Marketing Strategies in Port Industry: An Exploratory Study and a Research Agenda

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Abstract: Problem statement: Market globalization increases demand and the competition between firms. Ports as basic figurative nodes cannot remain separate from this change. Technological improvements, the increased demand of marine transports, the demand for new, bigger and more specialized vessels, has increased the competition among ports. **Approach:** In this competitive environment business mistakes may be proved fatal and marketing strategies arise as a means for differentiation. As such, modern ports suffer both from internal and external pressures. On the one hand, they need to exhibit management competency in the pursuit of suitable strategy and in the allocation of scarce resources. On the other, they no longer enjoy the freedom of a monopoly and therefore face a completely competitive market. **Results:** The selection of a suitable strategy is important for ports wishing to improve their financial results. The better financial capability for a firm means investing in the constantly changing shipping market. Economic prosperity also adds value to a firm that uses suitable marketing strategies to satisfy its customers. **Conclusion:** The present richer examined two alternative strategies-profit maximization and revenue maximization-and explores the factors that influence the application of these two strategies in the port industry. Data from 18 European ports were examined by multiple step-wise regression. The results proved the diversity of the two applications.

Key words: Profit maximization strategy, revenue maximization strategy, ports

INTRODUCTION

The development of global trade, combined with market globalization, has brought about significant changes in land, air and sea transports. Sea transports now account for 90% of total transports and constitute a critical part of transport policies, especially in the European Union as more than 90% of the EU's external trade and some 43% of its internal trade is transported by sea (Chlomoudis *et al.*, 2007). Ports as businesses combine an industry with services (Suykens, 1986) that pursue for increased effectiveness and productivity is continuous. Restructuring of old-fashioned organizations and management styles and/or privatization of all or some of the port activities (Tongzon, 1995) have been examined as potential remedy measures in this new era (Pallis and Tsiotsis, 2008).

Ports are the main part of the sea transport system as "the basic means to satisfy sustainable mobility" (Chlomoudis, 2006). In recent years, the structure and operation of ports has become adapted to the needs and demands of combined transports. These needs that focus on rapid and effective cargo management, actual port product development, adaptation to the new conditions of port production organization and the regulatory and institutional framework at an international level, have led to a complete change in port goals and character. Technological progress and increased demand for sea transport generate the need for investments and new infrastructures at ports. Together with infrastructure development, ports faced with an intensive competition offer now a wide range of services in terms of the quantities and varieties of cargos managed daily, the types of vessels anchored, the connection to land transports, the storage and other additional services (Roll and Hayuth, 1993) and value-added services.

The delivery of these services requires the use of both classic contributors (land, work and capital) and the level of technology, cooperation with other companies of the whole transport system (door to door) and the adaptation of port management to the new conditions (Roll and Hayuth, 1993). The need for a systematic process that will include the development of strategies to achieve goals and distribute resources to implement these strategies, based on which every port will be able to deal with market changes, is now

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apparent (Siomkos, 2004). The strategic planning of ports includes port marketing, which is of major importance because of its responsiveness to the continuously changing needs of the new free market and which is the linchpin between the internal and external environments of the port business.

The goals of ports-businesses, according to classical economic theory, are either to increase total revenue or to increase profits (Brown and Laverick, 1994). The selection of one of the two goals has been extensively explored in literature (Baumol, 1959; Amihud and Kamid, 1979). These goals are mainly associated with the way in which owners or managers control their ports (Amihud and Kamid, 1979) and/or with the short-term achievement of maximum efficiency (Marris, 1964) or the concept that the main goal of businesses cannot be restricted to the maximisation of profits (Brown and Laverick, 1994; Baumol, 1959).

It is therefore evident that the selection of one of the two goals can differentiate the strategy followed by the business. The obvious question is whether and to what extent these two goals generate or require different marketing policies, especially in the port industry.

This study begins with a brief description of port industry and the structural changes it has undergone in the recent years and continues with a literature review of theories describing the differences between the two strategies that businesses can adopt. Then, the methodology and research data analysis are presented.

