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The evolution of costing during the period 1985-2015: Progress or inactivity?

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Abstract

Purpose - This paper examines the evolution of costing process during the past thirty years. More specifically, the technological developments that have affected industrial firms are analysed, focusing on the type of production and the innovations that have been developed and affected costing related issues. Additionally, the creation of a new framework is examined, focusing on costing information that could be useful for making business decisions.

Design/methodology/approach - A field survey was conducted on a sample of Greek manufacturing firms. A structured questionnaire was used as a research instrument for collecting primary data. It was constructed incorporating questions used by similar surveys reported in the relevant literature.

Findings - The use of cost information for short-term decisions is prevailed over long-term (strategic planning decisions, evaluation of alternative options for the design or production of goods, product mix determination, introduction of new products), while the examination of the cost structure showed that the proportion of fixed cost covers almost 50 per cent of the total cost (fixed and variable) for most of half firms. Additionally, the proportion between direct and indirect production costs revealed that 76.8 per cent of the firms estimate that their direct costs would be up 80% of their total cost.

Research limitations/implications - The omission of other important factors and the relation between specific factors such as firm's size, industry sector and decision making process should be considered as well as the differentiation of the results according to the industry sector, or due to different costing purposes.

Originality/value - This is one of the few studies exploring the costing practice implemented by Greek industrial firms. The analysis of the findings shows that despite the technological developments that affected the costing area and the criticisms concerning the limitations of the traditional costing approaches, they are still predominant.

Key words: cost structure, manufacture, costing methods, theoretical gap

JEL classification codes: M11, M41

1. Introduction

Cost calculation process is globally considered as one of the most serious and complex accounting issues, concerning all type of organizations. Costing information is used as the basis for many different business decisions while, in recent years, after the revelation of a gap between the theory and practice on management accounting, there is an increased interest about costing practice (Bright et al., 1992; Tales and Drury, 1994). In recent decades, there is a growing interest in exploring the effects of technological developments in the production function that resulted in a new framework, created for modern enterprises. According to this framework, costing information is often being used for business decisions, but the technological changes created different requirements regarding the provision of cost information (Gupta, 2001).

Literature suggests that, decisions based on costing data require changes to the calculation and use of cost

accounting information (Kee, 2008). This fact was partially confirmed by experts who stress that the traditional approach of accounting could not support these changes (Scapens, 2006). Moreover, executives use a mixture of financial and non-financial data for improved decision making, thus making unavoidable the need for modifications regarding the estimation of the production cost (Bright et al., 1992). Relative studies revealed the existence of three main factors that have guided the evolution of costing systems namely, the presence of a gap between theory and practice, the changes in the business environment and a general criticism on the implementation of costing, in practice (Brierley et al., 2001).

The purpose of this study is to explore the costing evolution in Greece, during the past thirty years, based on the following main lines; a) the technological progress made b) the changes brought about by technological progress in the production function and the cost accounting systems and c) the changes in the

provision of cost accounting information and the decision-making process. In particular, modifications on the structure of production cost are addressed. Moreover, differences relevant to the diversification of the purposes for which companies are using the cost information are also examined. The time period of thirty years (1985-2015) was selected since, as Lukka and Granlund (1996, pp.1-2) assert, *"the 1980s witnessed, after a long silence, a renaissance of cost accounting issues. During the last decade both academics and practitioner started increasingly to question prevailing cost accounting thinking"*.

The paper is organized as follows. The changes in technology and production methods are discussed in the first section. Then the changes in the provision of cost accounting information, as well as changes in the decision making process, are also discussed. The second section discusses issues related to the research methodology adopted and describes the questionnaire used to collect the relevant data. The empirical results are presented in the third section, while in the fourth section, a discussion of the costing approaches for Greek firms is provide. The main conclusions, the limitations of the study as well as specific suggestions for further research are presented at the end.

2. Research Background

2.1 Changes in technology and production methods

During the last decades, significant changes have been introduced in the production function resulting from the technological advances. Fullerton and McWatters (2004) research on the impact of technological innovations in the area of pricing provides a significant and useful insight into this area. As they comment, based on the work of Holzer and Norreklit (1991) and Howell and Soucy (1987, p. 88), traditional cost accounting systems were designed for different environments. Additionally, Cobb (1992), as cited in Fullerton and McWatters (2004), states that, if those people involved in management accounting do not respond to the technological advanced environment and to the demands for information, then, in the future, they will be probably limited solely into a role of historical recording. Consequently, a new situation has emerged for firms, where it is necessary to collect internal information so as to ensure that better and informed business decisions are being taken. To achieve such an objective, changes are necessary to be made in various activities and business processes, as far as the calculation of cost and the use of cost information is concerned.

In addition, changes in consumers' habits have created the need for a different approach of managing enterprise resources. New costing approaches are introduced and recommended as a consequence of the various changes that resulted in the overheads' cost reduction. The automation of the production process inevitably brought changes to the allocation methods. The most noticeable change in the allocation process includes the shift from volume criteria to batch or product related criteria. A typical example that is related to the automation of the production process is

the Advanced Factory Management System (A.F.M.S.). However, the aforementioned changes had an impact, not only on the production process, but also on a wider spectrum of business functions, such as the justification and the evaluation of investments (Chen, 1996).

The continuous technological progress has introduced innovations in the production philosophy which significantly impact the production's general organizational framework. New philosophies, such as Lean Manufacturing or Lean Production, are primarily associated with the removal of everything considered as "unnecessary" from the production. The term "unnecessary" is related to inventories, waiting times, mistakes, failures as well as to the production activities that do not add value to a product. Hence, a need for broader changes emerges. One of the main causes for the introduction of innovative philosophies is the end of mass production. Nowadays, consumers demand a wide variety of high quality products which are produced in small portions while producers are mainly competing with a customer-oriented philosophy, developing products with strong innovative elements (Gamal et al., 2001, p. 2). In addition, the reduction of overheads facilitated the creation of Total Quality Management (T.Q.M.) which intends to minimize the rates of defective units. Moreover, it was a prerequisite for the implementation of Just In Time (J.I.T.) systems. The immediate effect of those two changes was the reduction of the intermediate safety stock which, in former organizational production's schemes, protected the firm from problems originated from defective units.

In the production process, one of the most important changes includes the developments in inventory management systems. An inventory management system is related to technological innovations that have occurred in recent decades. For example, the introduction of J.I.T. systems aimed at the satisfaction of a need for high production volume with minimum stock levels. The J.I.T. is a management method for the production and reserves that has, as a basic requirement the minimization of a machine's setup times for the production of different products. In this way, firms enhance their ability to produce in small portions, with minimum intermediate inventories between work centres. Consequently, firms are able to flexibly respond to changing market conditions and, at the same time minimize the levels of capital committed in inventories (raw materials and finished products). As a prerequisite for the implementation of J.I.T., the harmonization of production rates between labour centres (balancing production lines) is considered necessary. In this way, bottlenecks are eliminated and the need for intermediate inventories is reduced. Finally, this method satisfactorily co-operates with a "pull" system, where nothing is produced until needed.

An inventory control system is based on two basic models, the "Push" and "Pull model. In a "Push" system, the production orders are "pushed" from a central planning office to the plant, while, in a Pull system, nothing is produced until it is needed or requested by the next stage. In a J.I.T production system, a very small portion of the total production is

“pulled” during the different phases of production, using a Kanban card. In its essence, a Kanban is a part of the system that determines the supply or production, based on actual customer demand. Such a system is related to flexible production and J.I.T., while its main utility is to respond quickly to changes in the demand. In this way, each work centre produces only what is needed by the next centre, as it is determined from the actual demand. In other words, it represents a technique of J.I.T., in a repetitive production system. In such a system, a narrow range of standardized products are produced, while the demand is characterized by small fluctuations, creating conditions for smooth and uniform flow of production. These cards contain data (e.g. type and number) concerning the parts of a product expected to be required from each work centre during the production process and until its completion (Hilton, 2002, pp. 226-227). An alternative to J.I.T. system is the Manufacture Resource Planning II (MRPII) system that efficiently achieves to minimize intermediate inventory levels and shorten transit times for the production.

The term “Kaizen” is a Japanese word meaning the effort for continuous improvement. Such an effort is related to a horizontal organization chart, which fits well with the changing needs. Additionally, it works positively with modern business philosophies. The key element of a horizontal organization chart is the presence of fewer management levels and employees who cooperate in a horizontal structure. According to Hilton (2002, pp. 247-249) and concerning the production and costing process, such an attempt focuses on the cost reduction of an existing product. This reduction is achieved through small changes in activities rather than large and drastic changes. Finally, in the search for an effective method of performing a task, an additional feature of the new production's philosophy is the promotion of continuous improvement, an effort that is supported by Benchmarking.

