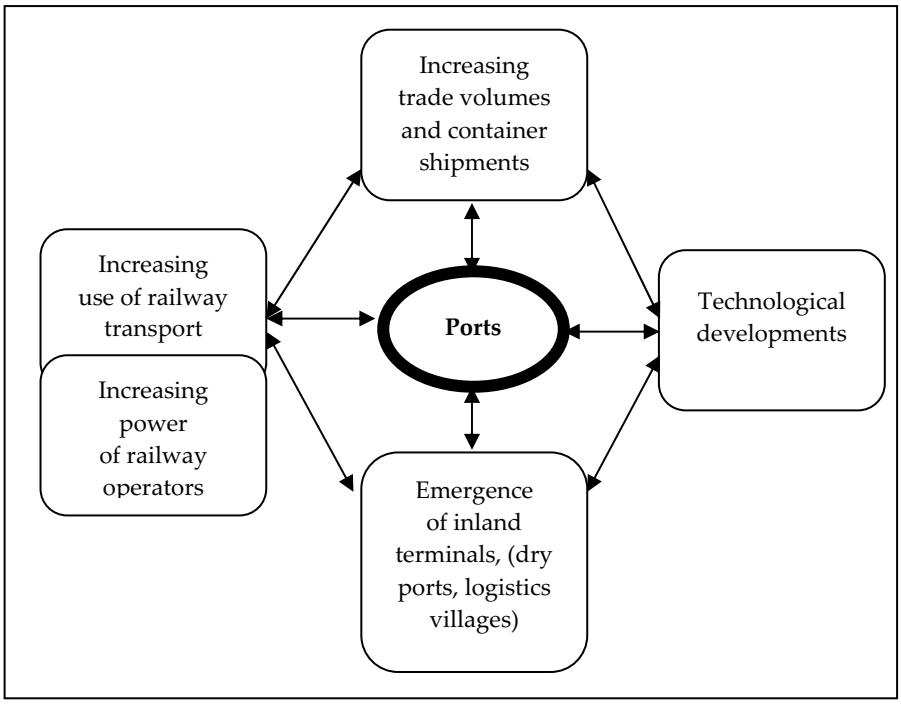

Figure 3. Impact of developments in intermodal transport on ports

Source: Authors.

Many railway operators have started to provide services to the customers of ports by increasing their service quality in terms of personnel, vehicles, information systems and connections to the main destinations in a cost-effective way. Road transport operators have also been involved in high quality service offerings to their customers. Hence, increasing service quality, offerings and capabilities of both railway and road operators have directed the ports to adjust their services in a way that is compatible with the land side operations. Although this could help port management to attract more customers by offering effective railway and road connections to the hinterland, it could also create unexpected pressure on ports in terms of their adjustment to high service levels of inland operators. One of the experts pointed out that "*increasing power of railway operators as well as their service offerings may be considered as a pressure on the port management in terms of meeting customer expectations, providing more on-time loading/discharging operations, less loss/damage to the cargo, smoother flow of both traffic and the documentation etc.*"

Another development in intermodal transport affecting the ports is the technology-related improvements in the vehicles, handling equipment and information systems. Information technology including GPS (Global Positioning System) and RFID (Radio Frequency Identification) provides an effective information system to provide real-time tracking data of containers and cargo handling equipment at the ports. Also, microwave technology including prime mover tracking system, tagging technology in transportation of cargo by rail including automated vehicle identification reader system, barcode scanners and voice recognition technology can be given as examples of other information technology systems to be employed in container ports (Kia et al., 2002). Apart from information systems, using advanced handling equipment at the terminals and vehicles such as automated guided vehicles, high speed vessels specifically for short sea shipping container services can be considered as important technology-related factors that affect the development of ports and intermodal transport.

Emergence of dry ports, inland ports or logistics villages in the hinterland of the port has an important effect on ports in terms of relieving the ports from congestion, handling operations and storage/warehousing activities. Congestion is increasingly becoming a problem and dryports reduce congestion in seaport's vicinity by switching from road to rail. By the use of rail transport, congestion is also reduced in seaport cities and the road connecting the cities and hinterland since road transport considerably decreases. As a result of these, railway operators gain an increasing market share. This shows that emergence of dry ports and increasing use of railways as well as the increasing market share of railway operators affects one another with regards to the developments in ports. As one of the experts mentioned; "*as the inland terminals relieve the ports from additional handling and other logistics activities, ports should improve their operations by investing new handling equipment, be seamlessly connected with the customs. Since intermodal operations are JIT-based operations, any delay or problems experienced at the port directly influence the performance of the intermodal system*". Dryports are parts of the intermodal transport system so that a dryport can be mentioned as an inland intermodal terminal which offers value-added services such as consolidation, warehousing, repair/maintenance of containers and customs clearance. Their main functions may be to bring seaports closer to customers and to solve main problems related to congestion at seaports. A seaport can be connected to more than one dry port in the region and this requires strong transport links in order to achieve seamless operations and the use of intermodal transport alternatives such as road/rail between seaports and dry ports may help to reduce congestion and to achieve faster operations. Since the implementation of dryports has a positive impact on the use of intermodal transport, specifically rail transport, it can also reduce the environmental impacts of whole transportation system.

Lastly, increasing volume of shipments (both export and import) has directed port systems to be connected with their hinterland. Container trade, the

fastest-growing cargo segment expanded at an average rate of 8.2% between 1990 and 2010, has largely driven by the increasing international division of labour and productivity gains within the sector. An unexpected recovery is noticed in container trade volumes driven by an increasing demand in all trade routes. Global container trade volumes bounced back at 12.9 per cent over 2009, among the strongest growth rates in the history of containerization in 2010 (UNCTAD, 2011). Hence, increasing volume of containerization as well as international trade can be considered as a very important driver that increases the use of intermodal transportation and the development of ports accordingly.

6.2. Main components of an intermodal transport-oriented port

The second question in the focus group study was addressed to the main concept of intermodal transport-oriented port concept. The participants were asked to define the main components of an intermodal transport-oriented port in a general view without considering Turkish ports. The main components that an intermodal transport-oriented port should have are shown in Figure 4. As seen from Figure 4, nine variables have been identified by the focus group participants. They are mainly related to hinterland/foreland accessibility, infrastructure, superstructure, technology orientation, location, service, interoperability, cargo, management/administration and space. The numbers in the parentheses represent the frequencies of the variables that are mentioned by the participants in the focus group. Findings of the study showed that the main components of an intermodal transport-oriented port has closely coincided with the main requirement of an effective container terminal components which were listed by Gray and Kim (2002) as; wide reach cranes, effective handling equipment, road and rail connections, large storage space, deep water and effective communications. This explains that an intermodal transport-oriented port should include all necessary components of a container terminal. However, there are some other factors that need to be considered especially in terms of services, technology orientation, cargoes and management/administration systems.

As seen from Figure 4, hinterland and foreland connectivity received the highest frequency in the focus group discussion. Following hinterland and foreland connectivity, infrastructure and superstructure of ports were considered as important components that an intermodal transport-oriented port should have. Another component with high frequencies was the technology-orientation. Main technological factors related to the ports are mainly divided into two as the equipment related to the hardware (gantry cranes, reach stackers, forklifts, RFID equipment etc.) and software (Terminal Operation Systems, Port Management Information Systems, Port Community Systems) (Oliver, Parola, 2007). Both hardware and software systems should be available in an intermodal transport-oriented port in order to accelerate the operations by providing real time data. In

addition, location, service and interoperability variables were considered important by the experts.

Although less frequently mentioned by the experts, cargo-related factors of ports can also play an important role in intermodal transport orientation of ports. While one of the experts stated that such a port should be able to handle transshipment cargo in addition to its ordinary cargo groups, another participant argued that the port should handle various cargo groups (dangerous, refrigerated etc.) mostly in a containerized form. With regards to the management-related component, one of the experts stated that "*intermodal transport-oriented port should be managed autonomously where board of management can include different representatives from the port authority, municipality, port operators, shippers' council, operators from the hinterland side of the port etc. so that an integrated solution can be suggested especially when considering the interest and needs of different parties working with the port*".

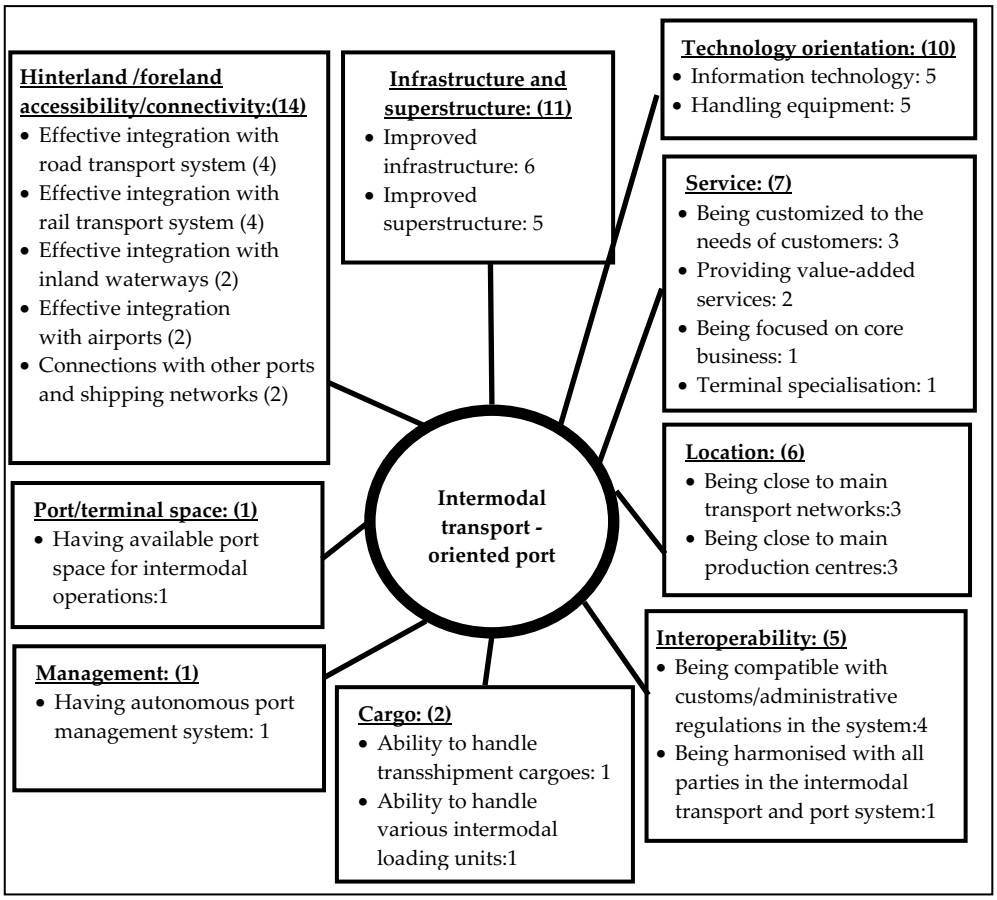

Figure 4. Main characteristics of an intermodal transport-oriented port

Source: Authors.

Space was also highlighted as a very important component by one of the experts by stating "*there is an increasing need for adequate space for intermodal operations at the port area. Intermodal transport operations require considerable control when compared to unimodal operations so that additional space is needed for the personnel, their offices, storage and operational areas for the cargo as well as wagons and handling equipment*".

6.3. Interoperability and interconnectivity

The relevant question in the focus group study was about the evaluation of interoperability and interconnectivity factors and their importance in an intermodal transport-oriented port system. Interoperability and interconnectivity concepts were explained to the participants in order to prevent any misunderstandings. Moreover, participants were asked to evaluate these two concepts by considering the ports in Aegean region. In the light of the findings of the focus group study, main components of both interoperability and interconnectivity were listed. Interoperability factors were divided into two as technical uniformity and operational uniformity as suggested by Floroiu (2010). Table 6 shows main sub-factors and variables related to the technical and operational uniformity according to the evaluations of the focus group participants.

Sub-factors related to the interoperability and interconnectivity were evaluated according to the characteristics of Port of Izmir and the ports in Aliaga region. Although there are eleven ports in Aliaga region (Ege Gübre-TCE Ege, Nemport, Batıcim, Petkim, IDC, Ege Celik, Habas, Petrol Ofisi, Total, Ege Gaz, Tupras), only two of them (TCE EGE and Nemport) are mainly concentrated in container operations and the participants mainly mentioned these two ports when considering ports in Aliaga region. Since the participants in the focus group evaluated the characteristics and conditions of the ports in Aliaga region as they were one port community, they were also categorised in Table 6 in one column. There are 3 container ports operational in the Aegean region of the Turkey. Port of Izmir is public port and, owned and operated by TSR. TCE Ege and Nemport port are private enterprise ports which started the operation in 2009 and 2010 respectively.

Port of Izmir faces the Aegean Sea and is situated at the pivotal point of the sea trade between Western Europe and North Africa. It serves a vast agricultural and industrial hinterland, and plays a substantial function in the country's exports. Many different types of commodities and cargo groups are handled in İzmir Port. The port is also connected with the state railway and highway network. Currently there is a port expansion and rehabilitation studies in Port of Izmir. Almost all of the global shipping lines such as MSC, Maersk, CMA, Cosco, Zim, Yang Ming, Hapag Lloyd, and other gobal lines, and local shipping lines such as Arkas Line and Turkon Line are calling Port of Izmir.

Table 6. Evaluation of interoperability and interconnectivity in ports in Aegean Region

Interoperability factors:	Port of Izmir	Ports in Aliaga Region
Interoperability of the overall port system	Low	Moderate
Technical uniformity:		
Information technologies linking port with customers, the customs agent, customs authorities and intermediaries	Moderate	High
Standardization and interoperability of handling equipment	Low	Moderate
Operational uniformity:		
Available port area for the port users/customers	Low	Moderate
Specialisation on certain cargo traffic	Low	Moderate
Interconnectivity factors:		
Hinterland connectivity:		
Integration of sea and rail interfaces	Moderate	Low
Integration of sea and road interfaces	High	High
Proximity to industrial zones	High	Low
Foreland (maritime) connectivity:		
Connected to the different locations/regions/ hub ports through feeder connections/services	High	High

Source: Authors.

TCE Ege Port is located in Nemruty Bay in Aliaga, 55 km away from İzmir city center. The port has 750 meters berthing line and -20 meter draft. It has railway station, TCDD Aliaga Biçerova, which is only 600 meters away from the port but the rail station is not connected to the port yet. Container lines calling TCE Ege Port include Maersk, Seago, Turkon, and Arkas Line (cabotage service).

Nemport, also located at Nemrut Bay, is the first private container terminal of Aegean region of Turkey. Its project started in 1999 and after ten years of legal permission and construction period, it started serving the first vessel in 2009. Total length of the berths is 820 meters allowing four vessels operate at the same time. Container lines serving Nemport include MSC, CMA, Borchard, Containership (local operator), and Arkas Line (cabotage service).

Interoperability

Interoperability can be discussed by considering different factors. According to the main literature, system-related interoperability (Stone, 2008), technical and operational uniformity (Floroiu, 2010) are the main issues. With regards to the system perspective, an interorganisational challenge plays an important role since the quality of the hinterland access depends on the behaviour of the many actors. Since individual companies cannot be able to appropriate the benefits of improving hinterland connections, organisational arrangements (coalitions) are necessary (Paixao, Marlow, 2003). Interoperability is operational and technical uniformity which allows actors and operators to use a network for different

purposes in order to provide door-to-door service and it is also related to the standardization, harmonization, or interoperability of equipment. In terms of technical uniformity under interoperability, use of information technology and standardization and interoperability of the handling equipment was listed. Using intermodal information technologies should help intermodal ports and terminals in maintaining or attracting additional traffic, since the competition for business is as fierce among ports and terminals as it is among carriers and enterprises. Although there are many benefits of using intermodal transport, some problems regarding the organisational interfaces and technical incompatibilities between the various companies and systems are existent in transport operations. Some tools such as cargo handling technologies, communication links and various coordination measures can be employed for bridging the gaps between the hinterland and port operations. Participants mainly agreed that ports in Aliaga region were better in terms of technological developments such as information and communication systems that allow a smooth integration of the port with the related parties. For instance, TCE EGE developed its own software for the management of terminal (T.O.S) developed by TCB Group allowing to provide information in real time. This system is able to manage different terminal activity areas such as ship and ground operations, billing, information reception and transmission via EDI, online consulting services with terminal clients and information downloads machinery management. On the other hand, experts using the Port of Izmir mainly pointed out that the technology-related services such as documentation, tracking etc. were mainly provided by the container shipping lines and the logistics service providers rather than port management itself. This shows that the container shipping lines and the logistics service providers have started to undertake the role of technology-related services' supplier on behalf of the port itself. With regards to the standardization and interoperability of handling equipment, it was mainly accepted that Port of Izmir has some problems in the investment of new cargo handling equipment and there are idle or broken gantry cranes at the port which decreases the efficiency and the performance of the port. This can also be related to the management type of the port. Since Port of Izmir is a public port owned and operated by Turkish State Railways and is now under privatisation process, operational and technical investments in the port are very limited. On the other hand, ports in Aliaga region are operated by private companies, and more investment is realised in this region.

Participants in the focus group study mainly considered two concepts related to the operational uniformity as "*available port area for the port users/customers and concentration on a specific cargo type*". This was also highlighted by Notteboom and Rodrigue (2009) that large terminals surface was needed in container operations for achieving seamless integration with the hinterland. There are some problems in Port of Izmir regarding these two factors. Participants in the focus group study as the main users of the Port of Izmir such as shippers and railway

operators mentioned that there is no available space for cargo operations at the port area and other value-added services. Another issue mentioned by the port representative and other port-related parties was the problem of concentration on specific intermodal cargo groups. This was again related to the management of the port. Since Port of Izmir is a state-owned port which accepts various cargo groups such as dry bulk, general cargo, RO-RO and passengers, there is no specific terminal dedicated to the management of container operations. This brings out a serious bottleneck with regards to intermodal operations due to considerable delays in the container handling operations and hinterland connections. One of the participants gave an example of livestock operations in Port of Izmir and stated that "*many trucks are needed for the transportation of livestock, which causes considerable congestion both inside and outside of the port area. This affects intermodal container operations negatively so that a specific terminal dealing with only container operations is needed in Port of Izmir*."

Hinterland connectivity

As seen in Table 6, interconnectivity factors are divided into two as foreland and hinterland connectivity. Hinterland connectivity was considered as a very important criterion in the connectivity of ports with intermodal transport systems. Since connectivity can be at the desired level as long as it provides cost effective solutions, land side of the ports should also be considered. As Kim and Gray (2002) stated; "*economies of scale are not achievable on the land side where investment has relatively been low and costs are high*". Hinterland is defined as a group of locations connected to the port through related goods flows (Rodrigue, Notteboom, 2010). The efficiency in these goods flows is directly related to the inland transportation opportunities and alternatives. Bichou (2009) stated, many ports in developing countries suffer from peripherality and poor inland transport links, which restrict their intermodal accessibility and proximity to inland markets. This case is almost the same in Turkey that all the participants mentioned that railway connections with the hinterland of both Port of Izmir and ports in Aliaga region are not appropriate for a true intermodal system. Although Port of Izmir has a direct railway connection, it is not considered as an efficient system. In terms of ports in Aliaga region, TCE EGE port does not have a direct railway connection, but it is located 600 m. away from a main train station in that region. Morever, Nemport does not have a railway connection in that region. Although the participants stated that shippers were aware of the main advantages of using the railway services in their inland transportation, limited range of railway services, and the capacity did not allow these companies to get the main benefits of railway transportation system. Another point discussed by the experts regarding the hinterland connectivity in terms of railways was the effective use of the railway tracks. Railways are mainly expected to be designed in three lines as one for inward, one for outward journeys and one for service tracks in case of any mainte-

nance needs of inward or outward tracks. However, railway tracks connecting to the ports currently have only one line which was also integrated into the passenger railway system. This decreases the possibility of operating block train operations for the containers and cargo groups entering or leaving the port. Opposite to the railway connections of ports in Aegean region, all participants agreed that the ports in Aegean region had efficient road connections. However, congestion was indicated as an important problem in the entrance and exit gates of the ports due to operational inefficiencies. Another factor highlighted in the hinterland connectivity dimension was the proximity to industrial zones. Although port of Izmir is closely linked to the main industrial zones in its proximity such as Manisa Organized Industrial Zone and ESBAS Export Processing Zone, ports in Aliaga region do not have such a connection with industrial zones and they are located far from important industrial zones in Aegean region. Although there is Aliaga Organized Industrial Zone in the proximity of the ports in Aliaga region, this zone serves only a limited number of companies compared to Manisa Organized Industrial Zone and ESBAS Export Processing Zone.

Foreland connectivity

Foreland connectivity was mainly considered according to the main components of Liner Shipping Connectivity Index. It was highlighted by the experts in the focus group that although ports in Aegean region did not have a hub port characteristics and ability to attract big container ships to the region, they were very well connected to the big ports and container shipping lines through feeder services. Volumes of export and import as well as the operations of the port were identified as the main factors influencing the number of container shipping lines calling at the port and their service frequencies. Lack of a hub port in the region was mentioned as an important problem in terms of connectivity. In case of an existence of a hub port in the region, level of connectivity in term of ships and container lines, TEUs handled etc. is expected to increase accordingly. One of the experts in the focus group study highlighted that "*interconnectivity of the ports should be evaluated by considering all ports in the region which have almost the same characteristics rather than focusing on the connectivity of a single port. Since ports in Aegean region are the ports in close proximity (around 35 miles), they can be classified as a cluster of ports in Aegean region and number of shipping lines calling all these ports in the region as well as the ship sizes etc. should be evaluated*".

6.4. Infrastructure and superstructure

Common points stated by the experts in the focus group study in terms of infrastructural and superstructural issues in ports of Aegean region were mainly about Port of Izmir. Since the ports in Aliaga region are in the development process and a considerable investment is provided to these private ports, some problems regarding the infrastructure and superstructure were mainly focused on

Port of Izmir. With regards to the infrastructure, the main issue highlighted by the participants was the inadequacy and inefficiency of handling equipment at the port. Despite inefficiencies experienced in handling equipment, investment plans of port of Izmir may enhance the operational performance in the near future. As mentioned by the representative from port of Izmir and the port consultant, tenders regarding the purchase of new handling equipment, technological investment and area expansion within the port area were expected to be operationalised by 2015.

A very serious superstructural problem indicated by the experts was related to the gates of the Port of Izmir. Due to the restricted height of the gates at the port, some specific cargoes cannot enter the port area, and this impacts the smooth flows of cargo entering or leaving the port negatively, and this problem also emerges as an impediment to the hinterland connections of the cargoes. Opposite to the private ports in Aliaga region having generally one main gate, Port of Izmir has four gates which are not equipped with advanced information systems. This slows down the speed of the operations since hard copy of the documents are needed at each gate at the port rather than connecting these ports via an information technology system. In the presence of such system, the gates can be connected to each other and the flow of documentation regarding the container and the companies using the port can be integrated with the operations at the port.

6.5. Location

Location component affecting the intermodal transport orientation of ports was added to the focus group guide since it may influence the accessibility of the port to the hinterland as well as the use of certain modes of transport. All participants at the focus group study agreed that Port of Izmir has a more favorable location compared to the ports in Aliaga region due to the factors listed below:

- **Climatic conditions**: The climatic conditions at Izmir city is favorable due to the limited strong winds, rare and low dense snow or rain which do not interrupt the cargo operations at the port so that a smooth flow of container entering or leaving the port and connections to road or rail operations is achieved.
- **Sheltered position:** Although there may be some unexpected weather conditions in the Port and Izmir city, the port is sheltered securely by eliminating any severe weather conditions.
- **Preferences of the shippers/forwarders:** Shippers and freight forwarders' perceptions regarding the port is also necessary and this is also linked to the location component. A comparison is generally made between port of Izmir and the ports in Aliaga region in terms of the services, speed, cost, transit time and hinterland connections by the shippers and freight forwarders. When transporting various cargoes from the hinterland of these ports, cost per ton is considered as an important determinant. Port of Izmir was identified as an option that offers lower transit times as well as lower cost per ton

due to its proximity to the hinterland areas. Since the main shippers in the hinterland of Aegean region are accustomed to using Port of Izmir for a long time, they do not prefer to switch to emerging ports in Aliaga region. This could be due to the fact that these ports are quite new in the Aegean region and this may lead to some hesitations of the port customers regarding the preference of the port. Moreover, many participants indicated that the services provided at the ports in Aliaga region as well as customs services are more expensive when compared to Port of Izmir. This could be considered as another factor affecting the preferences of the port customers.

- **Direct railway connection:** As a vital component supporting the intermodality concept, port of Izmir has a direct railway connection. Although the railway intermodality is not efficient due to the operational problems experienced at Port of Izmir, experts had a consensus on the importance of direct connections of the port with railways. Since inland transportation costs play an important role in the overall logistics costs of the shippers, intermodal transport capability or orientation of ports by focusing on effective railway connections has become a differentiating factor in the services provided by ports.

Despite the main advantages regarding the location of port of Izmir highlighted by the experts, it is important to note that the Ports in Aliaga region are located close to the main routes and there is a little deviation from the main routes of the ships compared to the location of Port of Izmir.

6.6. Tailor made services (customization)

Robinson (2002) suggests that ports form part of a value-driven chain and as such they can add value to the goods passing through them. Carbone and Martino (2003) indicate that procurement and pre-assembly stages are becoming of considerable significance and may well shape the future development of ports. Paixao and Marlow (2003) put forward a framework that can be adapted for adding value in a port environment by considering the leanness and agility factors. This involves adding value in the context of the different operations, services and capabilities that take place in a port environment including capacity to provide hinterland and foreland for road/rail access, launching new tailored services, handling different types of cargo, speed at which the port can take decisions on altering schedules, amending orders and changing design processes to meet customers' demands, variety of services in intermodal operations, capacity to convey cargo through the most diversified routes/modes at the least possible time to end-users premises, and capacity to deliver tailored services to different market segments and acting as collaborative intermodal hub networks. According to Notteboom and Rodrigue (2008), highlighted the importance of modal separation on container terminals (terminal specialization on specific modes of transport) that each transport mode received a specific area on the terminal so that operations on

vessels, barges, trucks and trains could not obstruct each other. This improved the service levels of terminals and ports in terms of intermodal transport orientation by preventing delays and unreliable operations.

Customization, as one of the main points highlighted both in the literature and by the participants, was another important issue discussed in the focus group. All experts agreed that increasing competition in the industry directed ports to offer value-added services that their customers (mainly shippers, forwarders and container shipping lines) require. The main factors considered according to the statements of the participants are listed below:

Management type of ports: Many experts indicated that the provision of tailor-made services depends on the management type of the ports. As De Langen and Chouly (2004) noted, developing port networks with hinterland nodes and dry ports could be considered as an strategic issue. In order to be successful in implementing this strategy, changes in the administrative structure of ports become more important. Since the management strategy of the port directly impacts the main services provided and the performance of hinterland connections as well as the investment to be made regarding these factors, it should be considered in the intermodal transport-orientation concept. Since Port of Izmir is a state-owned port and there is no specific and approved tariff system for value-added services provided to the customers, the port does not have a planning system for the provision of such services. This provides many service opportunities for third party logistics service providers, inland ports, logistics villages and other intermediaries operating close to the port area. With regards to the private ports in Aliaga region, some value-added services such as packaging, labeling, stuffing, stripping, information transfer about the position of the cargo, consolidation and deconsolidation are provided to the port customers. However, some problems were mentioned by the participants about the flexibility of the services. For instance, one of the participants mentioned that "*only big shipper companies can get some flexible solutions from the port especially in case of extra free time or storage options and this was considered to be very limited*."

Agreements between the container shipping lines and the private ports: Agreements between the container shipping lines and the ports vary according to the main contents of these agreements. Each container shipping line may sign a different agreement with different service requirements. While one of the agreements of a container shipping line with the port may require the port to provide various value-added services, another agreement may require the container shipping line to provide these services for the same port. This directly influences the service levels and expertise of the port in terms of providing such services to their customers.

6.7. Evaluation of intermodal transport-orientation of ports: development of a framework

Following the discussion of the specific elements of an intermodal transport-orientation of ports in Aegean region, an overall evaluation of the factors highlighted in the focus group is needed. Table 7 presents the current situation of container ports in Aegean region according to the main issues discussed in the focus group. Evaluation is only based on the comparison of the main ports discussed in the focus group research. Comparison is made according to the emphasis of the participants and the frequency of the factors mentioned.

Table 7. Comparison of container ports in Aegean Region

Main factors for intermodal-transport orientation	**Port of Izmir**	**Ports in Aliaga Region**
Hinterland Connectivity	Moderate	Low
Foreland Connectivity	Moderate	Low
Sea Access	Low	High
Infrastructure and Superstructure	Low	Low
Location	High	Moderate
Scope of Port Services	Low	Moderate
Interoperability factors:		
Technical uniformity:		
Information technologies linking port with customers, the customs agent, customs authorities and intermediaries	Moderate	
Standardization and interoperability of handling equipment	Low	Moderate
Operational uniformity:		
Available port area for the port users/customers	Moderate	Low
Specialization on certain cargo traffic	Low	Moderate

Source: Authors.

As seen in Table 7, while port of Izmir has some factors emphasized better by the participants, ports in Aliaga region are mainly considered as the ones that provide better technology-orientation both in terms of information systems and the handling equipment. Following the overall evaluation of the intermodal transport-orientation of ports in Aegean region, a framework is suggested (see Figure 5) which integrates various determinants of an intermodal transport-oriented port system. The main determinants constitute outcomes of the focus group study in the framework as well as the main factors highlighted in the literature review. The main factors shown in Figure 5 represent the common issues discussed in this study.

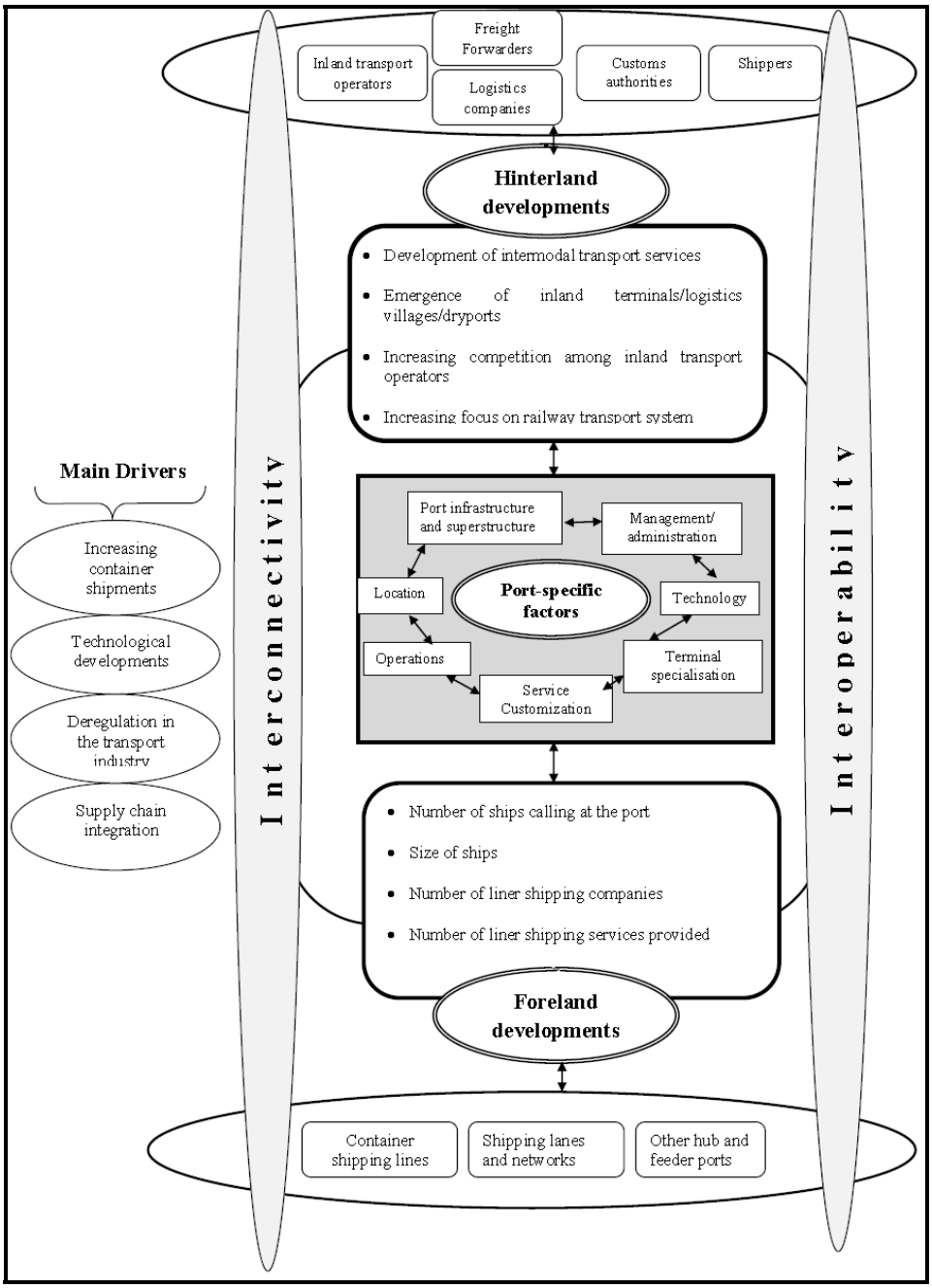

Figure 5. Framework for intermodal transport-oriented ports

Source: Authors.