Conceptual background:

Defining business' performance: The main purposes of port businesses today are success and excellence. Success is a multidimensional construct, (Porter, 1980) and so is excellence (Speed and Smith, 1993). Business success and excellence in port industry were associated with business performance from 1980-2000. The performance of a business (Speed and Smith, 1993) is not a one-dimensional construct and cannot be measured using only one factor (e.g., product production or service delivery). The performance of a business also includes other variables (Wright, 1985), such as consumer-user satisfaction, provided service quality, operating profit, management style and market share (Anderson *et al*., 1994), user-customer retention (Rust and Zahorik, 1993), efficiency (Rust *et al*., 1995) market share and cost effectiveness (Berger, 1995). More specifically, business performance defined (Sink and Tuttle, 1989) as a complex interdependence among efficiency, effectiveness, quality, productivity, working conditions quality, innovation and profitability.

Performance of service companies contains 6 dimensions (Fitzerald *et al*., 1991), based on competition, business economic performance, offered services quality, productivity, innovation and business flexibility. The first two dimensions, (Fitzerald *et al*., 1991) are associated with the strategy adopted by the business and the remaining four determine the success achieved by the business operation.

The complexity and the great variety of factors affecting the performance of a business make its measurement difficult. Performance can be measured with many factors using multiple inputs and outputs. These factors are not always the same, but they depend on specific dimensions, such as the form of business ownership, the intensity of competition, government intervention in the market, the degree of political accountability or political control, the style of management and business organizational structure (Fitzerald *et al*., 1991).

As previously mentioned, performance is a complex interdependence among many factors, one of which is productivity. In the port industry, productivity (e.g., how many tons of cargo are stevedored) (Tongzon, 1995), is used to measure port performance. Total port productivity, depends on a series of factors such as geographical position, fees, general economic activity and the efficiency of the terminal (Tongzon, 1995). Ports based on their older character-businesses owned by the state and being subject to state restrictions-are interested in maximizing their productivity on the condition of reaching a specific total revenue (Tongzon, 1995). Thus, to achieve revenue maximization every port should follow a specific strategy. The structural changes that took place in ports during the last decades and changed the form of their ownership from state to private (Port of Antwerp, Port of Tallinn, Port of Helsinki, Port of Hamburg, Port of Dublin), even though they did not change the original strategy of ports to maximize their productivity, changed the strategy to maximize revenue into a strategy to maximize profits in order to satisfy the demands of shareholders (Tongzon, 1995). These two strategies are not the same and require a different policy on the part of the companies to achieve the desired results (Baumol, 1959; Dunshire *et al*., 1991).

Defining inputs and outputs in the port industry: Management science has brought to light the idea of measuring efficiency (Charnes *et al*., 1994), where performance depends on the best production unit taking into account a series of multiple inputs and outputs in the production process. Inputs and outputs, (Roll and Hayuth, 1993), characterize the production process and

the type and level of service offered by the business. A series of inputs is necessary in every business during the production process to generate outputs. The most obvious inputs used by every business in its production process are the three production contributors: Land, work and capital. However, there are also other factors affecting business efficiency (Altubas *et al*., 2001).

Based on these approaches, profit maximization could depend on the difference in the fees for the external and internal services offered by a business.

In the port industry, many academics have examined performance and efficiency. In their research they have used a series of inputs, which are the number of people employed in a port (Barros, 2003; Barros and Athanassiou, 2004; Roll and Hayuth, 1993), the number of gantry cranes (Cullinane *et al*., 2004), the area occupied by the terminal (Cullinane *et al*., 2004; Wang and Cullinane, 2006), the fixed assets of the business (Barros, 2003; Cullinane and Song, 2003; Melendez-Hidalgo *et al*., 2007), operating cost (Barros, 2005; 2006), depreciations (Martinez-Budria *et al*., 1999), the total number of piers in a port (Cullinane *et al*., 2004).

In addition, the literature on the port industry refers to a series of outputs, which are total revenue (Cullinane and Song, 2003; Martinez-Budria *et al*., 1999; Liu, 1995; Park and De, 2004) total TEUs managed by the port (Cullinane *et al*., 2004; Liu, 1995), total tons stevedored at the port (Barros, 2003; Barros and Athanassiou, 2004; Martinez-Budria *et al*., 1999; Park and De, 2004; Roll and Hayuth, 1993) total vessel traffic (Barros, 2003; Barros and Athanassiou, 2004), passengers transported (Barros, 2006; Coto Millan *et al*., 2000), tankers and dry bulk vessels (Barros, 2006).