Of course, it should be understood that the determination of an inventory's optimal level is not an easy task. In one hand, the lack of inventory could result to additional costs, due to interruptions in the production process, losing suppliers' discounts that are provided over an order level, or losing a customer's confidence, if the firm fails to deliver customers' orders on time and, additional transportation costs incurred to the company (Garrison and Noreen, 2006). Despite the fact that all the aforementioned costs, except for the shipping and transportation, should not be recorded in the accounts, since they are characterized as opportunity costs, they undoubtedly affect company decisions. On the other hand, when a firm maintains high stock levels, whether or not they include raw materials or finished goods, it creates more maintenance and storage costs, insurance and transportation costs while the hazard of physical obsolescence is enhanced. Also, one should not forget the relative capital commitment and costs that are related to employee salaries. The production system is closely related to the costing process and Tatsiopoulos

et al. (2010, pp. 4-6) define a production system as “the combination of natural resources that cooperate to produce goods, services or works”. Natural resources or inputs can be grouped into three main categories: a) materials, b) capital equipment and c) human resources. The importance of each one of these three categories of resource affects and determines, to a significant degree, the organization of a production system.

Additionally, an issue that concerns both production organization and costing is production capacity. It includes the level of production that can be performed by the equipment and the organization (Martin, n.d). The level of capacity is an important issue for costing, since it is often used as a denominator for determining the percentage of indirect overheads, which is known as activity cost driver. Usually, for the accurate calculation of costs, the use of long-term productive capacity is proposed. In this way, it is possible to segregate the relevant cost elements between those caused by the used and unused capacity. The inclusion of unused production capacity in the denominator results in products over-pricing.

Finally, an advanced model for organizing production includes Cellular Manufacturing. In such a production process, autonomous production lines exist, which are organized by product in order to simplify the spatial structure and the material flow. Flexible workers with multiple skills are assisting such a model. As reported by Shim and Siegel (2002), a cell is comprised of machines controlled by a computer and an automated material handling equipment (such as a Flexible Manufacturing System-F.M.S). In practice, each cell produces a family of integrated products using robots, while the entire system is controlled via a computer. Although the initial cost of installing such a system is high, production cost for each unit is low and products are characterized by high flexibility and quality.

2.2 Changes in the provision of cost accounting information

Technological developments that were incorporated into the production, as well as different production philosophies, could not leave unaffected the structure of production costs. According to Tsai (1996), these developments led the direct labour cost to a proportional decrease, while increasing the indirect overhead in total production cost.

In a similar vein, Lowder (2006) claims that the significant changes that have occurred in the industrial business environment affected the administrative costs. The main modification includes the increase of indirect industrial costs, along with the reduction in the direct labour cost. To a large extent, the basic reason for the substantial restructuring of the product cost structure was the reduction of direct labour cost as a consequence of the introduction of modern technologies in the production process. However, the impact of this change was significant and is reflected on the need that alternative cost allocation methods or techniques should be developed.

The need for alternative methods of cost allocation plus the weaknesses of the traditional costing systems

are the two basic changes that are recorded in various research efforts. In particular, Lee (2003) records developments that signalled the research on cost systems after 1990. He argues that, during the 1990s, there was a widespread impression that there is a real need for a great change regarding cost systems. In particular, he cites the study of Gupta's (1993), who commented on the distortions caused by costs' calculation, claiming that, to a degree, this was generated by an erroneous process used for the allocation and accumulation of various cost items. In the same article, he also referred to Boer & Jetter (1993), who studied the changes in the cost structure that resulted in reductions of labour costs, while the importance of overhead is increased. In addition, a reference to the study of Dopuch and Gupta (1994, p. 48) is made relatively to the changes in production processes and their impact on direct and indirect overhead. Additionally, the need for constant changes on the business tactics in the production and marketing process is examined. Such changes increased the costs for setup (restarting the machines after reconfigurations) to a greater extent than the reduction of the direct labour cost and raw materials. This situation highlights the fact that changes in the cost structure played a significant role in the evolution of costing.

The changes made in the production process resulted in similar adjustments in Management Accounting. According to Kee (2008), in modern environments labour costs are almost 12% of the total cost, thus questioning the allocation methods which use criteria based on direct labour hours. On the other hand, the support of variable costing is favoured because it is not affected by changes in the production volume and the only true factor that affects profits is sales' fluctuation, as opposed to absorbing costing where profits are a function of both sales and production volume. In addition, the fictitious variation of earnings due to seasonal stocks' fluctuations should not be ignored.

On the same issue, Drucker (1990), as shown by Lere (2001), notes that traditional production costing systems have limitations arising from the technological changes that have occurred in the production process. More specifically, he states that the percentage of direct labour in the overall production costs has decreased considerably. Then, a justifiable question is raised, relatively to the problems a firm would face if it continues to associate the direct labour cost with the allocation of common or indirect overheads. Furthermore, the exclusion of "non-productive activities" from the calculation of production costs may contribute to the isolation of the production process from the whole organization, since a holistic approach of the firm has many advantages.

Another noticeable issue includes the complexity and variety of products available to consumers. The changes in consumer preferences created the need for a large number of more complex products, produced in small volumes and with different product characteristics (product diversity). This means that

different products could absorb different proportions of overhead and such a differentiation could have important implications. Additionally, working hours could also vary greatly, as well as the amount of material used and the machine operating hours (Tsai, 1996).

The disclosure of the erroneous allocation that exists in most traditional cost accounting methods created favourable conditions for the supporters of Activity Based Costing (A.B.C.) to consider how this "new" approach could provide the solution for the problems identified. However, in practice, it was proved that its implementation and operation was, in many cases, expensive and rather complex. Therefore, the process of finding alternative allocation methods continued. Such an alternative method is analysed by Lere (2001), according to which the implementation process requires some changes on the accounting system. These changes are necessary for calculating the allocation percentages, based on the average rates derived when the cost of overhead is divided based on the activity performed.

However, the introduction of these changes required the avoidance of using direct labour hours, as a measure for the calculation of the predetermined overhead rate (as a denominator). Although, this measure was widely used since, it is immediately available in any business (whether in time or in monetary units), the automation of the production process reduced its proportion in total product cost. Hence, Lere (2001) suggests an alternative allocation method by collecting overhead costs in many cost pools, so as to estimate the duration that each job requires, in different production's departments or phases. Finally, he argues that it is possible to extend the calculation of overhead rates, by introducing measurements that are not based on the unit level. In this way, it is applicable for traditional methods to include, during the process of common costs allocation, differences in the calculation of production costs deriving from fluctuations in production volume. Also, an approach that is based on measuring the cost of activities would make possible the inclusion of costs, that are related to additional activities carried out on behalf of a particular customer, during the negotiation process with the customer, in order for the firm to determine a price.

The introduction of changes in the allocation process is based mostly on shifting from unit level to other criteria, such as batch or product level, in order to calculate cost per unit, as a result of overheads' reduction caused by the automation of production. The allocation process inevitably is affected from technological developments, while the most salient change concerns overhead costs (Chen, 1996).

To sum up, based on the relevant literature, alternative ways of cost allocation require changes in the accounting system adopted by firms including: a) changes in the determination of the percentage for the allocation of overhead hours based on direct labour, a type of information that is easily accessible for all firms, b) the avoidance of using a "common" rate (blanket overhead rate) for allocating the sum of indirect

overhead. Instead, a separation of costing data into multiple cost pools, based on the rate of absorption in each section, is proposed as more preferable, and c) introducing other methods to measure overhead rates which are not related only to the unit level (such as attempts to make an ABC), in accordance with Lere (2001).

The established inadequacy of traditional cost systems led Chen (1996) to propose the creation of a new accounting system as an alternative solution. This system, as a part of the production system, is based on the simulation (Simulation Based Manufacturing Accounting) and supports the measurement of various costs in real time, based on different (alternative) scenarios. Moreover, he states that when companies implement Total Quality Management (T.Q.M.) programs, a change is introduced through the development of the Activity Based Costing (A.B.C), where the activities performed, during the production process, are the reason for the cost creation. Such an approach is being considered as the most appropriate and this is justified on the basis that, when activities are analysed and recorded in detail, then managers are encouraged to measure the value created for their customers, based on these activities. Indeed, this fact might provide a possible explanation for the observed shift to a more "customer centric" type of organization which, in recent years, is adopted by many firms. This shift is observed not only in the production process, but also includes all business functions, where the main concern is the immediate satisfaction of customer needs.

2.3 Changes in the decision making process

The knowledge derived from cost data could be used for different objectives including cost control, pricing, raw materials supply and the design of new processes. Bright et al. (1992) found that just a small percentage (11%) of the firms estimate the effects of alternative production methods on product's cost, while 43% of them retain more than one inventory valuation system so as to meet different costing objectives. According to the same research, the benefits that a firm expects to gain from the introduction of new costing accounting methods include enhanced profitability, cost reductions, timely and accurate information for the management team, reduced inventories' level, shorter delivery and waiting times and a less complex costing management system.