Conclusions and further research

The relevant literature on intermodal transport and ports supports the view that there is an increasing integration/orientation of ports towards the supply chains and intermodal transport systems. This integration/orientation requires a well-developed infrastructure, superstructure and efficient hinterland links with logistics centers and inland terminals as well as market and customer orientation of ports. Although specific examples of such supply chain-oriented ports are common in the port systems of developed countries, current port systems in emerging countries such as Turkey are not integrated to the supply chains and intermodal transport systems efficiently. Ports in the emerging countries are basically at the various stages of the port development process (ie. traditional service port, customer service port, value-added port, and intermodal transport-oriented port) depending on their capacity, location, technology, management, and operational performances. Various stages in the development of the ports are mainly considered as a prerequisite for achieving a full supply chain orientation for ports. Ports in emerging countries firstly need to adapt themselves to changes occurred in their environment before being involved in the supply chain orientation in order to achieve competitive advantages in the market. "Hardware" (technological) revolution achieved by the containerization need to be improved by "software" (organizational) revolution called intermodalism in emerging countries. It is well known that the ports as element of value chain systems play crucial roles for the efficiency of intermodal transport and supply chain systems. Therefore ports as interchange points in the intermodalism need to be transformed into the requirements of intermodal transport in emerging countries. Intermodal transport oriented ports are expected to help reduce the costs of transportation and increase customer service level by offering value added logistics services.

Intermodal transport in emerging markets and Turkey is in the growth stage. Turkey has a great potential for intermodal transport due to its geographic location, at the centre of road, railway, maritime and air transportation network interconnecting Europe, Caucasus, Central Asia, Northern Africa and the Middle East, it lacks the necessary facilities to facilitate the intermodal traffic flows. Strategic location of Turkey as a natural bridge offers tremendous intermodal transport opportunities on the basis of transport requirements of the Europe-Asia axis and there have been very crucial international unimodal and multimodal transport networks which involve Turkey in the region. Therefore, transportation strategies for revitalization of ports according to the requirements of emerging intermodal transport flows are vital for Turkey. A number of developments and changes occurred in Turkish port environment recently such as economic developments, increase in foreign trade and containerization, involvement in the important international transport corridors, investments in rail transport infrastruc-

ture and ports, developments in ports' hinterlands including logistics center and terminal projects, deregulations in the industry, and other related factors have driven ports to intermodal transport-orientation.

The focus group research employed in this study proved and explored that the factors which have driven Turkish ports to intermodal orientation as; increase in the foreign trade of the country and containerization, growing need and use of railway in the hinterland transport operations, emergence of logistics villages and inland terminals in the hinterland and technological advances in handling and ICT. The main components and characteristics of intermodal oriented port concept from the actors in the intermodal transport have emphasized in the study as connectivity both from the hinterland and foreland, favorable location, efficient infrastructure and superstructure, advanced handling and ICT, ability to provide customer oriented and value added services, collaborative managerial and administrative port structure, and lean, flexible and harmonized port operations. It can be concluded that these variables are keys for measuring the extent of intermodal transport orientation of ports especially from the perspectives of emerging countries. It also means that there is a need to integrate ports to the intermodal transport system from various aspects and layers of the intermodal transport system including the technical, operational, managerial, legal, and logistical aspects. The concept of interoperability and connectivity are key concepts which the port managers must consider in the orientation of ports for intermodality. When current situation of public and private ports in Aegean region Turkey are compared in terms of intermodal transport orientation, private ports seems to be more customer oriented and flexible even if their resources are limited.

In the port marketing studies, hinterland connections of ports are basically classified under the product/service variable of marketing mix. When the intermodal transport-oriented port concept is the case, place variable of port marketing mix also implies the intermodal operation capability of the ports and integration of land interface activities as well as all related variables stated in this study. Although an intermodal transport-oriented port can be categorised in the product and place variables of port marketing, other components of port marketing mix such as promotion and price should also be considered in the marketing of ports. For further research, the impact of port pricing strategies on the intermodal transport-oriented port systems can be suggested. Moreover, main promotion strategies that the ports pursue in their marketing actions can be analyzed by focusing on the intermodal orientation. In addition, a research can be conducted in order to understand how ports promote themselves considering the intermodal orientation concept by investigating their promotional tools.

Focus group studies in scientific research aim to generate hypotheses that can be further tested quantitatively and to generate information for structuring questionnaires in order to suggest new ideas for creative concepts. In the light of these, a questionnaire can be developed by considering the related variables ex-

plored in the focus group study and this questionnaire can be applied for different actors involved in port systems such as port authorities, inland transport operators, container shipping lines, logistics service providers, forwarders and shippers. The impact of relationship between the characteristics of port such as location, size, services provided on the intermodal transport orientation of ports can be investigated by employing regression analysis or other statistical techniques.

Since ports are unique systems depending on numerous factors such as location, services, foreland and hinterland connections etc., their level of intermodal transport-orientation may differ. Accordingly, the findings of this study can be quiet different for other ports in different countries and even within the same country. The main structure of this research together with different focus group settings and participants can be implemented for other regions/cities as well as other countries in order to identify the common components and points of difference in case of intermodal transport orientation of ports.

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THE EFFECTS OF DIVERSE MANAGEMENT VIEWS ON COMMUNICATION SKILLS REQUIRED AT MARITIME EDUCATION AND TRAINING

Abstract

There have been such diverse management views as experimental, developmental, professional, and convivial. The philosophical base of these management views are pragmatism, wholism, rationalism and humanism respectively. In terms of the attitudes prevailing them are respectively sensation, intuition, thinking and feeling. How each of these diverse managers handles business relations is important for the counterparts to be acquired if such relations are to be fruitful and favorable. When the attitudes of a manager are foreseen, at least to a certain extent, the actions to be taken against them might be thoroughly thought and arranged accordingly, and eventually are most likely to be effective. Such an ability to predict the attitudes to be encountered and take effective and proactive measures could be provided for learners at higher education through including in the curricula certain courses particularly designed for communication skills. These skills are thought to be the inevitable part of the higher education curriculum objectives in terms of both general educational aims and general transferable competencies. Such inevitability is to be more focused while discussing the curriculum objectives for maritime education and training, which concerns one of the most international and multidisciplinary industries. In connection with these facts, the purpose of this study is to clarify the cultural and philosophical bases of the most prevalent management views along with the core components of the communication skills that are to be emphasized in the curriculum objectives particularly concerning maritime education and training. The main tool to be made use of in the argumentative issue proposed / put forward and discussed comprises a thorough literature review plus the impressions made on and the feed back received by the author, who has taught communication skills at a higher maritime education institution.

Introduction - basic concepts of communication in general

The term "communication" simply can be defined as "the process of creating and sharing meaning through the use of symbols… an art and a form of expression" (Dobkin, Pace, 2003). It is said to be a learned process, learning through observation and experience and mostly informally (Caputo, Hazel and McMahon, 1994). Active both in the intrapersonal and interpersonal actions, it has extraordinarily wide range of area to act on and to be used as a complicated tool. "The mystery, power, and science of communication make it complex and multifaceted" (Dobkin, Pace, 2003). The basic elements said to be contained by every communication situation are: two or more communicators, one or more messages, one or more communication challenges, a certain amount of noise or interference, feed back exchange between communicators, and a communication setting or context (Dobkin, Pace, 2003).

The communication process, dynamic and ongoing rather than static, is thought to begin the perception, an active process involving the selection (choosing or identifying among the stimuli that come your way), organization (arranging the stimuli in some form that has meaning for your) and interpretation (giving meaning) of sensory data that help people make sense of the world.

The communicators are the initiator, one who begins or advances the communication process by generating a message, a symbolic expression of ideas, thoughts and feelings, and the interpreter, one who perceives and attempts to understand the message. The action of the former is called encoding, and that of the latter is decoding.

The messages generated and/or perceived move in two separate means of communication i.e. verbal communication where messages are expressed through a formal language, using oral, written, or signed words, or nonverbal communication where messages are expressed through symbols other than words, including hand gestures, facial expressions, touching, vocal infection, and clothing (Caputo, Hazel and McMahon, 1994; Dobkin, Pace 2003; Devito, 2002).

According to Dobkin and Pace (2003), communication with others can have influence on our understanding of ourselves, our confidence, and our ability to act. In other words, it improves our self-concept, an image or set of perceptions that we have about ourselves; it also improves our self awareness, the consciousness of our existence and degree to which we understand ourselves. Although both the intrapersonal and interpersonal communications contribute to the development of self-concept and self-awareness through cultural teaching, social comparisons, other's images, and interpretations and evaluations, the effect of the latter are more focused (Devito, 2002) Devito (2002) also attracts attention to the theories developed regarding interpersonal communication involving at least two persons from the linear model, wherein speaking and listening take place at different times, through the interactional view, in which speaking and listening do

not overlap, to the transactional view, according to which each communicator sends and receives messages at the same time.

The process of the interpersonal communication, according to Devito (2002), involves knowledge of interpersonal communication leading to greater interpersonal ability, a greater number of available choices for interacting and eventually greater likelihood of interpersonal effectiveness. Besides, interpersonal competence, ability to communicate effectively, depends on critical thinking, "logical thinking, well reasoned, unbiased and clear, relevant in professional life" which will prove valuable "whether in solving problems, improving relationships or resolving interpersonal conflicts at home or on the job". Caputo, Hazel and McMahon (1994) also claims that as relationships grow more interpersonal, the effectiveness of communication is characterized by the inclusion of such qualitative element (POSEE) as positiveness (a high regard for yourself and the other person), openness (a high degree of trust and honesty), supportiveness (descriptive rather than evaluative), equality (not treating the other person, or letting the other person threat you, as superior or inferior, but rather as a respectful equal), and empathy (putting yourself in the place of the other person). Quoting from Irwing J. Lee, the late communication authority Haney (1973) attracts attention to the five milestones on the way to becoming a competent practitioner of communication: "First, one acquaints himself with the subject matter-the studies, the theories, and the methods. In other words acquires the current knowledge of the field. Second, he acquires the ability to recognize and learn from proficiencies and shortcomings in the communication of others. Third, and more difficult, he comes to perceive and understand them in his own behavior. Fourth, he develops skills for improving his own communication. Fifth, and by far the most formidable accomplishment, he learns to prescribe for the communicative problems of others". Haney (1973) also warns about the manifold requirements of effective communication, claiming that "quantity, speed, and coverage, however, are not the only requirements of communication. It is also imperative that we communicate clearly and precisely. In contrast to the technological improvements, progress toward greater understandability has come much more slowly. It is quite possible for persons to fail to understand one another, even though they speak the same language". Haney (1973) underlines another important source of problems likely to hinder effective communication – perception, claiming that there is never a perfect match between reality and one's perceptions of it, and the range of disparity between the two is considerable. "When an engineer is measuring, testing, and the like, usually with the aid of precise gauges and instruments, his perceptions may be an extremely close approximation of reality. This is basically why bridges, tunnels, and skyscrapers not only get build, but generally stay built. But when the engineer is relating to and communicating with other human beings – when he is operating in a world of feelings, attitudes, values, aspirations, ideals, and emotions, he is playing in a very different league and the match between

reality and perceptions may be far from exact". Devito (2002) also attracts attention to the likely effects of interpersonal perceptions on interpersonal communication, and proposes some ways to think more critically about the perceptions and thereby to increase the perceptual accuracy. His proposals include "analyze your perceptions": When you become aware of your perceptions, you'll be able to subject them to logical analysis to critical thinking… "Recognize your own role" in perception, "avoid early conclusions", "avoid mind reading", check your perceptions: "describe what you hear or see, ask the other person for confirmation; and reduce your uncertainty".

Haney (1973) rightfully states that the act of interpersonal communication never occurs in a vacuum". In its simplest format, it is one man communicating out of his personalized world of feelings, perceptions, values and needs to another man in his world. To treat communication merely at the level of techniques, devices, and media is to imply and unseemly simplicity for a very complex process. To understand human co mmunication as fully as possible we must attempt to understand the communicator himself, the relationship between him and those with whom he communicates, and the organizational setting in which he may be communicating.

1. Managing cultural differences in the world of business

The term "culture" refers to "the shared social experience, the bulk of understandings humans have made to survive in a particular place in the world" (Caputo, Hazel and McMahon, 1994), or "everything that makes up our way of life, including shared values, knowledge, behaviors, and symbolic expressions" (Dobkin, Pace 2003). According to Haney (1973), among a number of interrelated variables which intervene between perception and reality, leading individuals to respond differently to events and complicating the process of communication enormously, culture takes an important place as "an extra ordinarily effective teacher". He then adds, "We are seldom conscious of what it has been teaching us until we contrast its lessons with those taught by other cultures". This outlook is supported by Caputo, Hazel and McMahon (1994) who describe culture as both overt and covert, "like an iceberg – typically one fifth above the waterline and four-fifths below…overt culture is only the tip of the iceberg where most of culture is covert and not easily observable or even recognizable by members of the cultural group". Such extraordinary nature of culture places much greater effects on interpersonal communication, which occurs "when you interact with someone from a different cultural background from your own". They state that interpersonal communication and intercultural communication are to a certain extent, alike, having the same underlying communication process; the two are not different in kind but only in degree – the former being "an ever changing transactional sharing that develops between people who find meaning with each other, and the

latter adding to this the unique aspect of culturally different backgrounds of interactants". Besides, even in the best of circumstances, a degree of communication dissonance (mismatch) can occur in intercultural encounters at least on three levels : language and non verbal behavior (the information people use to understand themselves and others through symbols), functions of communication (what the communications are trying to accomplish with their communication), and cultural level (the bulk of a person's awareness of identity). "A degree of dissonance is usually present in all intercultural encounters" (Caputo, Hazel and McMahon, 1994).

Perceptual interpretations of both language usage and nonverbal behaviors wherein emotional state can play an important role, seems to be an effective source of the challenges in intercultural communication. Another basic obstacle is said to be – stereotyping, "a common perceptual error that results from over generalizing or making weak generalizations about the people, places, or events". According to Caputo, Hazel and McMahon, stereotyping is "the tendency to see all members of a particular group of people as having the same characteristics. Often these stereotypes are unfavorable and put people at an unfair disadvantage".

As a brief response to the above mentioned risks and/or challenges of intercultural communication, Harris and Moran (1996) propose such actions as: cultural sensitivity possessing the knowledge, awareness, and skills to communicate effectively and appropriately with diverse people recognizing the differences (Dobkin, Pace, 2003; Devito, 2002); stating that "all management or professional development requires some global intercultural education and skills. Furthermore, we must learn to make beyond the mere coping with cultural differences to creating more synergy and embracing the well spring of diversity (P.4); sharing the legacy of diverse cultures advances our social, economic, technological and human development (P.15); whether one is concerned with intercultural training, education, or development, all employees should learn about the influence of culture and effective cross-cultural communicators if they are to work with minorities within their own society or with foreigners encountered at home or abroad (P.14); learning to manage cultural differences is a means for all persons to become more global and cosmopolitan in their outlook and behavior, as well as more effective personally and professionally (P.16); cultural understanding may minimize the impact of culture shock and maximize intercultural experience, as well as increase professional development and organizational effectiveness (P.135); and through cross-cultural experiences, we become more broadminded and tolerant of cultural "pecularities" (P.135).

2. Embracing cultural diversities in organizations

As Haney (1973) points out, a basic setting for communication behavior is the organization consisting of a number of independent people who require coordination if their individual efforts are to serve most effectively the organization's objectives. Organizations, which are actually micro cultures that operates with the larger context of a national macro culture (Harris, Moran, 1996) require greater communication competence on the part of their managers and key personnel. In this connection, Harris and Moran (1996) claim that as management itself is a highly cultural activity, to perform effectively outside one's native country, companies should be providing employees with technical knowledge for penetrating foreign markets and comparative management for dealing with foreign business and government e.g. comparison of regional management practices, cross-cultural negotiating skills, current international business issues and trends. This view is supported by Haney (1973) who states the development of management thought and practice requires an understanding and an application of communication skills and proficiencies, and new developments in the philosophy and practice of management depend upon the communication process for the implementation of new concepts and the intelligent integration of new research findings into the dynamic process of management. Haney (1973) also attracts attention to the impact of the organizational climate on the communicative effectiveness. He favors trusting and supportive climates rather than defensive ones. The former comprises description (acting nonjudgementally), problem-orientation (communicating a desire to collaborate in defining a mutual problem and in seeking its solution), spontaneity (straight forwardness, honesty), empathy (expressing respect for the worth of listener), equality (willingness to enter into participative planning with mutual trust and respect), and provisionalism (investigating issues rather than taking sides on them; problem solve rather than debate).

Harrison and Moran (1996) remind that management philosophies are deeply rooted in culture, and that management practices developed in one culture may not easily transfer to another. Differences in customs, behaviors, and values result in problems that can be managed only through effective cross-cultural communication and interaction. Hence, according to Harris and Moran (1996), the most basic skill that global leaders must cultivate is cross-cultural communications. Besides, "to create opportunities for collaboration, global leaders must learn not only the customs, courtesies, and business protocols of their counterparts from other countries, they must also understand the national character, management philosophies, and mindsets of the people" (Harris, Moran, 1996). As a consequence, the concluding remarks of this part are borrowed from the same study of Harrison and Moran (1996) respectively, as follows: Skillful global managers and executives are convinced of the necessity to manage cultural differ-

ences and develop the skills necessary to participate effectively in a global environment, and they understand the significance of such statements "During the first business meeting in Saudi Arabia, one does not conduct business, but uses the time to become acquainted and build trust; when doing business in Indonesia, shaking hands with either gender is acceptable, but using the left hand for taking food or giving a gift is unacceptable". Because management philosophies and practices are culturally conditioned, it stands to reason that there is much to be gained by including cultural studies in all management or professional development. Cultural insight and tools are helpful in the study of comparative management techniques, so that we become less culture bound in our approach to leadership and management practice.

3. The role of prevalent cultural patterns in shaping management views

Cultures are thought to differ in terms of their orientation, context, power distance, uncertainty avoidance, and masculinity-feminity dimensions. Each of these dimensions of difference is said to have a significant effect on the development of the group norms, and interpersonal communication (Dobkin, Pace, 2003; Devito, 2002). Differing in terms of orientation, for instance, results in individualistic vs. collectivist cultures and that in terms of context bears low context vs. high context cultures.

The members of high-context cultures, considered also collectivist, are believed to place great emphasis on personal relationships and oral agreements. The predominant principles of such cultures could be briefed as follows: thinking in terms of "we"; desiring harmony, avoiding confrontation, considering relationships more important than tasks (Dobkin, Pace, 2003), considering the group's goals most important, feeling responsible for the entire group, sharing leadership and placing little distance between leaders and members, spending much time to get to know each other and considering personal relationships important, preferring indirectness and face-saving (Devito, 2002). Some of the nations where high-context and collectivist cultural patterns prevail most are Japanese, Latin American, Thai, Korean, Apacho, Mexican, Chinese, The Philippinos, and Venezuelan.

Taking a brief look at the prevalent management systems in Europe will help reveal and clarify the role of predominant cultural outlook in shaping the overall management view. "If we conduct a properly European debate we find a global set of managers of a different kind. For European "globality", potentially if not yet actually, implies heterogeneity rather than homogeneity, individually rather than uniformity" (Calori, Woot, 1995). According to Calori and Woot, European management models embrace all four psychological types – thinking and feeling, sensing and intuiting – and a complete set of philosophical systems – rationalism and humanism, pragmatism and wholism. Shakespeare, Goethe, Cervantes and Tirso de Molina, each of whom stands for, or symbolizes both psy-

chological and philosophical outlook and culture for specific part of European life-style of their days, are considered "culturally laden images, implicitly, though not yet explicitly, underlie European managerial attributes… Between these cultural images and distinct managerial attributes lie particular conceptual models and generic European ideas" (Calori, Woot, 1995).

A European Management Model edited by Roland Calori and Philippe de Woot (1995) reveals that rooted from different psychological types and four different philosophical systems Europe embodies four diverse management views. In the West, the dominant philosophical view is "pragmatism", the psychological type is "sensing", and the manager is "experimental". The cultural outlook is represented by "Hamlet", a man born free in a community too strong exacting for him, who needs to change himself; knowledge bears fruit in works; a market place in which individuals wheel and deal. Represented by the USA, the terms of high value in this management are "the independent man of action", "individualistic approach", "gifted sales person", "talented actor", and "free enterprise" (p. 269). In the East, on the other hand, the dominant philosophical view is "wholism", the psychological type (attitude) is "intuition", and the "developmental manager" is in the process. The cultural outlook is represented by "Don Quixote", a man born social in a society too loose and rarefied for his liking, symbolizing the social whole that suffers by being torn apart. Practiced in Japan, Germany, Holland and Sweden, the culture in developmental management underlines the following points: close interconnectedness between worker and manager, banker and manufacturer", "product and production rather than market sales", "implicit sense of harmony", "concensus approach to management", "collective spirit in economy", and "social market" (p. 270). In the North, "rationalism" is the dominant philosophy, and "thinking" is the leading attitude. The manager is "professional", and the overall view is represented by Faust, the spirit of inquiry. Life is regulated by rules and principles. The points to be underlined in this northern management, seen in France for example, are: "sophisticated planning mechanism drawn out of rationalistic outlook on life and business", "focus on the institution", "objective, scientific, and rational outlook", and "hierarchical structure" (p. 271). In the South, the manager is a convivial manager, the philosophy is based on "humanism", and the attitude is "feeling". Tirso de Molina's Don Juan represents the high spirit of the South, the spontaneous willfulness of a culture that is innately opposed to rules and regulations. The Southern economic structure builds upon the family network. Family structure and infrastructure merge synergistically together. Personnel management is intrinsically social as opposed to extrinsically institutional. Likely to be seen in Spain, Portugal, Italy and Ireland, humanistic philosophy combines personal and social impulses to make "people and love" as important as "profit and loss" (p. 272).

4. Communication skills in higher education curriculum objectives

According to Barnett (1992), in higher education over the past thirty years, there has been a shift in the character of the curriculum from one that is theory based to one that is centered much more on the world of practice and action. Besides, there has been a shift from "subject-based objectives" to "general educational aims" comprising such competencies as analytical or synthesizing skills, critical skills and communication skills. Subject-specific abilities, "whether in the domain of propositional knowledge or in the domain of professional competence, cannot be sufficient for effectiveness in the modern world". The world of increasing change and uncertainty is thought to require the flexibility to move comfortably across disciplinary boundaries. Still another shift has been observed from specific professional objectives to general transferable objectives. "Curricula organized around objectives derived from the world of work are justified not just in terms of specific skills relevant to particular forms of occupation, but also in terms of much more general abilities, such as working in groups, communication skills (again) and being self-motivated".

What clearly attracts attention in the recent shifts in the higher education curriculum objectives is that communication skills are emphasized both in general educational aims and general transferable objectives. The overall movements in the curriculum objectives obviously concern higher education in general. In terms of maritime education and training, however, which is addressed to one of the most interdisciplinary and international industries, the focus on communication skills is to be even more stressed.

Conclusion

The terms "culture", "communication", and "management" are interrelated. An effective communication could serve as a sound bridge between "cultures" and "management". If the function of acting as a bridge is fulfilled at a desired level, at least the implicit root(s) of any management type will be clarified and, as a next step, the proper and effective communication towards that management, in compliance with the nature of the implied root(s), will be formed and practiced. In this connection, the purpose of this study is to attract attention to the interrelationships of the mentioned three terms and underline the fact that overlooking any one of these three terms is likely to result in incomplete acquisition of the other two. To reach this aim, the study has made the best use of related literature review along with the impressions made on as well as the feedback collected by the author, who has taught "communication skills" at a higher maritime institution.

The key term, among the above mentioned three, is "communication". That's why the main body of this study clarifies this term, including its very basic

nature, types and likely effects on life and business. The overview in this connection, does not dictate what sort of communication is to be used where and when. The aim is to provide the reader with the basic features of communication. Besides, the place of communication skills in the objectives of higher education curricula is presented, aiming to reveal the utmost focus on this term. Considering the outstanding nature of maritime education and training, which concerns one of the most internationalized and multidisciplinary industries, the need for "communication skills" in this particular field is underlined. The overview in the main body of this study related to communication skills implies, but not directly states, the effective practices so as to establish fruitful communications both in terms of internal and external contacts of any business.

The overall nature of culture and how it differs are also discussed in this study, particularly emphasizing its effects on management views. As an example, four different types of management views prevalent in Europe are analyzed in terms of the philosophical, psychological (attitudinal), structural, and functional aspects of each type, aiming to underline the importance of determining and practicing the required form of communication with such diverse cultures and management views so as to cope with any obstacles likely to be brought about by cultural differences.

The tacit interrelationships of communication, culture and management make it inevitably imperative that the learners at higher education in general and maritime education and training in particular be well equipped with communication skills in order for businesses to establish and enjoy constructive, peaceful, harmonious, supportive and collaborative working environment inside and fruitful contacts outside the companies. The complex and dynamic nature of each of these three terms are focused in the study, hoping to attract the attention of the academic world, particularly involved in maritime education and training, to the point that "communication skills" must take a privileged place in the higher education curricula.

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Sadık Özlen Başer

A NEW ECONOMETRIC TEST FOR COMPETITION IN TRAMP SHIPPING: PROSPECT FOR MACROECONOMICS?

Abstract

This study aims to develop a new economic tool that can be useful in determining the competition in the markets questioned. This method is especially thought to be effective in determining the perfect competitive markets, whereas, we suppose it might also be useful to distinguish less competitive markets even including the monopoly. In this technique, correlation coefficient is calculated with some time lags, according to the nature of the market, between the price and quantity. It is supposed that the correlation coefficient is to be +1 in perfect competitive markets, whereas –1 in monopoly.

This paper analyses the reactions of both the World tramp fleet and the Turkish tramp fleet against the overall oscillation in freights. In measuring the extent of this response, regression analysis has been deployed. The analysis has revealed that the fluctuation of the Turkish tramp fleet has been higher than that of the world tramp fleet. The excess in fluctuation has raised an inference that the Turkish tramp fleet has been exposed to a tougher competitive and more risky environment. The relevant research has also revealed that both the World tramp fleet and the Turkish tramp fleet have struggled within a perfectly competitive market.

Introduction

This study aims to develop a new economic tool that can be useful in determining the competition in the markets questioned. This method is especially thought to be effective in determining the perfect competitive markets, whereas, we suppose it might also be useful to distinguish less competitive markets even

including the monopol. In this technique, correlation coefficient is calculated with some time lags, according to the nature of the market, between the price and quantity. It is supposed that the correlation coefficiant is to be +1 in perfect competitive markets, whereas -1 in monopoly (Figure-1).

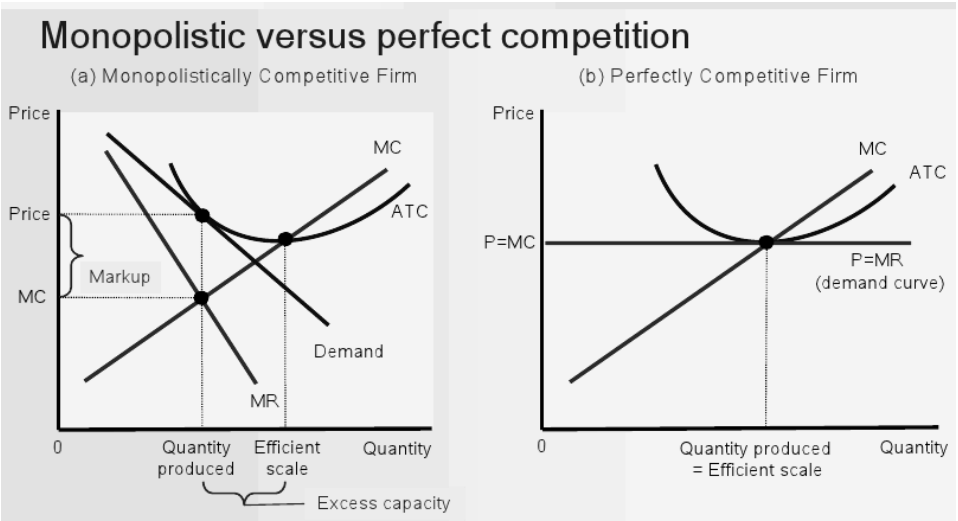

Figure 1. Competition in extreme markets

When one is looked at these two extremist markets: It is firstly discovered that their cost structures are nearly identical, although there are some benefits to capitals in monopoles markets. But market demand curves are different. While in perfect competition, the price elasticity of aggregate demand is nearly infinity while it is parallel to horizontal axis; in lesser competitive markets this value are mostly smaller than one and definitely in a negative slope. It is known first degree liner equations have a positive correlation coefficient if they have a positive slope while have a negative correlation coefficient otherwise (Genceli, 2001, p. 349). Figure 1 – panel (a) shows the long-run equilibrium in a monopolistically competitive market, and panel (b) shows the long-run equilibrium in a perfectly competitive market. Two differences are notable. (1) The perfectly competitive firm produces at the efficient scale, where average total cost is minimized. By contrast, the monopolistically competitive firm produces at less than the efficient scale. (2) Price equals marginal cost under perfect competition, but price is above marginal cost under monopolistic competition.

So, it may be concluded that the correlation coefficiants may vary between +1 and -1 on the diagonal axis (or it may be named as competition axis) in Figure 2 according to perfect competition and monopoly.

1. Shipping market types including tramps

Shipping industry is involved in diversed markets. Diversity in these markets must be reflecting the diversity in the functions carried out. As far as the factors specifying the nature of such markets are concerned, they could be highlighted as follows: The financial structures of the companies involved, pecularities sought in shipping services, the number of the service providers in the market in question, ease or freedom in entry and/or exit, and the number of the shipping service custumers (McConville, 1999). The micro economy theory discusses the types of such markets considering various models from perfect competition to monopoly/monopsony.

A through literature review scrutinizing the intra as well as inter-competitive relations within the markets in which shipping industry is more or less involved has lead the researcher of this study to a competition cube the details of which are presented in Figure 2. As can be seen in the figure, cargoes are taken as liquid and solid; service types are tramps and liners; and quantities (measured as ton-miles) considered to be in increase in rightwards, starting with a zero point. The vertical axis reflex solid/liquid distinction and the axis in depth points to tramps/liners. The axis presenting the quantities is the horizontal one and the increase is preceded from left to right. Each of the eight small cubes within the big one stands for a shipping type. Seven of the well known shipping types are represented through the seven of these small cubes. The invisible eighth cube covers a type of shipping with no clear shipping organization through which the cargoes are carried together with the solid items through feeder services indicated in cube nr:1. The most striking part of the figure must be the competition intersection, intersecting the cube diagonally. To the left of this competition intersect, takes place a steadily increasing competitive medium (assumed to reach a perfect competition). The more rightward movement the more monopolized the markets become where concentration keeps ongoing until the final point of monopoly/monopsony.

The gainings from the Cube figure could be highlighted as follows: All the sub-industries seem to be in a competition at least at one point (the invisible central point). This competition is experienced in the factor market. The shipping companies are abandoning one field while investing in another one (the opportunity cost dilemma). This is true particularly for the shipping companies involved in the sub-industries. Another point to be noted is that the personnel to be employed at the business and those qualified to be employed on board the ships are rather rare. Hence, another field of competition in the industry seems to be in human resources. Competition seems to be lower in the industries taking place along the intersecting points of the line whereas it looks higher in those intersecting along the surface. For instance, competition looks lower between dry bulk tramp shipping (3) and overseas tanker tramp shipping (6). The crude oil tankers

seem to have, very rarely, carried grains in small consignments. On the other hand, however, there seems to be a high competition between dry bulk tramp shipping (3) and industrial shipping (4). The same ships could be used in either of these two markets. The cube can be used to test the other shipping types.

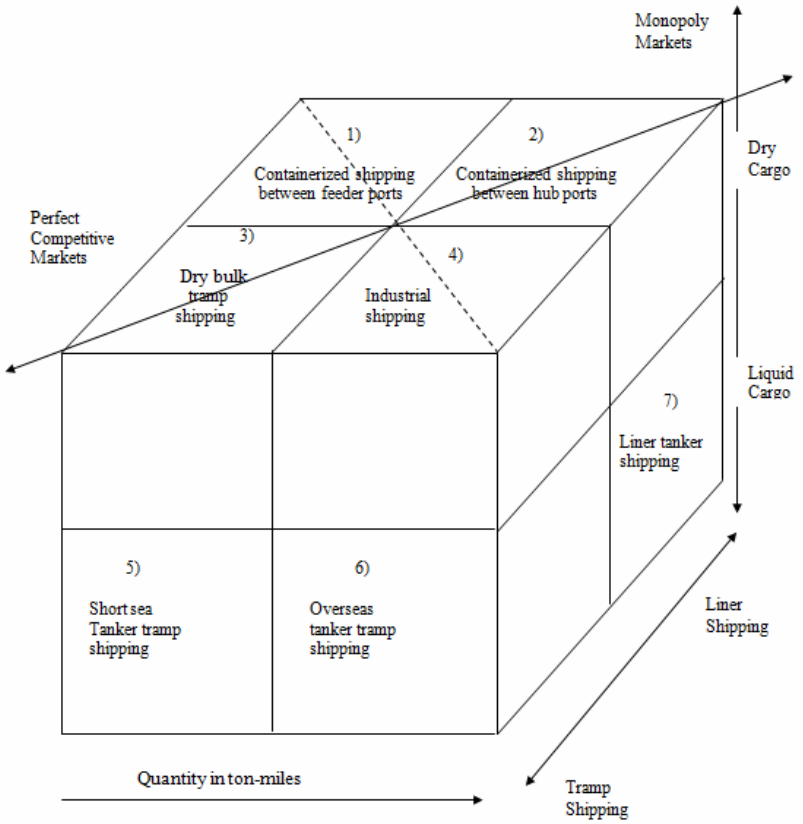

Figure 2. Competition structure in shipping

There seems to be an agreement in the researchers carried out in different years that in dry bulk tramp shipping, the main focus of this research, "the market complies with the assumptions of almost a perfect competition just as studied in the basic textbooks of micro economics". The reader may see the list of those studies in appendix 1 in the chronological order.

As for another sub-division of tramp shipping, industrial shipping: This is not a perfect competition market. It is relatively more competitive than most of liner shipping markets for it are affected by the basic features of tramp shipping. In this particular organization, formed as a result of long-term charters, the majority of the fleet belongs to the industry mentioned.

On the other hand, in no other shipping markets, one may observe the pure monopoly. Only in liner shipping; the relevant companies might display a sort of monopolistic attitude in determining their freight rates. Speaking of the monopolistic approach observable in this market, there could be alliances and conferences which are often practiced in the oligopol markets.

2. The scope of the study

The scope of this research includes not only the short term markets which covers at times only around 10% of the dry bulk cargo movements but also the total supply and demands regarding the long run dry bulk shipping. All the ship types concerned are all sizes of industrial and combined dry bulk ships as well as multipurpose dry cargo ships with no lines. These ships could be operated by their owners, bareboat chartered, bound through charter parties for a long time, time chartered for short periods or voyage chartered.

