

Zampeta, Vicky

**Article**

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**The Impact of Corporate Governance and the Cost of Capital in Shipping**

**Vicky Zampeta**

*Ph.D. Candidate, Department of Maritime Studies, University of Piraeus,  
vicky.zampeta@gmail.com*

**Abstract**

**Purpose** - The main aim of this paper is to analyze the impact of corporate governance and the cost of capital in shipping industry. The present study grasps on a doctoral thesis aiming to analyze the above developments in the shipping industry in general and mostly in the Greek owned shipping companies and how these developments have been evaluated by the top executives based on a market research we have conducted.

**Design/methodology/approach** - The main idea for the consolidation of the results of the regression methodology used is to analyze research hypotheses related to effects of Corporate Governance in the shipping industry, emerged in a previous article by Zampeta (2011) and Thalassinos and Zampeta (2012). The research hypotheses will be explored with econometric methodology to be confirmed or rejected depending on the statistical significance of the coefficients of the factors-variables selected and express their respective cases. The specific way of analyzing the answers from the questionnaires used sufficiently cover the concept of triangulation (triangulation) because they use primary research data (sample analysis questionnaires), with acceptable bibliography concerning the impact of globalization and the evolution international trade financing cost of shipping enterprises. There is a need to exploit the results of the factorial analysis used by Zampeta (2011), Thalassinos and Zampeta (2012) and Thalassinos and Zampeta (2015) to the methodology of regression to analyze research hypotheses related to the Factor of the Cost of Capital and the Factor of Corporate Governance and their impacts in the Shipping Industry.

**Findings** - The results of the subject research confirm the views of the top executives that specific explanatory variables are forming the factors referring to corporate governance and the cost of capital in the shipping industry. In addition, they have influenced the decision of the shipping companies to adopt the Corporate Governance structure in order to exploit the benefits of international integration of capital markets. Based on this result, more and more maritime firms have adopted the principles of Corporate Governance as an effective tool to deal with globalization and the cost of capital in the subject industry.

**Research limitations/implications** - Lack of statistical data with respect to financial indexes in addition to the small number of companies indexed in stock exchanges. The structure of the questionnaire has some limitations with respect to the total number of sub-questions describing the exact nature of the financial system followed by each company. Very limited bibliography on the issue.

**Originality/value** - *The approach followed in this study gives a particular interest in the results and create originality because it combines different methodologies aimed at similar research hypotheses as presented in the paper.*

**Key words:** corporate governance, corporate restructuring, shipping industry

**JEL classification:** G3, F3, M2

## 1. Introduction

The main idea for the consolidation of the results of the regression methodology used is to analyze research hypotheses related to effects of Corporate Governance in the shipping industry, emerged in a previous article by Zampeta (2011) and Thalassinos and Zampeta (2012). More specifically, by analyzing the findings from the factorial processing of 56 questionnaires collected from top executives of the shipping industry with some questions relative to the impact of Corporate Governance in shipping.

Corporate Governance has been analyzed based on the results of globalization in administrative structures adopted by multinational global corporations, among them ocean shipping companies. These companies have adopted policies to manage strong global competition, very competitive international capital markets, high cost of financing, huge flows of international trade and the impact of the recent financial and debt crisis, particularly in the Eurozone region.

As defined by the Organization for Economic Cooperation and Development (OECD) in 2004, Corporate Governance principles were developed mainly for the protection of minority rights and minority shareholders in companies and include 6 modules as described in the relevant manual of the Organization as following:

1.The guaranteed standards to achieve an effective corporate governance framework as set out in the relevant section:

"The corporate governance framework should promote transparent and efficient functioning of markets, be consistent with applicable law and determines the obligations of the various supervisory and regulatory authorities."

2.The rights of shareholders and their basic obligations as defined in the OECD manual with the following paragraph:

"The corporate governance framework should protect and facilitate the rights of shareholders."

3.The equitable treatment of shareholders, minority rights with subsection:

"The corporate governance framework should ensure the equitable treatment of all shareholders, including minority and foreign shareholders. All shareholders should be able to denounce the violation of their rights and be compensated if necessary."

4.The role of shareholders in corporate governance, participation in committees and responsibilities of each committee with subsection:

"The corporate governance framework should recognize the rights of shareholders arising from both legislation and private agreements, and to promote cooperation between the company and shareholders to create capital, jobs and the maintenance and function of healthy bodies."