Using cost information in taking strategic decisions triggered the revelation of problems arising from "traditional methods". Consequently, the necessary conditions for the development of new costing methods are closely related to accurate cost calculations. If the costing process physically diverges from its basic objective, the calculation of production costs for tax purposes, and is used as a tool to determine profitability, growth and even the probability of a firm's survival, then the accuracy of cost information is crucial. Therefore, when incorrect costing data are used for decision making, such as the determination of the selling price, the gains and losses of customers, or even the line removal of profitable products, then conditions

that could threaten a firm's viability can be created. Most of the observed changes are closely related to the difficulty of allocating individual costs accurately. Consequently, the discovery of such a process is one of the key issues of cost accounting as noted by several researchers, like Lere (2001), who suggested alternative ways of allocation.

Finally, there is strong criticism of the traditional costing methods and their insufficiency to operate in high-tech environments. As reported by Fullerton & McWatters (2004), one of the main issues for every firm during the decision process of adopting or not advanced technologies, is closely related to satisfy its need to successfully implement the long-term strategy, rather short-term. They also considered whether contemporary production systems which are based on advanced technology environments, lead in the adoption of different costing practices in order to meet different information needs. The basic belief behind this view is that traditional methods have completely different goals compared to a firm's strategic objectives. Strategic objectives address the on-going improvement and waste elimination, through modern production methods, thus minimizing activities that do not add value to the final product.

The primary objective that a firm sets for costing determines its subsequent choices. A typical example of the impact of the cost' objective on costing choices represents the need for financial reporting of a firm's creditors, in the German-speaking countries in Europe. This need leads to the development of a new costing approach, or of a different methodology, the Flexible Margin Costing, as the term "Grenzplankostenrechnung - GPK" is translated from the German language according to Lowder (2006, p. 9). The development of a different approach stems from the need to calculate cost accurately and correctly, an objective that, for the German speaking countries, has a particular importance. More specifically, as the profit margins are directly dependent on the cost, while profit margins' are limited globally for most firms, then an important factor, contrary to what is proclaimed by the accounting principles, is to take under consideration the total costs that are arising during all stages of a product's life cycle, until it reaches the end consumer (Lowder, 2006).

Additionally, Lowder (2006) notes that, a trend that takes into account production costs as well as costs that are not directly related to the production process, is observed. However, the introduction of such an innovative methodology is not without problems, particularly in relation to the attempt to include in the decision-making process costs that are recorded in the general ledger. More specifically, starting with absorption costing, which is considered as a traditional approach, one should not overlook the fact that it is mandatory under the legislation and accounting policies in many countries. However, based on its limitations, the proponents of the A.B.C. introduced it as an alternative for the allocation of indirect costs, thus aiming to fill the gap that was described. Despite the critics of A.B.C., its central point is the opportunity

provided to the firm to focus on the cost based on the premise that the cost objects are consuming activities. Additionally, the cost calculation process may include other types of costs incurred such as marketing or transportation costs. Also, an important change is the fact that it takes into account the actual level of capacity for the allocation process, so as to eliminate cost transfer due to different production volume, which is reported as a common problem of allocation.

Finally, there is a predominant view, as reflected by Bright et al (1992, p. 202), who claims that the traditional accounting approach could not support such changes. Therefore, improvements should be done that would provide improved cost control. Additionally, there is accumulated evidence suggesting that executives need a mixture of both financial and non-financial data to improve decision-making (Johnson & Kaplan, 1987; Drucker, 1990; Eccles, 1991). Bright et al. (1992) referred to a search conducted in 1990, on a large sample of industries in the United Kingdom, where the production and accounting techniques applied were studied. A lack of a uniform terminology for the advanced costing is observed (Eccles, 1991) while the concept of change is difficult to be determined since it concerns a situation including subjective criteria.

3. Research Methodology

3.1 Sample

A field survey was conducted on a sample of Greek manufacturing firms, with sales turnover of more than 500.000 €, during the fiscal year. The sample consists of 598 manufacturing firms, with a response rate of 45% taking into account the number of the firms that had initially agreed to participate in the survey (a 16% of the total population). Table 1, presents the general characteristics of the firms included in the sample. These firms are mainly medium sized firms (mean 111 employees) although there is a good representation of large firms (31.9% of them with sales of more than 20 M euros) as well. Food and Drinks industry is the sector with the higher representation (39%) in the sample.

As far as the characteristics of the respondents are concerned, a brief overview of the results shows that 77% the respondents are men, mainly aged between 36-45 years-old (39.3%) or older (34.8%), holding a higher education degree (71.3%), or even a master or PhD diploma (10.5%). Most of the respondents are currently working as accountants (56.9%) and supervise their department (31.2%), or they are head managers (42.4%), while the 22% of them are Chief Executive Officers (CEO's), indicating that costing departments are often staffed by senior executives. Finally, the average working experience (in years), for the position currently held is 11.30 years (approximately 18 years of total average working experience) indicating that, probably not only employees but the firms (employers) as well, are looking for a stable working environment. Such a situation is likely to imply, in generally, the significance of costing issues for the firms, where the frequent change of executives is considered as undesirable.

Table 1: Sample general characteristics

General firms' characteristics	Results
Average number of employees	Administration department: 33 Production department: 78
Average annual sales turnover (in .000 €)	2013: 28,934.51 2012: 32,382.25
Sales distribution (2013)	Up to 1 million: 14.1% 1-5 million: 27.4% 5-20 million: 26.7% 20-50 million: 15.8% More than 50 million: 16.1%
Average market share of the main activity	29.11 %
Number of the main products	Up to 10: 34.6% 11-50: 26.7% 51-300: 23.3% More than 300: 15.4%
Industry sector (including sectors with more than 4% in the sample)	Food and drinks: 39.0% Rubber: 10.0% Metal: 8.1% Concrete and blocks: 6.6% Chemicals: 5.0% Furniture: 4.8% Paper: 4.3% Other: 22.2%

3.2 Questionnaire Design

A structured questionnaire was used as a research instrument for collecting primary data while the questions included were mostly based on the relevant literature and used in similar surveys. Therefore, every possible effort was taken to ensure the validity of the present survey. The questionnaire was sent via e-mail, after achieving a telephone agreement from the person in charge of the accounting department.

Respondents were asked to point out if they were familiar with the sixteen (16) costing approaches that were included in the questionnaire, or if they had ever used any of them. Then, they were asked to answer: a) which, from these approaches they were using in the time that the survey was conducted, b) which of them was considered to be the most appropriate, in serving firm's main goals and c) which of them they believed could provide more accurate product cost calculations. Finally, the main reason for using them and the application areas of cost information, i.e. for what decisions a firm uses the cost information, are also examined. The hierarchy of ten different factors (reasons) was measured using a five-point scale (Likert type), where "1" represented the least important reason (purpose) of cost accounting information collection, while "5" indicated the most important reason (or area).

The questionnaire was tested (pre-test) before it was released, to assess the degree of its content validity (Saunders et al., 2009, p. 592). Such a test is used to check if the objectives of the research are correctly measured or captured. Moreover, in the field of costing, the lack of a well-defined terminology is a reality, which has

been noted by several researchers (Brierley et al., 2001; Bright et al., 1992), making the formulation and understanding of the factors examined, even more difficult. For the above mentioned reasons, it was chosen to send the questionnaire for a pre-test to two academic, two senior business executives employed as cost accountants and to one chartered accountant. The main aim of this process was to realize whether the respondents perceived the terminology, in a similar way (Dimitriadi, 1999, p. 95).

4. Results

Products' cost structure is consisted of three basic cost elements namely, the direct materials, the direct labour and the manufacturing overheads while their proportion in total cost is also significant. Moreover, it is considered as an important factor that affects the

choice of a costing method (Brierley et al., 2001). This sample, according to the calculated mean figures, direct materials cover 61 per cent of total cost, while the proportion of direct labour and manufacturing overhead are almost equal (20% and 19% respectively). According to the relative theory, manufacturing overhead is a cost that could complicate the cost calculation process, especially if a significant proportion of the manufacturing overheads is considered as an indirect cost, that it is not easily traceable and measured. However, as previously stated, cost calculation process is additionally affected by the proportion of fixed and variable cost. In table 2, the results of corporate cost structure are presented, along with the proportions of the fixed and variable costs in total cost, as well the reported direct and indirect costs.