Research hypotheses:
Alternative strategies Profit maximization strategy and revenue maximization strategy: Businesses follow several marketing strategies to achieve their purposes (success and excellence). Marketing strategies can be long- or short-term depending on the goals of the business (Baker *et al*., 1988; Doyle *et al*., 1992), strategies of target-market identification and segmentation (Hooley and Jobber, 1986), strategies of competitor identification (Doyle *et al*., 1992), strategies of competitive advantage creation (Baker *et al*., 1988) and pricing strategies (Doyle *et al*., 1992; Hall, 1980).

Modern businesses also adopt alternative strategies, such as profit maximization or revenue maximization (Yarrow, 1973). Many theories have been developed regarding these two strategies and the differences in the views of owners and managers about the strategy that businesses should follow at a given time (Baumol, 1959).

Classical economic theory argues that the purpose of businesses is profit maximization. In contrast, modern management theory suggests that the purpose of today's businesses is revenue maximization. Although Baumol (1959) believes that the main strategy of businesses should be revenue maximization, he recognizes the need to achieve satisfactory profits. Baumol (1959) argue that the strategy of revenue maximization is mainly a requirement of modern management that is mostly interested in increasing the company's size. At the same time, the company's owner is mostly interested in profit maximization (Baumol, 1959). Moreover, Marris (1964) supports that business success is achieved through the company's continuous development and more specifically through revenue maximization. The strategy of revenue maximization reflects managers' efforts to reduce the dangers and risks of their actions (Amihud and Kamid, 1979). It has been theoretically and empirically proven (Dunshire *et al*., 1991) that managers prefer strategies that will yield results with less risk than business owners. If managers select a strategy of profit maximization, then in a supposed financial disorder this strategy will lead to extremely reduced profits. However, if managers select a strategy that produces maximum profit (just offers a satisfactory rate of profit) the company's shareholders will be satisfied. Using this strategy, they will be able to maintain a satisfactory level of profits through the years and shape more appropriate strategies for the future. Thus, the strategies of profit maximization and revenue maximization are not the same.

In the port industry, each port should implement appropriate management and marketing policies. The strategy of revenue maximization has been more widespread among the ports that were under governmental supervision, since their main aim was to maximize service production, thus their revenue, without being interested in profit making (Talley, 2006). In this case, total revenue could be equal to total costs, thus giving no profit margin or they could have a deficit and be subsidized by the state (Talley, 2006).

In previous research carried out on port industry regarding port performance and efficiency measurement, total revenue constitutes the outputs of the use of inputs in service production (Cullinane and Song, 2003; Martinez-Budria *et al*., 1999; Liu, 1995; Park and De, 2004). According to researchers, the inputs used are the total cargo traffic in tons (Liu, 1995), the expenses for the staff and depreciations (Martinez-Budria *et al*., 1999), the fixed capitals of the business (Cullinane and Song, 2003) and the number of vessels that are stevedored at a port (Park and De, 2004).

On the contrary, from what we know today, total profits have not been used to measure port efficiency. Of course, other researchers (Wilder, 1981), state that total profits of ports directly depend on ship congestion at the terminal, but the profit maximization of ports is affected by the power of shipping companies. Moreover, Siomkos (2004) suggests that profits are determined by the existing technology and other factors (raw materials, capitals, workforce) and the characteristics of competition.

On this basis, the following research hypotheses are formulated:

H1: The strategy of profit maximization that a port can follow is different from the strategy of revenue maximization

H2: Total revenue is a multi-dimensional construct that depends on certain financial and not financial variables

H3: Total profit is a multi-dimensional construct that depends mainly on certain financial and not financial variables not necessarily the same as those influencing the revenues

MATERIALS AND METHODS

Data analysis: The initial aim of this research was to examine a pool of 60 European ports. However certain port authorities have neither published an audited Profit and Loss account statement nor they have used compatible accounting practices. This way ports like Bremerhaven, Algeciras, Felixtowe, Gioia Tauro, Le Havre, Genoa, Zeebrugge, Southampton, Constanza have been excluded from further analysis. A final pool of 18 ports was finally selected satisfying the above said requirements. These ports are presented in Table 1.