Since the end of the World War II, the market has diversed in terms of sizes with the effects of economies of scales. As a result of this diversification, a great number of horizontally neighbouring markets have emerged (as it can be seen in Fig. 2), made up of handy sized ships of up to 35 000 dwt, midsized handymaxes of 35 000–50 000 dwt, larger sized panamaxes of 50 000–75 000 dwt and the largest sizes of 80.000 dwt and over. Besides, combined ships are also operated in various different submarkets such as vertically neighbouring market of liquid and bulk cargoes according to figure 2.

No matter what sorts of arrangements are planned in terms of shipping, the ships operated in any unit of market or neighbouring market are all like in size and design; the only difference that could be of question is the ages of the ships wherein the changing technology plays an important role. It could be thought that the demands for each unit and neighboring markets are added together to form a demand function for the whole market. In this respect, any surplus tonnage in the industrial fleet could be operated in spot markets. Besides, despite the highly advanced classification or differentiation, the tonnage can possibly be marginally substituted in the neighbouring markets. Any excessive (surplus) tonnage in the panamax, for instance, could be operated in any market for larger sized bulkers or capesize ships, provided that the freight rates are convenient. In such a case, even if the shipping costs of panamax per ton is higher than those of capesizes, such substitutes and competition would be still possible as long as the market freight can meet the additional costs. Likewise, regardless of how efficient a large ship is, she still can offer transport services in partial loads, again provided that the freights can meet this costs. A similar competition is also available within the vertically neighbouring ship markets, particularly the combined ship market. In fact, in the long run and through fulfilling certain modifications needed, it could be possible for the ships to shift into the vertically neighbouring

markets, again according to the Fig. 1, e.g. shifting crude oil tankers into grain shipping (Zannetos, 1966).

3. The aim and the method of the research

This study aims to measure the responses of the World tramp fleet and Turkish tramp fleet to the changes in freight rates, keeping in mind that the market in question is a clear reflection of perfect competition.

This research makes use of regression analyses, as this method is accepted to be the most effective one in analysing the data concerning shipping (Goodwin, Kemp, 1979). Besides, almost all the examples of analyses scrutinized through the relevant literature are based on this method of regression analysis. The data used in this study are all based on reel demands and are parametric results. Hence, it is believed that the results extracted stand on sound basis. Çakıcı suggests that the basis of parametric tests is at least three times as much reliable as that of non-parametric ones (Çakıcı, 1991). According to the comments of Metaxes, accepted as an authority in tramp shipping economics, the trends in demands for tramp shipping is to be scrutinized thoroughly, and the primary data needed for such an analysis is those giving the actual fixtures based on the effective demands for tramp shipping in as many lines as possible. Metaxes underlines the fact that studying such extensive data will enable to reach dependable predictions about the trends for the future demands; otherwise, without such data, any predictions made will be no more than speculations (Metaxes, 1972, p. 275).

Considering the importance of the above mentioned comments, this research is based on the data giving the actual fixtures, including the changes in the supply related with the changes in the demands within a two year delay depending upon the research performed by Zachcial (1994). Thus, the research makes use of the indexed data adjusted from inflation. The indices mentioned indicate the annual average ship chartering freight rates, wherein the currency used is USD practiced with the Turkish owners' fixtures as well.

The indices and the data used belong to Lloyds (ISL, 2000, p. 179), which is known to be one of the oldest ship classification and research institute. The indexed data are gathered daily basis from the worldwide accepted dry bulk shipping routes. The trade within each shipping leg is included in these indices with the rate of a certain weight. These data are published in two basic categories depending upon the charter party types: Spot or trip charter rates and time charter rates. While analyzing the Turkish tramp shipping fleet, this research uses the data mentioned, as there exits no such institute in Turkey issuing such wide ranged data. In fact, even if such a Turkish institute existed, Lloyd's indices would be prefered since the field of this research is to cover the shipping activities in the international seas. Besides, as this study based on both short-term and

long-term developments, it makes use of both the "trip" and "T/C" indices of the Lloyd's.

This study uses the method of regression analysis, in a sense, as a type of competitionmeter. It is well known that owners usually respond to fluctuations in freights by increasing or decreasing their fleet volumes. According to Evans (1994), in any shipping with no fixed itineraries (and partly in industrial shipping) where perfect competition is dominant, because the shipping companies are price-takers and quantity-adjusters, the fleet volumes are supposed to rise when freights rise, and they are expected to fall down when the freights are lowered. Shortly, changes in market conditions are signalled to firms by changes in their market prices. There is a problem in this context, however, to be noted: Ship construction activities, for ships in question, take from one year in minimum to three years depending upon the ship size and characteristic. An interesting point related with this matter is that due to various cost sunks in the industry, decisions for scrapping are made within one to three years following the layup dates (Zachcial 1994). To be more precised, it could be said that shifting from short run to long run is realised within two-year periods in average, which naturally causes certain cobweb oscillations. In such a situation, as the supply elasticity (Evans, 1988; Wright, 1991) is greater than the demand elasticity (Strandenes, Wergeland, 1982), a sort of "increasing cobweb" model (Özateşler, 2000) appears and freights at both ends may be in sheer oscillations. The balancing power in this increasing cobweb model is the supply elasticity, in which, most of the time greater than the mentioned demand elasticity in the equilibrium. The supply elasticity which can vary from infinity to zero has a feature enabling the oscillations to get stabilized. As it is clearly seen in the model of this research, the power which controls the demand variations is the harmony experienced in the supply. And considering all the above mentioned point, this research includes the delays in time. Based on the two-year periods of delay in entering or exiting the market, while the indexed data are applied on both World tramp shipping fleet and Turkish tramp fleet, they are considered along with the fleet volumes expected to reach in the next two years. While doing this, the point taken into account is that the current prices command the mechanism determining the fleet volumes expected to be reached in the coming two years. Meanwhile, it is worth mentioning that McConville (1999) suggests that delays in time should be included in all models, which is particularly of significance for the analyses carried out when certain recessions are experienced in the freight rates. McConville also states that delay in the response of owners to the mechanisms in markets could be attributed to two such basic issues as the previously fixed and still valid contracts as well as certain expectations that the decreases in freight will last short.

As per the cobweb model, freights fall down to minimums and rise up to maximums (freight minimize and maximize) in relatively shorter periods and in greater rates than expected ones. This situation is supposed to attract the objec-

tions of the price-taker tramp owners. The hypothesis of this research is that in a perfect competition such objections or responses ought to be severe. As Koutsoyiannis (1979) suggests ceteris paribus price and quantity change in perfect competition will be stronger than that in monopolistic markets. Likewise, Laidler (1988) states that while relating the price with the production level, when the changes in demands against the changes in prices are taken into account, within all the industrial relations, perfect competition model is the approach which provides the most meaningful and expected developments.

The method used in this research is regression analyses which handled almost as a competitionmeter: The correlation between the changing freights and the developments in the fleet volumes as well as the regression equilibriums caused by this correlation is researched for both the World tramp fleet and Turkish tramp fleet. The relevant equilibriums and correlation coefficients aim to measure to what extent the fleets are open to competition, or in other words, to what extent they are affected by competition. Regression analysis method is thought to be useful particularly in determining the freedom of entering/exiting to/from markets, which is one of the basic assumptions of perfect competition model.

4. The practice in the tramp market

It might be acceptable that owners dislike competition; hence, since a market open to competition would mean more and sheerer competition owners would have to struggle more; such a competitive market would not attract owners. As an industrial producer, any owner tends to avoid competition. If the correlation coefficient is high, it would not favour owners, forming a great risk. No matter how unfavorable the situation is in terms of macro economic view, the most sensible way for owners is to avoid competition.

The linear relationship between freights and second hand ship prices is one of the aspects supporting the hypothesis of this study. When ships are more profit winning, increases in demands for second hand ships, considering that supply will not rise in the short term, will increase the prices of these ships (Stopford, 1997). The opposite relation is also valid. In this respect, the intensive agility at shipyards and the increases in the ship orders act as a barometer indicating an expectation for certain favourable positive developments in the future (Chrzanowski et al., 1979). The best response an owner is supposed to give to any long term positive expectations is placing orders for newbuilts. The contrary situation could also be experienced. In other words, despite the lowered ship construction costs, there could be certain contractions in the volumes of newbuilts during any recession periods.

5. Analysis of world tramp shipping fleet

In this analysis, Lloyd's indices are used as independent variables. The data extracted from the indexes mentioned are given in Table 1. It should be noted here, however, that the data belonging to the term up to 1999 have been compiled from the source mentioned whereas the others related to the recent years have been provided through various means of correspondences with the relevant institution, having the previously received data confirmed.

Table 1. Lloyd's Ship Manager İndex

Years	T/C (1971=100)	Spot (1966=100)
1994	335.4	199.8
1995	373.0	225.2
1996	339.1	193.3
1997	328.1	192.6
1998	247.3	172.3
1999	233.7	178.3
2000	245.5	195.2
2001	255.3	197.6
2002	257.3	203.3

Source: ISL, 2000; 179 (Data covering 1994–1999); info@isl.org (Data covering 2000–2002).

As for the dependent variables, UNCTAD's data are used. These data, aiming to reflect the volume of the world tramp fleet, comprise the combined ships integrated to dry bulk cargo shipping in addition to drybulkers. The relevant statistical figures are given in Table 2.

Table 2. World dry bulk tramp fleet (million DWT)

Years	World Fleet
1994	500 588
1995	523 256
1996	545 128
1997	562 024
1998	551 038
1999	552 162
2000	552 182
2001	563 308
2002	589 176
1994	600 262

Source: (UNCTAD, Review of Maritime Trasport (Various issues).

Analysis of variance (ANOVAR) table for the World fleet is given below (Table 3). The regression test, carried out through out F test, yields meaningful results at 0.05 degree of freedom. A strong correlation relation (R = 0.909) has been observed between the independent variables and the dependent variable. The determinant coefficient within the relation mentioned has been found to be (R2 = 0.827). This finding refers to the fact that the indexed data are able to explain 82.7% of the changes taking place in the fleet volume.

Table 3. ANOVAR Table (World Tramp Fleet - WTF)

Source of variation	Sum of squares	Degree of freedom	Variance estimate	F-ratio	F^{test}
Regression	$2.28x10^9$	2	139283806	11.937 >	$F^{0.05}$=5.79
Error	$4.77x10^8$	5	95440768.950		
Total	$2.76x10^9$				

And the regression equation is as follows:

Y^{WTF} = 439722.8 – 478.315 T/C + 1367.224 Spot

6. Analysis of Turkish tramp fleet

This analysis is smilar to the one used for the analysis of World tramp fleet. As independent variable, again Lloyd's indices are used. The relevant data is given in Table 1. As dependent variable, Turkish tramp shipping fleet is taken. The data related with the Turkish tramp shipping fleet, received from the 2003 Annual Sector Report issued by Turkish Chamber of Shipping (DTO, 2003, p. 65) comprise the total of bulkers and combined ships. These data are given in Table 4.

Table 4. Turkish dry bulk shipping (000 DWT)

Years	Turkish Fleet
1994	5,190.6
1995	6,800.8
1996	7,358.2
1997	7,667.9
1998	6,915.4
1999	7,056.7
2000	5,979.3
2001	5,595.7
2002	5,022.6

Source: DTO, 2003, p. 65 (DTO, Turkish Chamber of Shipping).

The relevant variance analysis is given in Table 5. F test yields meaningful results at the degrees of freedom 0.05 and 0.01. Regression is found to be meaningful, and the determination coefficiant (R2 = 0.925). The correlation coefficient, however, has been found strikingly high (R = 0.962). In summary, the indepent variables are able to explain 92.5% of the total changes in the independent variable.

Table 5. ANOVAR Table (Turkish Tramp Fleet - TTF)

Source of variation	**Sum of squares**	**Degree of freedom**	**Variance estimate**	**F-ratio**	**F** *test*
Regression	54102052.6	2	2706026.291	24.533 >	$F^{0.01}$=18.00
Error	441203.7	4	110300.942		
Total	5853256.3	6			

And the regression equation is as follows:

Y^{TTF} = 3623.279 + 20.621 T/C – 17.037 Spot

Conclusion

First of all, the overall evaluation clearly reveals that both the World tramp fleet and the Turkish tramp fleet put forward severe responses to the movements in freights. The response of the Turkish tramp fleet looks sheerer, though. Such responses, however, are to be regarded as the natural yields of perfect competition. Another overall conclusion that can be drawn is that Turkish tramp fleet can easily be claimed to be playing in a ground as competitive as the one where the World tramp fleet acts.

The main striking point to be inferred from the evaluation is the confirmed existence of the perfect competition model in the markets in question although the combined ships in connection with liquid bulk cargoes and the industrial ships believed to be standing relatively away from perfect competition are both included in the analysis. In the meantime, it could be interesting to note that the actual picture clearly shows that if there were statistics excluding the industrial ships from both the World tramp shipping and the Turkish tramp shipping fleets, both of these fleets would most likely to encounter a lot more competitive grounds. As far as the difference is concerned between the determination coefficients of the both fleets, it could be attributed to the fewer industrial ships or combined ships of the present, available in the Turkish tramp fleet when compared with that in the World fleet. This difference could also be attributed to, less likely though; the dry bulk cargo pools the importance of which has been felt more and more since the 1980's. Although the market share of the bulk pools is believed to be little to cause any deviation from perfect competition, they are to

be taken serious as they gather the "cream" of the market. As to the question of how they gather the cream: First of all, they are able to gain continuous flow of cargoes with relatively high freights, which can be considered to be a considerably important for the hard days of the owners in question.

The overall result gained through this research is that the Turkish tramp fleet is relatively fragile against any competitive pressures. In other words, its competitive power is rather limited; hence, it can be affected more by any oscillations in freights and more open to risks.

In a perfect competition model, which must be a utopia as it has never been experienced in full compliance with its ideal principles, the correlation between oscillations in freights and the fluctuations in the relevant fleet volume is supposed to be positive one. However, due to both the assumptions of perfect competition model and various exogen variables such as political, social, and natural factors, in real life it seems to be almost impossible to reach such a correlation. The determination coefficiant for the Turkish tramp fleet is 0.92, almost 1. The striking point, however, is that the determination coefficiant for the World tramp fleet is 0.82, only with a difference of 0.10. Meanwhile, it would not be wrong to state that there exits no space differentiation in tramp shipping on account of nature of perfect competition model.

The research results also reveal that freight rates in tramp shipping are formed by means of demand oriented triggers while in liner shipping they are determined through supply oriented triggering. Such an assumption offered in this research is proved to be true for both the World tramp and the Turkish tramp fleets. Besides, a delay of two years should be ragarded reasonable. The correlation tests have been subject to the delays of zero, one, and three years. With such delays, the regression correlation for both fleets is found to be meaningless (non-supported) even at the degree of freedom 0.05.

Another interesting point revealed is related with the through analysis of the regression equations for both of the fleets in question: While the response made by the World tramp fleet to time based contracts is negative, it is positive in spot markets. In other words, the growth of the World tramp fleet is based on spot markets. On the other hand, however, in the Turkish tramp fleet, the coefficients points to completely the opposite, i.e., spot based are negative while time-based are positive. The source enabling the growth of the Turkish tramp fleet could be thought to be the time based contracts. Related with this particular point, it is interesting to note that in the World tramp market time based contracts are prevalent while Turkish owners mostly prefer spot-based contracts. As already known (Svendsen ,1977), time based agreements of over nine-month charterings are less risky. Therefore, it can be inferred from the the choices of World and Turkish tramp owners, that the former are getting shorter contracts as they choose the less risky contracts whereas Turkish tramp owners need very long term time-based contracts for the fleet to grow further. In other words, in order to

secure further growing, most Turkish tramp owners do need to depend on long term contracts by taking lesser risks.

In measuring the impacts observed on quantities as a response to the short and long run price changes in the perfect competition markets, regression analysis has been employed through this study. Employing this analysis in this particular assessment has so far been the first and unique sample of application as far as the thorough review of literature has revealed. This approach has been tested with tramp shipping markets and favorable results have been gained. It still could be developed to further extents through researches employing different scales and data under different circumstances, in different areas, in various other markets alleged to have perfect competition. Such advanced studies might provide a more practicable method of distinguishing the competitive feature of the market in question which would lead to further distinguishing points clarifying the boundaries between the perfect competitive and the monopolistic markets. On the other hand, however, it has to be admitted that the model mentioned is to be considered doubtful in terms of its consistency, especially in the very long run analysis carried out within the abrupt changes in contemporary technologies. Speaking of the rapid changes in technology, tramp shipping sets a comprehensive example wherein modelling would be rather difficulty due to the socioeconomic and political variances resulted from the changes in the ship technologies. In addition to such difficulty in modelling, the long periods of time would accompany considerable changes in ship types and features which would affect transport costs and eventually bring about significant differences in freight indexes. Although the freight indexes are updated with certain intervals considering certain unavoidable changes resulted from various factors including technological developments, the concept of competition is to be considered a meaningful factor which could be measured in short and long run. When the analysis are confined into very short periods, in such industries as tramp shipping where time lags are quite natural, certain hindrance could be suffered in determining the recent situation. Hence, it is my sincere hope that the method proposed in this study will reveal sound and reliable results with the analysis covering up to ten years in today's environment of the technological change.

This technique could easily be used by other researchers in tramp, liner and industrial shipping organizations all over the world where many different types of competition are seen and may be useful by the other sectors of macroeconomics as well. Especially the equations derived from this test gives valuable information to the researchers. Of course it can be developed and scrutinized to a more complex form. But, the author of this paper assumes that it would be better to keep it in its simple form. In a global environment as today's lived, where specialization and division of labour is extremely important, "KISS" principle (Keep It Simple and Stupid) might give the better solutions ironically.

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Appendix A: the studies that reveals tramp shipping as a perfect competition market (in chronological order)

1 – (Marx, 1953) 2 – (Svendsen, 1958) 3 – (Zannetos, 1966) 4– (O'Loughlin, 1967)
5 – (Benhattan ve Walters, 1969) 6 – (Metaxas, 1972) 7 – (Shimojo, 1979)
8 – (Georgandopoulos, 1979) 9 – (Pace, 1979) 10 – (Norman, 1980)
11 – (Abrahamsson, 1980) 12 – (Frankel, 1982)
13 – (International Chanber of Commerce, 1982) 14 – (Miyashita, 1984)
15 – (Chrazanowski, 1985) 16 – (Beenstock, 1985) 17 – (Bruno, 1987) 18 – (Evans, 1988)
19 – (Hale and Vanags, 1989) 20 – (Wright, 1991) 21 – (Heaver, 1993) 22 – (Evans, 1994)
23 – (Kavussanos, 1996) 24 – (Rowlinson ve Leek, 1997) 25 – (Veenstra ve Franses, 1997)
26 – (McConville 1999)

Michael Roe

THE GOVERNANCE OF SHIPPING UNDER GLOBAL CHALLENGES: WHAT NEXT?

"We playwrights who have to cram a whole human life or an entire historical era into a two-hour play, can scarcely understand the rapidity (of change) ourselves. And if it gives us trouble, think of the trouble it must give political scientists who have less experience with the realm of the improbable".

Vaclav Havel, speaking to the US Congress, February 1990.

Introduction

Many public policy initiatives in the maritime sector have failed significantly in the past 25 years, with particularly notable examples from the European Union and its relationship with other jurisdictions. These range from the inconsistencies associated with liner shipping regulation, through repeated disasters in the bulk and ferry shipping sectors, to problematic relations between the European Union, the IMO, the OECD and major maritime nation-states and culminating in the recent inadequacies in EU ports policy initiatives and open dispute between European Commissioners over division of responsibilities in the maritime sector.

Maritime policy analysis presented in this chapter takes as a foundation Harvey's (1982, 1989, 1990) concept of a 'spatial fix' with regards to capital accumulation that requires continuous space-time compression to sustain the capitalist system's desire for growth. Passing from a Modernist environment characterized in governance terms by a period of state-centred hierarchies with maritime policy-making focussed upon state initiatives, state influence in supra-national and international bodies such as the EU and IMO, and state control of regional and local finance, we have moved from around 1970–1980 into a period of Post-modernism characterized by accelerated and intense compression of space and time as globalization continues to progress. This has made unviable the existing Modernist state-centric governance hierarchy. However, the archetypal state-

centric, hierarchical political and governance structures of the maritime sector have yet to catch up leading to the policy failures of recent years.

Governance in the maritime sector needs to adapt to meet the demands of a Postmodernist environment and the continuing pressure for accelerated space-time compression. At the same time we can question the lack of enthusiasm shown by the shipping industry for revision of the governance framework within which it currently works. Is this merely the response of an industry characterized by regulatory anachronism or is it a reflection of the advantages that can be gained from a weak and inefficient governance structure for an industry grounded in an environment where capital accumulation is paramount?

Seas continue to be polluted, administrations continue to argue, regulations are unenforced, security continues to be breached and people continue to die. All this occurs at an alarming rate and despite the vast quantity of energy and effort undoubtedly put into maritime policy-making by politicians, regulators, civil servants, pressure groups and the like. To continue with the same will bring no more success than we have seen in the past and it is an option only for those who either do not really care or who actually benefit from the situation as it stands. In this paper we shall consider some possible reactions to the problems in maritime policy-making and governance that clearly exist. But firstly to the industry itself.

1. The attitude of the shipping industry

Shipping is not ambivalent to the failures in policy. It publically espouses the advantages of clean, secure and safe seas through its representatives in the EU, the IMO, through national Ministries and ship-owning associations, through its own interest groups and professional associations. Yet it remains an industry out of control, situated within a governance framework that has no ability to affect its organization and practice in a meaningful way unless, as an industry it wants to adapt.

The causes of this loss of control centre on the inappropriate jurisdictional framework that remains central to maritime governance. This emerged through the twentieth century, based upon Modernist principles of control and command, rooted deeply in the nation-state regardless of jurisdiction. The new, globalized world, a product of the major capitalist shift to Postmodernism with its profile of flexibility and diversity and characterized by time-space compression has little in common with the traditional nation-state and the jurisdictional structures that are the feature of maritime governance – the IMO, the EU Commission, national Ministries and regional and local governments effectively controlled by national budgets and priorities. Maritime legislation and policy derived from such a nation-state dominated framework clashes with the globalized characteristics of the shipping industry generating a whole series of policy failures and allowing the

shipping industry to take commercial advantage of the structural failure within the sector.

This may not be a popular message either within the industry or for policy-makers, but few will deny the significant changes in society that have taken place from the second half of the twentieth century. Few can deny that maritime policy-making is fraught with disappointment and rather short of success. And few could effectively argue that the nation-state remains the best vehicle for maritime policy-making as technological and social change in the new Postmodern world generates the need for a new view on maritime institutions, governance frameworks, stakeholder involvement, media presence and the like.

Central to all this is the shipping industry itself. Quite understandably shipping wants to sustain a commercial environment that maximizes profit. Not all shipowners or participants in this market are willing to sacrifice anything to achieve this but the opportunity that current governance failure provides to abuse laudable policy aims to create additional profit is a major factor in the inadequacies of current policy-making. There are many operators and owners, ancillary actors and interested parties that are willing to take advantage of the governance failures that exist and who will only adopt acceptable policies if made to do so. The current governance framework, despite good intentions, produces policies that are commonly inadequate, often inappropriate, frequently ineffective and widely abused.

The success of the nation-state in retaining its influence in maritime policy-making bodies at all jurisdictions is notable in the light of the Postmodern revolution and especially for an industry where the process of time-space compression has been so influential. Mangat (2001, p. 9) suggested that this is even more impressive because globalization has created a post-Westphalian world where nation-states have lost the majority of their sovereignty and as a consequence have neither the 'capacity nor the willingness to develop and enforce policy'. This contradiction between a nation-state's impotence and the substantial policy role it retains is a reflection of governance inertia, in turn the greatest cause of the inadequacies in maritime policy.

Alderton and Winchester (2002, p. 39) went further in discussing flags of convenience and the failure of policy-makers to provide an adequate response to their deficiencies. International regulations are enacted on a state-by-state basis, reflecting the substantial residual power that the state has even in a Postmodern, globalized world. Quoting from the International Labour Organization's (2001) Characteristics of International Labour Standards, 'transforming these universally accepted goals and rules into a binding legal obligation is each State's sovereign privilege'. The state is privileged in that it can not only choose to act, but not to act – and many do just that when it comes to policy for flags of convenience (and many other areas as well). As Alderton and Winchester (2002, p. 39) went on to say:

"Where the nation-state is the bulwark of international regulation, sovereignty is for sale in the context of ship registration, and the state enjoys privilege".

Further, Alderton and Winchester, (2002, p. 40) added that there is clear evidence of:

"the deliberate attempt of the state to restrict the possibility of exerting its authority as an explicit economic decision (Flags of convenience) are formed in such a way that a path between the flag state and the ship owner is, at best, obscure and minimal".

They went on to suggest that the more rigorous standards applied to Flag States have exacerbated policy failure as they have encouraged unscrupulous states to develop registries to accommodate those vessels which would otherwise be unregisterable. Thus the nation-state remains significant in policy generation and approval but also a beneficiary of policy-evasion.

"In the context where international regulation is enacted upon a nation by nation basis then it is no wonder that this situation occurs. Where legislation still relies on a state as the analytical model, yet the context itself is irredeemably global, there is always a remainder, a remainder that, due to its sovereign privilege may create an unregulated environment where capital is free to act as it pleases" (Alderton, Winchester, 2002, p. 42).

This was reinforced by Bauman (2000, p. 192) citing Hobsbawm (1998, p. 4–5):

"What we have today is in effect a dual system, the official one of the 'national economy' of states, and the real but largely unofficial one of transnational units and institutions... [U]nlike the state with its territory and power, other elements of the 'nation' can be and easily are overridden by the globalization of the economy. Ethnicity and language are the two obvious ones. Take away state power and coercive force, and their relative insignificance is clear".

If this insignificance is so clear, why on earth do nation-states retain such a powerful force in maritime policy-making?

Putnam (1988, p. 433–434) contributed to this debate in citing Walton and McKersie's (1965) 'behavioral theory' of social negotiations. They saw much policy-making – particularly that which involves international issues (and this is epitomized by shipping) – as a two-level game. At the national level, domestic groups (for example ship owners) pressurize governments to adopt favourable policies and domestic 'politicians seek power by constructing coalitions amongst those groups'. At the international level, national governments seek to 'maximize their own ability to satisfy domestic pressures, while minimizing the adverse consequences of foreign developments'. Each nation state appears at both game boards.

"The unusual complexity of the two-level game is that moves that are rational for one a player at one board may be impolitic for that same player at the other board. The political complexities for the players... are staggering. Any key player at the international table who is dissatisfied with the outcome may upset

the game board and conversely, any leader who fails to satisfy his fellow players at the domestic table risks being evicted from his seat. On occasion however, clever players will spot a move on one board that will trigger realignments on other boards, enabling them to achieve otherwise unattainable objectives".

Shipping interests have been extremely adept (and fortunate) in playing this two-level game, using the pressure that inevitably falls on nation-states in international negotiations to ensure global fortune and domestic bliss (Druckman, 1978; Axelrod, 1987; Snyder, Diesing, 1977).

The, inadequate relationship between the state and shipping has been recognized for some time and even before the wider implications of the Postmodern epoch had started to emerge. Strange (1976, p. 358) had no compunction is suggesting that the 'authority of states over the operators and the market is generally rather weak' and contrasted this to other markets (for example the airline industry) where she saw considerably more authority. The significance of this is not whether the state should or should not be a central authority in maritime policy-making but whether it is realistic to sustain a maritime governance framework centred on the state if the relationship between it and the industry is so inadequate. Shipping is an industry, as we have seen again and again, where controlling its operation and administration is made more difficult perhaps than any other because it takes place so much outside national, territorial control and international law has recognized this situation in 'pronouncing the freedom of the high seas and the rule that at sea, the master exercises sole authority over his ship'. How can this be reconciled with national authority, national policy-making and national ambitions?

This weakness of state-shipping relationships despite the nation-state's continued domination of all jurisdictions and consequently all policy-making, encourages the highly mobile shipping industry to take advantage of this inherent governance failure. Clear examples exist in the playing off of nation-states, the EU and the IMO in the creation of tonnage taxes (providing privileges to a specific industry unlike those available in any other), the rise of Open Registries and Second Registries, the continued flaunting of international regulations, and the sustained protectionism that the shipping industry enjoys, often heavily subsidized. Strange's comment that:

"Considering the multitude of international problems which the transnational operations of ship-operators create, the impact of international law and organization on shipping is still relatively weak" (Strange, 1976, p. 361).

...remains as valid today as when written and also reflects the shipping industry's ability to take advantage of the failure in governance to not only extract help from nation-state governments under threat of flag or administrative abandonment, but also the impact their inherent ability to move national allegiance and confuse national location through the multiplicity of national associations they can command, can have on international regulation. The shipping industry

has the unique ability to choose to associate with whichever nation it wishes, to change this at will and to mix national associations effortlessly. In so doing it can avoid what it wishes to avoid, ignore what it wishes to ignore and to become nation-less or nation-orientated whichever is most attractive. Shipping is today ungovernable.

Strange went on to emphasize in particular how weak the IMO (then IMCO) was and little has changed. Regulations are slow to emerge, routinely ignored by the nation-states that agreed them and its concentration on safety, security and the environment along with the exclusion of trading issues makes its activities divorced from the real world. Nation-states make up the IMO, but the relationship between these same states and the shipping companies makes international regulation that much more ineffective. Strange, in a later publication (1996, p. 14) followed this up:

"the fundamental responsibilities of the state in a market economy... are not now being discharged by anyone. At the heart of the international political economy, there is a vacuum, a vacuum not adequately filled by inter-governmental institutions or by a hegemonic power exercising leadership in the common interest".

In fact the vacuum is a convenience for the international shipping industry, generated by a nation-state focussed governance framework that has become anachronistic in the light of the Postmodern change exemplified by globalization – made even more ironic in that the shipping industry has benefitted perhaps more than any other from the process of globalization itself. Thus shipping delights in the new globalized world whilst taking advantage of the lax governance that this new world permits. In the meantime policy-making frameworks, processes and institutions take their time to catch up. To quote Strange again (1996, p. 14):

"The diffusion of authority away from national governments has left a yawning hole of non-authority, ungovernance it might be called."

And this is 1996. So little has changed since. The result is that the shipping industry is headed for 'increased inequity and continued instability' (Strange, 1976, p. 364). The:

"need for control increases every year that shipping expands its role in the world economy and with every technical change that brings new problems. But compared with a hundred years ago, the general impression is not of increased but rather of diminished political authority, from whatever source" (Strange, 1976, p. 364).

Strange is not alone in her comments. Cerny (1995, p. 620–621), whilst not referring directly to the industry, said much that is pertinent to the governance difficulties that characterize the shipping sector. He cited Andrews (1994) who saw the state as an agent for the 'commodification of the collective, situated

in a wider, market-dominated playing field' (Cerny, 1995, p. 620). The nation-state then can be seen to increasingly free ride.

The state has found it increasingly difficult to balance its societal and commercial interests – something clearly apparent in shipping where the effective application of policy in areas of societal interest (for example safety, security and the environment) is compromised through commercial desires to retain a national shipping interest (through for example the introduction of a tonnage tax) with the shipping industry happily encouraging such compromises either directly (through flag desertion) or indirectly (through threat of flag desertion).

Cerny went on to emphasize the governance problems that are faced by a globalized world where the nation-state remains supreme. He suggested that an increasingly globalized world retains elements of anarchy but the structural composition of that anarchy changes. Whereas before globalization took off in the new Postmodern milieu nation-state relationships were paramount in governance, now what really matters are the relationships between the functional spheres of economic activity (for example shipping) and the new institutional structures which have filled the nation-state power void. This has not been recognized in maritime governance and policy failure is the result. To quote Cerny (1995, p. 620–621):

"Different economic activities... increasingly need to be regulated through distinct sets of institutions at different levels organized at different optimal scales. Such institutions, of course, overlap and interact in complex ways but they no longer sufficiently coincide on a single optimal scale in such a way that they could be efficiently integrated into a multitask hierarchy like the nation-state".

Thus the nation-state is no longer capable of being an effective vehicle for policy-making in a Postmodern, globalized industry. We have entered what Cerny terms a 'complex, world-wide evolutionary process of institutional selection' to find a way ahead for meaningful policy-making – but a process that the maritime sector has yet to recognize publically as it continues to exercise its global strengths to manipulate nation-state dominated maritime governance.

Picciotto (1991, p. 46) summed it up neatly, and using the neo-classical argument of Rugman (1982) and the Marxist arguments of Brett (1985), and Jenkins (1988) suggested that internationalized ownership of capital, exemplified by shipping, emerged, through international corporate groups facilitated by the existence of nation-state protectionist regulation – tariffs, national procurement policies, national financial protection measures. Foreign-owned capital is offered minimal national treatment (for example through tonnage taxation regimes which avoid the normal national taxation rules applied to others), but then becomes the staunchest of all nation-state defenders. Shipping thus obtains a significant competitive advantage by exploiting national differences (at the EU, IMO, WTO and so on) both politically and economically. Such internationaliza-

tion resulting from globalization is highly contradictory, reflecting both homogenization and differentiation, and makes effective policy-making impossible.

Chowdhury (2006, p. 141) also saw a close relationship between capital (in this case shipping), globalization and the role of the nation-state and how one relies upon the other but at the same time takes clear advantage of it – to the detriment of its organization, management, control and governance. He quoted Wood (2001, p. 36):

"It is the essential nature of capitalism that appropriation will always be separate from, and yet require enforcement by, legal, political, and military instruments external to the 'economy', as well as support from extra-economic social institutions... The economic reach of capital will always and increasingly, exceed the grasp of the extra-economic means required to reproduce and reinforce it. However global the economy becomes, it will continue to rely on spatially limited constituent units with a political, and even an economic logic of their own".

Or to put it another way, globalization can occur only in conjunction with nation-states (or something resembling a nation-state) as capital (i.e. shipping) uses their political space to generate wealth. This might well (and does) involve abuse of the nation-state, trading off one against another and placing true allegiance to a national flag against commercially generated loyalty. The outcome is a policy-making process that is only allowed to be effective if it permits capital's excesses to continue.