Table 2: Cost proportion and cost structure

Variables	Variable values	Percentage (%)	Cumulative Percentage %	Mean
Proportion of fixed cost	0-10%	7.9%	7.9%	48,11
	10-20%	10.4%	18.3%	
	21-30%	20.9%	39.2%	
	31-40%	8.7%	47.9%	
	41-50%	9.2%	57.1%	
	51-70%	21.2%	78.3%	
	71-80%	12.5%	90.8%	
	81-100%	9.2%	100%	
Proportion of variable cost	0-10%	6.3%	6.3%	49,32
	10-20%	17.5%	23.8%	
	21-30%	12.2%	36.0%	
	31-40%	10.0%	46.0%	
	41-50%	7.1%	53.1%	
	51-70%	23.9%	77.0%	
	71-80%	11.7%	88.7%	
	81-100%	11.3%	100%	
Proportion of direct cost	0-20%	4.8%	4.8%	68,10
	20-40%	8.8%	13.6%	
	41-50%	6.6%	20.2%	
	51-60%	10.9%	31.1%	
	61-70%	22.0%	53.1%	
	71-80%	23.7%	76.8%	
	81-90%	14.0%	90.8%	
	91-100%	9.2%	100%	
Proportion of indirect cost	0-10%	18.0%	18.0%	29,35
	11-20%	25.4%	43.4%	
	21-30%	25.0%	68.4%	
	31-40%	12.7%	81.1%	
	41-50%	7.5%	88.6%	
	More than 50%	11.4%	100%	
Proportion of direct materials cost	0-20%	4.3%	4.3%	60,45
	20-40%	14.3%	18.6%	
	41-50%	14.0%	32.6%	
	51-60%	19.0%	51.6%	
	61-70%	20.1%	71.7%	
	71-80%	14.7%	86.4%	
	81-90%	10.5%	96.9%	

	91-100%	3.1%	100%	
	0-5%	12.0%	12.0%	
	6-10%	24.3%	36.3%	
	11-15%	10.8%	47.1%	
Proportion of direct labour cost	16-20%	19.3%	66.4%	19,41
	21-25%	8.1%	74.5%	
	26-30%	12.4%	86.9%	
	31-70%	13.1%	100%	
	0-5%	10.5%	10.5%	
	6-10%	22.8%	33.3%	
	11-15%	15.5%	48.8%	
Proportion of overhead cost	16-20%	21.0%	69.8%	19,12
	21-25%	7.3%	77.1%	
	26-30%	8.9%	86.0%	
	31-70%	14.0%	100%	

According to the results presented in table 2, the proportion of fixed cost covers almost 50 per cent of the total cost (fixed and variable) for the 57.1% of the firms, while for 21.2 per cent of the firms fixed costs reaches 51-70 per cent of their total cost. The proportion of variable cost is quite similar, where almost half of the firms (53.1%) report variable costs higher than 50 per cent of their total cost, while for 23.9% of the firms variable cost covers 51-70 per cent of their total cost (which is one of the highest proportion recorded).

The analysis of the results concerning to the proportion between direct and indirect production costs revealed that the 76.8 per cent of the firms estimate that their direct costs would be up 80% of their total cost (direct and indirect), implying that indirect cost covers the remaining 20 per cent. However, the main problem with the indirect cost is related to its difficulty to be directly detected in each cost object during the allocation process and therefore, firms should find fair methods to complete this process.

It is also noteworthy that, almost 30 per cent of the firms' reported that their manufacturing overhead rates range between 21-50 per cent. Generally, a large proportion of this type of cost might affect the convenience and accuracy of the product's cost estimation especially, if the firm uses traditional costing approaches, which is the case, as it is found that the costing approaches that are well known and currently used by Greek firms are Actual Costing (53.4%) and Normal Costing (42.3%) (table 3).

Table 3: Costing approaches that have been used in past

Description of costing approach	(%) of cases
1. Actual Costing - A.C.	53.4%
2. Normal Costing - N.C.	42.3%
3. Job-Order Costing - J.O.C.	25.8%
4. Activity Based Costing - A.B.C.	25.1%
5. Standard Costing - S.C.	23.7%

Table 3a: Costing approach currently used

Description of costing approach	Rate (%)
1. Actual Costing - A.C.	33.5%
2. Normal Costing - N.C.	24.2%

3. Job-Order Costing - J.O.C.	11.0%
4. Activity Based Costing - A.B.C.	8.9%
5. Standard Costing - S.C.	8.5%

Table 3b: Most appropriate costing approach

Description of costing approach	(%) of cases
1. Actual Costing - A.C.	33.2%
2. Normal Costing - N.C.	15.2%
3. Standard Costing - S.C.	12.4%
4. Job-Order Costing - J.O.C.	11.1%
5. Activity Based Costing - A.B.C.	10.1%

Table 3c: Most precise costing approach

Description of costing approach	(%) of cases
1. Actual Costing - A.C.	38.4%
2. Normal Costing - N.C.	13.4%
3. Job-Order Costing - J.O.C.	13.0%
4. Activity Based Costing - A.B.C.	12.0%

Although, in the questionnaire was also included and other, more contemporary, costing approaches such as: a) Backflush Costing, b) Target Costing, c) Throughput Costing, d) Grenzplankostenrechnung (or Flexible Margin Costing), e) Resource Consumption Accounting (R.C.A.), these costing approaches appear to be used only by less than 5 per of the firms. The results in table 3a show that, almost one third (1/3) of the Greek firms are currently using the Actual costing approach while, one fourth (1/4) of these are using the Normal costing approach, namely that more than half of the firms use the "well-known" or traditional costing approaches. Moreover, the J.O.C. approach is highly correlated to the type and method of production and, therefore, such a choice is considered as "compulsory" for the firms that choose it.

Additionally, the results concerning the costing approach which is considered as more appropriate in achieving firms' objectives and more precisely identify the production cost are accordingly presented in table 3b and 3c. Again the superiority of Actual Costing is observed in both tables, followed by Normal Costing.

Turning now our attention to the purposes for which product costing information is currently being used (measurement scale ranging from "1": less

significant cause to “5”: most significant cause), the results (table 4) revealed that the most common cause for every single firm i.e. the preparation of Profit and Loss Statement for external reporting, was rated in fifth place, while the use of cost information for short-term decisions is prevailed over long-term (strategic planning decisions, evaluation of alternative options for the design or production of goods, product mix determination, introduction of new products).

Table 4: Firms’ decisions that are based on cost accounting information

Causes of cost accounting information collection	Mean
1. Cost control	4,60
2. Determination of pricing policy	4,33
3. Operations control	4,00
4. Measurement of effectiveness	3,96
5. Drawing up of financial statements	3,91
6. Efficiency measurement and segment profit analysis	3,88
7. Strategic planning decisions	3,83
8. Evaluating alternative options for the design or production of goods	3,48
9. Product mix determination	3,26
10. Introduction of new products	3,22

5. Discussion and Conclusions

This study aims to explore the evolution of costing process in Greece, studying a sample of 598 Greek manufacturing firms. The evolution is examined according to the relative theory, based on the changes that have been occurred during the past three decades. More specifically, the technological developments for industrial firms are analysed, focusing on the type of production and the innovations that have been developed, thus affected the costing area.

Literature suggests that traditional costing approaches have various limitations and may be problematic, during the cost calculation process especially, since cost accounting information is currently used for many different, short and long-term, decisions (Afonso et al., 2008; Chen, 1996; Lere, 2001; Tsai, 1996). In addition, executives seem to use a mixture of financial and non-financial data to improve the decision making process (Bright et al., 1992; Fullerton and McWatters, 2004). Finally, many studies revealed that there is a gap between management accounting theory and practice meaning that in every day practice firms might follow different methods and techniques (Brierley et al., 2001; Bright et al., 1992; Tales and Drury, 1994; Scapens, 2006).

This study examined the cost structure of Greek firms, the cost accounting approaches used and the decision-making process that is based on cost accounting information. The results indicate that Greek firms are mainly relying to rather traditional costing approaches (Actual and Normal Costing). Kohen and Kaymenaki (2005) assert that when the proportion of direct cost is high, then this could be resulted in choosing more traditional costing approaches, which

fits well to our results. The cost structure is a rather a difficult issue to be assessed and compared since, it could vary significantly across industry sectors and is affected from different degrees of automation, in the production process (Lamminmaki & Drury, 2001). It seems that when the results concerning Greek firms with other European firms are compared, a convergence between them and those located in Belgium, Sweden, Denmark and Finland, do exist (Abernethy et al., 2001; Brierley et al., 2001; Lukka and Granlund, 1996). Even though most of the results are referring to surveys, or case studies, conducted during the 90’s, however, the main issue is that, for the Greek firms, direct materials are still the main bulk of the cost structure, while direct labour and manufacturing overheads vary between 10-20%, for each cost type. Finally, the assessment and comparison of the cost structure for firms facing different economic conditions, technological levels and different size of market (according to population) is not an easy target. Our results were mostly compared to those referred in Bright et al. (2001), Drury and Tales (1992) and Lukka and Granlund (1996, pp. 8). In addition, Greek firms use cost information for many different purposes, other than taxation, however, according to their significance, the short-term decisions seem to prevail over long-term. Our results suggest that Greek firms are still using costing information mainly for short-term purposes, while they use more conventional approaches when collecting necessary costing information (Abernethy et al. 2001, pp.2; Byrne et al., pp.2-3; Chenhall and Langfield-Smith, 1998, pp.250; Pierce and O’Dea 2003, pp. 261)

However, there are some limitations that are worth noting, like the omission of other important factors, as well as the relation between specific factors such as firm’s size, industry sector and decision making process. Additionally, the results could vary according to the industry sector, or to costing purposes.