5.Transparency and disclosure to the full information and ensure transparency among shareholders in the following paragraph:

"The corporate governance framework should ensure the timely and accurate disclosure of all matters related to the financial situation, performance, ownership and governance of the company."

6.Obligations of the Board towards third parties, to shareholders and employees to paragraph below:

"The corporate governance framework should ensure the strategic management of

the company, effective control of the administration by the Board and the responsibilities of the Board towards its shareholders."

Such an importance of Corporate Governance was given by the OECD at the global level in order to safeguard the rights of shareholders, to address the problems of lack of transparency and irregularities in businesses which led to integrate Corporate Governance in the research objectives of this study. Particularly, the limited use of this concept by the shipping industry has created the need for scientific research to determine the possible impact attributed to CG to shipping companies either administratively or financially.

## **2. Literature Review**

Thalassinos and Zampeta (2012) refer to the main objectives and the new ways in which enterprises face the current economic crisis. They also refer to developments in international trade from 2011 to 2015 due to globalization. At the same time, they have proposed a model of administrative structure for the shipping companies with the integration of the main principles of corporate governance. The introduction of elements of corporate governance can generate positive prospects for the development of the shipping companies.

The study is based on market research using a questionnaire where the views of top executives reflected on questions and answers on specific issues, for example, the penetration elements of corporate governance in the shipping companies, the use of modern models of administrative and operational structure, the effect of the world financial system etc., in the performance of the shipping companies.

The study suggests that in shipping management systems are constantly being developed in two respects. First, using modern methods of design programs and measure performance and results and, secondly, the adoption of the main factors of corporate governance. The basic principles of corporate governance are a key tool for

improving the legal, institutional and regulatory framework of corporate governance and focus not only on economic issues but also on issues of organization and management of companies listed in international stock exchanges including the shipping companies.

Globalization has affected the shipping industry in a great extent, due to new developments in international trade. These developments have changed the structure of the shipping industry, particularly during the recession and due to the fact that global production has been decreased.

Toudas and Bellas (2014) have focused on the relationship between corporate governance and historical and expected returns. The authors constructed a corporate governance index (CGQL) measuring the implementation of the quality of corporate governance of listed companies in the Athens Stock Exchange separating businesses in democratic and dictatorial nature.

The purpose of the survey is the issues of corporate governance and their role in final decisions of investors. Thus, the authors tried to observe whether corporate governance is a benchmark of a company producing agent and modification of abnormal returns or risk factor, which can be a 'substitute' for the market risk (beta coefficient), using single and multi-diversified analyses. The findings lead to the creation of doubt with respect to the usefulness of corporate governance regarding the attractiveness of the company.

Arthus and Alvarez (2013) define Corporate Social Responsibility (CSR) as the active and voluntary business contribution to strengthening social welfare to concrete actions. In fact, they consider it as an intangible asset that generates competitive advantage and promotes sustainable development. The aim of this work is that businesses understand the importance of CSR as a corporate strategy that enhances the value of the business to become conscious that helps efficiency and effectiveness.

The authors are trying to prove that the improvement achieved in the intellectual capital of enterprises is associated with better

CSR actions. They argue that among other elements, a company consisting of a group of people that are installed in series to achieve a goal, a financial success. Achieving this goal requires the management of human, material and organizational resources under the rules of CSR.

As stated in the article, CSR creates a voluntary commitment from the companies to the society for economic development and environment protection, with responsible behavior by all parties that interact with each other. The idea, according to the authors in which CSR is based on that companies and society are not far from each other, however they are interrelated. The society has certain expectations of stable behavior by companies and their impact on society. The authors consider that the joint demands of the interested parties must be:

- Transparency of information;
- Improving confidence of society;
- The participation of both parties to the dialogue to achieve a beneficial relationship;
- Reciprocal concessions consist of thoughts that can develop and improve the economic, social and environmental environment in a balanced and sustainable way.

When the business works with a responsible attitude in the search of the needs of the parties concerned generates more confidence and reduce the risk associated with opportunistic behavior from them due to asymmetric information they have provide to the society.

The authors conclude that firms create more and more conscious communication with other parties with whom they interact in the market, creating positive and negative effects on performance, either of environmental or of social sphere. Every company has some basic goals that create value, improve efficiency and competitiveness. The application of ethical and corporate social responsibility in strategic management decisions should not jeopardize the achievement of these objectives.