Lambert (1991, p. 14) saw the confusion caused by the development of the EU and its relationships with member nation-states as ideal for big business, typified by the shipping sector but also applicable in others. Capital has become increasingly footloose and none so much as shipping capital which has adapted to the new, Postmodern, globalized environment to further its interests. Lambert suggested that 'national prestige industries (he cited automobiles, aeronautics and computers but shipping has been equally as active) milked the nation-states for massive subsidies only to link up with their rivals in other countries when competitive conditions dictated'. In shipping's case they even migrate to those with the best offer. Major firms with plans for investment could be seen to be playing off nation-states against each other to obtain 'maximum fiscal concessions and subsidies, only to move on when it suited them'.

As Berg (1993, p. 495) suggested, reality and perception thus differ. Kant's (1795) dualism of reality (noumena or things in themselves) and the individual's concepts of reality (phenomena or what we can know of things) can be seen to represent the process of globalization – the reality – and the perception of reality in the fictional significance that the nation-state retains. The two are not the same, and an effective governance framework will need to be framed in reality rather than perception if it is to work.

Denning LJ, in his judgement upon HL Bolton (Engineering) Co Ltd v TJ Graham and Sons Ltd (1957) 1 QB 159, although not once referring to shipping, passed comment on the modern company and its function in society, said at 172 with some relevance to the discussion here:

"A company may in many ways be likened to a human body. It has a brain and nerve centre which controls what it does. It also has hands which hold the tools and act in accordance with directions from the centre. Some of the people in the company are mere servants and agents who are nothing more than hands to do the work and cannot be said to represent the mind or will. Others are directors and managers who represent the directing mind and will of a company, and control what it does. The state of mind of these managers is the state of mind of the company and is treated by the law as such".

These same directors and managers are those who will also exploit the failure of shipping policy and the anachronistic structure that frames its origins and designs to their own purposes, using the hard to define, metaphysical characteristics of 'the company'. The example of the Open Registry ranks with that of tonnage tax as clear abuse of weak governance and inadequate policy-making. Examples abound but one clear policy failure that exemplifies abuse of good governance by the shipping sector can be found on a Panamanian website advertising the advantages of incorporation in Panama and clearly directed towards the shipping sector (Bowman-Gilfillan, 2004):

- No reporting requirements for taxes.
- No piercing of the corporate veil.
- Anonymous ownership.
- No capital requirements.
- Nominee directors (This is accompanied by "When we appoint nominee directors for the entities that we establish for our clients, we also provide our clients with pre-signed, undated letters of resignation from the directors so that our clients can replace those directors at any time". Need we say more?).

Meanwhile Zacher and Sutton (1996, p. 64) stressed the significance of the Open Registry failure in that the majority of nation-states view it favourably, willing to overlook inadequacies so that national shipping companies might benefit, and combining this with state subsidies through tonnage taxation and the like to maintain a national flagged fleet. Policies to control and regulate Open Registries are encouraged by the same nation-states through global jurisdictional authorities whilst at the same time the enforcement of such regulations are commonly given less than full attention as domestic priorities predominate. And through all this, the shipping industry understandably takes advantage – and will continue to do so until the governance of the sector is revamped.

We can conclude by considering developments that have taken place through 2009–2010 in Greece where the Ministry of Mercantile Marine was absorbed by the Ministry of Economic Development, Competitiveness and Shipping

following the election of a new government. One immediate impact stimulated by the London based Greek Shipping Co-operation Committee (GSCC) was that the number of ships registered under the Greek flag dropped by around 20% within three months. The result – 'reinstatement of a standalone Greek shipping ministry' in September 2009 accompanied by a Piraeus based Minister and Chios originating Deputy (Tradewinds, 2010). Whilst the strength of the Greek shipping community is apparent this contrasts with the denationalization of shipping and the absence of any allegiance to any flag when it proves to be inconvenient, regardless of nation or tradition.

"Observers might see in this volte face, which was clearly forced on the… administration, yet more evidence that shipping cannot be treated like any other branch of the economy. It moves to a different beat, where cycles and sentiment, gut feeling and statistics meld" (Tradewinds, 2010).

2. The problems of implementing governance and policy change

Neither governance nor policy change is ever easy and yet it is change that is required for the globalized maritime industry. The governance of policy-making is fundamental to its success and it is how policy is created and how it is put into effect that is far more significant than the policies selected. These are much more likely to succeed once the structural problems that face the industry are corrected.

Crosby (1996: 1404-5) addressed what he called the 'unpredictable nature of policy change' and how it is closely related to the task of successful implementation. Several features make implementation difficult:

- Commonly the need to change policy comes from an outside stimulus as international bodies and other nation-states encourage, insist or direct policy renewal (Nelson, 1989; Gordon, 1994). This makes change often unwelcome and subject to indirect influences as change in one policy may be closely linked to changes in others (Haggard, 1990; Callaghy, 1990).
- Changing policy will also change relationships between stakeholders and the distribution of power and benefits. This will always be unpopular with some actors and generate resistance (Haggard, 1995; Lindenberg, Ramirez, 1989).
- Whilst politicians negotiate it is normally what Crosby terms 'technocrats' who implement. However, their criteria and standards may be very different. Thus politicians negotiate at the IMO and the European Commission whist it is the industry itself that has to implement the policies agreed. This dichotomy is far from helpful. Technocrats may not be amenable to political trade-offs; politicians unresponsive to technical/operational niceties.

- The hierarchical nature of policy-making is very unresponsive. Kahler (1989) described it as a 'top-down, non-participative process confined to a narrow set of decision-makers' with little sense of ownership of the policy decisions.
- Those involved with substantial policy change are also likely to be new to the process or certainly peripheral to the 'establishment', making their proposals unpopular regardless of content, stimulus or impact.
- New policy arrangements and proposals are never cheap. Costs are always incurred in implementing new arrangements and even if there are savings elsewhere, the balance of expenditures and those incurring them will have changed. This makes for suspicion and resistance.
- There is always resistance to change from those entrenched regardless of the benefits that may follow. The established maritime governance is constituted of a range of institutions and individuals with long-standing arrangements, procedures, relationships and rewards. New governance structures and policy-making and implementation processes will interrupt the existing 'comfortable' situation.

Crosby cited the theoretical 'linear model' of policy formulation, selection and implementation to which current maritime policy-making subscribes but from which it deviates when it is convenient and significant stakeholders require. In practice, policy-making is 'fragmented and open'. In one way policy implementers are commonly excluded from the process of policy formulation and selection – carried out by politicians advised by the industry – and the latter may feel it has little ownership of what is agreed (Ayee, 1994; Mazmanian, Sabatier, 1989; White, 1990). One result is failure of those policies, with numerous examples from the maritime sector including EU policies for ports, liner shipping, places of refuge, a European flag and various fiscal and financial measures, not least tonnage tax. The other is a tendency for the implementers (the shipping industry) to be selective in policy implementation, and active in policy evasion. Hence the need for new governance, new stakeholder involvement and new institutions – the latter emphasized by Sletmo (2002, p. 8) in his discussion of maritime policy and his claim that 'no policy can be better than the institution implementing it'. De Vivero et al. (2009, p. 623) bring us right up to date in their discussion of maritime policy and institutions. They suggest that maritime policy is growing into a significant feature of governance and consequently the state adjusts its politico-administrative structure; but as such it needs new institutions to accommodate ever widening objectives:

"Piecing together the maritime territory puzzle, connecting and linking geographical areas on different scales and with different features, sharing powers and competences between states and, in the states, between the various tiers of the administration, does seem to require an institutional complex in which the state, despite playing a key role, is not the sole actor, and neither is sufficient on its own for maritime space to be effectively governed".

They consider that a reflexive or adaptive governance orientation (Folke et al., 2005) would seem more appropriate characterized by very limited technical control and a predominance of uncertainty and risk. Experiment in extended public participation and stakeholder responsibility would be 'opportune'; and a long-term, systemic approach should be adopted.

Stoker (1998, p. 21) viewed it as all about achieving legitimacy of power, without which governance must fail. He quoted Beetham (1991, p. 19):

"For power to be fully legitimate... three conditions are required; its conformity to established rules: the justification of the rules by reference to shared beliefs; and the express consent of the subordinate, or the most significant among them, to the particular relations of power".

Clearly the rules of power can be made more or less legitimate and those that currently apply to maritime policy-making tend more to the less than the more. A system can be designed to decrease or increase legitimacy and the current system is in Stoker's terms a 'myth'. What is needed is an effective move towards enhancing legitimacy.

Jordan (2001, p. 198) is less than convinced that this can ever be achieved, seeing the realism of domestic politics reducing international policy implementation at home to a 'transmission belt', translating 'international imperatives into state politics' (Evans et al., 1993). Hoffman's (1995, p. 5) view was that domestic politics always lie at the base of international or supranational policies with states 'ferrying between the national and international sphere of policy-making' always keeping in mind their domestic agendas. Whilst the nation-state retains control of global, international and supranational policy-making – as it does in the maritime sector – then the priorities of the nation-state will always come first and policy-making will remain vulnerable to abuse by those trading off one state against another.

This was something that Puchala (1972, p. 275) had pointed out many years before in explaining the 'realist' case, supported by a number of others (Aron, 1966; Hoffmann, 1964; Morgenthau, 1967). International policy-making is seen as a 'process of mutual exploitation wherein governments attempt to mobilize and accumulate the resources of neighbouring states in the interest of enhancing their own power'. International organizations are created and tolerated simply to achieve international autonomy, military security, diplomatic influence and heightened prestige for the nation-state. They are created used by national governments for their own self-interest. 'They are made at the convergent whims of those (national) governments and flounder or fossilize as their usefulness as instruments of foreign policy comes into question' (Hoffmann, 1964, p. 179, 219–230).

"What we are observing 'out there' and calling international integration are really international marriages of convenience, comfortable for all partners as long as self-interests are satisfied, but destined for divorce the moment any partner's interests are seriously frustrated. Hence, international integration drives not to-

ward federalism or nationalism or functionalism, but toward disintegration. It never gets beyond the nation-state" (Puchala, 1972, p. 276).

Unfortunately, so convinced are many that no alternatives exist that the question is never seriously asked whether 'international actors other than national governments may independently influence the allocation of international rewards' (Puchala, 1972, p. 276). Nowhere is this more true than in shipping and nowhere is more advantage taken of the inequities and inefficiencies in policy that result. And to draw the whole discussion back to the debate of the Modernism epoch and its transmogrification into Postmodernism, Cooper and Burrell (1988, p. 92) remind us that Modernism was associated with the power of rational thought and the essential capacity of humanity to perfect itself with implications for the 'organization' (think policy-maker) as a circumscribed, administrative-economic function. This contrasts with the Postmodern organization with its focus on discourse, and questioning and rejection of ethnographic rationalism. New institutions are a requirement of the new Postmodern epoch that can accommodate the changed environment in which shipping works, one no longer centred on the nation-state but truly globalized, with changed dynamics, ideals and measures of success and failure. New organizations, new institutions, new policies and a new governance to match the new world in which shipping operates. However 'our analytic capabilities are rooted in methodological territorialism' (Scholte, 2000, p. 66–67) made less appealing with the 'ever-growing porosity of domestic-foreign boundaries' (Rosenau, 2000, p. 1). Shipping provides an excellent example.

Brenner (1998, p. 463), citing Harvey (1982, p. 423) insisted that any improvement in governance would have to understand the multi-scalar notion of the spatial-fix, whereby jurisdictions, although commonly hierarchically modelled and forming the basis of current policy-making institutionalism, are actually not only artificial but also inappropriate. Policy-making institutions based upon jurisdictional hierarchies ignore the multiple and overlapping scales and the complex inter-meshing of 'transnational corporations, monetary regimes, legal codes, interurban networks and state regulatory institutions' that actually exist in the maritime sector. Consequently policy is inadequate. The circulation of capital reflected by the shipping industry constantly creates tensions between 'concentration and dispersal, between local commitment and global concerns'. The intensification of globalization is the latest phase in capital's reconfiguration of itself, creating a Postmodern world where the notion of fixed jurisdictional hierarchies centred on the nation-state is nonsensical (Harvey, 2000, p. 58).

3. So what is to be done?

It is commonly easier to see that there is a need for change rather than how to change. However in the case of maritime policy-making and governance things

may be different in that there appears to be a marked resistance not to the changes themselves so much as to the need to make changes at all. The jurisdictional hierarchy centred upon the state, and dominated by traditional interests remains a comfortable and convenient structure for those central to it as well as those at whom policies are mainly directed – the shipping industry. To instigate and sustain a debate on governance change in these circumstances is difficult if not impossible.

Despite this there are a number of proposals that can be made which may help to direct change for the future, when and if this is allowed to occur. Remember, maritime policy is not only about commercial success and competition, but also about supporting society, inhibiting terrorism, providing for clean seas, and restricting illegal immigration, illegal drugs, money laundering and death and injury. Surely we owe it to ourselves to ensure that policy-making is as effective as it can be regardless of the wrench this might require in revamping the governance of the sector?

So what can be proposed?

Institutional Change

There are considerable vested interests in the governance of shipping remaining largely as it is now – take for example many shipowners who as we have seen already benefit from the chaos and confusion that currently characterizes shipping policy-making. Also many shipping ancillary activities who through tradition or self-interest see no need for change or fear that change will threaten their comfortable existence (brokers, P and I Clubs, the legal and banking industries etc); governments of nation-states who dominate the policy-making process – traditional maritime nations, Open Registry states; locations of major maritime institutions – New York, London, Paris, Geneva, Copenhagen etc; and of course those interests focussed upon the nation-state in more general terms who see a move towards a different institutional structure with a reconfigured jurisdictional emphasis as a threat. Lined up against change is all that encompasses the capitalist establishment – politicians, governments, business and so on.

However, just because a structure for policy-making has become institutionalized does not mean that fundamental change cannot nor should not occur. Remember that before the traditional, Modernist, maritime jurisdictional frame focussing upon the state was established centring on institutions such as the IMO, WTO, OECD, EU Commission and the national ministry, there were other patterns of policy-making. These may well have been less adequate but simply that change occurred to develop the modern-day policy-making structure suggests that change can occur again. Postmodern, globalized society is here; the 20th century Modernist society has moved on and the need to revise the institutional structure for maritime governance to match Postmodern trends is clear.

Institutional change is supported from many directions. Peters and Pierre (2001, p. 133) were clear in their desire for change, linking policy change and institutional change in both directions:

"Policy changes trigger or necessitate institutional changes and similarly, institutional changes frequently entail some degree of policy change".

They see the dual process of political integration (exemplified by the growth of size and influence of the EU) and decentralization to the local and regional levels (classically Postmodern), stimulated by globalization and these twin impacts as requiring institutions to change not only in structure and interrelationships from the formalized hierarchy of present but also to widen their dialogue to include a much greater range of stakeholders.

Zurn (2003, p. 354) emphasized the need to develop institutions to reflect the moves towards governance beyond the nation-state as society becomes 'denationalized'. Although it is hard to disagree with his stress that ' the shape of more recent inter, trans and supranational institutions is hardly compatible with the traditional notion of state sovereignty in the national constellation' it is possible, in fact desirable, to go further and to suggest that perhaps governance based on jurisdictional institutions is irrelevant in the Postmodern, globalized world where a new configuration of more complex but relevant policy-making relationships needs to be found reflecting similar relationships in society.

Storper (1997, p. 188–190) made many similar points relating in particular to territorially bound institutions – which of course characterize the shipping sector. Describing territorialization as declining or just simply low (for example with increasing globalization), 'locational substitution' becomes increasingly possible (again shipping but also many other activities with globalization). There occurs what he terms 'a race for the bottom'; effectively a competitive bidding war for economic activity – a frenetic activity of 'states and localities'.

Because major global business organizations (for example shipping companies) interact across many territorial economies and not just a single nation-state, there exists 'little harmony between the rules by which such firms intend to relate to these environments and the relational assets already built up in those places'. Policy-making institutional change becomes a necessity to reflect these new relationships.

Institutional change is necessitated by the changes that have occurred in the globalized, Postmodern world which makes policy-making institutions structured around formalized nation-state principles an anachronism. Consequently not only might the established institutions of the UN, WTO, EU and the like have to change the way they work, the relationship they have between jurisdictional levels and the formulation and exercise of their power, they might even have to contemplate the unimaginable – giving up maritime governance for a new mechanism entirely. This new structure remains unclear but this is no reason to avoid

debate, especially as effective maritime governance remains elusive under the current system.

Stakeholders

The relationship between effective governance and policy-making is at the same time both clear and confused – clear because it is seemingly obvious that to create effective policies you need to include those most affected by them in drawing them up. Only then can ownership be achieved and if something is not owned then it is not uncommon that is also unloved. Confusing because deciding who is a stakeholder, what role they play and whom to include is never straightforward. Whilst shipowners, freight forwarders and port operators are clearly maritime stakeholders, what about 3PL organizers, maritime consultancies and the owners of Lloyds List? And then there is always the general public, environmental pressure groups and the broadcast media; politicians, banks, lawyers and virtually every industry in the world.

The issue of stakeholders has become increasingly significant in recent years. For example, Freeman (1984) related stakeholders to effective strategic management, Goodpaster (1991) assessed the relevance of stakeholder analysis to business ethics, whilst Gordenker and Weiss (1995) indicated the significance of NGOs as stakeholders at the United Nations particularly in the context of international relations. Donaldson and Preston (1995) examined corporations and the importance of stakeholders, Dicken et al. (2001, p. 91) suggested that it was vital to try and include all stakeholders when analyzing the global economy, and Hemmati et al. (2002) in discussing governance generally, and Hess (2008, p. 455) considering value chains and networks, both included stakeholders as central features of their analysis.

The significance of stakeholders in our discussion of governance in the maritime sector and the central role of the changing nation-state is emphasized by the existing work on the relationships between these areas. Examples come from Picciotto (1998, p. 3) who suggested like many others, that the state had become significantly more fragmented representing what he called a move from government to governance. The consequences have been a shift from 'direct government economic intervention and management' to 'public semi-autonomous bodies' operating as market regulators. These new regulators now formed the new public sphere composed of the stakeholders that constitute each respective sector – banks, police, social services, utilities and the like – and in the maritime sector such bodies as shipbrokers, port authorities, P and I clubs, lawyers, freight forwarders and logisticians. Thus stakeholders have tended to replace politicians and government employees as the process of governance has developed and refined.

Macleod and Goodwin (1999, p. 506–507) confirmed this trend suggesting that the drift from government to governance was clear and unstoppable (Wolch,

1989) and was reflected in the state's relative decline in 'direct management and sponsorship of social and economic projects' and what they called an 'analogous engagement of quasi and non-state actors in a range of public-private partnerships and networks'. Stone, (1989, p. 3) agreed:

"What makes governance... effective is not the formal machinery of government but rather the informal partnership between City Hall and the downtown business elite. This informal partnership and the way it operates constitutes the city's regime; it is the means through which major policy decisions are made".

Jessop (1997, p. 574) also confirmed this process of moving from government to governance with evidence of a decline in state sponsorship and political hegemony to partnerships between 'governmental, para-governmental and non-governmental organizations in which the state apparatus is often only first amongst equals'. Governments have always relied on outside agencies to realise state objectives but that this reliance has been 'reordered and increased'. The state of course can also benefit through this by enhancing 'their capacity to project state power and achieve state objectives by mobilizing knowledge and power resources from influential non-governmental partners or stakeholders' (Jessop, 1997, p. 575).

The role of stakeholders in governance has been taken up in earnest by the EU who has recognized at least in principle, how important they are to the creation of effective policy. The Commission's 2001 White Paper on Governance (Commission of the European Communities, 2001, p. 14–15), developed through their 2009 White Paper (Commission of the European Communities, 2009, p. 3 and 6) emphasized the importance of societal contribution to policy-making and the involvement of those most directly affected whilst their 2008 White Paper on Maritime Policy stressed the need for a 'stakeholder consultation structure' feeding opinion and expertise into the development of maritime policy and 'allowing the exchange of best practices' (Commission of the European Communities, 2008, p. 6).

An appreciation of the significance of stakeholders in maritime sector policy-making has grown in recent years reflecting the need to incorporate them more in the process of governance (see for example Aspinwall, 1995 and Bennett, 2000: 893). Sutherland and Nichols (2006, p. 6) stressed that governance of marine spaces was actually the 'management of stakeholder relationships' and that good governance would only come with the 'recognition of the interests of all stakeholders'. Central to this were stakeholder identification, engagement and management of inputs. Pomeroy and Douvere (2008) discussed in some detail the application of stakeholder theory to marine spatial planning including the value of stakeholders to the policy-making process, how to define stakeholders and their relative significance and how to empower them. However, in most cases the definition of a maritime stakeholder remains conservative and this should stimu-

late a reappraisal of what is meant by the term, whom else should be included (and whom not) and in what way

Pallis concentrated upon the role of Maritime Interest Groups, their representation, structures and influence on policy-making. Pallis (2005–2006) and Pallis and Tsiotsis (2006) identified 37 maritime interest groups made up of business associations (82%), trades unions (10%) and regional interests (8%). They considered the input of port interest groups in the European Union when the Port Services Directive was proposed in 2005-6 identifying nine groups with direct port interests. This was not claimed to a comprehensive sample but represented those who had expressed interest during the consultation phase. Once again only those with direct (rather than indirect interests) were represented.

Notable is the large number of interest groups that exist in the maritime sector – and possibly the significance of their input to maritime policy-making as a result; and that here we are keeping the definition of a stakeholder very narrow – those with direct, close and well defined interests. Current policy-making in the EU and at other jurisdictional levels already consults with these organizations and it is these who tend to respond to calls expressing interest when maritime policies are being discussed. However, it excludes all the indirect stakeholders upon which maritime policy impinges to a greater or lesser degree – interest groups, other sectors of the economy, individuals, politicians, media and so on.

Notteboom and Winkelmans (2002) had earlier considered the significance of stakeholders to ports policy, recognizing the importance they should have in the policy-making process. Here they did not confine their definition to only those with clear and direct interests but extended the discussion somewhat further to include community groups and environmentalists, economic and contractual stakeholders, those related to public policy, and those representing the community. Stakeholders were expected to vary according to the issue, the port, the purpose of the policy-making and much more. In all cases ports were viewed as characterized by multiple stakeholders. This was further taken up by Wang and Slack (2002), Wang, Ng and Olivier (2004, p. 238), Dooms et al. (2004) and Coeck and Dooms (2007).

De Langen (2007, p. 459–460) outlined the importance of stakeholders to port clusters including rather wider interests than those indicated by Pallis. These covered importers and exporters, transport service providers, environmental groups, regional government, manufacturing industry and port labour. However many more might also have been included if maritime governance was to take full account of stakeholder interests. Brooks and Pallis (2008, p. 413, 419) took up this message citing De Langen (2007) as well as Wang and Slack (2002) to suggest that port governance required consideration of three axes – spatial-jurisdictional context, logistical capabilities and not least the stakeholder community which they saw as including much more than the primary customers of the port.

Table 1. Influential actors in the globalization of regulation

Community	Examples of Key Actors
Organizations of states	IMO, EU
States	UK, US, Japan
International business organizations	IACS, ICS, ICC
National business organizations	None
Corporations	Lloyds Register of Shipping, classification societies, insurers
International NGOs	IMO, Friends of the Earth, International Confederation of Free Trade Unions
National NGOs	None
Mass publics	Yes – catalyzed by the Titanic, Torrey Canyon and Herald of Free Enterprise disasters
Individuals	Edward Lloyd, Justinian
Epistemic communities of actors	Strong

Source: Braithwaite and Drahos (2000: 476–477).

As part of a much wider discussion, Braithwaite and Drahos (2000: 476–467) outlined what they saw as the significant stakeholders in the globalization of maritime policy-making, divided between various definitions of the community (Table 1).

Furger (1997: 446, 449 and 453) meanwhile, saw stakeholders as intermediaries in the policy-making process and noted that 'institutionalized distinction of regulators and regulatee makes government agencies blind to a large number of institutions which cannot be equated to regulators or regulatees but which have nevertheless an impact on safety and environmental protection as significant as traditional regulations'. Or in plain English, policy-makers are trapped by inertia into considering only the 'regular' stakeholders they always have. New stakeholders are considered 'an avoidable nuisance rather than a social resource' and this is despite the fact that the maritime sector is largely shaped by them. Sletmo (2002: 3) meanwhile recognized the range of stakeholders in shipping policy suggesting this had to encompass 'national and international agencies as well as national and global shipping corporations, their customers, their owners and labour'. He went on to emphasize that 'certain aspects of policy are strongly promoted by or supported by groups far removed from the business of shipping and maritime transport'.

Sletmo' s view is far from all embracing and in many ways reflects that adopted by the current range of policy-makers including the EU. The contention here is that meaningful maritime policy-making will need to be far more comprehensive encompassing a much wider range of those affected if it is to start to

avoid the failures in policy that we have identified. Hosseus and Pal (1997) provided a detailed analysis of policies and policy instruments for the Canadian shipping industry and in so doing implied a much wider range of stakeholders that were involved. Some 473 shipping topics were derived, most of which could be associated with identifiable stakeholders. These were subsequently consolidated into more limited areas shown in Table 2 which again reflected a very wide range of those influenced and affected by maritime policy-making – far wider that conventionally consulted. The unconventional expression of some of the topics was related to the content analysis approach that was utilized but despite this, the implications for stakeholder choice were clear.

Table 2. Shipping policy topics

Abandoning of	Department	Industries	Passenger lists	Shipping
Act	Deregulation	Information	Periodicals	Shuttles
Aeronautics	Developing countries	Information system	Pilots	Signals and signalling
Aids to navigation	Disadvantaged	Insulation	Pneumatic equipment	Simulators
Allowance	Division	Interior	Services	Soundproofing
And pier	Domain	Iron and steel	Price	Speed
Astronautics	Earth stations	Legislation	Producing	Sponsored
Automation	Education	Liability	Productivity	State aid
Automotive	Efficiency	Lighthouses	Navigation	Storage and moving
Berth	Electronic equipment	Load line	Radar in navigation	Stranding of ships
Builders	Emergency employee	Losses	Rail transport	Studies
Buoys	Engineering	Maintenance and repair	Rates	Study and teaching
Careers	Environment	Manoeuvrability	Rat-proof construction	Subsidies
Cathodic Protection	Facilities	Manning	Reform	Surveys
Characteristics	Fenders	Manoeuvring	Registration	Survivability
Classification	Financing	Maritime	Regulation	Taxation
Coastwise shipping	Fisheries navigation	Mathematical models	Repair facilities	Techniques
Collisions at sea	Fouling	Medicine	Replacement	Tele-communications
Common Carriers	Fuel	Models	Routes	Test centers – US
Conferences	Fumigation	Movement	Routing and scheduling	To transit
Consolidation	Government aid	Nautical paraphernalia	Classification rules	Transfers to foreigners

Containerization	Guides	Network	Rural transportation	Transit time economics
Contracts, maritime	Hazards	Of disabled persons	Safety	Transportation
Convoys	Highway	Officials'	Sailing cards	Trucking
Corporations	Hulls	Operation	Satellites	Underwater navigation
Costs	Hydrography	Operators	Scrapping	Unitized cargo
Data Processing	Hydrostatics	Optimum ship routing	Sector	User fees
Decks	Impact forces	Painting	Ship handling	Vehicles

Source: Hosseus and Pal (1997: 411).

Stakeholder issues are topical in the current debate about governance and much has been said about widening and deepening participation. However, the truth is that whilst recognition of the need to involve stakeholders in the maritime policy-making process would help to reduce the severity and extent of maritime governance failure, it is not enough. Far more needs to be done to involve those both directly and indirectly affected by maritime activities – the media, politicians, electorates of all sorts and jurisdictions, individuals, interest groups – rather than the lip service paid to stakeholder involvement by current processes of consultation with the traditional institutions and disciplines.

Speed

Karl Marx was convinced:

"Thus the creation of the physical conditions of exchange – of the means of communication and transport – the annihilation of space by time – becomes an extraordinary necessity for it" (Marx, 1992, p. 349, 524).

Santos (1995, p. 171) viewed accelerations as 'culminating moments in history' which 'concentrate powers that explode to create something new' and he cited Michelet (1833) in stressing the significance of time and acceleration in the course of history. He suggested that the first reaction to acceleration is to adore the 'underlying velocity' and noted the emergence of railways and steam boats to support this. We may not be so interested in the emotional reaction to speed and acceleration, but its importance more generally is clear. Meanwhile Nielsen and Oldrup (2001) stressed the strong relationship between time, mobility and speed in the transport sector through their editing of a series of related papers, which included in particular the contribution by Nielsen and Jespersen (2001).

Much has been written in the past 30 years about the notion of speed and its relationship to society. This has extended to debate about acceleration and its role with respect to flows, which are considered in the following section. An appreciation of how speed, acceleration, flows and governance interact centres upon the evidence of a new societal era that we have conveniently termed Postmodern, the

emergence of an intensely globalized world community, and how the characteristics of the maritime sector and the policies that it brings are largely determined by the relationship between these stimuli.

One of the earliest commentators on the significance of speed was Porter (1968, p. 5–6) who suggested that the second industrial revolution had occurred based on what Michael (1962) termed the 'silent conquest of cybernation'. This Postmodern cybernated society had been accompanied by enormous changes both in the means and speed of travel. Although our consideration of the Postmodern places it somewhat later than Michael, this may just reflect our knowledge now of the substantial changes that have occurred, whereas Michael had the vision to see them as they began. Certainly changes in speed – in effect and more specifically acceleration - have been central to the new era that has emerged and which places such stress upon maritime governance.

Stalder (2006, p. 155) focused upon the relationship between Modernist time – formal, mechanized, predictable and globally defined – and that of the Postmodern era where suddenly the characteristics of time have been altered so that virtual instantaneity has replaced the traditional temporal concepts that applied to Modernist markets. He defined multiple times dependent upon the context, user, place and so on for which hierarchies are very inappropriate.

"Rigid hierarchies are too inflexible to deal with multiple temporalities; their historical rise to dominance, from the seventeenth century onward, was connected with the imposition of a dominant temporality, clock time, on everyone. Flexible (Postmodern) networks, by their very flexibility, are not capable of doing this, and nor do they require it" (Stalder, 2006, p. 158).

Crogan contributed significantly to the debate about speed, society and the new era and along with Brugger (1999) commented on the work of Virilio (for example 1995, 1999) who has been foremost in emphasizing the relationships that existed.

"all aspects of human experience are increasingly determined by the dominance of what (Virilio) terms 'logistics' over politics, culture and society... a total reorientation of economic activity and social/political organization which has occurred in conjunction with the development of mass and total war in the last two hundred years, culminating in the post-war period" (Crogan, 1999a, p. 142).

Whilst we may not agree with the time period – seeing the Postmodern era emerging from the Modern in the twentieth century and the reference to war is a distraction (although its significance and accuracy may well be undeniable) – the drift of Crogan's (and Virilio's) argument is clear. Crogan emphasized Virilio's identification of three types of speed in modern society which we can suggest underlies the Postmodern, globalized society – nomadic or revolutionary speed (riot and guerrilla warfare); state appropriated and regulated speed (management of public ways); and global, total warfare, planetary over-armament speed (nuclear strategy) (Crogan, 1999a, p. 142; Deleuze, Guattari, 1988, p. 137–138). Speed

was seen as a fundamental component of logistics in which a 'nation's potential is transferred to its armed forces' resulting in the decline of the significance of the nation. Crogan (1999b, p. 164) went on quoting Derrida and his consideration that the continuing growth in significance of speed to the new society at that time was just becoming apparent:

"Are we having today, another, a different experience of speed? Is our relation to time and to motion qualitatively different? Or must we speak prudently of an extraordinary – although qualitatively homogenous – acceleration of the same experience?" (Derrida, 1984, p. 20).

Agnew (1994: 72) suggested that the continued acceleration of society could be interpreted as stimulating the 'disappearance of space' with wealth untied to territory and nation-states consequently undermined or at least their pecking order rejigged to reflect changed status. Beckmann (1999a, 1999b, 2004, p. 98) summarized much of the debate on speed and in more detail discussed its Postmodern relationships (2004, p. 88) commenting on Bauman's (2000, p. 11) view of mobility as a function of 'exitability'. Individuals' tendency towards increasing 'escape velocity' suggests that speed and mobility 'enables absenteeism just as much as it permits proximity'. Increasing velocity reflects escape, slippage, elision and avoidance. This 'capacity to disengage, withdraw and move away is the privilege of the motile hybrid'. Think Postmodern shipping.

Hassan (1999, p. 1–2) noted that the present day institutions are unsuited to the new 'neoliberalised, high-speed network society' situated within a 'hierarchy of speed' where time is seen as social and not absolute, rejecting the assumptions of Newtonian physics that space and time were containers, and abstract and absolute forces of nature. Time forms an essential part of societal change the most significant recently being that of globalization. The new society is 'predicated upon acceleration (and) the flexibility of economy and society' (Hassan, 2009, p. 11).

Armitage and Graham (2001, p. 113, 116) emphasized the links between the globalized society, speed, mobility and wealth. Economic growth in contemporary capitalism depends upon increasing rates of the processes of production which includes the movement of materials and the exchange of information, or in their words, 'trade is dependent on the overproduction of speed' (115). Similarly, 'what is required, above all, is recognition of the centrality of speed in contemporary societies' (121). Shipping is no exception. Capitalism demands ever-increasing production (what Armitage and Graham term 'over-production') and this requires 'ever-more efficient use of fractured, punctuated and rigidly organized social time – seconds, hours, days, months or years'. Today's globalized economy is centred upon space and time and especially the 'increased efficiencies of time, acceleration, (and) increased rates of increasing speed. 'In trade, acceleration is sought to reduce production, consumption and circulation time' (Armitage, Graham, 2001, p. 116).