Future research should therefore include other important factors such as advanced production methods currently used, to examine whether they could result in significant differences on cost structure. Additionally, it would be interesting to explore the differences of costing practice stemming from differences in the number and types of the products (uniformed or customized, innovative or traditional). Finally, the exploration of the costing process in practice and the causes behind the unwillingness of Greek firms, to adopt innovative costing approaches, would be an area that needs further investigation. Useful comparisons could be made between organizations operating in a particular sector, as to determine whether or not, significant differences respecting the cost structure data, do exist.

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Efficiency Study of Greek Health Units of the Public Sector using Data Envelopment Analysis Method, before and during the start of the Economic Crisis

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Abstract

Purpose – The purpose of this paper is to investigate the Technical Efficiency through an Efficiency Study of Health Units of the Greek Ministry of Health, before and during the start of the Economic Crisis in Greece.

Design/methodology/approach – The research has been designed to collect data regarding the Health Units of the Public Sector from the Greek Statistical Authority (ELSTAT) and to process that data with the use of the Data Envelopment Analysis software. The methodology of the research extends to the application of the Efficiency Study of Decision Making Units (DMUs), the study of variations of Technical Efficiency during a number of years and the extraction of conclusions regarding variations in Technical Efficiency at a time period before and during the start of the Crisis. Data from large Health Units was used in order to achieve comparison of the results.

Findings – We calculate the DEA scores based on the most common DEA models (CCR, BCC and Super Efficiency) for the Health Units of the Greek Ministry of Health. We examine the variation in Technical Efficiency of the Health Units during the extent of the time period of the study. The Efficiency Study of the Health Units leads to useful conclusions regarding the variation in the observed Efficiency of the Units and the integration of the Efficiency variation studies, as part of the initial stage of an Integrated Crisis Management. The research ranks the efficient and non-efficient units and suggests ways of improvement.

Research limitations/implications – This is a study about the Health Units of the Public Sector using size as a criterion. The investigation is limited to the Public Health Sector and its conclusions cannot be extended to the Private Health Sector. There are no geographical restrictions.

Originality/value – This is an innovative research which allows for further case studies in the future and completion of Efficiency studies after the end of the Economic Crisis.

Keywords: Economic Crisis, Data Envelopment Analysis, Efficiency Study, Decision Making Unit, Health Units.

JEL Classification: C60, I1, H12.

1. Introduction

The aim of this paper is to investigate the Relative Efficiency of Healthcare Units of the Greek Ministry of Health (Public Sector), through a comparative Efficiency Study for a period preceding the onset of the Economic Crisis and ending at the beginning of the Economic Crisis. Subsequently, the Efficiency performances form part of a new application for changing Relative Efficiency and the knowledge acquired can be used in Doctoral Studies. The research methodology extends to the implementation of an organisation's Efficiency Study using factual health units' data provided by the Greek Statistical Authority (ELSTAT) and integration of the analysis in part of the interpretation of the Economic Crisis framework.

For the measurement of the Technical Efficiency of health Decision Making Units (DMU), Data Envelopment Analysis (DEA) was used. The DEA is a non-parametric method for the measurement of

Efficiency of a Decision-Making Unit (or Unit), such as an organisation or the Public Service (Ray, 2004) and is a mathematical method of linear programming measuring Efficiency systems (Ozcan-Gunai & Tektas, 2006). The DEA compares the total inflows and outflows of several DMUs based on the principle that the DMUs transform inflows into outflows (Thanassoulis, 2001). The DEA neither discovers nor uses production function which links inflows to outflows, but uses only the inflows and outflows themselves, solving a system of equations in order to calculate the values of the inflows or outflows so that the DMU becomes a profitable one.

Farell, based on the work of Debreu (Debreu, 1951), who analysed the Efficiency of financial systems (according to Pareto) and Koopmans (1957), developed DEA's basic concepts (Coelli, 1996). Farell expressed the overall Efficiency of the production DMUs with the total productivity factor. Farell defined Technical

Efficiency as the combination of production factors defined by the production function and used for the production of the maximum amount of outflow without wasting them and Economic Efficiency or Allocative Efficiency which refers to the combination of inflows which minimises production costs, given the values of those figures (Farell, 1957).

Charnes, Cooper and Rhodes (1978), defined the Decision Making Units and introduced the DEA method as a method of linear programming for the measurement of systems' Efficiency, implementing it particularly to bodies of non-profit public programmes (Charnes, Cooper & Rhodes, 1978). The DEA model they developed and which was named CCR is the basic DEA model referring to steady return to scale (SRTS), namely that changes in outflows are proportional to changes in inflows. The CCR model creates the Production Probability Set (PPS) (Thanassoulis, 2001) and the effective threshold, which consists of few DMUs exhibiting exactly the same maximum Efficiency, thus characterising a very large percentage of DMUs as inefficient.

Banker, Charnes and Cooper (1984), then developed a model which was named the BCC model and refers to the variable Efficiency scale - Variable Return to Scale, that is, when the change of inflow leads to a non-proportional change in outflow. The BCC model achieved a widening of the effective limit with the introduction of DMUs characterised by the CCR model as inefficient and thereby characterising the units based on Relative Efficiency with respect to a minimum acceptable Efficiency threshold rather than their absolute Efficiency (Banker, Charnes & Cooper, 1984). The BCC model is now used by most researchers for the decision-making DMUs or in comparison to the CCR model.

Then, younger scholars developed new mathematical models of the DEA method in order to extend the method, such as the Andersen and Peterson models, which defined the Efficiency Index as greater than the unit and explained the circumstances under which the ultra-productive models are unreachable; Doyle and Green, who calculated the Efficiency of DMUs multiple times and showed the results in Efficiency cross tables. Also, the Cook *et al.* model, with the DEA extension for the handling criteria of a qualitative nature, the Torgesen *et al.* model, with the efficient DMUs classification methods based on savings or production gain, the Friedman *et al.* model with the overall framework which includes normal relevancy analysis and a multiple delivery method and the Sowlati *et al.* model with a group of technical projects and the comparison of inflow and outflow criteria of real projects (Sowlati, 2005).

The basic mathematical models of the DEA method with the stated limitations are shown in Table 1 (based on Charnes, Cooper & Rhodes (1978); Banker, Charnes & Cooper, (1984); Farantos (2015)). The mathematical relationships along with the limitations that have been used in the basic mathematical models are explained.

According to Arkay, Ertek & Buyukoskan (2012), the DEA has a leading role amongst non-parametric

Efficiency measurement methods, analysing its many advantages (such as performance measurement opportunities and benchmarking, requirement of small computing power, ideal for handling large numbers of DMUs) in comparison to its few disadvantages (such as intense influence from possible errors and extreme data points) (Arkay, Ertek & Buyukoskan, 2012).

The DEA is classified among the non-parametric methods of Linear Programming for the measurement of Efficiency of businesses and bodies and prevails among the other non-parametric methods (Free Disposable Hull, Analysis Indicators) as well as among Parametric Methods, such as Stochastic Frontier Approach (SFA), Distribution Free Approach (DFA), Thick Frontier Analysis (TFA), Ordinary Least Squares (OLS) and Financial Methods Regression (Bauer *et al.*, 1998).

The Pareto Efficiency (Pareto Optimum or Efficiency) is defined in the DEA using diversification of the control exercised by the DMU towards the inflows or outflows, based on whether the DMU can increase its outflow without further increase of inflow in the case of control of inflow, or if the DMU can reduce inflows without further reducing outflow in the case of control of outflow (orientation of outflows). The DEA borrowed and used the concept of Pareto Efficiency from Economics Science (Thanassoulis, 2001).

During the application of the DEA method some inputs and outflows are exhibited, the control of which is not under the DMU control. These inflows and outflows are called non-discretitive or exogenously defined. The exogenously defined inflows and outflows are important for the implementation of the method, are treated in a special way and modern models have been developed to achieve their handling and integration into a comprehensive application of the method (Banker & Morey, 1986).

The Efficiency of the DMUs can only be accessed through a rigorous mathematical solution of the DEA method. Existing opinions or information which are generally accepted or incorporated into written text or previous assessments can be used to be introduced in the DEA models in order to ensure extraction of more reliable conclusions (Allen *et al.*, 1997).

The DEA method often uses sensitivity analysis. The sensitivity analysis is the process of handling faulty or incomplete data. The sensitivity analysis is performed by the operation of several models for the same DMUs, in which some inflows or outflows are replaced by other inflows or outflows, in order for the results of the original model to be confirmed or ruled out and to compare the results of the models. Then a single set, containing the comments for all models used in the sensitivity analysis, is generated.

Strategic Management and the DEA are connected to modern organisations. Strategic Management includes the vision, mission, objectives and goals, of which the degree of their achievement is confirmed or refuted by the application of the method (Allen *et al.*, 1997).