Havlíček, Břečková and Zampeta (2013) explored the latest trends in management and quality in service especially in SME's. The authors classified quality as a subset of

effective marketing management that is known in the modern market by the term Customer Relationship Management (CRM). The original idea of quality control based on product quality will be gradually replaced by the integrated quality management on the desires, needs and expectations of the customers.

Increased competition means that it is possible to consider quality perspective of the transaction, but the so-called relational perspective is even more common in management. This is attributed through the creation of permanent links between the two parties, the company on one side and the costumer on the other. Regarding the entire process of an effective management model, the authors have proposed a system emphasizing the strategic management and the operational control of quality with the use of an entire management quality structure of continuous processes. The proposed model has been designed based on data from a number of SME's from the Czech Republic.

Black, Kim, Jang and Park (2008) have examined whether and how the capitalization of a company from the application of the elements of corporate governance has been affected. Previous research in emerging markets using elements supporting the association of corporate governance has been proved to affect the performance and the capitalization of the associated companies. The authors have developed an index of corporate governance, consisting of five individual indicators including the structure of the Board, the shareholder structure, the transparency, the shareholders' rights and the procedures followed by the Board.

The main problems encountered in this study were the possibility of reversing the effects of variables, the lack of certain data, the degree of effective adoption of principles of corporate governance and the risk of failure of an important parameter. The investigation confirmed the existence of significant correlation between the level of corporate governance and market capitalization of the sample consisting of listed Korean companies for the period 1998-2004, while it has been

proved that companies with high corporate governance index exhibit a higher index Tobin's q. This item is influenced mainly by the structure of the Board, the shareholder structure and the transparency in decision making. Less important indicators have been proved the rights of shareholders and the Board procedures.

For companies with a high corporate governance index, the study has noted the following: The corporate performance is influenced by fluctuations in the overall profitability of the industry. The volume of investment is lower but more influenced by the profitability and the growth potential of the company. The increase in sales is lower. The efficiency is significantly influenced by the growth opportunities. The structure of the Board affects the profitability of the company. The dividend yield is higher and significantly influenced by the profitability.

La Rocca (2007) examined the relationship between corporate governance in the financial structure and capitalization of the companies, emphasizing the complexity of the object due to the interaction between these elements. His research showed that the corporate governance mechanisms can create corporate value if they are used internally in a proper way.

Corporate Governance defines the system according to which the responsibility for taking decisions is distributed within a company in order to represent all shareholders as required (Lazzari, 2001; Zingales and Rajan, 1998) as well as regulations and practices used to protect shareholders from any opportunistic behavior of the administration as it is supported by Shleifer and Vishny (1997). Giannakopoulou, Thalassinou and Stamatopoulos (2015), have an article with a detailed literature review on the issue of corporate governance.

Weiss and Steiner (2006) argued that corporate governance generally refers to the overall control of the activities of a company that includes the formation of corporate objectives, strategies and plans and the appropriate management structure to operate responsibly for the internal (employees,

creditors, suppliers) and external groups (environment, society, customers).

Since the 1990s, the term corporate governance has become a business idiom worldwide as it is pointed out by Bradbury, Mak and Tan (2006). The existing literature on the theory of stakeholders indicates that companies should move beyond the traditional approach to protecting the interests of shareholders and respond more to the demands of other stakeholders (Clement, 2004; Preble, 2005). After the collapse of Enron discussions on corporate governance have focused on issues concerning the separation of ownership and control, and the alignment of the ownership interest with other bodies involved in the management of the company (Marnet, 2005). The rules and factors that lead to effective practices in corporate governance include formulating and independence of the board (Cornelius, 2005) and the audit committee (Cotter and Silvester, 2003; Constantinides, Harris & Stulz (2003). Tersigni and Lemoine, 2006), the disclosure of information and transparency (Chiang, 2005), accounting standards (Agrawal and Chadha, 2005) and the structure of corporate ownership (Defond, M. L., & Hung, M. 2004; Thomsen, 2004).

Bhagat and Black (2001), Klein (2002), and Peasnell, Pope and Young (2005) in parallel studies have shown that the high level of corporate governance largely depends upon the independence of the board and the impartiality of the audit committee. According to them, the independence and the impartiality of the audit committee contribute to the accuracy and integrity of the financial statements thereby reducing sprawl and inefficient monitoring of corporate accounting processes that can lead to high corporate value unnecessarily and weak rights abuse issues response system shareholders.