Variables used in this study comply in general with two criteria: The first has to do with the activities of the port per se. Research supports that activities of a port may be decomposed to seven handling stages: (1) passage of the ship through the approach channel up to the quay; (2) transit storage; (3) loading the cargo on to land transport; (4) discharge of the cargo from the ship's hold to the quay; (5) moving the cargo from transit to the loading platform; (6) moving the cargo from the quay to transit storage; (7) departure of land transport from the port area (Lopez and Poole, 1998). The second criterion follows a rather more mechanistic-exploratory-way based on availability of data and validity of the research instrument (Cullinane and Song, 2003).

Table 1: Selected ports

Belgium	Antwerp	Portugal	Sines
Germany	Hamburg	Finland	Helsinki
Estonia	Tallinn	Finland	Kotka
Ireland	Dublin	Finland	Turku
Greece	Piraeus	Sweden	Malmo
Greece	Thessaloniki	United Kingdom	Belfast
Spain	Malaga	Netherlands	Amsterdam
Spain	Barcelona	Spain	Bilbao
Netherlands	Rotterdam	Slovenia	Koper

Therefore two set of variables were introduced for consideration. The first set of variables examines the financial status of the selected port whilst the second provides a more productive role of the port.

The first part of variables includes financial data to depict the bottom line situation of any port authority. Although certain considerations have been arisen for the data compatibility every effort has been made to transform the data to a attuned way. Notes on accounts have been induced in the analysis and certain provisions have been made for similarity reasons. Variables include: Tangible fixed assets (Barros, 2003) representing the existing available infrastructure (land and building, machinery and equipment, fixtures and fittings and vehicles) of the port. Note that this variable encapsulates investments made at a previous stage of development. To capture the pace of investment it has been decided to incorporate depreciation (Martinez-Budria *et al.*, 1999) as a further financial measure. In addition, operating expenses (Barros, 2005) are examined to estimate the cost side of the equation. Nevertheless wages and salaries were not included to cover for diversified operating statuses-e.g., port operators are not usually included in this part of this P and L account. Finally according to our main hypotheses of this study-to explore the possibility of the simultaneous existence of two distinct marketing strategies-profit and revenue maximization, operating profit and total turnover included in the analysis.

In the second set of variables the productive ability of the port is introduced and the role of the total port traffic is examined. Variables include the whole number of vessels approaching the port for loading or unloading activities (Barros and Athanassiou, 2004), divided in number of tankers, bulk carries and container ships (Barros, 2003). The importance of total port throughput or the port's capacity was examined by the total TEUs loaded or unloaded (Cullinane *et al.*, 2004; Tongzon, 1995), total tons movement (Coto Millan *et al.*, 2000; Liu, 1995) and total and by type of vessel Gross Registered Tonnage (tankers, bulk carries, container ships). This research also attempted to explore the rather neglected role of the passenger in the main port activities-as a means for profit or revenue generator-and included passenger and cruise passenger movements (Coto Millan *et al.*, 2000).