In recent years the relationship between speed, acceleration, globalization and society has centred around the work of Virilio and his numerous contributions to the debate (in particular 1977, 1995 and 1999). Commentators on Virilio abound (see for example Benko, 1997, p. 24; Dickens, Ormrod, 2006, p. 61, 89–90; Armitage, 1999a, 1999b, 1999c, 2000a, 2000b). There has been a substantial number of other publications widely ranging in opinion but throughout there has been a degree of consistency in accepting that the Postmodern era has a close relationship to the increased emphasis on speed and acceleration in society. In the case of the maritime sector this is clearly manifested through the sector's relationship with globalization, and the need to view all that it brings to the policy-making process and the structure of governance. Examples of related work include Der Derian (1990, 1999), Conley (1999), Crogan (1999a), Cubitt (1999), Gane (1999), Kellner (1999), Leach (1999), McQuire (1999) and Zurbrugg (1999) all of which featured in a special edition of Theory, Culture and Society focusing on Virilio's ideas. Additional commentary can be found in Der Derian (1992, 1998), Gilfedder (1994), Wark (1988).

Der Derian (1999, p. 215) provided commentary on the contribution Virilio has made to the debate on speed, time, acceleration and the Postmodern. Speed is seen as shrinking the globe and the Postmodern effect is one derived from acceleration, causing mental confusion of 'near and far, present and future, real and unreal' which affects all society. Governance and policy-making can no longer hold on to the historical tradition of the known, the fixed, the close and the well-tried but must now in a sense become more 'unreal' and recognize that the acceleration of speed has generated a totally new scenario where time and space are one, where the meaning of domesticity and the nation-state is unclear, and where there is little that is fixed, immovable, inflexible or guaranteed. Where the individual can be as influential as the corporation; where communication is not reserved to those within a sector but is extended to influences far beyond; where the media can create reality and substitute one reality for another almost at will. Virilio saw all these trends in modern society and we can see how they affect policy-making and governance in all sectors, not least shipping.

"Real time now prevails above both real space and the geosphere. The primacy of real time, of immediacy, over and above space and surface is a fait accompli and has inaugural value (ushers a new epoch)" (Virilio, 1995, p. 1).

That new epoch is the Postmodern and it requires a new epoch of governance.

Despite this Virilio is not wholly convinced that the Postmodern represents anything different from the Modern. Armitage (1999a, p. 6, 8, 11) suggested that Virilio contributes significantly to critical cultural and social theory by concentrating on the relationship between military space, territorial organization, dromology and the aesthetics of disappearance and dismissing what he terms the sterile debate over Modernism and Postmodernism. Virilio is certainly not a self-defined

Postmodernist, something claimed for him by Harvey (1989, p. 351), Waite (1996: 116), Sokal and Briemont (1998, p. 159–166) and Gibbins and Reimer (1999, p. 143). Virilio in fact consistently refers to Modernist writers such as Kafka and Aldous Huxley and Modernist artists such as Marinetti and Duchamp. Virilio writes with optimism of key Modernist features:

"it's the global dimensions of the twentieth century that interest me – both the absolute speed and power of the twentieth century's telecommunications, nuclear energy and so on, and at the same time the absolute catastrophe of this same energy!" (Virilio, 1998, p. 2).

Far from making his work of less relevance his pre-occupation with speed and acceleration remains highly pertinent and reflects the changes that have taken place in society and which impact upon maritime governance. Writing in 1997 his relevance is clear:

"We're heading towards a situation in which every city will be in the same place – in time. There will be a kind of co-existence, and probably not a very peaceful one, between those cities which have kept their distance in space, but which will be telescoped in time. When we can go to the Antipodes in a second or a minute, what will be left of the city? What will remain of us? The difference of sedentariness in geographical space will continue but real life will be led in a polar inertia" (Virilio, Lotringer, 1997, p. 64).

In effect the difference between 'here and there is obliterated by the speed of light' (Armitage, 1999a, p. 11). The change that we have seen occurring in Postmodernism and the manifestation of the next era of capitalism is something Virilio has long associated with speed and its position at the 'heart of the organization and transformation of the contemporary world' (Armitage, 1999a, p. 1). He identified 'productive interruptions', 'jumps' and 'creative dynamics'.

Jumping to our final section, Dickens and Ormrod (2006, p. 11) made the link between time-space compression and the next phase of capitalism, beyond the Postmodern. This sees the expansion of capitalism to new and even more distant territories, facilitated by the ever-increasing power of speed over distance, territory and space. Whilst current new spatial fixes as envisaged by Harvey (2006) are being made in Japan, Brazil, Russia and China, encouraged by new technology, this same new technology is also beginning to open up extra-territory, outside the established and traditional global market-place in the form of space-based infrastructure (satellites, shuttles etc) and undoubtedly, eventually capital investment on other planets and moons. At this point (soon to occur) capitalism's new territorial boundaries are almost unlimited – perhaps only by the human imagination – and the role of speed and its accumulation of space, is central. More of this in the final section after a consideration of the importance of 'flows'.

Flows

Luke (1991, p. 320–321) was an early advocate of the notion that society was becoming spatially less fixed and increasingly centred more upon process and even more specifically flows. A central feature of the Postmodern era has been the move away from territory and space (characterized by the Westphalian notions of the nation-state) defining what is possible and toward a refocus towards the movement of information, data, capital, people and products over increasing distances and in shorter periods of time. The process of globalization has required and only been possible because of space-time compression, itself a notion that is centred upon process rather than object. Flow rather than space.

Luke suggested that:

"Moving from place to flow, spaces to streams, introduces non-perspectival, anti-hierarchical and dis-organizational elements into traditional spatial/Industrial/national notions of sovereignty".

This makes the traditional Westphalian state outdated in the new globalized society and the characteristics of maritime governance – hierarchy, organization, nation-state directed – of increasingly less relevance. Modern governance needs to be adapted to accept movement, flow, stream and change rather than a 'one size fits all', rigid structure to policy-making that cannot accommodate the globalized world. To quote Luke again:

"The ethnographic settings of self-rule defined by the classical Westphalian universe of borders, shorelines and airspaces in spatially construed grids of/for sovereignty increasingly collide in the transnational universe of technoregions generated out of global monetary transactions, commodity exchanges, technical commerce, telecommunication links, and media markets".

He saw the unconstrained access by policy-makers to flows, rather than the existing closed domination of place, as a crucial attribute. The 'reality of place, expressed in terms of a sociocultural context of spatial location, gradually is being resituated within the hyperreality of flow'. Cooke (1990, p. 141) agreed stressing that globalized society has no centre, rather it is a decentred space of flows whilst Blatter (2001, p. 176, 178) also emphasized how the traditional Westphalian notion of nation-state policy-making is being eroded by flows of information, capital, services, goods and people.

The space of flows is a widely debated concept whose origins can be found largely in the work of Castells (1992, p. 348–353; 1996: 378-478; 2000a, p. 13–14) who has long been the main proponent of what he terms the 'network society'. We shall not debate the concept here but note its widespread acceptance as a characteristic of the new, globalized (and what we have termed Postmodern) society. For further discussion see for example Stalder (2006, p. 46, 152–154) who considered the historical development of Castells' concepts; Friedman (2000, p. 113), who debated the relationship of flows to governance; Hassan (2009, p. 11)

who saw the rise of digital capitalism creating a new societal morphology that has no relationship to space; Allen (2003, p. 60–64) who placed the flow of power into a geographical context; Dicken et al. (2001); Yeung (2000, p. 201) who examined the development of network flows in Hong Kong business; Webster (2002, p. 97–123) and Soja (2000, p. 212–216) who provided extensive analyses; Watts (1991); and Taylor (2000a, 2000b, p. 161) who examined the relationship between flows, states and cities.

Castells also stressed the significance of a wide range of interactive stakeholders (2000a, p. 12), the role of the media (2000a, p. 13), the importance of networks in replacing hierarchies (2000a, p. 12, 19) and how all this relates to continued globalization. The rise of flows and networks is not a short-term or temporary thing. Its relevance to the debate on the new maritime governance is clear.

Taylor (2005, p. 705), along with Stalder (2006, p. 10), highlighted the link between globalization and Castells' notions of flows suggesting that nation-states increasingly are being undermined and replaced by networks of cities. However, rather than seeing space and flow as alternatives he emphasized that the two work together with nation-state responsibilities exercised through processes and flows with consequential impact upon their effectiveness, power and relationships. Castells earlier (2000b, p. 1111) had stressed how our global conceptions were dominated by the 'mosaic of states' forming the 'global political map through which we 'view world spaces'. As Lewis and Wigen (1997, p. ix) noted, it is a 'key geography… through which people order their knowledge of the world'. Taylor (2000a, p. 1111) stressed that these uncriticized and unexamined metageographies were taken for granted and consequently 'ripe for radical reconsideration at a time of global transformation'. As Arrighi (1994, p. 81) stated 'deficiencies in our perceptual habits… causing non-territorial spaces-of-flows… have gone unnoticed alongside the national spaces-of-places throughout the history of the modern world system'.

Meanwhile Storper (1997, p. 170) agreed; globalization was making 'contemporary economies… placeless, mere flows of resources'. He also saw no future for the nation-state within these flows with the:

"locus of control over important dimensions of the economic development process… passing from territorialized institutions such as states to deterritorialized institutions such as intrafirm, international corporate hierarchies or international markets that no know no bounds".

Storper (1997, p. 177–178, 182) went on to discuss the issue of flows at some depth. The globalized supply chain would see resources flowing within and between companies and markets with no dependence on any particular place creating what he called a 'flow economy'. This is where a 'location offer (sic) only those factors of production that could potentially be substituted by a large number of other locations'. Such conditions he described as 'non-specific, locationally

substitutable and perfectly elastic' are increasingly close to reality. Shipping presents one very specific case which exhibits these features more than any other. The result is a globalized sector, characterized more by flows rather than spaces, which remains caught in a governance time-warp, with policy-making allowed to remain dominated by a Modernist, state-centric, hierarchical institutional framework that was designed for territorialized economic activity and wholly inappropriate for current purposes. Table 3 is one interpretation of the flow/territory dichotomy. In particular, Cell 1 is represented by firms with high territoriality and high international flows – something reminiscent of the shipping industry before the onset of serious globalization and supported by the institutional policy-making framework we have today. Cell 2 meanwhile is represented by low levels of territorialization yet high international flows – very much the modern shipping industry – but which lacks a policy-making structure to support it.

Table 3. Flows and territories

	HIGH	**LOW**
HIGH	1 Intra-firm trade with asset specificities. Intermediate inputs of FDI. International markets served from territorial Industrial districts. Inter-firm and inter-industry trade.	2 International divisions of labor (eg in routinized manufacturing). International markets (eg in consumer services). Inter-firm and inter-industry trade without territorial core.
LOW	3 Locally serving production to specialized tastes with low international competition.	4 Local commerce in basic services not delivered via big-firm hierarchies.

Source: Storper (1997, p. 192).

Friedmann (2000, p. 113), quoting Castells (1997, p. 349) took up this theme in relating Castells' notion of flows and the need to accommodate this into governance.

"The space of flows… dominates the space of places of people's cultures. Timeless time as the social tendency toward the annihilation of time by technology supersedes the clocktime logic of the industrial era (Postmodern governance supersedes Modern governance). Capital circulates, power rules and electronic communication swirls through flows of exchanges between selected, distant locales, while fragmented experience remains confined to spaces. Technology compresses time to a few, randomized instants, thus de-sequencing society and dehistoricizing history. By secluding power in the space of flows, allowing capital

to escape from time, and dissolving history in the culture of the ephemeral, the network society disembodies social relationships, introducing the culture of real virtuality" (emphasis added).

Modern governance needs to accept that capital is constantly attempting to 'escape from time' and that globalization increasingly allows this to happen. As a central feature of globalization, shipping governance should be designed accordingly. Taylor (2005, p. 706) agreed but saw it as a complex inter-relationship of three levels of flows which represent three different networks generated by three different agents. The three networks are what might be termed the supra-state network, the inter-state network and the ultra-state network:

"The first is a network of flows between states; it represents the contemporary operation of the Westphalia process through cities... The second is a network of flows above states: it represents an interpretation of globalization processes as an increasing geographical scale of operation. The third is a network of flows across and beyond states: it represents an interpretation of globalization processes as transcending states and their boundaries".

Dickens and Ormrod (2007, p. 105–107) also stressed the network significance of the move from an emphasis of place to one of flow whilst assessing the moves by capital to continue expansion beyond the conventional terrestrial limits of globalization to that of the cosmos.

The Postmodern credentials of the space of flows are well documented. Castells (1989, p. 16–17) was direct about the close relationship seeing flexibility as a key part of the move towards flows, processes and change in production, consumption and management. Under the Postmodern arrangements, the advantages of economies of scale and depth of organizational power are retained whilst divesting the rigidity and difficulties of adapting to the new environment that comes with traditional Modernist models. Thus large-scale shipping activities can be pursued in a framework of flexibility with few constraints that allows it to take advantage of the Postmodern market and the laxity of the existing policy-making structures. Waterman (1999, p. 358) concurred seeing a close relationship between Castells' ideas, globalization and the Postmodern evidenced throughout much literature (for example Beck, 1992; Giddens, 1990; Hall, Held and McGrew, 1992; Harvey, 1989, 1996; Melucci, 1989; Poster, 1984, 1990; and de Sousa Santos, 1995).

4. Cosmic capitalism and the outer spatial fix

So where does capitalism go from here? It is beginning to exhaust the resources of this planet with few locations left to exploit. Shipping has done its bit in opening almost everywhere to everything and along with modern communications the process of globalization has ensured that the capitalist structure has the opportunities to generate and dispose of capital in almost endless ways. Shipping has been fundamental to this and is even active in exposing the last outposts

of the capitalist desert to the desires and addictions of modern society – the Antarctic and the Arctic Oceans and the shipping routes north of Russia and Canada as classic examples. Where next is the cosmos.

Far-fetched as this might sound it is far from it. Although it is beyond the scope of this chapter the expansion of capitalism into the limitless space that surrounds this planet is going on already – and in the process capital can be generated through the exploitation of new markets, territory and resources. Maybe even the exploitation of new labour if some time in the future a colony of Martians (or Venusians… etc) who are happy to undercut the Filipino, Vietnamese or even North Korean seafarer, is discovered. You can bet that the experienced shipowner from planet Earth will not miss the chance to employ them at lower rates, in poorer conditions, and less well trained if the opportunity affords itself. And think of flagging? Off-shore registers might become off-planet registers with names such as Mars, Venus, Jupiter and beyond becoming ever more common. With the poverty of rules, regulations and legislation to control Earth-like activities, the complete absence of the nation-state and the perpetuation of state structured Earthly extra-terrestrial governance institutions (eg the UMO), the potential of the cosmos for the maritime sector is mind-blowing.

Examples of those already commenting on the capitalist market in the cosmos centre around Dickens and Ormrod (2006, 2007); Dickens (2009); Parker (2009); and Parker and Bell (2009a, 2009b). In particular Dickens and Ormrod (2007, p. 49–67) emphasized how Harvey's (1989, 1990) conception of the crisis of capitalism – in needing a constant fix of new sources of capital and its disposal and hence the rush towards globalization – can be extended to territory beyond planet Earth and what they termed the 'humanization of the universe'. This they called the 'outer spatial fix' whereby capitalism searches for new markets and sources of resources (labour, land, materials etc) extra-terrestrially. Whilst shipping may find itself a little constrained by the need for oceans, it is certainly not beyond imagining the use of extra-terrestrial land forming the administrative basis for new flags, legal regimes and methods of avoiding terrestrial regulations and constraints – something that might well appeal to many a shipowner. Thus cosmic capitalism might well centre around the use of outer space to facilitate the capitalist dream on Earth. And the consequence – is the need for cosmic governance to administer the generation and application of cosmic legislation and policy that affects Earthly activity. Given that we at present have ineffective terrestrial governance for the shipping industry, the prognosis is not good. But perhaps that is for discussion in the future

Some final thoughts

Our travels through globalization, governance, Modernism and the Postmodern have reflected the enormous complexity of policy-making especially

in a sector that has such close inter-relationships with other sectors, across jurisdictions, continents, disciplines and social networks. Shipping is a highly global, highly political, human activity that makes attempts to control and manoeuvre its activities by nation-states, governments, institutions often impractical and always difficult. The current maritime policy-making and governance system is inadequate for this purpose despite its lofty ambitions, extensive good will and the determination and dedication of many to succeed. New approaches are needed.

These new approaches will have to involve substantial change. The current maritime governance situation has remained largely unaltered since the early twentieth century and rests upon the established series of institutions that may have been added to (for example the emergence of the EU) but have remained the same in form, operation, jurisdiction, power and influence. New institutions may be needed, certainly new ways of organizing them and in particular the communications and power that flows between them. New ways of looking at how the maritime sector can be organized and controlled are undoubtedly needed to ameliorate the problems of flag-hopping, the advantages taken by the shipping industry of the nation-state dominated structure at present, and to absorb and accommodate the entirely globalized environment within which shipping now operates.

What is perhaps most important however, is not so much that the specific changes which have been outlined here are carried out, not even that the need for change is accepted, but that the question is asked whether the current maritime governance system is optimal, appropriate for its purpose and could not be improved? Despite the continued clear manifestation of maritime policy failure there is little (if any) debate about whether things might need to change.

We have placed considerable emphasis upon the substantial and profound changes that have taken place in society generally – through Modernism and Postmodernism over the past century or so – which in turn have major ramifications for governance and policy-making in all sectors. Globalization and the altered role of the nation-state are significant reflections of these changes and shipping is a significant global player yet working in a governance framework designed around obsolete societal structures. The result is that the role and characteristics of maritime governance need at least to recognize that societal change has occurred and that in turn implies the need for reflection and consideration of governance change as well. A Postmodern society (or whatever else it might be called, but clearly a changed society) requires Postmodern governance if policies are to be respected, effective and relevant. Clearly that is far from the case at the moment.

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MODELLING MULTIPLE STAGES MANUFACTURER ORIENTED SUPPLY CHAIN WITH UNCERTAINTIES AND CONSTRAINTS

Introduction

Supply Chain Management (SCM) shows the interaction among upstream to suppliers and downstream to the final customer with information and operations based activity. Up to now, SCM has increasingly been recognised that it could reduce supply chain total cost and, therefore improving companies' performance. Thus, it is essentially necessary for companies to build an effective and efficient supply chain system. There has been considerable research concerning the grocery supply chain and retailers (Chopra, Meindl, 2007, Stank et al., 2001, Arshinder et al., 2009). However, manufacturers in non-grocery sectors may face very different issues. This chapter will provide an example that considers multiple stages manufacturer oriented Supply Chains (SC) including Supplier, Raw Materials (RMs) warehouse, RMs transportation company, Manufacturer, Finish Goods (FGs) warehouse, FGs transportation company and customers with different types of uncertainties and constraints. It summarises different uncertainties from the literature and then is based upon a real case study (interview). The uncertainty in manufacturer oriented multiple stages SC has been summarised as supply uncertainty, demand uncertainty, process uncertainty and the constraints have been summarised as RMs inventory capacity, RMs availability, productivity, FGs inventory capacity, and transportation capacity. Following this a generalised model in the light of the case study has been developed. Using simulation, Just-In-Time (JIT) and JIT plus safety stock strategies have been tested in different uncertain environments. As a result, we find that in terms of different uncertain-

ties, the performances of the same strategy are different; different strategies could perform differently in the same uncertain environment. Therefore, for a company, it is necessary to make decision in the light of real situations. This developed model could provide an insight for company managers making decisions using simulation. It also contributes to academic research for a real case based multiple stages manufacturer oriented SC study with uncertainties and constraints.

1. Uncertainties in SCM

Uncertainty has been studied in different areas of supply chain management with different research methodologies for many years. We shall summarise literature in the light of different research methodologies. There are two types of research methodologies have been employed, namely: survey (interview) and mathematical modelling. Davis (1993) categorises uncertainty in a supply chain into three: demand uncertainty, supply uncertainty and technological uncertainty. By using surveys, Fynes et al. (2004) undertake a study on SC relationship quality and performance incorporating demand and supply uncertainty. Ho et al. (2005) indicate the key elements of supply chain uncertainty namely: demand variation, product variation, product complexity, sourcing complexity, and order process variation. Wong and Boon-itt (2008) undertake multiple case studies in the Thai automotive industry in order to explore the roles of environmental uncertainty and institutional norms in affecting supply chain integration. Merschmann and Thonemann (2011) address the relationship between environmental uncertainty, supply chain flexibility, and firm performance through a survey of German manufacturing companies. Srinivasan et al. (2011) survey 127 American companies to identify the relationship between buyer–supplier partnership quality and supply chain performance with environmental uncertainty.

Using a mathematical modelling method, Mitra et al.(2009) consider SC planning problems, and formulate a multi-site, multi-product, multi-period supply chain planning problem with product demands, machine uptime and various cost components uncertainties using the fuzzy mathematical programming approach. Peidro et al. (2010) develop a fuzzy linear programming model that focuses on SC planning problem on a medium-term basis (tactical level) which integrates procurement, production and distribution planning activities with demand, process and supply uncertainties. Gupta and Maranas (2003) summarise earlier work(s) and address the problem of tactical planning supply chains planning under demand uncertainty. Sodhi and Tang (2009) extend a stochastic linear programming (LP) model of deterministic supply-chain planning with integrating demand uncertainty and cash flows for the medium term. You and Grossmann (2008) develop a model to address optimising supply chain design and planning problem under a esponsive and an economic criterion with demand uncertainty. Guillén-Gosálbez and Grossmann (2010) develop a bi-criterion sto-

chastic non-convex mixed-integer nonlinear program (MINLP) to address optimal design and planning of sustainable chemical supply chains (SCs) with uncertainty in the damage model, and then to evaluate environmental performance (cost). Longinidis and Georgiadis (2011) introduce a mathematical model for undertaking better supply chain design; the model integrates financial considerations with demand uncertainty. Applequist et al. (2000) concern risks of investing chemical SC under uncertainties' considerations of production, demands, and inventory. Hsieh and Wu (2008) analyse coordinated decisions in a decentralised supply chain with uncertainties on both demand and supply sides. Hua et al. (2006) study two cooperative game models addressing cooperation and its implementation between the manufacturer and the retailer under demand uncertainty. Xiao et al. (2010) develop a game theoretic model of a three-stage supply chain in order to evaluate the effects of lead-time and the length of selling season on both demand uncertainty and inventory-holding costs. Jung et al.(2004) analyse deterministic planning and scheduling models which incorporate safety stock levels and under demand uncertainty using a simulation based optimisation approach.

Table 1. Summary of supply chain management studies incorporating uncertainties

Article	Supply chain	Uncertainty type	Research objective	Research method
Fynes et al., 2004	N/A	Demand, supply	SC relationship quality and performance	Survey
Ho et al., 2005	N/A	Demand, product, product , sourcing, and order process	Measuring supply chain uncertainty	Survey
Wong, Boonitt, 2008	7 Thailand Companies	Demand, supply and technological uncertainty	Supply chain integration	Multiple case studies and interview
Merschmann, Thonemann, 2011	A German manufacturing company	Demand, product, product , sourcing, and order process	Investigating the relationship between flexibility, uncertainty and firm performance	Survey
Srinivasan et al., 2011	127 US firms. Buyer and supplier	Exchanging relationships and superior partnership quality	Examining relationship between buyer–supplier partnership quality, and	Survey

Article	Supply chain	Uncertainty type	Research objective	Research method
			supply chain performance	
Mitra et al., 2009	Raw material suppliers, production unit, customers	Product demands, machine uptime, cost and components	Total cost of the planning model, margin provided in the constraint violation and the extent of demand satisfaction	Fuzzy mathematical programming
Peidro et al., 2010	Procurement, production and distribution planning	Demand, process and supply uncertainties	Service level , Inventory cost, Planning nervousness (period), Planning nervousness (quantity) and Total cost	A fuzzy linear programming model
Gupta, Maranas, 2003	Six production sites manufacturing with 30 products and demand market	Demand	Midterm planning of multisite supply chains (cost)	Stochastic programming
Sodhi, Tang, 2009	Supplier, manufacturer, (including plant and warehouse), customer, bank	Demand	Net cash, cost, the probability of an adverse event (running out of cash, not meeting demand, or having excessive inventory)	stochastic linear programming (LP)
You, Grossmann, 2008	Suppliers and manufacturing	Demand	Supply chain design and planning(lead time and income)	Bi-criterion optimisation model
Guillén-Gosálbez, Grossmann, 2010	Chemical supply chains	Uncertainty in environmental damage	Incomes (i.e., sales of products) and the total cost	Bi-criterion stochastic nonconvex mixed-integer nonlinear program (MINLP)

Article	Supply chain	Uncertainty type	Research objective	Research method
Longinidis, Georgiadis, 2011	Plants, warehouse, distribution centre and customer	Demand	Optimal design of supply chain networks with financial aspects	Mixed-Integer Linear Programming (MILP) and a real case study
Applequist et al., 2000	N/A	Production, demands, and inventory	Risk management of chemical supply chain investments	Deterministic mathematical programming models and stochastic programming-based methods
Hsieh, Wu, 2008	One Original Equipment Manufacturer (OEM), one manufacturer, and one distributor	Demand and supply	Capacity allocation, ordering, and pricing decisions	Mathematical modelling
Hua et al., 2006	A manufacturer and a retailer	Demand	Cooperation and its implementation between the manufacturer and the retailer	Cooperative game models
Xiao et al., 2010	One retailer, one manufacturer and one subcontractor	Demand	Ordering, wholesale pricing and lead-time decisions	Game theoretic model
Jung et al., 2004	Sale regions, plant A, plant B	Demand	Target customer satisfaction level for products (planning period, cost)	Simulation based optimasation

Table 1 presents the papers that have considered uncertainty in SCM. Demand uncertainty has been the main issue studied. From table one, based on the literature and the case studies in this paper, uncertainty could be categorised into supply uncertainty, demand uncertainty, process uncertainty, and technology uncertainty. In this paper, only the first three types of uncertainties have been taken into account for model development, because it is hard to measure technology uncertainty using mathematical modelling.

2. Constraints in manufacturing SC

Although there are lots of papers considering uncertainties in the field of SCM, constraints are different with uncertainties. The lack of constraints that have been assembled from real case studies instead of only using logical assumptions requires them to be summarised. In the literature, constraints including resource constraints, capacity constraints, service level constraints, financial constraints, shipment size constraints, and factory capacity have been considered for many years in solving different SC issues. For instance: Li and Womer (2008) study a supply chain configuration problem (SCCP) under resource constraints, which is based on multi-mode resource-constrained project scheduling (MRCPSP) for configuring the supply chain subject to explicit resource constraints. Lee and Kim (2002) undertake a study on Production–distribution planning in the supply chain considering capacity constraints upon product and part inventory, the inventory of raw materials for products and the inventory of raw materials for parts, the resource availability constraints for product and parts, machine centre operation time constraints inventory in the warehouse, and the distribution operation time constraints for the stack and warehouses. Yan et al. (2003) undertake an MIP supply chain design model, in which many generic constraints based upon logical assumptions including the balance constraints of materials (or components) and products, the capacity limit constraints, the throughput limit constraints, and the service level constraints have been considered. Lai et al. (2009) discuss the impact of financial constraints under sharing inventory risk between retailer and supplier. Jung et al. (2008) develop an approach to evaluate of the performance and the decision on safety stock related variables under production capacity constraints. Huang and Ye (2010) analyse the impacts of lumpy demand and shipment size constraint on supply chain integration in vendor-managed inventory. Wu et al. (2010) extend TOC-SCRS (Theory of Constraints-supply chain replenishment system) that is a replenishment method of the TOC supply chain solution under the constraint of limited factory capacity assumption. Li et al., (2011) consider the coordination issue in a decentralized supply chain consisting of a vendor and a buyer with service level constraint. Taleizadeh et al.(2011) consider a multi-buyer multi-vendor supply chain problem in which the buyer has limited capacity to purchase products and the vendor has a warehouse limitation to store products. In the next section, the summarised constraints of manufacturer oriented SC from a real case study will be noted.

3. Model development

In this section, based on the literature and a case study, a comprehensive model incorporating uncertainties and constraints has been developed. The uncertainties in the model have been considered as supply uncertainty, demand

uncertainty, and process uncertainty. The constraints including RMs inventory capacity, RMs availability, Productivity, FGs inventory capacity, and Transportation capacity are mainly derived from interview rather than the literature where constraints are based on logical assumption. More details will be explained in the following sections.

Case study

The case company is a Chemical Industry Co. Ltd.. It is a sino-foreign joint-venture specialising in the manufacturing of kinds of fine chemicals, intermediate pharmaceuticals, intermediate pesticides and intermediate dyes. It has about 150 employees with annual sales of 10 million pounds (data based on 2010). The case supply chain is one of the company's productions (requires 3 main RMs) SC, the finish goods (FGs) supply many other chemical companies.

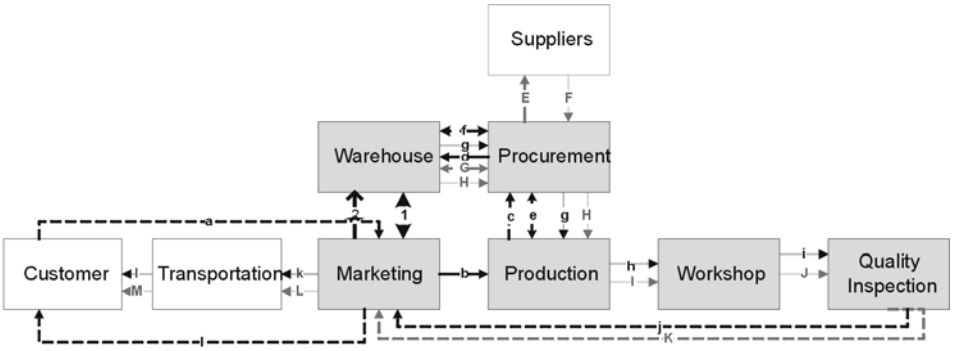

Figure 1. Supply Chain Map in case B supply chains

Material flow when Raw Materials are not available
Information flow when Raw Materials are not available
Material flow when Raw Materials are available
Information flow when Raw Materials are available

a. Customer makes order to marketing department;
b. Marketing department sends order information to production department;
c. Production department calculates Raw Material (RM) quantity, and send this RMs order to procurement department;
d. Procurement department checks RMs with warehouse.

If RMs are enough:

a. Procurement department discusses production plan with production department;
b. Procurement department prepares the RMs with warehouse;
c. Procurement department delivers RMs form warehouse to production department.

If any main RM is not available:

a. Procurement department contacts suppliers to order RMs;
b. Supplier delivers RMs;
c. Procurement department prepares the RMs with warehouse;
d. Procurement department deliveries RMs form warehouse to production department.

Producing FGs:

a. Production department adjusts produce plan and arranges RMs in workshop;
b. Workshop produces;
c. Quality inspection and contact with marketing department;

FGs satisfying customer order:

a. Marketing department contacts transportation company and customer to arrange finish goods delivery;
b. Transportation company deliveries finish goods to customer; depending on the location and different transportation company.

Update FGs inventory level:

a. Market department checks finish goods inventory;
b. Delivery FGs to warehouse if exceeding current customer demand;

From figure 1, it clearly shows that in reality, there are two situations leading to uncertainties, which have been represented by (i) shortages of RMs for production and (ii) shortages of FGs inventory for satisfying customer demand. These two situations appeared for both case companies. In the first situation, when any type of raw material is insufficient, the production will stop and wait for the raw material. In the second situation, if on-hand inventory of FGs is not enough for satisfying the current customer order, the order goes to the backorder process or the customer could be lost. However, managing RMs and FGs inventory especially in a SC (because of SC uncertainties) is a conflictive issue, because it has to be noticed that the RMs shortage could influence manufacturer production and the ability of the manufacturer to satisfy the customer order. The SC performance will be influenced. On the other hand, keeping too much inventory on either RMs or FGs will increase inventory cost, and then the supply chain performance will be influenced.

Based on the literature regarding the uncertainties in the SC and the case study, there are lots of sources to be considered in the model development. In next section, the generalised model has been developed incorporating the flows (information and material) and constraints that includes the SC uncertainty factors and constraints.

4. Simulation model

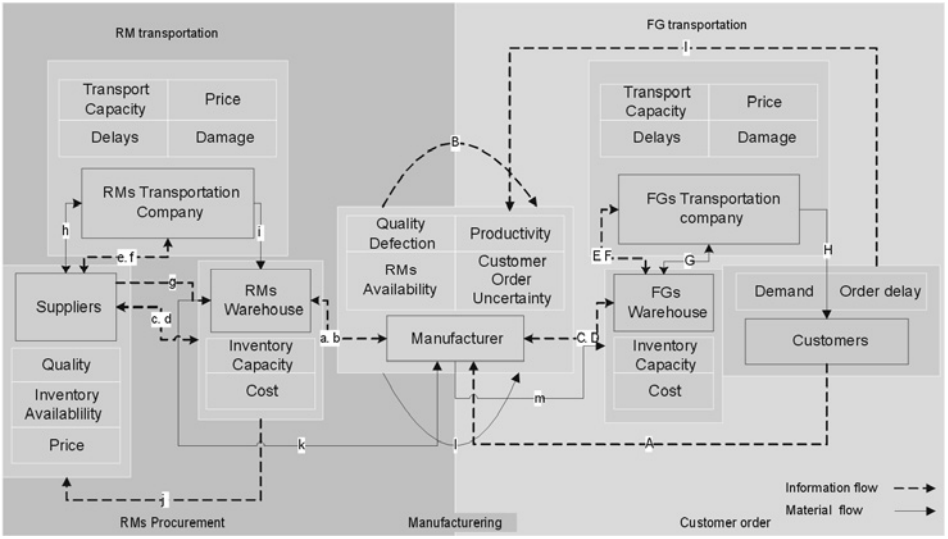

Figure 2. Model of supply chain with constrains

The developed manufacturing SC model is shown in figure 2, which includes the following two processes, namely (i) RMs procurement and RMs shipping to RMs warehouse process; (ii) FGs production, satisfying customer demand and FG's shipping to customer:

In terms of RMs procurement and transportation:

a. Manufacturer shares the production plan to RM's warehouse.
b. RMs warehouse reports the RMs' on-hand inventory information to manufacturer.
c. RM's warehouse places order (RM) to suppliers.
d. Supplier gives feedback incorporating inventory availability to RMs' warehouse.
e. Supplier contacts RMs' transportation company to arrange the delivery.
f. Transportation company confirms the delivery requirements with suppliers.
g. Supplier provides delivery information to RMs' warehouse.
h. RM transportation company picks up RM from supplier.
i. RM transportation company ships RM to RMs' warehouse.
j. RM's warehouse gives feedback to supplier and makes the payment.
k. RM's warehouse updates inventory and deliver RMs to manufacturer workshop.
l. Manufacturer produces FGs.
m. Manufacturer delivers FGs to FG's warehouse.