The huge levels and areas of corporate power is concentrated in the hands of large multinational companies will lead to the belief that business should assume responsibility towards the stakeholders for more transparency and openness (Egri & Ralston, 2008).

In today's competitive business environment, corporate governance and social responsibility have become the focus of regulators, shareholders and various other stakeholders worldwide (Chau and Leung, 2006). Some argued that the family business is not the best form of government because it provides dominant position to shareholders and members of their families by providing the opportunity to expropriate the interests of other shareholders through high compensation, linked transactions, high dividends and risk avoidance (Bartholomeusz and Tanewski, 2006). This study supports that family businesses can adopt sound practices of corporate governance and social responsibility that will lead to the maximization of shareholders' interests and to sustainable development.

Several studies (Cheffins, 2009; Grosse, 2012; Kirkpatrick, 2009) showed that corporate governance was a major cause of the current financial crisis, because it failed to protect against excessive risk taking by the Boards of companies. Even the proponents of corporate governance argue that various deficiencies related to the procedures and laws governing the framework for corporate governance to the global economic crisis, combined with other factors that have not been accurately determined are likely to play a role in global economic crises (Yeoh, 2010).

Other scholars (Walls, Berrone and Phan, 2012; Poole, 2010) have argued that the crisis was a result of failure across the financial system due to the lack of transparency and accountability standards. They argued that corporate governance has not played a central role in the current economic crisis. For this conclusion Mülbart (2009) argued that even if the researchers could show many examples of bad practices of corporate governance, before and during the crisis, their examples do not support the claim that the failures of corporate governance was a major cause of the crisis.

Mülbart (2009) noted that while the actions of corporate governance may have failed in the financial crisis, there was enough evidence to suggest that inappropriate structures of corporate governance were at the roots of the

financial crisis US. The executive pay was a hot topic in the debate on the financial crisis because of the form of incentives used in the effort of companies to successful business strategy.

Applying the principles of corporate governance, as described above, by including them in the questionnaire, a market research has been conducted addressed to top executives from the shipping industry. The answers of the executives who participated in the survey have been analyzed with the method of Factor Analysis offering useful conclusions regarding the relevance and the effectiveness of the implementation of the principles of corporate governance in the administrative structure of the shipping companies.

### **2.1 Empirical Evidence**

The issue of Corporate Governance has been included in this study into the questionnaires and has been described by two questions with eight sub-questions. The analysis of these questions arose two factors. The strongest factor appears as VAR02 in the models below which has selected four sub-questions describing essentially the concept and the definition of Corporate Governance. The research hypotheses discussed in this study, which are based on this factor are the following:

1. *The modern form of the strategy applied in the shipping industry has lead shipping companies to adopt the Corporate Governance system.*

2. *The intense competition that developed as a result of globalization has lead shipping companies to adopt the Corporate Governance system.*

3. *Modern financial systems developed because of globalization have lead shipping companies to adopt the Corporate Governance system.*

4. *The development of the capital market and the consolidation of stock markets because of the globalization have lead shipping companies to adopt the Corporate Governance system.*

5. *The integration of stock markets because of the globalization creates conditions to adopt the system of Corporate Governance by shipping companies.*

6. *Borrowing methods developed in the global financial system because of globalization have lead*

shipping companies to the decision to adopt the system of Corporate Governance.

The above research hypotheses will be explored with econometric methodology to be confirmed or rejected depending on the statistical significance of the coefficients of the factors-variables selected and express their respective cases. This method of analysis of the responses derived from the questionnaires used sufficiently cover the concept of triangulation because they use primary research data (sample analysis questionnaires), with acceptable bibliography concerning the importance of corporate governance in the conduct of the administrative structure of shipping business while confirms similar studies in shipping (Syriopoulos, 2007). Other studies have concluded that Corporate Governance in the shipping industry improves the administrative structure and the financial performance of the shipping companies (Syriopoulos and Theotokas, 2007; Syriopoulos, Merika and Vozikis, 2007).

The approach followed in this study gives a particular interest in the results and create originality because it combines different methodologies aimed at similar research hypotheses as presented below.

### **3.1 The Factor of Corporate Governance and its Impact in the Shipping Industry**

*Research Hypothesis 1 (Model 1: Corporate Governance and Business Strategy):*

[The modern form of the strategy applied in the shipping industry has led shipping companies to adopt the Corporate Governance System].