Table 2: Selected variables

	No. of vessels in general	No. of Tankers	No. of bulk carriers	No. of container ships	Total GRT	GRT tankers	GRT bulk carriers	GRT container ships	Total TEU	Total tons in-out	Passengers + cruise passengers	Tangible fixed assets	Operating profit	Operating expenses	Revenue	Depreciation
Amsterdam	4758	1267	461	430	70895	18172	14510	15808	183360	56794000	13987000	472000000	29300000	70388619	99688619	16900000
Antwerp	15729	4047	12	3503	264641	36683	582	121900	6718196	151705000	8000	957024000	73544000	214205000	287749000	45900000
Barcelona	9815	768	177	2153	216592	15143	2841	63047	2314581	38267000	1927000	1372818000	58033000	199609000	257642000	25347000
Belfast	6136	437	66	200	71471	2470	1151	947	235902	13514000	1406000	233268941	18977719	18137183	37114902	5446920
Bilbao	3714	812	792	719	50485	20248	4625	6939	686870	36118000	121000	742809000	38873000	23212000	62085000	21176000
Dublin	7287	490	508	1678	127424	3524	2288	9162	680679	20795000	1245000	217004000	25592000	40831000	66423000	8485000
Hamburg	10197	905	929	7357	195247	10326	17006	153968	8878093	11552900	110000	934731029	30535850	230233914	260769764	29341545
Helsinki	12200	92	23	802	160861	614	395	7030	419589	11733000	8548000	309161556	31086349	50747641	81833990	11881467
Koper	2312	125	594	489	27486	2235	7275	6457	222049	15391000	1000	149277000	19953165	77410582	97363748	3970257
Kotka	2733	221	13	704	26002	1186	113	6475	460623	9578000	12000	88920000	8267000	26449000	34716000	6666000
Malaga	1869	38	67	368	32844	310	1128	14550	452099	6049000	286000	9008668	-643728	16019455	14196466	73557322
Malmo	2525	391	249	104	48031	1946	504	637	37851	9003000	155000	28095365	9488686	54545989	67735576	3693597
Piraeus	30568	809	135	1565	198148	6372	580	30849	1412554	19948000	11539	192529311	17718117	126419070	144137187	9143381
Rotterdam	28728	7259	1092	6154	534630	128104	57785	179023	9575400	353576000	1504000	2290817000	174257000	281347000	455604000	83162000
Sines	1351	974	54	263	29692	17686	3721	7848	121957	26934000	1000	70358726	3767580	30363185	34130756	72808370
Tallinn	10030	236	314	441	126271	2026	1024	2649	227378	41243000	6447000	460438000	46756000	18442000	75285000	11973000
Thessaloniki	2732	581	559	618	20475	6182	2493	8692	355180	16358000	121000	43091156	6887000	39060000	45947000	3649000
Turku	3017	100	1	50	79659	520	2	298	20429	3926000	3620000	72658862	8575969	15548010	24123979	3900661

Table 3: Correlations

	No. of vessels in general	No. of tankers	No. of bulk carriers	No of container ships	Total GRT	GRT tankers	GRT bulk carriers	Total TEU	Total tons in-out	Tangible fixed assets	Operating profit	Operating expenses	Revenue
No. of vessels in general					0.841**								0.717**
No. of tankers					0.862**	0.964**	0.824	0.780**	0.963**	0.822**	0.914**	0.743**	0.845**
No. of bulk carriers							0.724**						
No of container ships					0.770**			0.969**	0.785**	0.759**		0.886**	0.860**
Total GRT	0.841**	0.862**		0.770**		0.843**	0.759	0.823**	0.893**	0.886**	0.923**	0.849**	0.927**
GRT tankers		0.964**			0.843**		0.913	0.720**	0.955**	0.851**	0.929**		0.807**
GRT bulk carriers		0.824**	0.724**		0.759**	0.913		0.707**	0.903**	0.789**	0.833**		0.749**
GRT container ships		0.797**		0.959**	0.844**	0.742**	0.723	0.993**	0.879**	0.839**	0.763**	0.943**	0.937**
Total TEU		0.780**		0.969**	0.823**	0.720**	0.707**		0.871**	0.807**	0.743**	0.911**	0.907**
Total tons in-out		0.963**		0.785**	0.893**	0.955**	0.903**	0.871**		0.881**	0.934**	0.797**	0.892**
Tangible fixed assets		0.822**		0.759**	0.886**	0.851**	0.789**	0.807**	0.881**		0.936**	0.842**	0.925**
Operating profit		0.914**			0.923**	0.929**	0.833**	0.743**	0.934**	0.936**		0.746**	0.880**
Operating expenses		0.743**		0.886**	0.849**			0.911	0.797**	0.842**	0.746**		0.973**
Revenue	0.717**	0.845**		0.860**	0.927**	0.807**	0.749**	0.907**	0.892**	0.925**	0.880**	0.973**	

**: Correlation is significant at the 0.01 level (2-tailed). *: Correlation is significant at the 0.05 level (2-tailed)

As the EU initiative for the short sea shipping (Maritime Transport Policy, 2007) comes into power from 1999 the impact and the benefits of the port passenger industry seems rather a totally unexplored area with few studies addressing the issue in the literature (Pantouvakis *et al*., 2008).