In terms of the FGs production, transportation and satisfying customer demand:

A. Customer places the order to manufacturer.
B. Manufacturer receives the order with internal checking.
C. Manufacturer shares the customer order information with FGs' warehouse.
D. FGs' warehouse reports inventory information to manufacturer.
E. FGs' warehouse contacts FG's transportation company to arrange delivery.
F. Transportation company confirms the delivery requirements with FG's warehouse.
G. Transportation company picks up FGs from FGs' warehouse.
H. Transportation company ships FGs to customer.
I. Customer makes payment and gives feedback to manufacturer.

The case company's supply chain includes suppliers, RMs transportation company, RMs warehouse, manufacturer, FGs warehouse, FGs transportation company and customers. The SC model consists of four sub-models namely: (i) Customer Order model (customer placing order to manufacturer, manufacturer contacting FGs warehouse); (ii) Manufacturing (Production) model; (iii) RMs Procurement with Transportation model (since placing procurement order, contact with RMs transportation company and then depositing goods into RMs warehouse) and (iv) FGs Satisfying Customer Order with Transportation model (FGs from FGs warehouse to FGs transportation company and finally arrive at customer) Bracket here??. With the constraints derived from the literature and interview, the developed SC model is also subject to lots of constraints. For suppliers, inventory level and price lead to uncertainties. For both RMs and FGs transportation companies, transportation capacity, price, delays, and damage will influence RMs and FGs shipments. For warehouses (both RMs and FGs), inventory capacity and holding cost have to be considered. For the manufacturer, it is more complicated. In terms of productivity, RMs availability (any type of RM shortage will stop production), and customer order uncertainties (e.g. order information delay) have been considered in the model. For the customer, demand uncertainty has been considered along with order (or amount of order) delays that are due to relationship between customer and manufacturer. In the model, customer demand is mainly satisfied by FGs inventory. If the FGs inventory is insufficient, there will be two situations, namely: (i) the production plan plus on-hand inventory could satisfy customer order; (ii) the order (a part of or whole) processes into back order.

Notation

- T: the number of planned time periods;
- I: the number of different types of raw materials;
- S_i: the maximum inventory capacity of RM i;
- S_o: the maximum inventory capacity of FGs;

- U_o: the maximum production capacity in one period;
- $x_o(t)$: at the beginning of on-hand inventory of FG (before status updated) of period t;
- $x_i(t)$: at the beginning of on-hand inventory of RM i (before status updated) of period t;
- r_i: the amount of RM i required to produce one unit of FG;
- $l_c(t)$: the information lead time of customer placing an order from customer to manufacturer at period t;
- $l_c^d(t)$: the lead time of delayed customer order information from customer to manufacturer at period t;
- $l_i^s(t)$: the (physical) lead time of shipping RM i from supplier to RMs warehouse at period t;
- $l_i(t)$: the total lead time of procurement RM i, from the acting of placing the order from manufacturer to supplier until the acting of physical receiving the RM at period t;
- $l_i^d(t)$: the lead time of delayed shipments of RM i from supplier, RMs transportation, to RMs warehouse at period t;
- $l_o(t)$: the lead time of manufacturer producing the FGs at period t;
- $l_o^d(t)$: the lead time of defective products to be reworked at period t;
- $l_s(t)$: the total lead time of shipping amount of FGs from FGs warehouse to FGs transportation company then finally arrive at customer at period t;
- $l_s^d(t)$: the lead time of shipping delayed FGs from FGs warehouse to FGs transportation company then finally arrive at customer at period t;
- $\eta_d(t)$: the random variable varies customer order (from 0.8 to 1.2), which follows uniform distribution;
- $\xi_d(t)$: the random variable representing the fraction of customer orders received/ processed by manufacturer on time at period t;
- $\xi_i(t)$: the random variable representing the fraction of RM orders received/ processed by suppliers on time at period t;
- $\xi_o(t)$:the random variable representing the fraction of perfect FG produced on time initiated at period t;
- $\xi_s(t)$: the random variable representing the fraction of FGs orders received by customer on time at period t;
- $d(t)$: the expected customer demand of FG during period t, which based on historical data;
- $D(t)$: the random customer demand of FG during period t;
- $D_o^r(t)$:the on time received customer demand at period t;
- $D_o^d(t)$: the delayed customer demand that arrive at period t;
- $DMD(t)$: manufacturer actually received customer order at period t;
- $u_i(t)$: the planned order quantity for RM i at period t, which is a decision variable;

- $u_i^r(t)$: the amount of orders for RM *i* received on time by suppliers at period *t*;
- $u_i^d(t)$: the delayed amount of orders for RM *i* at period *t*;
- $URM_i(t)$: the RMs warehouse actually received RM *i* at period *t*;
- $u_o(t)$: the FG production plan at period *t*,
- $u_o^r(t)$: the FG on time production requirements at period *t*;
- $u_o^d(t)$: the quality defective finish goods at period *t;*
- $u_o^s(t)$: produced finished goods at period *t*, which subjects to the constraints *;*
- $UFG_o(t)$: the amount of FG that manufacturer actually produces at period *t,* which is subjects to producing lead time *;*
- $s_o^r(t)$: the amount of FGs could be used to satisfy customer demand at period *t;*
- $s_o^R(t)$: the FGs delivered to customers on time at period *t;*
- $s_o^d(t)$: the delayed delivery of FGs to customers on time at period *t;*
- $CFG_o(t)$: customer actually received FGs at period *t.*

Customer order model

This model represents the customer order process at each period (representing process A, B, C and D in figure 3). The historical data has been time based regressed in terms of the collected historical case company data $d(t)$ (in total 48 weeks in case company A and 217 days in case company B). In the interest of customer demand uncertainty $D(t)$, the customer demand has been represented by a random variable $\eta_d(t)$, which follows the uniform distribution U (0.8 to 1.2) in this study, which will be presented in more detail in the next section. Then there are two types of dynamic lead time (placing order lead-time $l_c(t)$ and delay lead time $l_c^d(t)$) which may influence the manufacture actually received customer order in one period. Note both types of lead times are dynamic variables that could be different over the time period. $\xi_d(t)$ represents on-time rate of manufacturing received customer order $D_o^r(t)$ at a period. It should be noted that an amount of the customer order (after order placing lead time) arrives at the manufacturer on time in the period; however, there might be an amount of order delayed $D_o^d(t)$ (depends on the parameter value of 1-$\xi_d(t)$) that will arrive in a period, which depends on the delay lead time parameter 's value ($l_c^d(t)$) during this period. However, how much of the customer order that the manufacturer actually received in the period ($DMD(t)$) depends on two factors (i) on-time arrived customer order at the period ($D_o^r(t)$) and (ii) delayed customer order from previous period(s) but arrived at the period ($D_o^d(t)$).

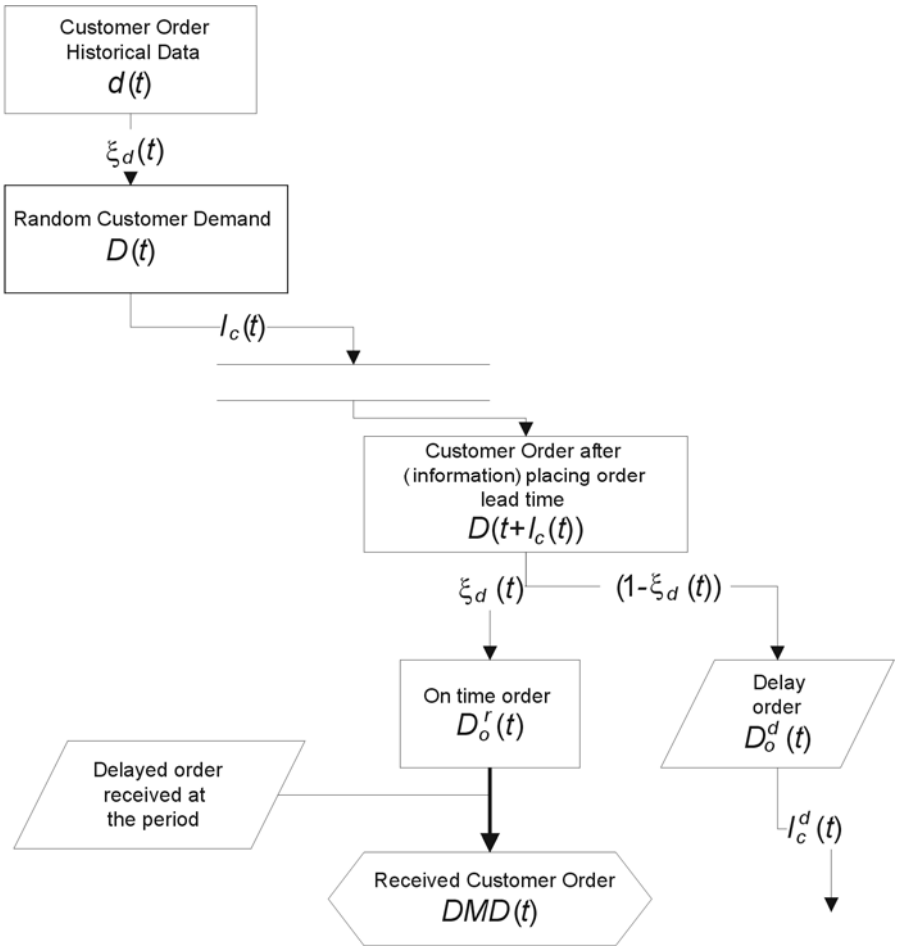

Figure 3. Customer order model

Raw material procurement and transportation model

This model denotes the actions of RMs procurement (represented by *c, d, e, f, g, h, i,* and *j* in figure 3). In the model, there are two situations, namely: on-time RM *i* and delayed RM *i*. Meanwhile, RMs transportation lead time $l_i(t)$ and delayed RMs delay lead time $l_i^d(t)$ have been considered. Firstly, there is a RMs procurement plan $u_i(t)$, however, in terms of uncertainties, a part of procurement is on time delivered ($u_i^r(t)$, $\xi_i(t)$) to supplier, and a part of procurement has to be delayed ($u_i^d(t)$, $1\text{-}\xi_i(t)$). This amount of delayed RMs procurement plan will join with the procurement action after delay lead time $l_i^d(t)$. Actually received RMs ($URM_i(t)$) includes two parts, namely: (i) delayed procurement plan(s) that originally happened from previous period(s) and arrived during this period; (ii) on-time procurement plan ($\xi_i(t)$).

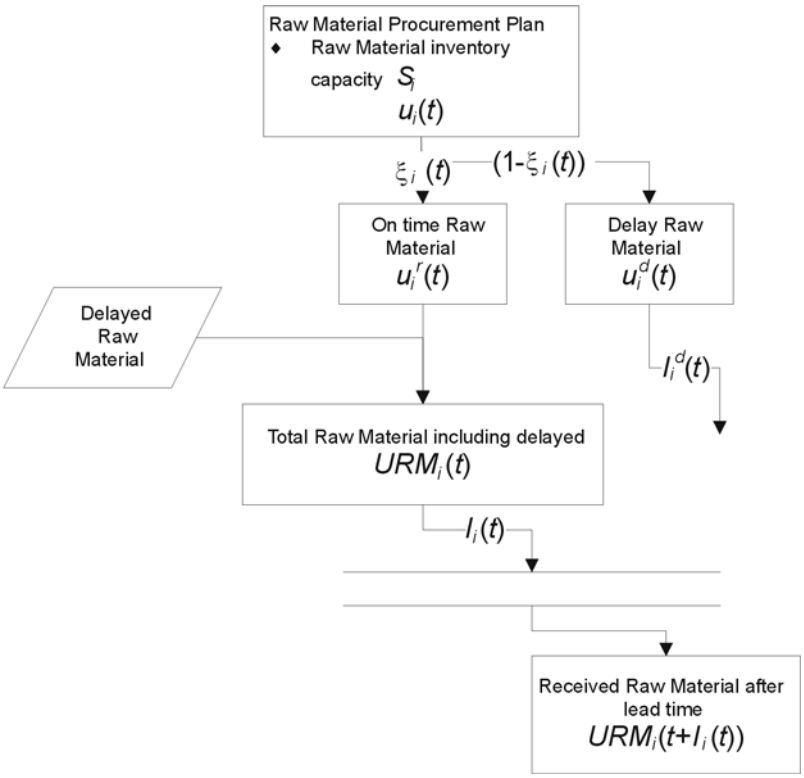

Figure 4. Raw material procurement and transportation model

Production model

The production process follows the production plan and is subject to constraints such as RM availability, productivity and FGs inventory capacity (representing *a, b, k, l,* and *m* processes in figure 3). There is a dynamic parameter to represent a production lead time $l_o(t)$ and a reproduction lead time $l_o^d(t)$ (because of defective quality) that follows a uniform distribution (in this paper) and may change over periods. In the first place, the total production plan ($u_o^r(t)$) is the sum of the production plan ($u_o(t)$) based on forecasting and amount of defective quality that has to be produced in this period ($u_o^d(t)$). The number of defective quality FGs is the sum of defective quality FGs that has to be reproduced at this period. It could be the original from previous period(s), which depends on the value of reproduction lead time $l_o^d(t)$ at that period(s). Afterward, there are constraints ($x_i(t)$, U_o, S_o) to control manufacturer production ability ($u_o^s(t)$) in this period. After production lead time, because of uncertainties, there are two situations that (i) $\xi_o(t)$ make sure the percentages of manufacturer actually produced FGs in this period ($UFG_o(t)$); (ii) a part of FGs could need to reproduce after the period of $l_o^d(t)$.

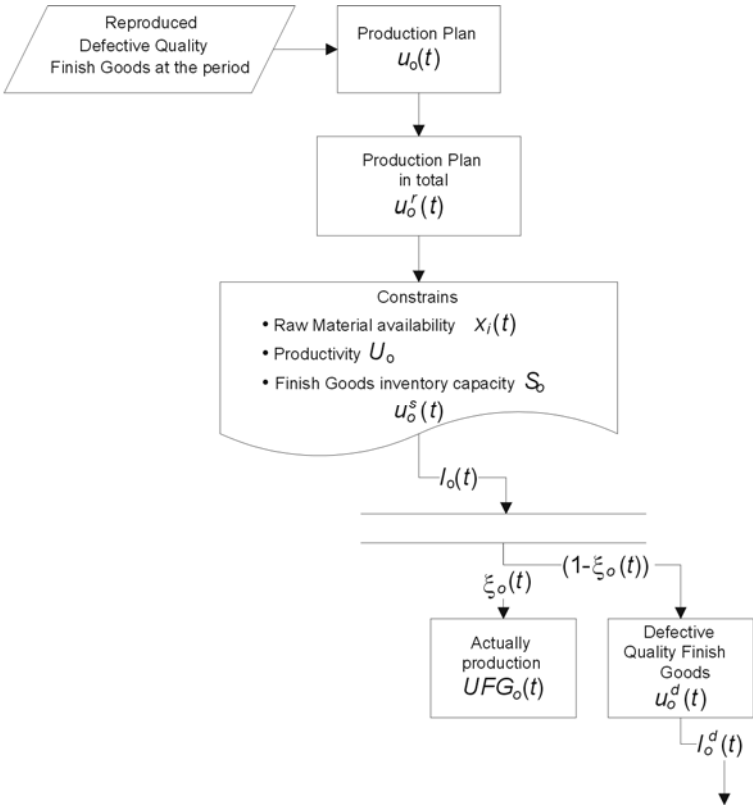

Figure 5. Production model

Finish goods fulfilling customer order and transportation model

This model represents how the FGs satisfy customer demand and how to ship the goods from FGs warehouse to the customer (representing *E, F, G, H,* and *I* in figure 3). The ability of the manufacturer to satisfy the customer order depends on the size of the customer order, FGs on-hand inventory level, and actually the manufacturer produced FG in the period. Then transportation uncertainty ($\xi_i(t)$) may lead to shipments delay. There are two types of lead-time in the model, the FGs shipping lead-time $l_s(t)$ that is different in terms of different period and the size of the shipment , and shipping delay lead time $l_s^d(t)$. Firstly, the manufacturer and FGs warehouse plan the FGs delivery in order to satisfy the received customer order ($DMD(t)$) in this period. However, according to the literature and interviews, the manufacturer may not be able to satisfy all the customer orders, because only a limited amount of FGs is available (depends on at this time, manufacturer satisfy customer order ability ($x_o(t)$, $UFG_o(t)$)). Then the manufacturer delivers all available FGs ($s_o^r(t)$) in accordance with received customer orders in this period. However, in terms of the uncertainties of transporta-

tion, there is an amount of FGs delivered on time ($s_o^R(t)$) and the number of FGs is delayed ($s_o^d(t)$) , and received after delay lead time ($l_s^d(t)$). The customer eventually received FGs ($CFG_o(t)$) after the shipping lead time $l_s(t)$ which includes two parts, namely: (i) on-time FGs at this period; (ii) delayed FGs which originate from previous period(s) arrive during this period.

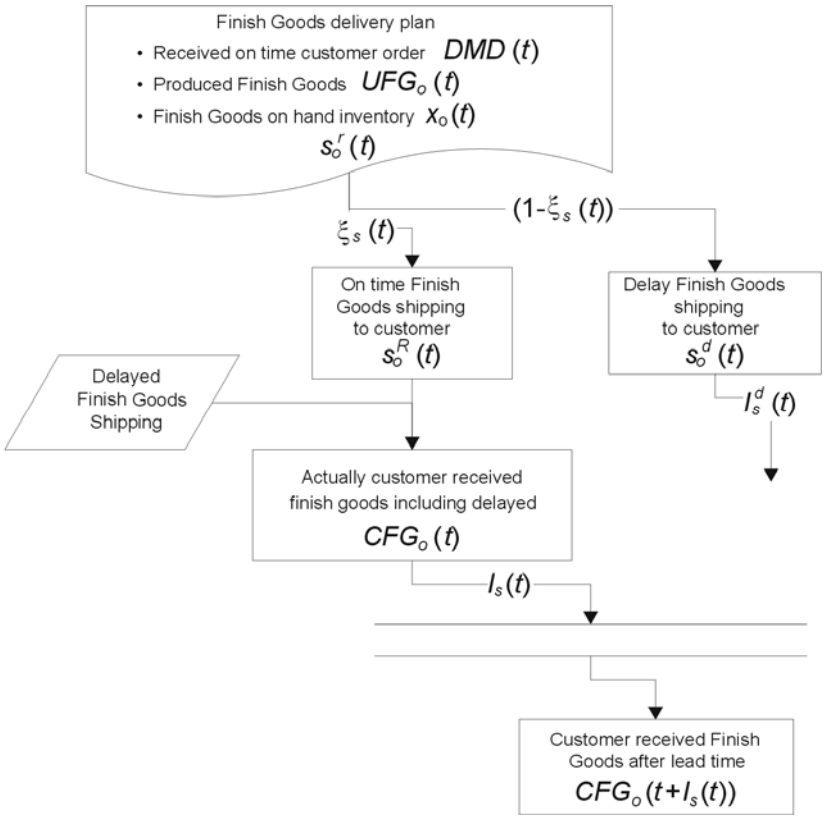

Figure 6. Finish goods fulfilling customer order and transportation model

5. How to use the model: example of improvement strategies and its results

Methodologies

Simulation has been identified as to 'use a computer to evaluate a model numerically, and data gathered in order to estimate the desired true characteristics of the model' (Law, Kelton, 2000, p. 1). In this study, the supply chain system has been simulated by MATLAB. The SC includes suppliers, warehouses, transportation companies, manufacturer, and customers. It has been recognised that

the simulation method has been used in modeling logistics and supply chain problems in many cases, e.g. measuring the bullwhip effects in dynamic situations (Min, Zhou, 2002). Especially, when SC systems are large-scale or too complicated for analytical methods, simulation is a good alternative. Meanwhile, a simulation model is significant evaluating dynamic decision rules in supply chain processes (Min, Zhou, 2002), because simulation can quantify benefits and issues (Terzi and Cavalieri, 2004). In the literature, simulation has been employed in lots of supply chain management studies. Banerjee et al. (2001) proves that partial shipments can be a desirable way for improving eventual customer service at the retail level of a supply chain system by simulation. Lee et al. (2002) use a supply chain simulation model with combined discrete-continuous simulation. Pierreval et al. (2007) undertake a continuous simulation system for automotive industry SC. Abdulmalek and Rajgopal (2007) analyse the benefit of lean manufacturing and value stream via simulation. Zhang and Zhang (2007) study sharing demand information in a supply chain via simulation.

Model evaluation

The developed model represents RMs procurement, production and FG satisfying customer demand, which contains four sub-models. The customer demand model simulated the uncertainties ($\eta d(t)$, $lc(t)$, $lcd(t)$ and $\xi d(t)$) of the relationship between customer and manufacturer in terms of the customer order uncertainty, and customer relationship uncertainty such as placing order information flow uncertainty (that due to for example the relationship management, negotiation). The production model represents the manufacturing production process with uncertain parameters ($lo(t)$, $lod(t)$ and $\xi o(t)$). The performance of production depends on lots of factors such as RMs availability, productivity, FGs inventory capacity, customer demand forecasting, defective quality. The RMs ordering model represents the procurement of RMs. Suppliers, RMs warehouse, RMs transportation company and the manufacturer have been involved. Therefore the related uncertainties have been considered and addressed by uncertain parameters (e.g. $li(t)$, $lid(t)$, $\xi i(t)$). In the FGs satisfying customer demand and shipping model, FGs warehouse, manufacturer, FGs transportation company and customer have been considered. The uncertain parameters are $\xi s(t)$ $lsd(t)$ and $ls(t)$. In the performance evaluation, it is a multiple measurement system, instead of only concerning the single performance which has been studied in much literature; the developed model suggests multiple supply chain performance indicators such as cost, lead time and customer services level.

There are many advantages of using the model. Firstly, the model concerns multiple stages supply chain as a system, which is based on the case studies and literature. The developed model takes supplier, RMs transportation company, RMs warehouse, manufacturer, FGs warehouse, FGs transportation company and customers from the upstream until the downstream of the whole SC into account.

Therefore, users could make better systemic decision in the surrounds of the whole supply chain. Secondly, constraints and uncertainties have been addressed. According to the interviews and literature, there are lots of constraints and uncertainties within a supply chain; however the traditional models usually neglect some of those. For example Chu and Lee (2006) consider a two-member supply comprising a downstream retailer and an upstream vendor. In this supply chain, they only considered the customer demand uncertainty. Kelepouris et al. (2008) study how demand information sharing can reduce order oscillations and inventory levels in a two-stage supply chain consisting of a warehouse and stores with customer demand uncertainty. Helper et al. (2010) analyse a single product in two-echelon capacity constrained supply chain consisting of a supplier and two retailers with uncertain lead time. Nevertheless, the developed model, based on a case study (discussed earlier), has considered uncertainties in suppliers, warehouses, manufacturers, and customers, which associate with transportation as well. Thirdly, it is flexible in that (i) different strategies could be adopted and compared in the model; (ii) four sub-models and multiple supply chain performance indicators could be used alone or together; (iii) all uncertainty parameters could follow a different uncertainty distribution with different sensitivity tests. In this paper, all parameters have been set up to follow a uniform distribution, however, any one of those parameters could be set up to follow different random distributions such as a Poisson distribution, in terms of the user's requirement. For example, in the customer order model, if the customer demand random variable ηd(t) has been set up to U(0.7, 1.3) following a Poisson distribution, which could denote that the customer demands vary positively and negatively 30% in accordance with peak time and peak off time (such as seasonal products). If the maximum and minimum boundary of any one of on-time rate parameters (ξd(t), ξi(t), ξo(t) ξs(t)) or lead time parameters (lc(t), lcd(t), lod(t), lo(t), lip(t), lis(t), lid(t), li(t), lop(t), los(t), lsd(t), and ls(t)) has been changed, the relative uncertainty will change as well. These parameters also can be set up to follow a different random distribution. The examples of using the model flexibly will be explained more in the next section.

Strategy description

In manufacturing, JIT has been seen to reduce inventory levels, reduce investment in inventory, improve quality of incoming materials, and consistent high-quality products, improve operational efficiency, better cooperate with suppliers and customers, and therefore to improve customer satisfaction (Yasin et al., 2003). However, quality is essential with a JIT system because any quality problem will negatively affect the next process and the whole system (Schroeder, 1999). JIT strategy plus different levels of safety stock (10% and 20%) have been employed to offset the high requirements (quality and other supply chain uncertainties) of implementing JIT, because according to (Schroeder, 1999), JIT requires

nearly perfect quality for every process. However in a SC, there are lots of uncertainties such as RM supply in terms of supply defective quality or shipment delay, and production quality problems. Additionally, holding too much inventory will increase the inventory cost. Alternatively, holding too little inventory will influence customer services and the production plan, therefore it is hard to identify how much inventory should be held to get the optimal profit. In this paper, JIT plus different safety stock rates have been tested and compared in different uncertain environments. The different strategies affecting the SCP could then be observed.

Results and analysis

In this section, the tested results will provide the insight for users about how to use the models making decisions in different types of uncertainties. In the sample, the case company makes daily decisions, and according to interviews, there are 217 periods in each sample and the sample size is 200. Table 1 shows the results. Four strategies have been adopted in the simulation in terms of the case companies' strategies, JIT and JIT plus safety stock at 10% and 20%. The uncertainty environment has been represented by 0.7 to 1.0 and 0.9 to 1.0. In the interest of testing the impacts of lead time parameters on SCP (here is total cost), all lead time parameters have been set up to 7 periods and 1 periods. The objective shows on the supply chain total cost. Note: Objective 1 cost is in thousand pounds and SD means standard deviation.

Table 2 . Case company simulation result

Lead Time	Uncertainty		COMPANY		JIT		JIT+10%		JIT+20%	
			MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD
Lead Time = 7	ξ_d	0.7	3.4353	0.34	**2.4180**	0.08	3.2309	0.09	4.1663	0.11
		0.9	3.4855	0.37	**2.4598**	0.18	3.2706	0.10	4.2228	0.12
	ξ_i	0.7	4.1762	0.59	3.6434	1.53	**3.5216**	0.17	4.5156	0.13
		0.9	3.6795	0.44	**2.6407**	0.57	3.3673	0.11	4.3438	0.12
	ξ_o	0.7	3.9517	0.54	3.6024	1.55	**3.4546**	0.20	4.4343	0.13
		0.9	3.6166	0.42	**2.6239**	0.58	3.3458	0.11	4.3185	0.12
	ξ_s	0.7	3.5221	0.39	**2.5258**	0.36	3.3120	0.10	4.2769	0.12
		0.9	3.5189	0.39	**2.5223**	0.36	3.3085	0.10	4.2734	0.12
	ξ	0.7	4.0352	0.53	**2.8230**	0.64	3.4172	0.09	4.3867	0.11
	ξ	0.9	3.6425	0.42	**2.5385**	0.34	3.3248	0.10	4.2878	0.12
Lead Time = 1	ξ_d	0.7	2.4471	0.01	**1.6436**	0.01	2.3651	0.02	3.1874	0.03
		0.9	2.4252	0.01	**1.6217**	0.01	2.3432	0.02	3.1655	0.03

Lead Time	Uncer-tainty		COMPANY		JIT		JIT+10%		JIT+20%	
			MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD
		0.7	2.4827	0.01	**1.6635**	0.01	2.3961	0.02	3.2304	0.03
	ξ_i	0.9	2.4371	0.01	**1.6284**	0.01	2.3536	0.02	3.1799	0.03
		0.7	3.1800	0.45	**2.3065**	0.33	2.8451	0.04	3.7144	0.04
	ξ_o	0.9	2.4988	0.01	**1.7640**	0.02	2.5030	0.02	3.3411	0.03
		0.7	2.4208	0.01	**1.6174**	0.01	2.3389	0.02	3.1611	0.03
	ξ_s	0.9	**2.4165**	0.01	**1.6130**	0.01	**2.3345**	0.02	**3.1568**	0.03
	ξ	0.7	3.2871	0.45	**2.3983**	0.33	2.9482	0.04	3.8296	0.04
	ξ	0.9	2.5347	0.01	**1.7946**	0.02	2.5374	0.02	3.3795	0.03

Table 2 has shown the simulation results of the case company with different strategies in different uncertain environment. The strategies include (i) the case company original strategy; (ii) Just In Time (JIT) strategy; (iii) JIT plus safety stock at 10% strategy; and (iv) JIT plus safety stock at 20% strategy. In order to compare the effects of setting different values of lead time parameters, two scenarios incorporating lead time equal to 7 and 1 have been employed. The tested results clearly represent the contribution of using the models to supply chain management that has been seen as a dynamic system with multiple levels and uncertainties. There are five main points of using the developed models. Firstly, different types of uncertainty lead to different performance in a strategy. Taking the uncertain level from 0.7 to 1.0 as an example, when the lead time parameters ((lc(t), lcd(t), lod(t), lo(t), lip(t), lis(t), lid(t), li(t), lop(t), los(t), lsd(t), and ls(t)) have been set up to 7, for company strategy, when customer demand uncertainty parameter (ξd(t)) is varying from 0.7 to 1.0 (other uncertainty parameters ξi(t), ξo(t) and ξs(t) are determined as 1.0), the SCP (cost) is 3.4353, however, if customer demand has been known (ξd(t), ξo(t) and ξs(t) equal to 1.0) and RMs procurement and transportation is uncertain, the SCP is increasing to 4.1762. If only FGs production is uncertain (ξd(t),ξi(t), and ξs(t) equal to 1.0, ξo(t) equals from 0.7 to 1.0), the SCP is 3.9517. When the FGs fulfilling customer demand and transportation parameter is varying, the SCP is 3.5221. If the SC is very uncertain in all models (ξd(t), ξi(t), ξo(t) and ξs(t) are varying from 0.7 to 1.0), the cost will be 4.0352. This situation has been shown under other strategies as well. For example, in a JIT strategy, when all lead time have been reduced up to 1 period, the uncertainties equal from 0.9 to 1.0, when the customer demand is uncertain (ξd(t) U (0.9 to 1.0), the SCP is 1.6217, and it will be increased to 1.6284 if only RM procurement and transportation is uncertain. When FGs production is uncertain (ξo(t) equals from 0.9 to 1.0), the SCP is 1.7640. If the uncertain environment changes to FGs fulfilling customer demand and transportation, the SCP is changing as well (1.6130). If all types

of uncertainty have been considered (ξd(t), ξi(t), ξo(t) and ξs(t) U (0.9 to 1.0)), the performance is 1.7946. Therefore, it is important for a company to considering what types of uncertainty exist and how uncertain they are.

Secondly, in a different environment, the SC could perform better with different strategies. JIT strategy seems be better to the case company, however, when the company faces two types of situations, JIT plus 10% strategy is better. The situations require two conditions: (i) RMs procurement and transportation (ξi(t) equals from 0.7 to 1.0) or FGs production uncertainty (ξo(t) equals from 0.7 to 1.0); (ii) lead times are up to 7 periods. Thus for a company, the better strategy could change in terms of different uncertainties.

Thirdly, although the SC is uncertain, in some specialised conditions, all adopted strategies could get the best result which considering adopting the same strategy in other uncertain environments. For example, in the case SC, it clearly shows that if the lead time has been limited to 1 period and only FGs fulfilling customer demand and transportation is uncertain (ξs(t) U (0.9 to 1.0)), all adopted strategies including the case company's strategy are performing better than in other uncertain environment. The cost is 2.4165 for company's strategy, 1.6130 for JIT strategy, 2.3345 for JIT plus 10% safety stock strategy and 3.1568 for JIT plus 20% safety stock strategy. However, for example, when the uncertain environment changes to FGs production uncertainty, even the uncertain level is the same (from 0.9 to 1.0), the performances of all strategies are worse. The cost is 2.4988 for company's strategy, 1.7640 for JIT strategy, 2.5030 for JIT plus 10% safety stock strategy and 3.3411for JIT plus 20% safety stock strategy.

Fourthly, for the same types of uncertainty, a different level of uncertainty results in the same strategy. If the environment is more uncertain, by using the same strategy, the performance is worse. For instance, if there is only RMs procurement and transportation is uncertain, for the case company strategy, the performance is 4.1762 when the uncertainty is from 0.7 to 1.0, and the performance is improved to 3.6795, when the uncertainty is reduced (from 0.9 to 1.0). For JIT strategy, the performance is 3.6434 and reduces to 2.6407. It is the same that if all models are uncertain: when ξd(t), ξi(t), ξo(t) and ξs(t) are varying from 0.7 to 1.0, the performances are 4.0352 (lead time equals to 7) and 3.2871(lead time equals to 1); however when ξd(t), ξi(t), ξo(t) and ξs(t) are varying from 0.9 to 1.0, the performance is 3.6425 (lead time equals to 7) and 2.5347 (lead time equals to 1).

Fifthly, if the lead time is decreasing, the performance is better. In the above models, there are lots of lead time parameters considered as well. Table 1 clearly shows that reducing lead time could significantly improve SCP in all types of uncertain environments for all strategies. In JIT strategy, when the lead times are up to 7 periods, in different uncertain environments (U 0.7 to 1.0), the SCPs are 2.4180, 3.6434, 3.6024, 2.5258, and 2.8230. If the lead times are all reduced to 1 period, in the same uncertain environment, using JIT, the SCPs are improved to 1.6436, 1.6635, 2.3065, 1.6174 and 2.3983. This situation has been shown in other

strategies as well. For example, even the uncertain level reduced (from 0.9 to 1.0), for strategy JIT plus 10% safety stock, the performances in a situation of lead times up to 7 periods are 3.2706, 3.3673, 3.3458, 3.3085 and 3.3248. It has been improved when the lead times reduce to 1 period (the performances are 2.3432, 2.3536, 2.5030, 2.3345 and 2.5374).