A model for the application of the DEA model in the ranking of Information Systems projects with financial institutions was developed by Sowlati, Paradi & Suld. The researchers examined the Information Systems so

as to find the most effective one in order to reach decisions which are more beneficial to the operation of the organisations. Researchers believe that political interference is a hindrance to improving the Efficiency of organisations and propose the implementation of financial criteria in view of this improvement. (Sowlati, Paradi & Sulda, 2005).

The utilisation of the applications, the policies and health strategies for health institutions was analysed by Renner et al., who proposed the creation of an Efficiency measurement and strategy implementation system in the Health Regions of the Sierra Leone. In their study the effect of non-Efficiency of Health Units on the realisation of local and international health goals is observed. (Renner et al., 2005).

Economou et al. (2015) measured the efficiency of the Greek rural primary health care, using a restricted DEA model in southern and western Greece. The results demonstrated noteworthy variation in efficiency. The results indicated potential for considerable efficiency improvement in most rural health care units, with emphasis on prevention and chronic disease management, as well as wider structural and organisational reforms.

The Efficiency studies, as decision-making tools, are used for the creation of proposals for the realisation of objectives, for future policy planning and improvement of the utilisation of future resources. (Movahedi et al., 2007).

Table 1: Basic Mathematical DEA Models

General DEA Model (Charnes, 1978)	Mathematical formulation DEA Model	CCR Model Charnes & Cooper & Rhodes (1984)	BCC Model
Efficiency = $\frac{\sum_{r=1}^s U_r Y_{rj}}{\sum_{i=1}^m N_i X_{ij}}$ i is the footnote of entries (i = 1,2,...,m) j is the annotation of DMUs (j = 1,2,...,n) r is the annotation of exits (r = 1,2,...,s) X _{ij} is the i entry of j DMU Y _{rj} is the r exit of j DMU s is the number of exits m is the number of entries n is the number of DMUs	$U_r Y_{ro} = \sum_{i=1}^m N_i X_{io}$ subject to (Restriction) $\frac{\sum_{r=1}^s U_r Y_{rj}}{\sum_{i=1}^m N_i X_{ij}} \leq 1$ U _r >= 0 N _i >= 0 i is the footnote of entries (i = 1,2,...,m) j is the annotation of DMUs (j = 1,2,...,n) r is the annotation of exits (r = 1,2,...,s) o is the DMU under examination X _{ij} is the i entry of j DMU Y _{rj} is the r exit of j DMU s is the number of exits m is the number of entries n is the number of DMUs	$Max\theta = \sum_{r=1}^s U_r Y_{ro}$ s.t. (Restrictions) $-\sum_{r=1}^s U_r Y_{rj} + \sum_{i=1}^m N_i X_{ij} \geq 0$ $\sum_{i=1}^m N_i X_{io} = 1$ N _i > ε U _r > ε or $Min\theta = \sum_{i=1}^m N_i X_{io}$ s.t. (Restrictions) $-\sum_{r=1}^s U_r Y_{rj} + \sum_{i=1}^m N_i X_{ij} \geq 0$ $\sum_{r=1}^s U_r Y_{ro} = 1$ N _i > ε U _r > ε	Additional Restriction $\sum_{j=1}^n \lambda_j = 1$ {(X,Y):>=Σxjλj και Y<=Σyjλj}

Source based on Charnes, Cooper & Rhodes, 1984 and Banker, 1980.

2. Efficiency Study and Crisis Management

The study aims to integrate the study on efficiency with the DEA method in a pre-crisis period, in a comprehensive crisis resolution framework. In the past, an efficiency study using the DEA method was performed on the Turkish banks, demonstrating how the advent of the Economic Crisis affects Efficiency (Ozcan-Gunai & Tektas, 2006).

The effect of the Iranian Crisis on the Efficiency of railways was analysed by Movahedi et al. This Crisis was caused by the Islamic Revolution and the subsequent war. The study analysed the period 1971-

1985 and showed a negative change of efficiency measures due to the impact of the Crisis. (Movahedi et al., 2007).

The DEA method has been used in Argentina to study relative efficiency for several years (2003-2007), during a period when the traffic of units (airports) had decreased by approximately 50%. DEA was used in two stages in order to draw conclusions about the impact of the economic crisis on the change of the DMUs efficiency (Barros, 2008).

After the Asian economic crisis of 1997, the banking system of the Philippines entered a series of

malfunctions. The DEA method, using the Malmquist index for the comparison of efficiency at different time periods, was used to measure the change in relative Technical Efficiency of banks under the influence of the Economic Crisis over an extended period (Dacanay, 2007).

During the period prior to the Greek Economic Crisis, the Hellenic Health System faced serious problems, such as operational deficiencies, inadequate management, funding problems and lack of evaluation mechanisms. These problems accumulated despite the multiple and diverse legislative initiatives which took place over a period of 30 years before the Economic Crisis. These problems made the country's health system particularly vulnerable to fluctuations in the economy. The lack of specific provisions for the forthcoming advent of the economic crisis in the health field and lack of institutional and functional shielding of the Hellenic Health System led to loss of preparation and weakness in handling the new data (Economou, 2010).

Crises generally occur frequently in modern societies. Crises affect all management levels of an organisation. The levels of an organization which are under threat because of the crisis are the mental, physical, moral and spiritual ones (Mitroff, 2005). Threat, uncertainty and the sense of urgency are characteristic features of each crisis (Boin et al, 2005).

Economic Crises occur when a period of steady growth development is followed by a period of decline. The current global Economic Crisis, which affects and interacts with the national crises, is due to a Crisis of the social and political state. Modern societies developed their social and political state in its present form after the Second World War, in order to address social problems and to avoid a Crisis similar to that of the 1930s. However, the modern social and political state did not work in the desired way and in the process exhibited failures and malfunctions that led to the modern Economic Crisis (Castels et al., 2012).

The Economic Crisis in Greece, is closely linked to the global Economic Crisis. The Greek Economic Crisis started in the early 2010. Greece's developmental and financial debt reached great heights and Greece's economic weakness indexes exceeded those of all other countries of the Euro zone. An explanation for the Greek financial crisis is considered to be the corruption of politicians and the ruling class and the government's appeasements after the political changeover following the junta (Matsas M., 2010). Greece's continuous course in the direction of European integration and globalization played an important role in the development of the Economic Crisis in Greece (Lesser, 2005).

Economou et al. (2014) analysed the effects of the Economic Crisis on Health and the Health System in Greece. They analysed the responses of the health system during the crisis, the changes in the public financing of the health system, the coverage of insured persons, the changes in the design of health services as a result of a reform effort that Greek governments have

attempted mainly to target the reduction of costs and the increase the efficiency of health services.

Economic Crises occur periodically depending on a growth rate of the economy based on the recurrence of the economic situation (during the economic situation's main path). The intensity and the recession of the economy alternate between periods of flourishing and periods of crisis. Russian economist Nikolai Kondratiev studied the recurrence of economic activity and summed up the results of this study in the theory of economic cycles (Kondratiev cycles or Kondratiev Waves). According to this theory, new technology causes economic flourishing and a sense of euphoria that favours the economy. But as the evolution of this technology completes its cycle and the technology is incorporated in everyday life then the Crisis appears. Schumpeter and other followers of the theory of economic cycles completed the theory by stating that these cycles appear every 50 years and result in a major crisis or a world war. In between these long-term economic cycles, medium or short-term cycles manifest. (Korotayev, Zinkina & Bogevolnov, 2011). The K waves were identified a hundred years ago, but there is no comprehensive theory of interpretation, although their existence has been proved experimentally. (Grinin, Devezas & Korotayev, 2012). The modern global Economic Crisis and hence all Economic Crises associated with it, are included in the economic cycle of Information Technology, which after developing for half a century is nearing its recession creating a "Kondratiev winter".

Crises go through a cycle consisting of stages which refer to conditions prior to, during and after the crisis (Mitroff, 1996), (Fink, 2002). Crisis Management has been found to follow the three stages of a Crisis which are the stage preparing for the Crisis and integration of experience from previous Crises, mainly Crisis Management with the use of Crisis Management Support Systems (CMSS) and post-Crisis recovery and damage restoration. (Combs, 2007; Augustine, 1995; Olson, 2009). An Integrated Crisis Management (ICM) may include the Crisis Management corresponding to the three stages, that is, Risk Management, Crisis Management and Disaster Management. The Integrated Crisis Management is differentiated into sequences depending on the type of the present crisis and the course used to approach it (Farantos & Koutsoukis, 2015).

In this study a comparative Efficiency Study of a period of 5 years prior to and during the start of the Greek Economic Crisis is carried out. We use a model for the comparison of the Efficiency scores derived from the processing of the results. We try to identify major changes in the Efficiency scores in order to identify impacts of Administrative Reforms aiming to alleviate the bureaucracy which we identified as taking place during the period under consideration. We use the results in order to enrich the Integrated Crisis Management with knowledge about the behaviour of organizations with respect to the effective measures before the start of the Economic Crisis and we draw conclusions about the contribution of the implemented reforms.