The econometric analysis of Model 1, shown in Table 1 below is considered as dependent variable the factor that describes Corporate Governance of the questionnaire (VAR02), and as independent variables four factors VAR26, VAR27, VAR28 and VAR29 coming from different questions of the questionnaire related with business strategy.

The coefficients of Model 1 (Beta, Standardized Coefficients) 0.216, 0.315, 0.225 and 0.217 for variables VAR26, VAR27, VAR28 and VAR29 respectively, are shown

with a positive sign and are statistically significant at 1% significance level, 5% and 10%. The coefficient of multiple determination (Adjusted R Square) is high, 0.447, for this type of analysis as the statistical F. The results suggest that these factors are related to the developments that have been occurred in shipping mentioned by the executives in the market research involved in this work. This confirms the Research Hypothesis 1 with respect to the existence of a causal relationship between the business strategies followed or will be followed by the shipping companies and recent developments in the area of Corporate Governance.

*Research Hypothesis 2 (Model 2: Corporate Governance, Globalization and Competition):*

[The strong competition developed due to globalization has led shipping companies to adopt the Corporate Governance System].

The econometric analysis of Model 2, shown in Table 1 below, is considered as dependent variable the factor that describes Corporate Governance of the questionnaire (VAR02), and as independent variables three factors VAR15, VAR17 and VAR19 coming from different questions of the questionnaire that referred to globalization and competition.

The coefficients of Model 2 (Beta, Standardized Coefficients) 0.195, 0.464 and 0.271 for variables VAR15, VAR17 and VAR19 respectively, are shown with a positive sign and are statistically significant at 1% significance level, 5% and 10%. The coefficient of multiple determination (Adjusted R Square) is high, 0.530, for this type of analysis as the statistical F. The results suggest that these factors are related to the developments that have been occurred in shipping mentioned by the executives in the market research involved in this work. This confirms the Research Hypothesis 2 with respect to the existence of a causal relationship between globalization and competition created by the developments in Corporate Governance in the shipping industry.

*Research Hypothesis 3 (Model 3: Corporate Governance, Globalization and Financing Cost):*



[Modern financial systems developed due to globalization have lead shipping companies to adopt the Corporate Governance System].

The econometric analysis of Model 3, shown in Table 1 below, considers as dependent variable the factor that describes the Corporate Governance of the questionnaire (VAR02), and as independent variables four factors, VAR07, VAR08, VAR17 and VAR19 coming from different questions of the questionnaire that referred to globalization and the financing costs of the shipping companies.

The coefficients of Model 3 (Beta, Standardized Coefficients) 0.196, 0.503, 0.224 and 0.269 for variables VAR07, VAR08, VAR17 and VAR19 respectively, are shown with a positive sign and are statistically significant at 1% and 5% significance level. The coefficient of multiple determination (Adjusted R Square) is high, 0.710, for this type of analysis as the statistical F. The results suggest that these factors are related to the developments that have been occurred in shipping mentioned by the executives in the market research involved in this work. This confirms the Research Hypothesis 3 concerning the existence of a causal relationship between globalization and the financing costs of shipping companies leading them to adopt the Corporate Governance system.

*Research Hypothesis 4 (Model 4: Corporate Governance, Globalization and External Debt):*

[The development of capital markets and the integration of stock markets due to the globalization have lead shipping companies to adopt the Corporate Governance System].

The econometric analysis of Model 4, shown in Table 1 below, considers as dependent variable the same as in the previous three cases (VAR02), and as independent variables four factors VAR07, VAR08, VAR19 and VAR21 that refer to globalization, financing costs and the factors influencing the decision of executives to raise borrowed funds abroad.

The coefficients of Model 4 (Beta, Standardized Coefficients) 0.120, 0.448, 0.237 and 0.349 for the variables VAR07, VAR08, VAR19 and VAR02 respectively, are shown

with a positive sign and are statistically significant at 1% and 10% significance level. The coefficient of multiple determination (Adjusted R Square) is high, 0.751, for this type of analysis as the statistical F. The results suggest that these factors are related to the developments mentioned by the executives in the market research involved in this study. This confirms the Research Hypothesis 4 for the existence of a causal relationship between globalization financing costs and raising capital from abroad have lead shipping companies to the adoption of the Corporate Governance system.

*Research Hypothesis 5 (Model 5: Corporate Governance and Stock Markets):*

[The integration of stock markets due to the globalization creates conditions to adopt the system of Corporate Governance by shipping companies].