Summary

This chapter has introduced a developed multiple stages manufacturer oriented supply chain model consisting of four sub-models that have been generalised from a real case study incorporating summarised uncertainties and constraints. The SC consists of Supplier, Raw Materials (RMs) warehouse, RMs transportation company, manufacturer, Finish Goods (FGs) warehouse, FGs transportation company and customers. Within the SC, uncertainties have been considered as supply uncertainty, demand uncertainty, process uncertainty, which represented as uncertainty parameters, namely: (i) in process uncertainty: (lc(t), lcd(t), lod(t), lo(t), lip(t), lis(t), lid(t), li(t), lop(t), los(t), lsd(t), and ls(t); (ii) demand uncertainty: ξd(t); (iii) supply uncertainty ξi(t) (for RM), ξo(t) and ξs(t) (for FGs). There are lots of constraints (e.g. RMs inventory capacity, RMs availability, productivity, FGs inventory capacity, and transportation capacity) which have been generalised from a real case study and considered in the model as well. Afterward, using MATLAB simulation, Just-In-Time (JIT) and JIT plus safety stock strategies have been tested in different uncertain environments. The result shows that in terms of different uncertainties, the performances of the same strategy are different; different strategies could perform differently in the same uncertain environment. Therefore, for a company, it is necessary to make decisions in the light of real situations. This developed model could provide an insight for company managers making decisions using simulation. It also contributes to academic research for a real case based multiple stages manufacturer oriented SC study with uncertainties and constraints.

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PROBLEMS OF THE ELECTRONIC ECONOMY

Olga Dębicka

CLOUD COMPUTING – NEW OPPORTUNITIES FOR IT INVESTMENTS IN GLOBAL ECONOMY

Introduction

IT has become the major facilitator of business activities in the world today. In a tough and uncertain economic climate, where customer demand and market opportunities are unpredictable, organizations need to be able to have business processes that can provide them with the flexibility and agility to adapt. IT, in conjunction with the business, is looking at how business process management and process automation tools can enable this sleeker, swifter responsiveness to change (Dębicka, 2007).

Information technology (IT) has been in a perpetual state of evolution since the advent of the first computer system (Kasprzak, 2003) . The pace of this evolution has continued to accelerate, particularly in today's business environment (Dębicka, 2009). Factors such as globalization, the growth of dynamic business ecosystems, acceleration toward a service-based economy, and the commoditization of many traditional business activities are all contributing to a transformation of IT. Cloud computing represents the next phase in the logical evolution in the delivery of IT services, building on previous innovations that include grid, utility and on-demand computing that were first pioneered by IBM.

1. Strategic use of IT in enterprises in digital economy

Initially, IT's primary role was to improve the efficiency of business processes by automating repetitive manual activities. At that time, many IT activities (such as performance evaluation) were inwardly focused and perceived as esoteric by other business groups. Due to this inward focus, IT organizations were technology-focused in the way they delivered services, communicated to their

customers, and measured their performance. This focus persists, as evidenced by many service-level agreements (SLAs) that are loaded with technological jargon rather than concentrating on intended business results. Such a technology focus does not reflect or articulate the true value of IT services to the organization's customers.

With the advancement of technology, IT has moved beyond its role as a simple means to improve the efficiency of manual tasks to become a significant means for gaining business advantage (Kisielnicki, 2008) (table 1).

The evolving global economy presents organizations in every industry with the difficult challenge of maintaining quality, growth, and innovation while concurrently reducing costs in ever-shorter product life cycles. As attempting to balance these opposing needs, enterprises face new complexities in the modern marketplace: a shortage of skilled resources; greater demand for differentiation from growing competition; global shifts in supply and demand; the evolution of new business models; and the need for sustainability across multiple markets.

No matter in what business involved, every enterprise can benefit from the new class of adaptive technology to support core manufacturing, store, branch, or service operations – as well as multi-enterprise supply chains. In evaluating potential solutions, today's manufacturers look for technologies that can handle increasingly complex business operations as well as anticipate, innovate, and accelerate delivery of world-class products and services. To that end, the most useful operations-focused solutions enable role-based productivity in everyday activities by integrating people, processes, and business systems across organizational boundaries. Simultaneously, the ideal solutions also allow ideas, knowledge, data, and business insights to flow freely during every step of the product or service life cycle.

The benefits associated with the use of information technology (IT) in an organizational environment are well established (Thouin, 2008; Renkema, 2000). IT enables organizations to manage organizational knowledge, to improve decision making, and to increase the effectiveness and efficiency of many crucial organizational processes (Gregory, Prifling, 2008). Among such strategic benefits arising from IT investment, one can include:

- support for the organization's strategy or vision;
- long- or short-term viability of the organization;
- provide customers with unique value proposition;
- desire to be seen to be innovative;
- permit new business models;;
- permit new forms of organization;
- build barriers to entry;
- "lock in" customers;
- geographic or market expansion.

Table 1. The development of IT support for business

Decade	Market demands	Ideal company	IT performance criteria
1960s	Price	The efficient firm	Efficiency
1970s	Price, quality	The quality firm	Efficiency + quality
1980s	Price, quality, choice/ delivery time	The flexible firm	Efficiency + quality + flexibility
1990s and beyond	Price, quality, choice/ delivery time, uniqueness	The innovating firm	Efficiency + quality + flexibility + innovate ability

Source: T. Renkema, *The IT value quest: how to capture the business value of IT-based infrastructure,* John Wilkey & Sons, Chichester 2000, p. 154.

While IT has become integral to the success of many companies (enabling new business services through the innovative use of technology), the ability to isolate and articulate the specific value of IT to these business services has remained elusive. One possible explanation for this is that a conscious and concerted approach to managing IT from a service-oriented business perspective has been lacking. From a research perspective, the benefits of IT investment have been difficult to verify due to the measurement ambiguity with respect to IT inputs and outputs, long time lags associated with IT payoff, the role of IT in redistributing wealth among firms in an industry, and mismanagement of IT (Brynjolfsson, 1993).

Today, CIOs (chief information officers) are being asked to show quantifiable value from IT investments. Often a company's largest capital investment, IT is expected to generate innovative business services, improve internal collaborative capabilities, and support dynamic business systems. Many CIOs are challenged by a lack of time or resources to make the transition to the new IT focus, relying instead on tactical corrective actions that typically do not have sufficient impact to effect meaningful change (Ernest, Nisavic, 2007).

2. Business pressures and support of cloud computing solutions

Investment in IT has become a dominant part of the capital expenditure budget of many organisations in both the service and manufacturing sectors. Only in 2009 global purchases of IT goods and services by businesses and governments amounted $ 1.66 trillion, according to a report from Forrester Research (*Forrester*…, 2009). As a result decision-makers are faced with difficult questions:

– How should IT investments be designed and managed to ensure alignment with corporate strategy?

- How should such investments be justified prospectively, and how can success be measured retrospectively?
- What more (than technology) is needed to realise the full potential of IT?
- What are the risk implications of these investments? How can the value of IT investments be managed over time?

These are crucial question today, as there are more new options available for businesses as new ways of implementing IT soultions and the new strategies are emerging to support organisational transformation (figure 1). One of them is cloud computing, which represents one of the most significant shifts in information technology many of us are likely to see in our lifetimes.

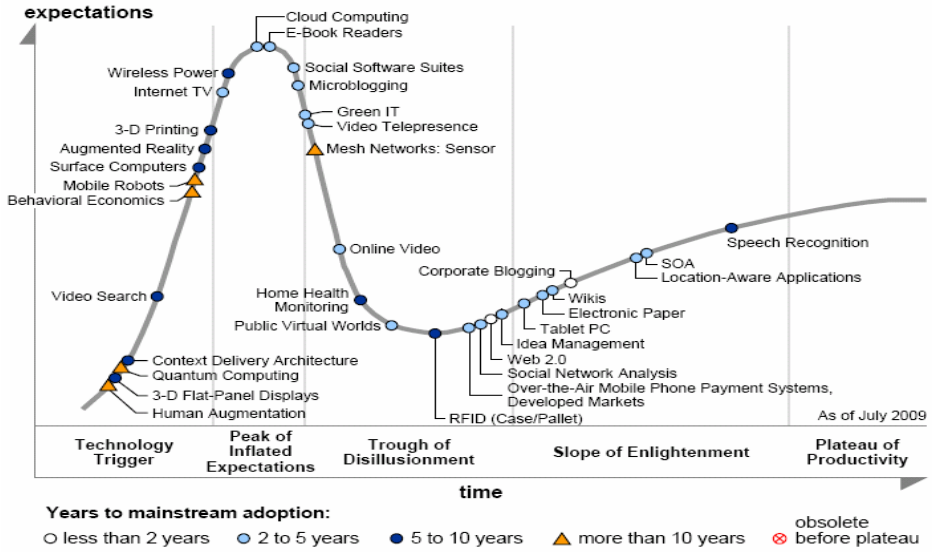

Figure 1. Gartner's Emerging Technologies Hype Cycle 2009

Source: J. Fenn, *Inside the hype-cycle:what's hot and what's not in 2009*, p. 11, http://my.gartner.com/it/content/1101800/1101817/august12_hype_cycle_final_jfenn.pdf.

Cloud computing is a significant advancement in the delivery of information technology and services. According to Gartner's Hype Cycle Special Report for 2009, "technologies at the 'Peak of Inflated Expectations' during 2009 include cloud computing, e-books… and Internet TV, while social software and microblogging sites…have tipped over the peak and will soon experience disillusionment among enterprise users"(Fenn, 2009)[1].

[1] Gartner's annual Hype Cycle Special Report provides a detailed look at technology maturity across the IT industry. The 2009 Gartner Hype Cycle Special Report evaluates the maturity of 1,650 technologies and trends in 79 technology, topic and industry areas. New Hype Cycles this year include cloud computing, data center power and cooling technologies, and mobile device technologies.

Since we are in a time of belt-tightening, this new economic model for computing has found fertile ground and is seeing massive global investment. According to IDC's analysis, the worldwide forecast for cloud services in 2013 will be in the order of 44.2bn USD, with the European market ranging from 971m EURO in 2008 to 6,005m EURO in 2013 . The US companies are set to increase their adoption on cloud computing over the next decade from 10% to 70% of their IT spendings (ENISA, 2009).

Various definitions and interpretations of cloud computing exist, but usually cloud computing has been defined as a model for "…enabling ubiquitus, convenient, on demand network access to a shared pool of configurable computing resources (e.g. network, server, storage, application and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction" (Verdantix, 2011).

The US National Institute of Standard and Technology (NIST)[2] definition of cloud computing describes its five essential characteristics:

1. "On-demand self service – users are able to provision, monitor and manage computing resources as needed without the help of human administrators.
2. Broad network access – computing services are delivered over standard networks and heterogeneous devices.
3. Rapid elasticity – IT resources are able to scale out and in quickly and on an as needed basis.
4. Resource pooling – IT resources are shared across multiple applications and tenants in a non-dedicated manner.
5. Measured service – IT resource utilization is tracked for each application and tenant, typically for public cloud billing or private cloud chargeback" (Mell, Grance, 2011).

Furthermore, according to NIST definition, there are three basic types of cloud computing: Infrastructure as a Service (IaaS), Platform as a Service (PaaS) and Software as a Service (SaaS).

In **IaaS** cpu, grids or clusters, virtualized servers, memory, networks, storage and systems software are delivered as a service. Perhaps the best known example is Amazon's Elastic Compute Cloud (EC2) and Simple Storage Service (S3), but traditional IT vendors such as IBM, and telecoms providers such as AT&T and Verizon are also offering such solutions (*Clash*…, 2009). Services are typically charged by usage and can be scaled dynamically, i.e. capacity can be increased or decreased more or less on demand.

[2] Founded in 1901, NIST is a non-regulatory federal agency within the U.S. Department of Commerce. NIST's mission is to promote U.S. innovation and industrial competitiveness by advancing measurement science, standards, and technology in ways that enhance economic security and improve our quality of life.

PaaS provides virtualized servers on which users can run applications, or develop new ones, without having to worry about maintaining the operating systems, server hardware, load balancing or computing capacity. Well known examples include Microsoft's Azure and Salesforce's Force.com. Microsoft Azure provides database and platform services starting at 0.12 USD per hour for compute infrastructure; 0.15 USD per gigabyte for storage; and 0.10 USD per 10,000 transactions (table 2). For SQL Azure, a cloud database, Microsoft is charging 9.99 USD for a Web Edition, which comprises up to a 1 gigabyte relational database; and 99.99 USD for a Business Edition, which holds up to a 10 gigabyte relational database. For .NET Services, a set of Web-based developer tools for building cloud-based applications, Microsoft is charging 0.15 USD per 100,000 message operations[3].

Table 2. . Pricing for Windows Azure compute instance (virtual server) [4]

Compute instance size	CPU	Memory	Instance storage	I/O performance	Cost per hour
Extra small	1.0 GHz	768 MB	20 GB	Low	$ 0.04
Small	1.6 GHz	1.75 GB	225 GB	Moderate	$ 0.12
Medium	2x1.6 GHz	3.5 GB	490 GB	High	$ 0.24
Large	4x1.6 GHz	7 GB	1,000 GB	High	$ 0.48
Extra Large	8x1.6 GHz	14 GB	2,040 GB	High	$ 0.96

Source: http://www.microsoft.com/windowsazure/features/compute/.

SaaS is a software that is developed and hosted by the SaaS vendor and which the end user accesses over the Internet. Unlike traditional applications that users install on their computers or servers, SaaS software is owned by the vendor and runs on computers in the vendor's data center (or a colocation facility). Broadly speaking, all customers of a SaaS vendor use the same software: these are one-size-fits-all solutions. Well known examples are Salesforce.com, Google's Gmail and Apps, instant messaging from AOL, Yahoo and Google, and Voice-over Internet Protocol (VoIP) from Vonage and Skype.

[3] All the prices are taken from the official website of Microsoft Company dedicated to Windows Azure and Microsoft SQL Azure, http://www.microsoft.com/windowsazure/features/database; as of October 2011.

[4] Windows Azure compute provides developers a platform to host and manage applications in Microsoft's data centers across the globe.

3. Cloud benefits and challenges

By providing on demand access to a shared pool of computing resources in a self-service, dynamically scaled and metered manner, cloud computing offers compelling advantages in speed, agility and efficiency. Today, cloud computing is at an early stage in its lifecycle, but it is also the evolution and convergence of several trends that have been driving enterprise data centers and service providers over the last several years.

Clouds are of particular commercial interest not only with the growing tendency to outsource IT so as to reduce management overhead and to extend existing, limited IT infrastructures, but even more importantly, they reduce the entrance barrier for new service providers to offer their respective capabilities to a wide market with a minimum of entry costs and infrastructure requirements – in fact, the special capabilities of cloud infrastructures allow providers to experiment with novel service types whilst reducing the risk of wasting resources (Neidecker, Lutz, 2010).

The question of whether the company's solution should be in the cloud or not is an important one to ponder. Economic considerations are one of the key reasons to introduce cloud systems in a business environment in the first instance. Large companies can afford to build and expand their own data centers but small- to medium-sized enterprises often choose to house their IT infrastructure in someone else's facility .

The particular interest typically lies in the reduction of cost and effort through outsourcing and / or automation of essential resource management.

Obviously, technological challenges implicitly arise from the non-functional and economical aspects, when trying to realize them. As opposed to these aspects, technological challenges typically imply a specific realization – even though there may be no standard approach as yet and deviations may hence arise. In addition to these implicit challenges, one can identify additional technological aspects to be addressed by cloud system, partially as a pre-condition to realize some of the high level features, but partially also as they directly relate to specific characteristics of cloud systems.

In order to allow for economic considerations, cloud systems should help in realizing the following aspects (Neidecker, Lutz, 2010):

– **Cost reduction** is one of the first concerns to build up a cloud system that can adapt to changing consumer behavior and reduce cost for infrastructure maintenance and acquisition[5].

[5] Anticipated cost reductions were as high as 40%–50% when implementing an internal private cloud (as opposed to dedicated IT). These savings would come from better use of hardware as well as a reduced support team. "*Carbon disclosure project study 2011. Cloud computing – the solution for the 21st century*", Study produced for Carbon Disclosure Project by Verdantix, p. 10.

- **Pay per use** – the capability to build up cost according to the actual consumption of resources is a relevant feature of cloud systems. Pay per use strongly relates to quality of service support, where specific requirements to be met by the system and hence to be paid for can be specified. One of the key economic drivers for the current level of interest in cloud computing is the structural change in this domain. By moving from the usual capital upfront investment model to an operational expense, cloud computing promises to enable especially SME's and entrepreneurs to accelerate the development and adoption of innovative solutions.
- **Improved time to market** is essential in particular for small to medium enterprises that want to sell their services quickly and easily with little delays caused by acquiring and setting up the infrastructure, in particular in a scope compatible and competitive with larger industries. Larger enterprises need to be able to publish new capabilities with little overhead to remain competitive. Clouds can support this by providing infrastructures, potentially dedicated to specific use cases that take over essential capabilities to support easy provisioning and thus reduce time to market.
- **Return of investment (ROI)** is essential for all investors and cannot always be guaranteed – in fact some cloud systems currently fail this aspect. Employing a cloud system must ensure that the cost and effort vested into it is outweighed by its benefits to be commercially viable – this may entail direct (e.g. more customers) and indirect (e.g. benefits from advertisements) ROI. Outsourcing resources versus increasing the local infrastructure and employing (private) cloud technologies need therefore to be outweighed and critical cut-off points identified.
- **Turning CAPEX into OPEX** is an implicit, and much argued characteristic of cloud systems, as the actual cost benefit (cf. ROI) is not always clear . Capital expenditure (CAPEX) is required to build up a local infrastructure, but with outsourcing computational resources to cloud systems on demand and scalable, a company will actually spend operational expenditure (OPEX) for provisioning of its capabilities, as it will acquire and use the resources according to operational need.
- **"Going Green"** is relevant not only to reduce additional costs of energy consumption[6], but also to reduce the carbon footprint[7]. Whilst carbon emission

[6] Only in the USA annual net financial benefits associated with the energy saving from cloud computing are forecast to reach $824 million by 2011, rising to $12.3 billion by 2020 for the 2,653 global firms with annual revenues in the US above $1 billion., "*Carbon disclosure project study 2011. Cloud computing – the solution for the 21st century*", Study produced for Carbon Disclosure Project by Verdantix, p. 16.

[7] The US businesses with annual revenues of more than $1 billion can cut CO2 emissions by 85.7 million metric tons annually by 2020 as a result of spending 69% of infrastructure, platform and software budgets on cloud services. *Ibidem*, p. 17.

by individual machines can be quite well estimated, this information is actually taken little into consideration when scaling systems up.

Recent surveys show that the top two benefits of cloud computing are speed and cost (*Oracle* …, 2011). Through self-service access to an available pool of computing resources, users can be up and running in minutes instead of weeks or months. Making adjustments to computing capacity is also fast, thanks to elastically scalable grid architecture. And because cloud computing is pay-per-use, operates at high scale and is highly automated, the cost and efficiency of cloud computing is very compelling as well.

According to the results of an independent study[8] to quantify the economic benefits of cloud computing to business and to Europe's five largest economies (in alphabetical order, France, Germany, Italy, Spain and the UK), widespread adoption of cloud computing has the potential to generate over €763 billion of cumulative economic benefits over the period 2010 to 2015. This is 1.57% of Cebr's estimates of the total cumulative GDP of the five economies over the same period. The breakdowns between the individual economies and between the different components of the aggregated benefits, a discussion of which follows, are shown in table 2.

It was founded that widespread cloud computing adoption has the potential to support significant direct and indirect job creation which, across the five economies, is predicted to be in excess of 2.3 million net new jobs on a cumulative basis over the period 2010 to 2015. Cloud computing adoption is expected to yield annual net new jobs of 446 thousand across the five economies by 2015.

Extracting value from cloud system employment is not always straight forward, as it depends on the cost and effort to be invested first versus the (potential) gain from the employment of such a system. There is little knowledge so far about when and under what circumstances to move to a (public or private) cloud, respectively when to distribute capabilities in a hybrid cloud. Though outsourcing to clouds can reduce start up time and makes better use of resources due to the elasticity of the infrastructure, the additional effort to move services and large datasets into a new environment, as well as the risk to lose control over the system, makes such a movement a considerable business decision. As long as interoperability is at a stage where no simple movement from local to cloud platforms is possible, additional knowledge is required to support such decisions and in the long run allow for autonomic management of outsourcing and reconfiguration decisions.

[8] The study was undertaken by Centre for Economics and Business Research Ltd (Cebr) on behalf of EMC, a global commercial technology company, providing systems, software and services to its business clients. See: "*THE CLOUD DIVIDEND: Part one the economic benefits of cloud computing to business and the wider EMEA economy France, Germany, Italy, Spain and the UK*", Centre for Economics and Business Research Ltd, London 2010**,** www.cebr.com, pp. 7–8.

Table 3. Cumulative economic benefits (2010–2015)

	France	Germany	Italy	Spain	UK	EMEA
	mil EUR					
Business development opportunities	24,599	32,642	23,995	16,866	29,555	127,657
Business creation	51,377	69,507	43,305	30,939	20,026	215,153
Net total cost savings of which:	26,323	37,740	28,463	22,008	26,206	140,740
– IT CapEx savings	28,653	36,378	30,461	23,013	36,176	154,682
– IT OpEx savings (FTEs / productivity)	13,818	18,139	14,533	10,396	16,943	73,829
– IT OpEx savings (power & cooling)	11,107	14,345	11,821	8,510	10,566	56,349
– Additional cloud services expenditure (PAYG)*	27,255	31,122	28,353	19,910	37,481	144,120
Indirect GVA	60,450	81,351	55,007	40,737	42,202	279,747
Total Economic Benefit	162,749	221,239	150,770	110,550	117,989	763,297
Direct and Indirect employment ('000)	469.4	789.4	455.8	392.5	289.0	2,396.2

Source: Cebr analysis.

There are a number of issues and concerns that are holding some organizations back from rushing to the cloud. The top concern far and away is security (*Top threats …*, 2010). Given the reduced cost and flexibility it brings, a migration to cloud computing is compelling for many SMEs. A survey undertaken by the European Network and Information Security Agency (ENISA) confirms that major concerns for SMEs migrating to the cloud include the confidentiality of their information and liability for incidents involving the infrastructure (*A SME…*, 2010). While one can debate the relative security of public clouds versus in-house data centers, the bottom line is that many organizations are not comfortable entrusting certain sensitive data to public clouds where they do not have full visibility and full control. So some particularly sensitive applications will remain in-house while others may take advantage of public clouds. Another concern is quality of service, since clouds may not be able to fully guarantee service level agreement in terms of performance and availability. A third area of concern is fit, the ability to integrate with in-house systems and adapt SaaS applications to the organization's business processes.

Governments are also interested in the possibility of using cloud computing to reduce IT costs and increase capabilities. For example, the US government GSA (General Services Administration) now offers a portal for cloud computing ser-

vices (*General…*, 2011). Governments too, have serious hurdles to overcome – in terms of public perception of the secure processing of citizens' personal information in cloud computing infrastructures. On top of this, there are also legal and regulatory obstacles which prevent many eGovernment applications from moving to cloud. Nevertheless, both governments and SMEs face the reality that many of their employees will be using cloud-based services whether or not this is part of their official policy.

Conclusions

To recap, cloud computing is characterized by real, new capabilities such as self-service, auto-scaling and chargeback, but is also based on many established technologies such as grid computing, virtualization, SOA shared services and large-scale, systems management automation. Cloud computing offers compelling benefits in terms of speed and cost, but also presents serious concerns around security, compliance, quality of service and fit. Organizations will likely adopt a mix of public and private clouds. Some applications will be appropriate for public clouds, while others will say in private clouds, and some will not use either.

Cloud technologies and models have not yet reached their full potential and many of the capabilities associated with clouds are "…not yet developed and researched to a degree that allows their exploitation to the full degree, respectively meeting all requirements under all potential circumstances of usage" (Neidecker, Lutz, 2010).

Many aspects are still in an experimental stage where the long-term impact on provisioning and usage is as yet unknown. Furthermore, plenty of as yet unforeseen challenges arise from exploiting the cloud capabilities to their full potential, involving in particular aspects deriving from the large degree of scalability and heterogeneity of the underlying resources.

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Karol Kreft

ECONOMIC EVALUATION OF NETWORK INTRUSION DETECTION SYSTEMS

Summary

What we are curently observing is the formation of new economic realities where information plays the fundamenal role. Companies must deal with the issue of information security just as much as they deal with other key tasks connected with managing their business. They are forced by new conditions to work efficiently towards the security of information, the role of which has now increased and become a deciding element for companies to retain stability on the market. Companies should use modern technologies in order to stay competitive.

The costs of intrusion detection tend to be perceived as economicaly inadequate. This opinion is very often the result of the fact that the management of the companies is not educated in the field of computer science. Financial support for a network intrusion detection system will be doubtful if the technological aspects will be mentioned as the only benefits. The fact that the managament realises how necessarry it is to bear any expenses of the information security simply does not bring the actual financial support needed.

What one needs to do beforehand in order to build an efficient and reliable system of intrusion detection is to find the economic advantages of such an investment and set an appropriate budget. These two aspects can be achieved by carrying out a convincing presentation, which will show how the company may benefit from the system of intrusion detection. It is also important to present the methods of controlling such an investment, and estimate the profits

Introduction

To buy and install the latest and most expensive systems is not the main goal of the majority of companies. The information technology should therefore contribute to the increase of the companies' profits. In case of intrusion detection the borne costs do not generate the revenue themselves. It is only the calculation of the investment's yield that can convince the company's management to bear the expenses of building the system. Presenting the technical issues may only be considered after the plan has been aproved by the management.

Based on the opinion poll that was carried out by ICSA/ISAC among 745 respondents the most significant impediments for launching a system of intrusion detection include:

- budget limitations,
- lack of government's support,
- lack of qualified specialists responsible for security,
- underqualified users of the information technology system,
- exclusion of the intrusion detection system from the safety policy,
- technical difficulties,
- lack of appropriate security tools.

The results of a similar poll carried out by „Information Week" among 2700 respondents in 49 countries are shown on the chart below.

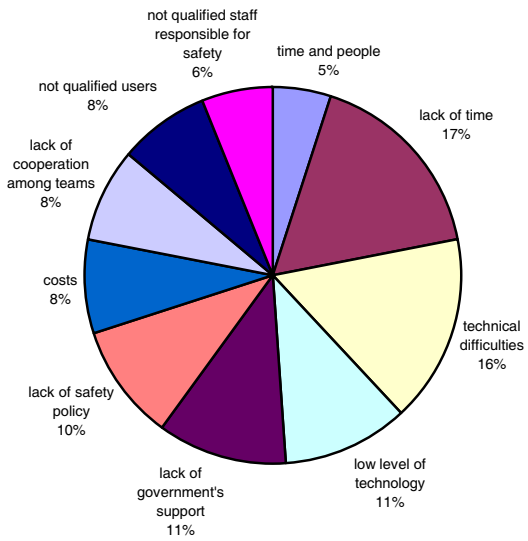

Figure 1. The hindrances for launching an intrusion detection system

Source: Own case study based on the „Information Week's" poll.

1. Intrusion detection system - total cost of ownership

In order to estimate the financial effect of an intrusion detection system the expected increase of income should be compared with the system's price and costs of implementation and development. The costs of launching the system are not difficult to estimate. What one needs to take into account besides the direct cost of the investment are all the indirect costs that appear during the system's operation. According to the consulting agency called Gartner Grup the direct costs comprise only 15–21% of the total cost of the information system's purchiase and service.

The total cost of ownership is the sum of both the planned and any additional costs connected with the ownership and using a specific system thoroughout its lifetime.

The total cost of ownership of the intrusion detection system can be devided into direct and indirect ones.

The direct costs include:

- equipment and software of the intrusion detection system,
- additional software (database managing systems, tools needed for the set-up of the equipment and software) and the necesarry computer equipment (network cables, network cards),
- installing and start-up of the intrusion detection system, including the cost of building the network which is ususally about 20% of the total cost of ownership,
- hiring people and training (according to Partner Group's data these costs are estimated to be 17–27% of the total cost of ownership),
- intrusion detection system's maintenance includes the salaries of IT specailists working on the system, and any costs of service including any potential reactions against attacks (according to some statistics these costs may be about 9% to 13% of the total cost).

The indirect costs include:

- losses caused by the reduction of efficiency. This occurs when employees start to use the new solutions without enough expirience which may result in outages or stoppage of work,
- any loss caused by the intrusion detection system's outage.

When carrinig out a more detailed analysis of the ownership's total cost one should consider:

- the price of the computer that is going to be in charge of the operating console and the controle server,
- the price of the computers that are going to controle the sensors of the the intrusion detection system,
- the price of the equipment necesarry to control the network traffic,
- the price of any additional software or equipment,

- the price of data storage discs,
- costs resulting from the reduction of network traffic,
- the salaries of the system operators including the 24 hour shift,
- the salaries of staff responsible for administration of the system, taking action in case of any incidents or investigation after attacks,
- creating and implementing the incident reaction plan,
- the cost of restoring the system after it has been attacked,
- the cost of downtime caused by a failure in other components of the system.

The exponential development of information technology is the reason why the information infrastructure is getting older. While planning the year's budget one must consider depreciation which, in terms of information technology, reflects the aging of computers, network equipment and software.

There are several systems of network intrusion detection available free of charge. Such free systems may seem more attractive in terms of economy. Nevertheless, having implemented the free system one may discover that its total cost is higher than the commercial system's (due to the lack of any support from the producer).

Having estimated the total cost of ownership of the network intrusion detection system a company may come to the conclusion that it is not able to cover all the financial needs. In such cases outsourcing should be considered as a solution. If one estimates the total cost of ownership, and knows how much such a service costs when provided by other companies it may turn out that outsourcing will pay off.

2. Financial loss as the effect of network intrusion

The model presented below makes it possible to estimate the potential loss caused by the network intrussion.

Output data:

- CN – time needed to restore the system as it has been before the intrusion (hours),
- WIi – IT Specialist's wage (PLN/hour),
- WPi – the wage of the employee who is using the system that has been intruded into (PLN/hour),
- LI – the number of IT Specialists,
- LP – the numer of the employees using the system that has been intruded into,
- KZ – replacement of the equipment and the cost of the spare parts,
- N – the number of attacks in one year,

- Z – the profit generated by the information system, in case where a company cannot generate any profit without the information system - the company's profit should be used for calculation,
- KS – fixed cost generated by the system, in case where a company cannot generate any income without the information system – the company's fixed cost should be used for calculation.

The cost of restoring the system that has been intruded into:

$$SN_n = \sum_{i=1}^{LI} WI_i * CN_n + KZ_n$$

where: n – is the nubmer of network attacks.

The loss caused by the less productive employees who have been using the information system and also by the fixed cost of the company:

$$SP_n = \sum_{i=1}^{LP} WP_i * CN_n + \frac{KS}{52 * 5 * 8} * CN_n$$

Losing the profit as the result of the intrusion followed by a dowtime of the system:

$$SZ_n = \frac{Z}{52 * 5 * 8} * CN_n$$

Losing the profit generated by the computer network which has been attacked is not the only cost that should be taken into account. What one should also analyse is the potential refund to be payed to the clients who have not been provided the proper service.

The total one year's cost caused by the lack of network intrusion detection system:

$$SR = \sum_{n=1}^{N} SN_n + SP_n + SZ_n$$

The costs that are difficult to estimate are as follows: confidential information that have been given out, losing the clients and their trust, a worse image of a company. All these factors should also be considered while estimating the loss of a company as the result of not having the network intrusion detection system.

What could make an advantage of implementing such a system is the fact that the employees responsible for the information safety would not have to do their time- consuming, labour-intensive tasks connected with the mannual detecting of the intrusion (such as: analysing the files of the register or network traffic, updating the signature base, and scanning the network).

Automation of the network intrusion detection system allows to reduce the number of the employees responsible for safety. All the tasks previously covered by a group of employees can now be handled by just one well trained operator.

3. Network intrusion detection system - the example of an economic evaluation/appraisal

A company is considering the applying of the system. Four of the systems available on the market comply with the company's requirements. The effectiveness and the total year's cost of ownership is presented in Table 1.

Table 1. The total cost of ownership of the network intrusion detection system, and its effectiveness

Name of the system	System 1	System 2	System 3	System 4
Total year's cost of ownership SC(i)	12 000 PLN	15 000 PLN	19 000 PLN	25 000 PLN
Effectiveness E(i)	95%	97%	98%	99%

Source: own case study.

By 95% of effectiveness one should understand that among 100 network attacks 95 will be detected and the network system will be defended. Only 5 attacks will not be detected and will result in the company's loss. No system available on the market can provide 100% safety.

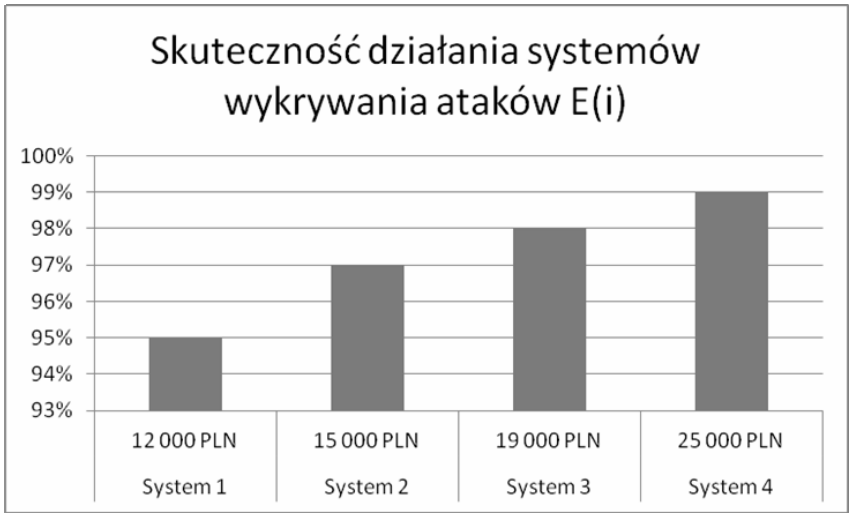

Figure 2. The effectiveness of the network intrusion detection system, and the total year's cost of ownership

Source: Own case study.

Based on the information gathered we are going to be able to estimate the company's loss in case of the lack of network intrusion detection system.