The relevant data are presented in Table 2.

Data analysis: Research data were initially analyzed using the bivariate correlation process and the calculation of the Pearson correlation coefficient in order to measure the strength of the relationship among the variables used in research. It is clear that a high correlation coefficient is expected between variables (inputs-outputs) and a lower correlation coefficient among inputs. In this way, it is expected to numerically confirm the relationship between inputs and outputs that is suggested in literature. The correlations are presented in Table 3.

Table 3 provides robust evidence for the nature and the strength of the relationships between variables by attending the relevant correlation coefficients. The higher and the closer to 1 the Pearson correlation coefficient is, the stronger the correlation of one variable with another is (Field, 2005).

It should therefore be noted that:

- Total profits present a high correlation with the number of tankers and the total tons stevedored at a port. They also present a high correlation with the fixed assets of the business
- Total revenue on the other hand present a high correlation with the total volume of containers stevedored at the ports, with the total TEUs, with the total tons of all types of cargo and with the fixed assets of the business

To confirm the hypotheses of the research we used the stepwise regression method. Stepwise regression was applied twice to draw conclusions and operating profit was used as a dependent variable in the first case and in the second case the revenue of ports was used as a independent variables. Dependent variable and the rest variables in Table 2 were used as independent variables.

In the first case, operating profit was used as a dependent variable and the rest variables in Table 2 as the results are presented in the Table 4 and 5.

Table 4: R-adjusted R^2: Model summary

Model	R	R^2	Adjusted R^2	Std. Error of the estimate	R^2 change	F change	df1	df2	Sig. F change	Durbin-Watson
					Change statistics					
2	0.970(b)	0.940	0.932	10503.599	0.064	16.053	1	15	0.001	1.808

Predictors: (Constant), Tangible fixed assets; Predictors: (Constant), tangible fixed assets, No. of tankers

Table 5: Coefficients (a)

Model		Unstandardized coefficients		Standardized coefficients			Collinearity statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
2	(Constant)	3994.539	3225.511		1.238	0.235		
	Tangible fixed assets	0.038	0.008	0.570	5.124	0.000	0.324	3.086
	No. of tankers	10.045	2.507	0.445	4.007	0.001	0.324	3.086

Dependent variable: Operating profit

Table 6: R-adjusted R^2 model summary (d)

Model	R	R^2	R^2	Adjusted the estimate	Std. Error of change	R^2 change	F df1	df2	Sig. F change	Durbin-Watson
						Change statistics				
3	974(c)	0.948	0.937	29855.170	0.024	6.604	1	14	0.022	2.742

Predictors: (constant), GRT container ships; Predictors: (Constant), GRT container ships, tangible fixed assets; Predictors: (constant), GRT container ships, tangible fixed assets, No. of vessels in genera; Dependent variable: Revenue

Table 7: Coefficients (a)

Model		Unstandardized coefficients		Standardized coefficients			Collinearity statistics	
		B	Std. Error	beta	t	Sig.	Tolerance	VIF
3	(Constant)	22563.070	10511.228	2.190	0.050			
	Total GRT	0.294	0.134	0.313	2.190	0.040	0.181	5.527
	Tangible fixed assets	0.014	0.004	0.365	3.256	0.006	0.295	3.388
	TEU	0.071	0.027	0.353	2.570	0.022	0.196	5.111

Dependent variable: Revenue

Table 4 shows that the two variables account for 93.2% of total sample variance (Adjusted R^2 = 0.932). There is also no problem of multicollinearity since the values of Tolerance and VIF are at quite a good level (Tolerance>0.01 and VIF<10) (Field, 2005). According to the results of Table 5 the variable "operating profits" depends on the tangible fixed assets of a port (e.g., facilities) and the number of tankers loading or uploading in a port:

$$f \text{ (Operating Profit)} = 4054.8 + 0.038 \text{ (Tangible Fixed Assets)} + 10.045 \text{ (Number of Tankers)}$$

In the second case, stepwise regression was applied and total revenue was used as a dependent variable and the rest variables in Table 2 as independent variables. The results are presented in the Table 6 and 7.