Similarly the econometric analysis of Model 5, shown in Table 1 below, with the same dependent variable (VAR02), suggests that the corresponding factors in Model 5 are related to the developments reported by the executives in this market research. This confirms the Research Hypothesis 5 with respect to the existence of a causal relationship between the stock markets and the implementation of the Corporate Governance system in shipping companies.

*Research Hypothesis 6 (Model 6: Corporate Governance and External Debt):*

[Methods of lending that have been developed in the global financial system because of globalization have leaded the shipping companies to adopt the system of Corporate Governance].

Finally, Research Hypothesis 6, with the same dependent variable (VAR02) and the corresponding factors in this model have been also confirmed as shown in Table 1 below. The results suggest that these factors are related to the developments mentioned by the executives in the market research involved in this study. This confirms the Research Hypothesis 6 for the existence of a causal relationship between globalization, borrowing costs and the implementation of the Corporate Governance system in shipping companies.

**Table 1: Corporate Governance (Question 7, Factor VAR02)**

	Mod: 1	Mod: 2	Mod: 3	Mod: 4	Mod: 5	Mod: 6	
Constant		0.413					
t-stat		0.882					
VAR07			0.196***	0.120*			Model: 3, 4
t-stat			2,607	1,733			
VAR08			0.503***	0.448***			Model: 3, 4
t-stat			4,785	4,957			
VAR09					0.320***		Model: 5
t-stat					3,727		
VAR10					0.425***		Model: 5
t-stat					3,727		
VAR14						0.162*	Model: 6
t-stat						1,839	
VAR15		0.195*				0.210**	Model: 2, 6
t-stat		1,778				2,937	
VAR17		0.464***	0.224**				Model: 2, 3
t-stat		4,091	2,059				
VAR19		0.271***	0.269***	0.237***			Model: 2, 3, 4
t-stat		2,653	3,376	3,201			
VAR20						0.151*	Model: 6
t-stat						1,809	
VAR21				0.349***		0.648***	Model: 4, 6
t-stat				3,644		6,479	
VAR26	0.216*						Model: 1
t-stat	1,728						
VAR27	0.315**						Model: 1
t-stat	2,513						
VAR28	0.225**						Model: 1
t-stat	2,159						
VAR29	0.217*						Model: 1
t-stat	1,829						
Adj R squa	0.447	0.530	0.710	0.751	0.312	0.626	

Sign F	0.00	0.00	0.00	0.00	0.00	0.00	
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VAR019 appears to be statistically significant in 3 of the 6 Models (Models 2, 3 and 4) that have been selected by the processing of the survey data concerning corporate governance in the management systems of the shipping industry.

VAR07 and VAR08 appear to be statistically significant in 2 out of 6 Models (Models 3 and 4) that have been selected by the processing of the survey data concerning corporate governance of shipping, while VAR15 is statistically significant in Models 2 and 6, VAR17 in Models 2 and 3 and VAR21 in Models 4 and 6.

Between the 6 Models selected Model 3 has four dependent variables, all statistically significant at 1% level and a considerably high coefficient of multiple determination (Adjusted R Square), 0.710. Model 4 is also considered of high importance with four independent variables and a high coefficient of multiple determination (Adjusted R Square), 0.751, however one of the independent variables is significant at 10% significance level.

### 3.2 The Factor of the Cost of Capital and its Impacts in the Shipping Industry

In addition to Corporate Governance discussed in section 3.1, primary research through questionnaires revealed a second important factor that has been considered by the top executives participated in the market research as a key issue in the formation of the modern administrative structure in the shipping industry. This factor is the cost of capital described in question....of the questionnaire. Therefore there is a need to exploit the results of the factorial analysis used by Zampeta (2011), Thalassinos and Zampeta (2012) and Thalassinos and Zampeta (2015) to the methodology of regression to analyze research hypotheses related to the second issue of the present study. More specifically the impact of the cost of capital in the shipping industry is presented in this section in a similar way as in section 3.1 above.

The cost of capital in shipping finance will be analyzed based on the results of globalization in administrative systems adopted by multinational global corporations, the global competition in the industry and the latest developments in stock markets and capital markets.