During the period under study (2006-2010), the Greek Government tried to implement major reforms aimed at increasing the Efficiency of Health Units mainly through bureaucratic relief. These reforms constitute a continuation of the constant reform efforts in the field of Health which have been implemented since the political changeover following the junta (1974). The reforms of the study period focused on the reduction of operating costs of Health Units, mainly through the reduction of procurement costs, the application of new information technologies and the use of Information Systems. In this way, the reduction of inflows was intended which would consequently increase Efficiency. The reform provisions for the operation of Health Units during the period under consideration are shown in Table 2 (based on Papageorgiou et al., 2014). The description and evaluation of each reform effort are given.

The provisions of the Ministry of Health established the details of the implementation of the procurement system, simplification of bureaucratic procedures and reforms affecting the Efficiency of Health Units especially in the application of Information and Information Systems. It was considered that the introduction of the procurement system and electronic tendering and procurement services in accordance with international practices would contribute to the increase

of Efficiency by reducing costs. Electronic registers of products and services as well as electronic registers of suppliers and providers were also considered to reduce inflows and economise on resources ultimately increasing the Efficiency of health units. The clinical and administrative systems implemented in hospitals during the study period (which were later used as legacy systems to other systems that were designed to increase Efficiency during the Economic Crisis) have attempted to benefit the efficient functioning of the administration through the optimization of the quality of the Services, organization of large amounts of information, reduction of bureaucracy, rationalization of cost management, improvement of resource use, and from the perspective of human-factor, better patient care, reduced waiting times, reduced human errors, better patient service and reduced hospitalization. The DEA method is used in this study in order to assess the fluctuation in the efficiency scores of Health Units during the whole period under study. In this way, the impact of the reforms undertaken in the Health Units on the efficient operation of the plants can be assessed. To assess the effect of the administrative reforms that took place during the study period regarding the efficiency of the DMUs the application of Data Envelopment Contrast Analysis (DECA) is used (Farantos, 2015b).

Table 2: Reform provisions for the operation of Health Services in conditions of pre- Economic Crisis

Provision Name	Year	Description	Evaluation
L. 2716/99	1999	Law on Mental Health - Application of programme "Psychargos" - De-institutionalisation of patients	Closure of majority of psychiatric hospitals, development of day units and hostels in half receivables, non-application of Efficiency measurement
P.D. 60/07	2007	Contract Procedures for Procurements - tendering. Introduction of agreement procedures by a Health Region.	Positive evaluation regarding its implementation.
L. 3458/07	2007	Publication of contract notices for supplies or services to the daily press.	Positive evaluation regarding its implementation.
L.3580/07	2007	Supplies of Ministry of Health bodies. Establishment of Committee of Health Supplies (C.H.S.) aimed at the designing of a supply system for Hospitals. Establishment of Registries of Certified Products and Services and Certified Suppliers & Service Providers. Establishment of a system of quality control of supplies and services carried out by limited companies.	Difficulties in the implementation of the supply system.
P.D. 118/07	2007	Analysis of processes and regulations governing competitions and public procurements with extensive reference to the required technical specifications	Benefit from the concrete specifications but bureaucratic delay.
L.3846/10	2010	Establishment of price monitoring and possibility of e-procurement for supplies and services.	Objectivity in execution of competitions.

L.3867/10	2010	Establishment of possibility of tendering without authorisation from the appropriate Health Region up to the amount of €45000. Obligation for marking of lower price for supplies and services regarding medical devices.	Simplification of bureaucratic procedures.
L.3868/10	2010	Improvement of the organisational structure of the Ministry of Health bodies. Configuration of the day operation of hospitals, incentives for the coverage of needs of the region, configuration of administrative issues of Health Regions and Hospitals, Establishment of Consultation, Transparency & Accountability Councils and Regional Health Planning & Social Care Councils in Municipalities and Regions. Establishment of 28 powers of the National Council for Public Health (N.C.P.H.).	Reforms which affect the Efficiency of the management of health units.

Source based on Papageorgiou *et al.*, 2014

Note: L.: Law P.D.: Presidential Decree.

DECA is based on the comparison of the efficiencies of the DMUs in two or more time periods, related to the study of a phenomenon such as the economic crisis or the pre-crisis period. If we already know some DMUs' inflows and outflows, we use the DEA method to extract the DMUs' efficiency score. The implemented reforms cause changes in the operation of the DMUs in order to make them more efficient by reducing inflows.

We study the variation of Efficiency scores during the study period, by dividing the DMUs into three categories; efficient ones, i.e. those which have been within the efficiency level for at least one year of the studied period, the top 10 non-efficient ones, i.e. those not included in the efficiency level but are the top ones just below the efficiency level limit and whose efficiency is, theoretically, easier to improve, and the 10 least efficient ones, i.e. those that are far from the efficiency level and have great room for improvement. In this way, we interpret the change in Efficiency scores as to the Efficiency level. Through analysis the results of the study, we draw useful conclusions about the effect of the implemented reforms on the change of the Efficiency of the DMUs during the studied period.

3. Case study of Health Units with the DEA method

The Case Study of Health Units with data provided by the Greek Statistical Authority (ELSTAT) begins with the selection of DMUs to be used. The selection of DMUs is the first step towards the implementation of a DEA study (Banxia, 2001). We select 105 DMUs using size as a criterion. These units are located in major cities of the country and also scattered in all regions of the country, without any geographical restriction. We use code numbers for the units based on the figures provided by ELSTAT (Hellenic Statistical Authority) and not serial numbers, in order to allow for further

expansion of the research by comparing the performance of the DMUs one by one.

We measure the Technical Efficiency of large health units (Health Care Hospitals) of the Greek Republic. During the selection process the geographical distribution of the Health Units is not taken into account. According to Mariolis *et al.* (2008), Greek citizens express significant dissatisfaction with the provided Health Care services (Mariolis *et al.*, 2008), therefore the application of the DEA method is important because the DEA Efficiency Studies offer important tools for the improvement of the DMUs' Efficiency. In order to receive the data an agreement between the researchers and the Greek Statistical Authority is signed and permission to process such data is received by the Administration of the Greek Statistical Authority (ELSTAT.). The Health Units are not shown by name but by code numbers. We choose to use the data relating to the largest Health Units since the DMUs must use the same inflows and produce the same outflows but also fully developed DMUs should not be compared to very small DMUs that could create a false picture of the score Efficiency. The selection of data inflows and outflows is the first and perhaps most difficult point in the assessment of Efficiency (Scheel, 2000). Table 3 shows the numbers and names of the inflows and outflows that we choose in order to supply data to the DEA model X. It also shows the status of each inflow and outflow as exogenously defined.

We used the free software EMS130, developed by Holger Scheel, which enables the processing of exogenous defined inflows and outflows. The results of the software are verified by other free software.

For Model X of our analysis, we use two basic mathematical DEA models, the CCR model, which ranks the DMUs by selecting the ones with ultimate

Efficiency as efficient, judging a small number of DMUs as efficient and the BCC model, which categorises more DMUs as efficient compared to the previous model, expanding the effective threshold to a larger number of efficient DMUs.

Most importantly, we use the Super Efficiency model, which categorises the DMUs in descending order

and in this way apart from creating an effective limit for DMUs with a rating above 100%, it is mainly useful for the comparison and improvement of inefficient DMUs and for the creation of proposals for their improvement and their classification as efficient (Yawe, 2010).

Table 3: Definition of inflows – outflows of study on Efficiency of Health Units

Model	Inflows			Outflows			
	Name of Model	Number of inflow	Name of inflow	Hexogenous determination	Number of outflow	Name of outflow	Hexogenous determination
Model X	I1		Number of Doctors	No	O1	Number of outgoing patients	Yes
	I2		Number of Nurses	No	O2	Number of days of hospitalization	No
	I3		Number of administrative staff	No			

We choose to use the BCC model which is referred to in the variable return to scale (VTRS), in order to assess a broader Efficiency limit consisting of several DMUs, against the CCR model. Nevertheless, we use the CCR model as a supplement, in order to proceed with the comparison with the BCC model. We prefer the BCC model BCC to the CCR because in our case the increase of inflow does not cause a corresponding increase in outflow, to expand the Efficiency threshold and because in the case of health facilities, the demand for health services is not dependent on administration (Yawe, 2010). The results are freely optimised due to the number of DMUs and the dissemination of results. We create a table of processed data to proceed to the analysis of results.

From Table 4, we see the following values for the number of efficient DMUs: 13 efficient DMUs for 2006 (a percentage of 12.38%), 10 for the year 2007 (9.52%) 7 for the year 2008 (6.66%), 10 for 2009 (9.52%), 11 for 2010 (10.47%). It is reminded that the DMU codes are those originally used by ELSTAT. The percentages in the year columns are the DMU efficiency scores for each year with big being the highest value. Values over 100% are

due to the use of the Super Efficiency model which is used for ranking the units in absolute values. The units that exceed 100% are placed above the efficient level (while in another model on the effective threshold).