From the results of Table 6 the third model is proposed with three variables that account for 93.7 % of total sample's variance. There is also no problem of multicollinearity, since the values of Tolerance and VIF are at quite a good level (Tolerance>0.01 and VIF<10)

(Field, 2005). According to the results as it seems from Table 7 the variable "total revenue" depends on total vessel gross registered tonnage, tangible fixed assets and total TEUs stevedored at the port:

$$f \text{ (revenue)} = 22563.525 + 0.294 \text{ (total GRT)} + 0.014 \text{ (TEU)} + 0.071 \text{ (Tangible fixed assets)}$$

RESULTS AND DISCUSSION

The results provide robust evidence that the two strategies-profit and revenue maximization- are found to be distinct First due to the fact that various variables differently load to the stepwise regression and secondly because revenue although inserted has not finally included as profit predictor in all our regression models. A further interesting conclusion supports that no financial variables from the P and L account-such as operating costs and depreciations-may significantly influence the strategies' pursue. This contradicts the rather common notion that ports are cost centers and that by reducing expenses better results are expected. A

better outcome is envisaged when the "sell" department functions well in every port and attracts new or retains the old customers.

Moreover, examining the two equations of stepwise regression, tangible fixed assets is a factor affecting total revenue and operating profits. It seems that past investments in fixed assets not only have return, but also contribute to the increased future productivity of ports. This leads to the conclusion that the investments in tangible fixed assets such as new terminals, storage areas and other equipment that were made in previous years by port authorities yield profits and revenue for ports. Another important outcome is that profits depend also on the number of tankers approaching a port contrarily with revenues that depend both on container transportation and on the total tonnage of the vessels. This assumption could be important for port managers as they could differentiate their strategy determination taking into account the environmental constraints applied in liquids freight transportation. Finally, both models do not accommodate the passengers' transport as a revenue or profit contributor. The low correlation coefficients identified as well the insignificances observed may support that in the total bulk of port operations passengers are the "sleeping giant". As their part in the process for the time momentum has not been sufficiently exploited and neither negative nor positive roles may be attributed to their participation perhaps a more rigorous approach to some future study may be required.

CONCLUSION

Ports as traditional transit points play an emerging role in the new global era. Maritime transportation literature emphasizes in this particular role of ports as transitional logistic points. Also the globalization of trade and the growth in sea transport have resulted in port traffic increases at an average of about 3% per year. Moreover, the technological improvements and rapidly growing Eastern markets have intensified the competition, impacting on port activities. New port infrastructures have been planned, improvements in port services have been designed and new maritime transport technologies have been applied, so that ports improve their efficiency and their services in order to compete with national and international competitors. These circumstances postulate the adoption of new marketing strategies, more competitive and targeted to the improvement in port financial state. Port managers forced to deal with new competitive environment by adopting strategies such as profit or revenue maximization in order to reach their goals.

This research, taking into account the results has concluded that two distinct strategies may be applied or used from relevant port authorities. Regarding profit or revenue maximization strategies port managers should adapt their tactics to the set goals and consequently adopt the most suitable marketing strategies. This study argues that one strategy may focus on profit maximization and this seems to be the case for of state owned and controlled companies. A second distinct strategy mainly focuses on revenue maximization and considers them as of major importance. This strategy suites more to the more risk averse controllers-as in the case of managers-who prefer size to profits. In a direct analogy one may assume that depending on control status (manager or port operator versus owner or port authority) one of the two strategies may be selected. The social contribution of every port is considered to be responsibility of the state and thus is not included in this study.

The two strategies examined in this research suggest ways that a port authority can increase its total revenue or profits. The adoption of either of these two strategies may improve ports' financial status and can therefore provide decision makers with better and more alternatives. Consequently, one may decide whether to proceed with investments and in what business section (liquid or bulk or container) or whether cost cut-offs appear as the most appropriate solution. New roles, changing market environments require flexible and decisive solutions and a clear eagerness on keeping customers satisfied (Notteboom, 2004).

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