The concept of the cost of capital in shipping finance has been included in this study into the questionnaires and has been described in two questions, question 11 and question 13. The factorial analysis of these two questions arose two factors in each one of them. The strongest factor appears as VAR08 in the Models below which has selected four sub-questions describing essentially alternative ship financing solutions. The research hypotheses discussed in this section are based on this factor are the following:

7. *The modern form of the strategy undertaken in the shipping industry leads to an increase in funding costs for the shipping companies.*

8. *The development of the capital market and the consolidation of stock markets due to the globalization lead to increased financial costs for the shipping companies.*

9. *The strong competition and the business strategy developed as a result of globalization leads to increased financial costs for the shipping companies.*

10. *The intense competition, business strategy and Corporate Governance developed because of globalization leads to increased financial costs for the shipping companies.*

The above research hypotheses will be explored with econometric methodology to be confirmed or rejected depending on the statistical significance of the coefficients of the factors-variables selected and express their respective cases. As mentioned above, the specific way of analyzing the answers from the questionnaires used sufficiently cover the concept of triangulation (triangulation) because they use primary research data (sample analysis questionnaires), with acceptable bibliography concerning the impact of globalization and the evolution international trade financing cost of shipping enterprises while simultaneously confirms

similar studies in shipping (Syriopoulos, 2007; Syriopoulos and Theotokas 2007).

This approach, as stated in section 3.1, gives a particular interest in the results and creates originality in this study as it combines different methodologies aimed at similar research hypotheses as presented below.

*Research Hypothesis 7 (Model 7: Financing Costs and Business Strategy):*

[The modern form of the strategy undertaken in the shipping industry leads to an increase in funding costs for the shipping companies].

The econometric analysis of Model 7, shown in Table 2 below considers as the dependent variable the factor that describes the cost of capital of the questionnaire (VAR08), and as independent variables three factors VAR26, VAR27 and VAR28 coming from different questions of the questionnaire related with business strategy.

The coefficients of Model 7 (Beta, Standardized Coefficients) are 0.300, 0.322, and 0.295 for variables VAR26, VAR27 and VAR28 respectively. All coefficients are shown with a positive sign and are statistically significant at 1% and 5% level. The coefficient of multiple determination (Adjusted R Square) is acceptable, 0.425, for this type of analysis as well as the statistical F. The results suggest that these factors are related to the developments mentioned by the executives in the market research involved in this study. This confirms the Research Hypothesis 7 with respect to the existence of a causal relationship between the cost of capital of the shipping companies and the business strategy they have adopted.

*Research Hypothesis 8 (Model 8: Financing Cost, Globalization and Stock Markets):*

[The development of capital market and the integration of stock markets because of the globalization lead to increased financing costs for shipping companies].

The econometric analysis of Model 8, shown in Table 2 below, considers as the dependent variable the factor that describes the cost of capital given in question number 11 of the questionnaire as VAR08 and as independent variables three factors VAR09,

VAR10 and VAR15 coming from question number 12 (VAR09, VAR10) and question number 4 (VAR00015) related to the developments on the stock markets and globalization.

The coefficients of Model 8 (Beta, Standardized Coefficients) are 0.206, 0.275, and 0.572 for variables VAR09, VAR10 and VAR15 respectively. All coefficients are shown with a positive sign and are statistically significant at 1% and 5% level. The coefficient of multiple determination (Adjusted R Square) is high, 0.594, for this type of analysis as well as the statistical F. The results suggest that these factors are related to the developments mentioned by the executives in the market research involved in this study. This confirms the Research Hypothesis 8 with respect to the existence of a causal relationship between the cost of capital of the shipping companies and the developments regarding globalization and stock markets.

*Research Hypothesis 9 (Model 9: Financing Cost, Competition and Business Strategy):*

[Strong competition and the strategy developed due to globalization leads to increased financing costs of shipping companies].

The econometric analysis of Model 9, shown in Table 2 below, considers as the dependent variable the factor that describes the cost of capital as in hypotheses 7 and 8 (VAR08), and as independent variables four factors VAR16, VAR17, VAR26 and VAR28, coming from the questions 9 of the questionnaire (VAR16, VAR17), 19 (VAR26) and 20 (VAR28) related to the developments associated with competition and business strategy.

The coefficients of Model 9 (Beta, Standardized Coefficients) are -0.234, 0.421, 0.287 and 0.263 for variables VAR16, VAR17, VAR26 and VAR28 respectively. Apart from the factor corresponding to variable VAR16 displayed with a negative sign, the other factors appeared with a positive sign and are statistically significant at 1% and 5% level of significance. The coefficient of multiple determination (Adjusted R Square) is high,

0.596, for this type of analysis as well as the statistical F. The results suggest that these factors are related to the developments mentioned by the executives in the market research involved in this study. This confirms the Research Hypothesis 9 with respect to the existence of a causal relationship between the cost of capital of the shipping companies and the developments regarding competition and business strategy followed by the shipping companies in the period of study.