The data below is the statistics taken to calculate a company's loss as a result of network intrusion during one year.

- average time needed to restore the system so it provides exactly the same service as before the intrusion: CN = 6 hours,
- average wage of the IT specialist responsible for data safety: WI = 85 PLN/hour,
- average wage of an employee who is using the IT system: WP = 50 PLN/hour,
- the number of IT specialists responsible for the safety of IT system: LI = 2,
- the number of employees who are using the IT system: LP = 10,
- one year's profit generated by the IT system: Z = 500 000 PLN,
- one year's cost generated by the IT system: KS = 100 000 PLN,
- the average number of network intrusion during one year N = 87.

The cost of restoring the system that has been attacked:

$$SN=LI*WI*CN= 2*85*6 = 1020 \text{ PLN}$$

The loss caused by a worse performance of the workers in terms of productivity, and by the fixed cost of the IT system:

$$SP =LP*WP*CN+ (KS*CN)/(52*5*8)=10*50*6+(100\ 000*6)/(52*5*8)= 3\ 288{,}46 \text{ PLN}$$

The loss of profit as a result of the downtime of the IT system:

$$SZ=(Z*CN)/(52*5*8)=(500\ 000\ *6)/(52*5*8)= 1\ 442{,}31 \text{ PLN}$$

The total loss caused by one case of network intrusion:

$$S =SN+SP+SZ= 1020 +3\ 288{,}46 + 1\ 442,\ 31 = 5\ 750{,}77 \text{ PLN}$$

The total one year's loss caused by network intrusion:

$$SR=S*N= 5\ 750{,}77\ *87 = 500\ 316{,}99 \text{ PLN}$$

The loss caused by a worse performance of the workers in terms of productivity, and by the fixed cost of the IT system:

4. The choice of an economically optimal network intrusion detection system

The effectiveness of intrusion detection system E(i) and the probability of the system's failure VS(i) are dependent from each other:

$$VS(i) = 1 – E(i)$$

In our case the risk which is presented as RVC(i) (Risk Value Currency) can be calculated based on the following formula:

$$RVC(i) = SR(i) *V(i)$$

In various studies or literature the term „Safeguard Cost Efficiency" - SCE(i) means . the adequacy of the cost of maintaining security on risk reduction.

$$SCE(i)= RVC(i)-SC(i)$$

Table 2. Cost efficiency of the network intrusion detection system

The system's name	System 1	System 2	System 3	System 4
Total one year's cost of ownership SC(i)	12 000 PLN	15 000 PLN	19 000 PLN	25 000 PLN
The risk in currency unit RVC(i)	25 016 PLN	15 010 PLN	10 006 PLN	5 003 PLN
The cost efficiency SCE(i)	13 016 PLN	10 PLN	-8 994 PLN	-19 997 PLN

Source: own case study.

The cost efficiency defined in this way may indicate the quality of the risk management.

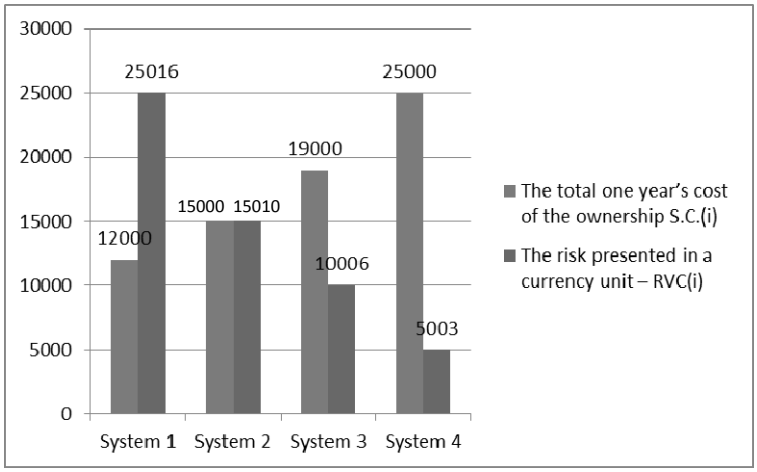

Figure 3. The total one year's cost of the ownership of the network intrusion detection – system SC(i) and the risk presented in a currency unit – RVC(i)

Source: Own case study.

The effectiveness defined in a traditional way is the result of what has been described as the relation between the final effects and the costs that have been carried. In our case the cutback on risk is the final effect while the carried cost is the total one year's cost of ownership of the network intrusion detection system.

Based on the data presented in the table above all the systems are worthwhile, and the most efectie one is at the same time the cheapest. Such high effectiveness should encourage to invest in safety.

Table 3. The effectiveness of the network intrusion detection system

The system's name	System 1	System 2	System 3	System 4
The risk before implementing the intrusion detection system	500317 PLN	500317 PLN	500317 PLN	500317 PLN
The risk after implementing the intrusion detection system	25016 PLN	15010 PLN	10006 PLN	5003 PLN
The cutback on risk as the result of before implementing the intrusion detection system	475301 PLN	485307 PLN	490311 PLN	495314 PLN
The total one year's cost of ownership of the system SC(i)	12000 PLN	15000 PLN	19000 PLN	25000 PLN
Effectiveness	39, 6	32,4	25,8	19,8

Source: Own case study.

According to the writer when choosing the economically optimal system of detection the network intrusion one should rely on the ownership of the security and its final cost MSC(i), as well as on the final cutback on risk MRVC(i).

$$MSC(i)= SC(i+1)-SC(i)$$
$$MRVC(i)=RVC(i)-RVC(i+1)$$

Table 4. The ownership of the intrusion detection system – final cost, and the final cutback on risk

The system's name	System 1	System 2	System 3	System 4
The ownership of the intrusion detection system – total one year's cost SC(i)	12000 PLN	15000 PLN	19000 PLN	25000 PLN
The risk after implementing the intrusion detection system	25016 PLN	15010 PLN	10006 PLN	5003 PLN
Final cost of ownership MSC(i)	12000 PLN	3000 PLN	4000 PLN	6000 PLN
Final cutback on risk MRĄC(i)	475301 PLN	10006 PLN	5004 PLN	5003 PLN
MRCV(i)-MSC(i)	463301 PLN	7006 PLN	1004 PLN	-997 PLN

Source: own case study.

In case of implementing the first of the systems presented above the risk is reduced by 475 301 PLN with the carried cost of 12 000 PLN.

What has been gained is 463 301 PLN (MRVC(i)>MSC(i)).

Implementaion of the second system presented in the table above will increase the cost of safety (comparing to system numer 1) by the amount of 3 000 PLN and will reduce the risk by the amount of 10 006 PLN.

What is gained in this case is 7 006 PLN (MRVC(i)>MSC(i)).

In case of System number 3 the safety cost rises (comparing to the second system) by the amount of 4 000 PLN, and the risk is reduced by 5 004 PLN.

Here the profit is 1 004 PLN (MRVC(i)>MSC(i)).

If we decide to choose system nr 4 we are going to pay 6 000 PLN more for safety (comparing to system 3) and reduce the risk by 5 003 PLN.

We lose 997 PLN (MRVC(i)<MSC(i)).

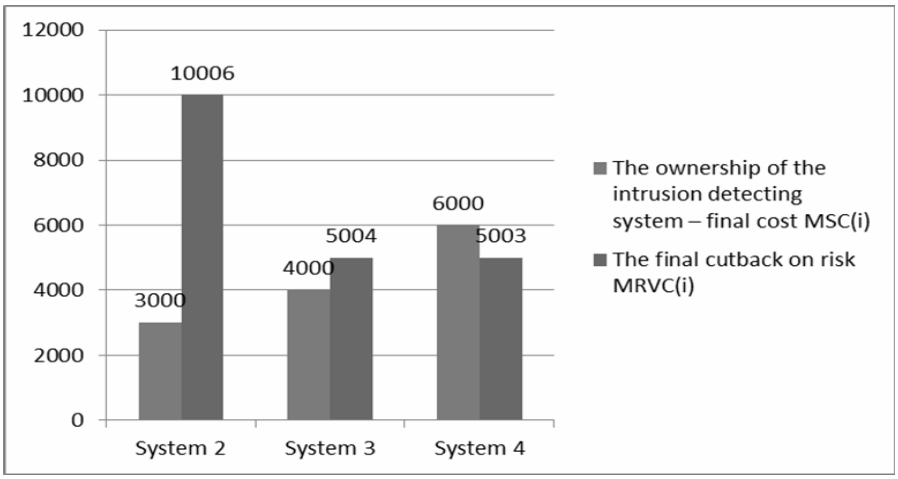

Figure 4. The ownership of the intrusion detecting system – final cost MSC(i), and the final cutback on risk MRVC(i)

Source: Own case study.

It turns out that System 3 is the optimal choice.

Conclusions

The system which proved to be the optimal version in terms of economy has been chosen based on the condition MRVC(i)=MSC(i). The implentation of system 4 will result in the final cutback on risk smaller than the final cost of the ownership which doesn't make the purchase of that system worthwhile. After the optimal system has been chosen it needs to be confirmed wether the risk level guaranteed by system 3 is acceptable.

The redundancy of IT specialists responsible for safety due to the fact that some procedures are going to be carried out automatically by the detecting system itself has not been taken into account in the calculation presented herein.

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Michał Laskowski

MARKETING STRATEGIES FOR SOCIAL NETWORKS

Abstract

Marketing activity within the social media is the new form of internet activity among companies nowadays. This way of gaining new clients and keeping the relationship with them is defined as being highly effective at low costs. It requires some effort from organization's side in order to provide interesting message to the users of a social network. What seems to be most difficult is to sustain the high level of activity and to evoke interest within the target group. It is the long-term result that is the most valuable feature of the social marketing, and measuring only the ROI factor itself may be misleading. Looking at the best developed countries in the world, for example Norway, one may get the impression that it is a marketing channel with a big potential, and the companies are going to be more and more willing to get involved in such sort of promotion.

1. Virtual societies

It was most probably Howard Rheingold who first used the term „virtual society" in 1994 to describe a group of people who may or may not meet with each other face to face and who exchange their ideas, words using the keyboard. The development of information infrastructure in the society was the main factor that contributed to the creation of internet society.

Apart from typing on a keyboard people nowadays communicate with each other not only using voice recorded digitally, but also using pictures and videos. New groups are created spontaneously and what is specific about them is that the interest in them may rise and fall rapidly. What is more interesting a lot of new sub-societies develop very quickly from the already existing societies. The reason why it is so is that the possibility of creating groups is unlimited. Once the subscribers are defined, the new communication channel is ready to use.

The role of internet societies is not limited only to activating the relations among people by the use of technology. Where there are consumers, there is usually a marketing message. Companies have quickly realized how helpful the social networks are in getting in touch with the users of internet.

Table 1. The most active brandy on facebook.com October 2011

	Last 6 months	Last 3 months	Last month	Last 2 weeks	Last week		
#	Facebook page name	Fans	Change	ER	RR	PP	Score
1.	Coca-Cola	35 009 884	+2.45%	0.03%	0.06%	14	52%
2.	Disney	29 074 491	+2.00%	0.11%	0.00%	24	53%
3.	Starbucks	25 743 820	+2.95%	0.13%	0.29%	15	60%
4.	Oreo	23 269 575	+1.66%	0.06%	0.00%	13	45%
5.	Red Bull	22 663 987	+1.87%	0.03%	0.00%	57	49%
6.	Converse All Star	20 881 937	+1.28%	0.01%	0.00%	25	50%
7.	Converse	20 408 268	+1.74%	0.01%	0.04%	25	58%
8.	Skittles	19 459 212	+1.72%		GO PRO		
9.	PlayStation	17 584 778	+2.22%	0.02%	0.00%	33	42%
10.	iTunes	17 287 721	+2.27%		GO PRO		

Source: Social Bakers, http://www.socialbakers.com/facebook-pages/brands/ (23.10.2011).

The effectiveness of creating and developing societies for the sake of business has been proved by the results that companies have in their marketing activity of this kind (drawing 1). Coca-cola has gained 35 million fans within the facebook.com society reaching the first place globally. A user's internet activity is determined by clicking the "like" button when becoming a fan of a brand, so not only does he get the producer's marketing message, but also supports this brand in an active way. What producers gain by having such fans is obvious: a) fans are potential clients who enable companies to send them marketing messages (advertisement), b) the users agree to get any types of messages from brand representatives, other than marketing ones, not only those regarding sale, c) they simply demand any sort of activity from a producer's side. The supporting activity of the internet users is not for free. Most companies, in order to attract them, offer some additional bonuses such as special offers, discounts, competitions or limited collections prepared solely for their internet fans. A network society membership is not infinite. It is just as easy to lose fans as it is to gain them. Sometimes it only takes clicking the "don't like" button .The potential of using network societies in the selling process lies within the active marketing. The methods of network marketing are used to a great extent in the branch of FMCG for food products.

There are 5 brands from this branch within the first ten in ranking. The entertainment (Disney, iTunes, Playstation), and clothing (Converse) companies are also there a bit further in the ranking. The fact that a brand is popular globally is reflected by its activity within a network society.

According to the survey „Social Diagnosis 2009" 82% of the polish internet users were the members of social networks, the other two more active groups were only the ones using web pages (91%) and mailbox (89%). What this survey proves is that social networks are one of the three most important ways of spreading information in the internet. Further in the ranking were the communicators (79%) and web pages regarding work and learning (75%). If companies ignore these indicators especially within segments B2C, C2C, G2C, they will not be able to use their own marketing potential

2. The use of a network society for business reasons

Electronic commerce has been developing in a dynamic way around the world for a couple of years now. A significant number of internet users began their activity on auction portals such as eBay. Online shopping is just the next step. The development within the pay technology, such as instant online transfers, texts, and credit card service, has with no doubt contributed to a dynamic rise of the online sale in the last few years. A remarkable number of orders is nowadays paid and sent to a customer on the same day. The latest trend in the development of e-commerce is the F-Commerce, which is sale by the use of social networks. Is it possible to sell goods on for example facebook.com portal? Yes, definitely. Owing to the fact that this portal is open towards various applications it is possible to implement all the functions of an online shop there. (Drawing 1).

It was Vobis that as one of the first companies launched the social selling platform in Poland. 4000 goods were chosen to be presented on the platform in the category of computer equipment. Although its functioning as well as the number of goods is limited, the platform offers full sale service:

1. Making an order from a basket.
2. Confirmation of an order.
3. Instant payment.
4. Tracking the status of an order.

There are many IT solutions available on the facebook.com portal, which make it possible to establish an online shop there. As far as the polish market is concerned the solution of InFlavo (Drawing 3) is a remarkable one, because it is integrated with the system of e-transfers and with the logistic operator called "Paczkomaty 24/7". Not only is a client able to track the status of his payment, but the whole process of sending his good as well. It is all possible to handle from the level of social network webpage.

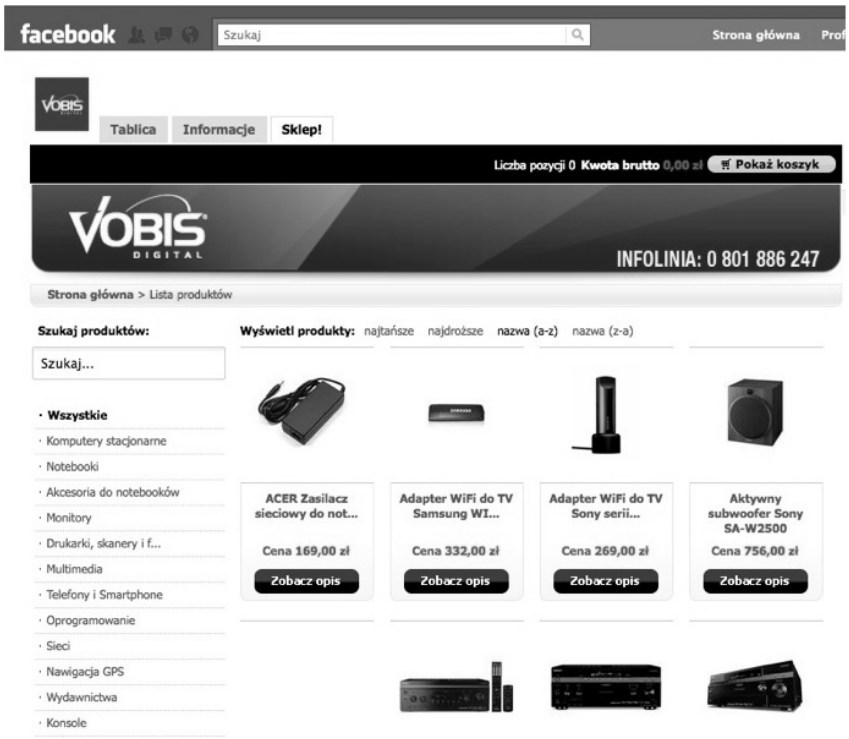

Figure 1. Application of an online shop on facebook.com platform

Source: facebook.com/vobispl.

Figure 2. The applications of online shops on the social networks

Source: Own case study.

3. Viral marketing

A snowball effect is the aim of every marketing specialist who is using a network society. The possibility of sending and sharing information easily on

the society networks makes the internet users willing to use this function a lot. A marketing message given initially to a group of 100 people may reach as many as 500 people in just 2 days, 3000 people in one week, and up to 50 000 people in one month. Whether such message will be ignored or become a success among the society is determined by its attractiveness, and depends on whether the internet users will feel the need of passing this information on. The truth is that 95% of the snowball effect campaigns are bound to fail, but on the other hand the remaining 5% of them result in spectacular success, which highly exceeds a company's marketing possibility of reaching its potential clients using the classic tools of promotion.

The campaign gobarbara.com created by the Pixnet Company is a good example of the potential that is hidden in the social networks media. An internet application makes it possible to insert any words (generated by a synthesizer) in the lyrics of Barbra Streisand's song. This simple application, which guarantees a unique multimedia effect, has gained 64 millions openings, 9 millions visits among 5 millions users. Having estimated the population of Poland to 40 millions, the message has reached 12,5%. The following line chart shows the activity of internet users on gobarbara.com. portal. A dynamic rise in its popularity was observed during the first two months, and then followed by the slow fall of interest among the users. It is a typical curve of one-time internet projects.

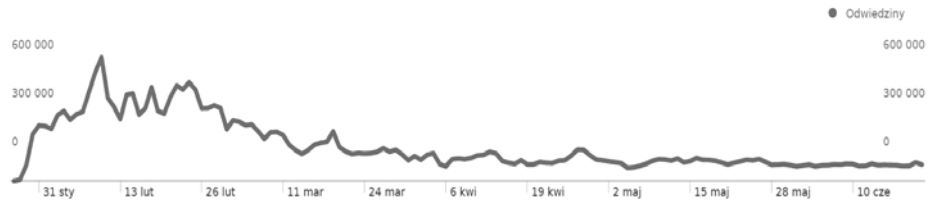

Figure 3. The number of visits on the social campaign gobarbara.com

Source: Pixnet Sp. z o.o.

This campaign was neither created nor planned by any big media house. According to its makers the idea was carried through within just one weekend as a stepping-stone to more difficult and more serious projects. The total budget of this project was barely 40 USD because the authors had access to some server resources that were not in use at that time, and they could use them for free. It is the idea itself not the engagement or quality that a success depends on in the social campaigns. In case of gobarbara.com it was the possibility of generating the personalized version of the song that the users liked most of all. The project gained a spectacular success on the polish market because of the possibility to share both the song and the information about the portal.

4. Social networks most commonly used within business

The facebook.com portal has a leading position on the global market. It has actually become the main portal of any social activity in the internet. Never before have so many companies begun to use any new communication platform in such a short period of time. Nevertheless, the service does have some competition on the global market. If one looks on the map (Drawing 5) it will turn out that facebook.com has not reached a leading position in countries such as Brazil, Russia, China, Japan, Iran. Counting the populations of these countries up may prove that the position of facebook.com is weaker than one could have expected. The service Orkut.com is an interesting project created by Google Inc. has gained in popularity in Brazil and India. Unfortunately, due to a much weaker usefulness of this application Orkut.com lost its leading position in these countries in 2010, and the concern itself stopped any development works on it.

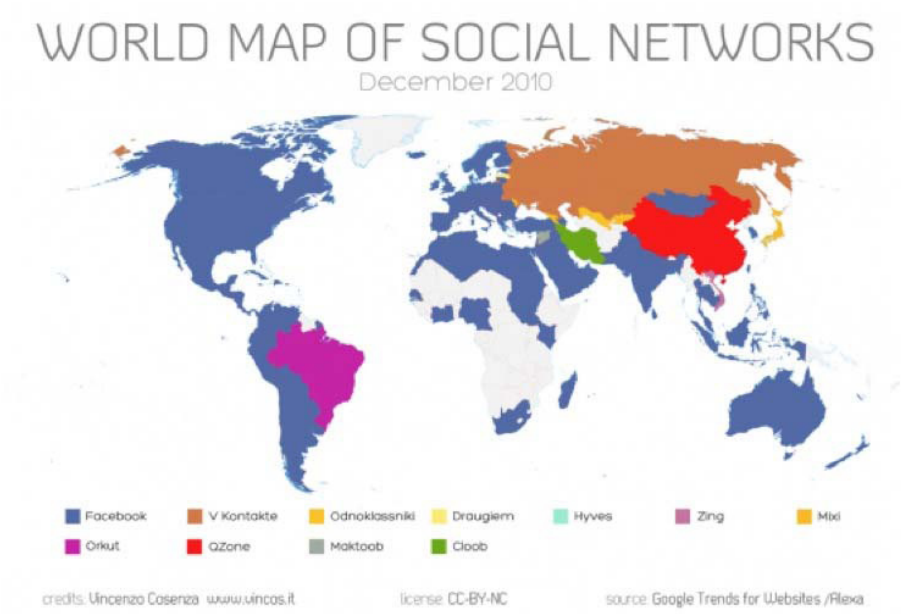

Figure 4. Popularity of social services around the world in 2010

Source: Google trends / Alexa.

Asking companies about the portals that were most helpful for them in their business activity will only prove the leading position of facebook.com. (Drawing 6). The other ones just behind it are: Twitter, then YouTube, Linkedin, MySpace and Groupon. The use of video in business activity is growing every year. Owing to the YouTube portal it is not necessary to buy extremely expensive commer-

cials. Every enterprise can create its own video channel in order to publish the recordings showing their products, manuals, advice and many more on the internet. If a society evaluates the video as an interesting one, it is bound to be watched many times, and to fulfill its advertising function for the enterprise. The next service is Linkedin, an application dedicated for the purpose of building and keeping business relations among professionals. Owing to this portal not only may its users get quick advice, take part in group discussions or get new members of their project teams, but they can also give virtual recommendation or present their own professional achievements. Myspace service is devoted to the entertainment branch, where most artists publish their songs, or news for their fans. Despite its fall of popularity in favor of Facebook.com or youtube.com Myspace still has a huge base of active artists who make this portal alive. The classic business magnate in the field of sending advertising emails, Groupon, placed itself on the sixth position.

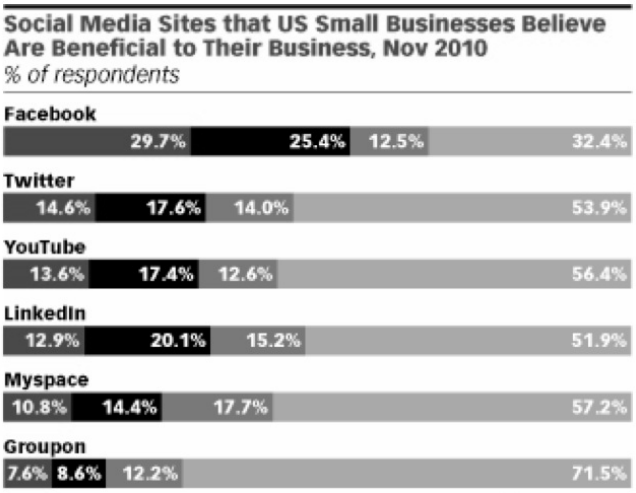

Figure 5. Social networks most useful for enterprises in the USA

Source: marketer.com.

5. The strategy of existing in social network media

How to launch, control and to keep one's position in social network media? Regardless of whether a campaign is private or a business one it should be treated as a marketing process that has its goal defined in a clear way. All the actions should be planned in advance and fulfilled according to the strategy that has

been chosen. It may even take one year before the first relevant effects, such as financial ones, will be noticed.

5.1. Monitoring of the activity

Monitoring is the basic tool when working with social media. It is worth checking what the internet users write on a given subject before starting a marketing campaign. There are both commercial and free tools available to complete such tasks. What the free ones offer is a simple function of searching for any statements in the text written in internet. They are tools such as:

1. **A search engine.** Typing in a statement is enough to be able to identify initially if there is anything to be fund on this specific subject on the net, and in which context it is used.
2. **Google Alert.** This free of charge service allows us to constantly monitor any new content being addend on the net. What one needs to do is simply type in the text which is going to be monitored, for example "The University of Gdansk", and choose the frequency of sending the alerts. Ones these settings have been done, the application is going to send us emails reporting any new entry including the key sentence that has been added on the internet for example on a weekly basis.

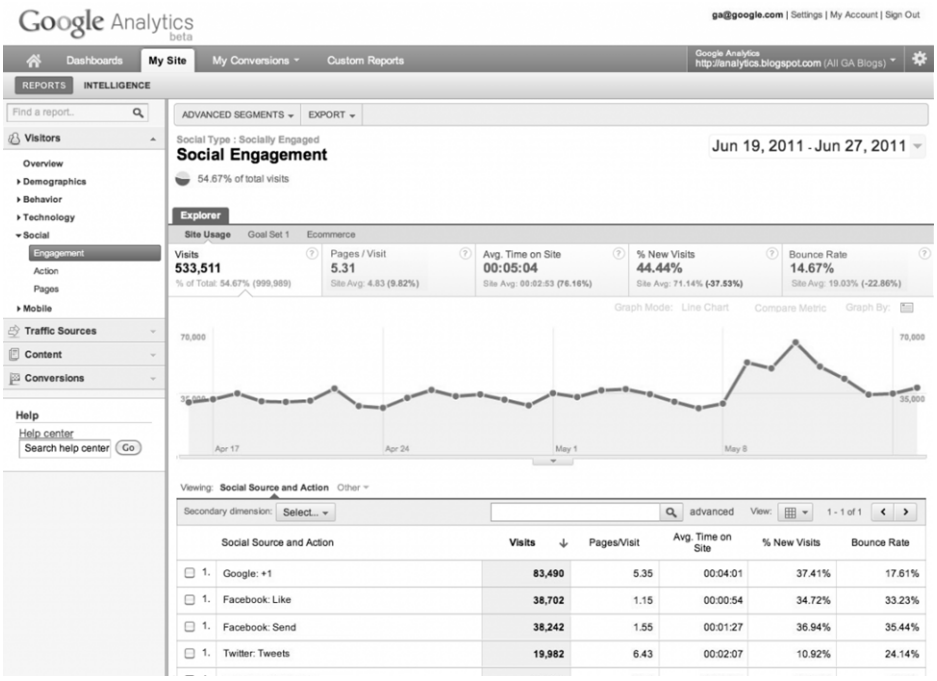

Figure 6. Traffic statistic generated by the Internet society in Google Analytics

Source: google.com/analytics.

3. **socialmention.com** provides the real-time search of statements which are addend only to social networks, for example blogs, comments, or user profiles. It also offers the function of detecting the type of message: "positive", "negative", "neutral".
4. **Google analytics** has provided the facility of tracking the users who have opened a web page from a social network (drawing 6).

The commercial tools provide a deeper analysis connected with a monitored brand, the storage of results, creating the charts of trends, and determining the sort of a message. Here is an example of such service:

5. **NewsPoint**, a company which primarily deals with a classic monitoring of newspapers and printed mass media. They have launched another product which is monitoring of the social media. The possibility of ordering both a classic and social report is the basic advantage of the service which provides an additional opportunity to compare the effect in media (given that the methodology of both reports is the same).

5.2. Brand presence strategy

To set the strategy of a brand presence in the media is a basic and the most crucial document for every marketing specialist. A social activity is long-term effect oriented, which is difficult to measure by the calculable factors of sale. To set the appropriate strategy and to hold on to it strictly may be a key to the successful campaign. The message to the whole population in general is hardly ever the aim of a campaign. It is mostly targeted at specific consumers who are the group of potential clients. (Drawing 8). The selection of a target group makes it possible to adjust the message in a more accurate way, which will evoke a higher level of interest.

The analysis should show how often the target group uses the social network which is the average level of a user's engagement and a buying impulse. If such activity of a target group is too low, the choice of social marketing will most probably be not the right channel. As an example of a badly chosen target group one could name managers of a higher level who are not using the social network for the time being. It is the quality of a message that is most important in the social marketing field. The key question is whether the content being offered / graphics / video will be gripping enough for a society to become interested in it in an active way by sharing, commenting and spreading it. A consistent strategy throughout the whole campaign, for example 18 months, will help to build trust in users, provide both sufficient repeatability of a message and sufficient amount of information in order to evoke buying impulse in users as the final reaction. Only after these factors have been achieved can the investment become cost-effective. There are not many companies that agree to accept the factors of effectiveness other than sale itself. The quality measures regarding the users' quality and the brand's position on the market are rarely perceived as sufficient criterion.

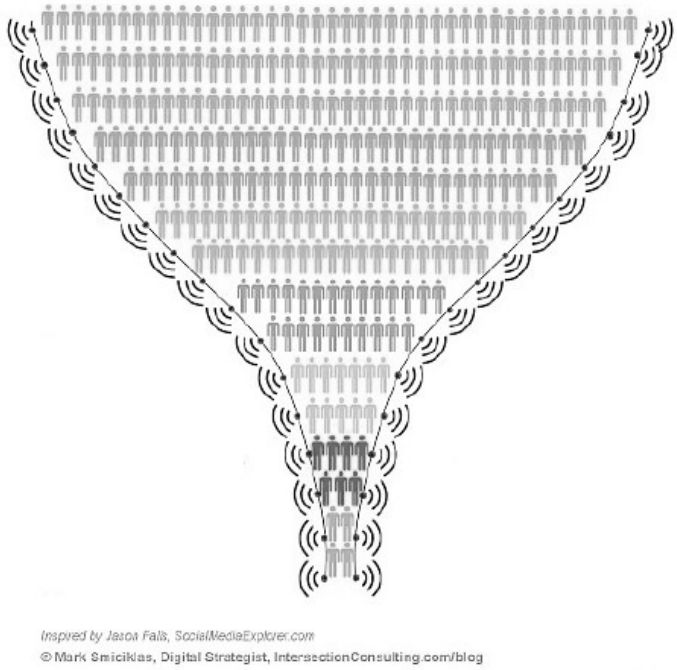

Figure 7. The choice of a target group within the social marketing

Source: www.intersectionconsulting.com/blog.

The last feature of a strategy is the selection of advertising channels. Since there is a wide range of social networks, the attempt to stay active on all or most of them would be highly ineffective. As a target number one should stay active on just 3 or 4 internet portals on a regular basis. It is facebook.com and Youtube.com that are regarded as the most important ones. The other portals include:

1. Blogs: Blogger, Wordpress
2. Microblogging: Twitter, Blip
3. Social Networking: Myspace, Goldenline, Linkedin, Ning, Mixxt
4. Konowledge databases: Wikipedia: Bizneswiki, Wikispaces
5. Social Bookmarking: Delicious, Google Reader
6. Social News: Digg, Wykop
7. Civic journalism services
8. Photography: Flickr, Picasa

5.3. Competition for a high status

To be present in social networks is only a part of success. Because of a huge amount of comments dedicated to every user the services try to evaluate new entries and only display those which appear to be most interesting for the user. As far as facebook.com is concerned its users have the possibility to switch the

view between "latest" and "most popular" (Figure 8). In the first option all the entries are displayed chronologically by the date they were added. In the option "most popular" the latest entries from only some of the users are displayed. According to some unofficial information these messages come from the users / companies whose profiles we have visited, the users whose entries we have commented on, and the users whose pictures / videos have been watched by us.

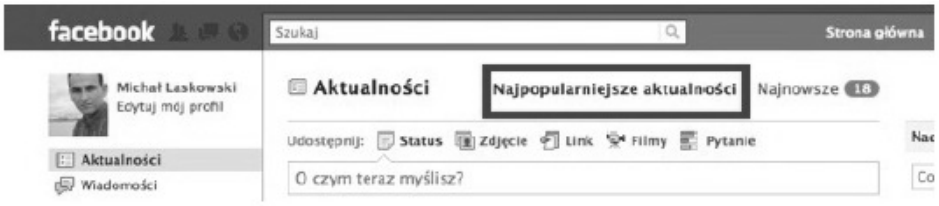

Figure 8. The "latest"/ "most popular" function on facebook.com

Source: facebook.com.

The competition for a high status inside the social networks is a separate factor of building a status. Thus, the issue of search engine optimization is still as recent as possible. Some users come across a message not within a social network, but by using a search engine for example gogle.com.

5.4. Staying active

To stay active is with no doubt the most difficult aspect of carrying out a campaign within a social network. It is not a particularly big challenge to launch social channels or to fill them with the latest news about a company, its products and special offers. The difficult part is to generate an interesting content, especially the not-for-sale one, as well as the ongoing searching for some fascinating subjects to publish. A company that orders such service must stay active, which may cause some difficulty. Having no personal contact with a company the marketing agency may struggle to offer any message that will be either funny or ironic, so it is essential that the sales department, which orders outsourcing, assists the agency. Once a company decides to use social marketing, it should find some time and resources within its team to support a marketing agency or a media house in the scope of theoretical knowledge or creativity.

Conclusions

It turned out that business activity within social networks can generate sale using electronic sale channels. Provided that a company sets a consistent strategy

and uses the monitoring tools on a regular basis using social networks in order to support sale is not a particularly difficult process. Companies take this risk counting on the possibility of launching a campaign with the snowball effect, and as a result they reach hundreds of clients more than they have expected.

The potential of social networks in business can also be estimated using Norway as an example, a country which observed the most significant rise of activity within internet society 2–3 years ago. It is very difficult to launch new business there without any support of society, friends, or clients who are satisfied with the service of a company. Factors such as personal recommendation and the offer of high quality are the most determining buying impulses.

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