*Research Hypothesis 10 (Model 10: Financing Costs, Competition, Business Strategy and Corporate Governance):*

[Strong competition, business strategy and Corporate Governance developed because globalization leads to increased financing costs of shipping companies].

The econometric analysis of Model 10 that follows in Table 2, considers as the dependent variable the same factor as in Models 7, 8 and 9 (VAR08) and as independent variables three factors VAR02, VAR17 and VAR28 coming from questions 4 (VAR02), 9 (VAR17) and 20 (VAR28) associated with developments in

competition, business strategy and corporate governance.

The coefficients of Model 10 (Beta, Standardized Coefficients) are 0.476, 0.343, and 0.168 for variables VAR02, VAR17 and VAR28 respectively. All coefficients are shown with a positive sign and are statistically significant at 1% and 5% level. The coefficient of multiple determination (Adjusted R Square) is high, 0.958, for this type of analysis as well as the statistical F. The results suggest that the independent variables are related to the developments in the dependent variable as it has been mentioned by the executives in the market research involved in this study. This confirms the Research Hypothesis 10 with respect to the existence of a causal relationship between the cost of capital of the shipping companies and the developments in competition, in business strategy and in the implementation of corporate governance by the shipping companies.

**Table 2: Cost of Capital (Question 11, Factor VAR08)**

	Model: 7	Model: 8	Model: 9	Model: 10	
Constant	-2.748***	-0.580	-0.346	-0.386	
t-stat	-2.644	-0.998	-0.471	-0.724	
VAR02				0.476***	Model: 10
t-stat				4.243	
VAR09		0.206**			Model: 8
t-stat		2.339			
VAR10		0.275***			Model: 8
t-stat		2.932			
VAR14					
t-stat					
VAR15		0.572***			Model: 8
t-stat		6.172			
VAR16			0.234**		Model: 9
t-stat			2.385		
VAR17			0.421***	0.343***	Model: 9, 10

t-stat			3.578	3.202	
VAR19					
t-stat					
VAR20					
t-stat					
VAR21					
t-stat					
VAR26	0.300**		0.287**		Model: 7, 9
t-stat	2.425		2.464		
VAR27	0.322***				
t-stat	2.657				
VAR28	0.295***		0.263***	0.168**	Model: 7, 9, 10
t-stat	2.799		2.955	1.985	
Adjusted R squar	0.425	0.594	0.596	0.658	
Sign F	0.00	0.00	0.00	0.00	

VAR28 appears to be statistically significant in 3 out of the 4 Models (Models 7, 9 and 10) that have been selected by the processing of the survey data concerning the cost of capital in the shipping industry.

VAR26 appears to be statistically significant in 2 out of 4 Models (Models 7 and 9) that have been selected, while VAR17 in two Models (Models 9 and 10).

All the Models in Table 2 have selected a constant term coefficient statistically significant in Model 7 only (-2.748\*\*\*) with a negative sign in all the cases.

Between the 4 Models selected Model 9 has four independent variables, all statistically significant at 1% and 5% level and a considerably high coefficient of multiple determination (Adjusted R Square), 0.596. Model 10 is also considered of high importance with three independent variables and a high coefficient of multiple determination (Adjusted R Square), 0.658, however the coefficient of the constant term is not significant.

#### 4. Conclusions

It is important to stress the importance of each one of these factors as explanatory variables of the two super-factors referred to corporate governance and the cost of capital in the shipping industry as it has been approved by the 10 Models selected in the above Tables 1 and 2. The results confirm the views of the top executives participated in the market research that specific explanatory variables forming the factors in this study and they have influenced the decision of the shipping companies to adopt the Corporate Governance structure in this industry. There is a causal relationship between the evolution of the administrative model of shipping enterprises with the adoption of the rules of corporate governance (Models 1-6) and changes in the cost of capital for the shipping companies (Models 7-10). In all cases, the coefficients are statistically significant with a high coefficient of multiple determination for this kind of analysis. Based on these results, it is possible that the principles of Corporate Governance will be adopted by the shipping

industry as an effective tool to deal with globalization and the cost of capital in the near future in the subject industry.

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