It is observed that there is no specific upward or downward trend for the values of efficient DMUs during the period under consideration. With the exception of year 2008, the number of efficient DMUs is around 10% of the total. We can conclude that the implemented reforms during the period 2006-2010 did not lead to the desired increase in the Efficiency of the DMUs, but to a slight reduction if we focus on the years 2006 and 2008. We also notice that the DMUs that maintain the first position, DMUs 10, 197, 232 occupy the first place for several years, which shows a stability in the occupation of the first place, without being affected by the Administrative Reform. Many other DMUs which were characterised as efficient, exhibit a random fluctuation in their Efficiency scores sometimes being placed above or below the Efficiency limit during the years, a fact which also does not confirm the impact of the reforms on the increase of Efficiency of the health units.

Table 4: S.E. Table of relevant Efficiency of efficient Health units - period 2006-10

DMU	2006	2007	2008	2009	2010
10	66,55%	big	Big	big	big
13	57,52%	100,13%	58,59%	62,14%	53,34%
15	73,66%	140,40%	57,00%	57,78%	65,02%
18	48,72%	57,66%	54,72%	108,45%	136,97%
28	67,54%	95,76%	217,69%	198,69%	186,42%
29	63,72%	104,37%	61,69%	55,99%	55,07%
40	88,39%	86,81%	186,87%	152,73%	65,28%
41	108,39%	94,75%	77,48%	88,10%	77,32%
43	46,67%	84,42%	44,93%	87,34%	116,00%
46	121,68%	70,47%	67,69%	99,40%	77,70%
76	106,53%	105,79%	101,39%	96,28%	92,57%
108	86,23%	112,18%	126,75%	94,15%	92,80%
115	277,05%	262,43%	283,41%	475,00%	370,68%

132	76,19%	103,60%	101,18%	105,75%	157,72%
160	116,59%	115,54%	102,60%	99,60%	100,88%
166	57,58%	125,00%	125,00%	59,18%	47,01%
167	82,44%	86,79%	111,14%	83,50%	84,12%
178	147,29%	95,76%	84,12%	79,84%	64,50%
197	big	135,16%	Big	big	118,66%
232	big	big	82,10%	124,07%	72,18%
238	67,38%	100,82%	65,45%	77,19%	70,16%
239	69,17%	91,28%	115,74%	67,88%	69,07%
245	105,56%	94,74%	50,00%	66,27%	65,86%
246	107,05%	104,40%	76,93%	83,76%	83,74%
247	143,58%	173,38%	211,38%	192,81%	154,14%
251	106,03%	105,73%	101,63%	117,54%	113,13%
291	92,13%	108,01%	92,70%	91,02%	89,36%
294	100,07%	99,35%	80,71%	69,86%	72,68%
319	85,88%	99,74%	80,15%	82,28%	big
329	82,25%	103,71%	83,93%	79,78%	77,47%
Number of Efficient DMUs	13	10	7	10	11

Table 5 refers to the top 10 (with the greatest Efficiency performance) inefficient DMUs for the period 2006-2010. From this table it is observed that, with the exception of one DMU which almost continuously improved its Efficiency (107), many DMUs reduced

their Efficiency (32, 65, 225, 255, 259, 276) while the others remain stable. Therefore, it is concluded that the implemented reforms have a negative effect on the operation of the top inefficient DMUs and do not contribute to the improvement of their Efficiency.

Table 5: Table of the top 10 inefficient DMUs for the period 2006-2010

DMU	2006	2007	2008	2009	2010
32	86,97%	84,29%	80,60%	79,76%	71,73%
65	89,76%	89,99%	85,91%	55,78%	46,11%
77	91,26%	86,14%	85,86%	80,66%	85,32%
107	79,32%	76,77%	86,03%	95,37%	87,86%
185	83,03%	84,05%	72,67%	78,01%	80,50%
202	86,75%	77,81%	81,01%	73,89%	80,15%
225	96,01%	44,44%	42,96%	45,21%	51,89%
255	89,06%	99,88%	83,47%	71,15%	76,01%
259	79,27%	73,38%	72,14%	70,87%	68,17%
276	87,74%	40,69%	43,76%	49,14%	44,59%

In Table 6 we see the ranking of the bottom 10 inefficient DMUs for the period 2006-2010, according to the Super - Efficiency model. It is observed that five DMUs increased their Efficiency (4, 74, 153, 322), while five retained their Efficiency (7, 59, 105, 176, 231, 266).

This result is not considered satisfactory for the weakest in terms of Efficiency DMUs, given that the implemented reforms should have pushed these DMUs to raise their Efficiency considerably.

Table 6: Table of bottom 10 inefficient DMUs for the period 2006-2010

DMU	2006	2007	2008	2009	2010
4	41,39%	54,58%	49,51%	59,43%	53,11%
7	39,58%	38,96%	35,58%	40,30%	36,92%
59	36,66%	41,32%	32,13%	41,92%	39,85%
74	39,04%	42,55%	42,10%	64,01%	53,52%
105	19,29%	16,12%	16,54%	20,10%	20,56%
153	35,40%	42,56%	45,73%	51,78%	47,59%
176	42,58%	50,27%	44,76%	49,56%	45,12%
231	29,99%	42,42%	33,62%	39,09%	32,17%
266	42,97%	38,61%	46,94%	43,50%	41,99%
322	36,81%	45,03%	37,97%	40,81%	44,38%

Table 7 shows the performance of VRS relative Efficiency of efficient health units for the period 2006-

2010. From this table it is observed that only four DMUs (115, 197, 247, 251) out of 30 maintain the Efficiency

score of 100%, whereas four show a significant increase in their Efficiency, 10 proceed with their Efficiency decreasing, while the rest exhibit random fluctuations in their Efficiency. And from this table it is evidenced

that the reforms have not exhibited any concrete results in terms of increasing the Efficiency of health units but on the contrary, there is a tendency of reducing the Efficiency of the efficient DMUs.

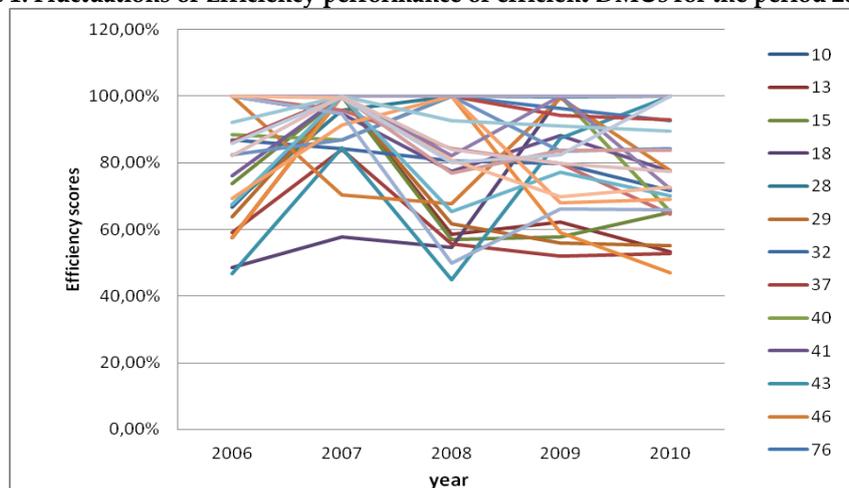
Table 7: VRS Table of relevant Efficiency of efficient Health Units for the period 2006-2010

DMU	2006	2007	2008	2009	2010
10	66,55%	100,00%	100,00%	100,00%	100,00%
13	57,52%	100,00%	58,59%	62,14%	53,34%
15	73,66%	100,00%	57,00%	57,78%	65,02%
18	48,72%	57,66%	54,72%	100,00%	100,00%
28	67,54%	95,76%	100,00%	100,00%	100,00%
29	63,72%	100,00%	61,69%	55,99%	55,07%
40	88,39%	86,81%	100,00%	100,00%	65,28%
41	100,00%	94,75%	77,48%	88,10%	77,32%
43	46,67%	84,42%	44,93%	87,34%	100,00%
46	100,00%	70,47%	67,69%	99,40%	77,70%
76	100,00%	100,00%	100,00%	96,28%	92,57%
108	86,23%	100,00%	100,00%	94,15%	92,80%
115	100,00%	100,00%	100,00%	100,00%	100,00%
132	76,19%	100,00%	100,00%	100,00%	100,00%
160	100,00%	100,00%	100,00%	99,60%	100,00%
166	57,58%	100,00%	100,00%	59,18%	47,01%
167	82,44%	86,79%	100,00%	83,50%	84,12%
178	100,00%	95,76%	84,12%	79,84%	64,50%
197	100,00%	100,00%	100,00%	100,00%	100,00%
232	100,00%	100,00%	82,10%	100,00%	72,18%
238	67,38%	100,00%	65,45%	77,19%	70,16%
239	69,17%	91,28%	100,00%	67,88%	69,07%
245	100,00%	94,74%	50,00%	66,27%	65,86%
246	100,00%	100,00%	76,93%	83,76%	83,74%
247	100,00%	100,00%	100,00%	100,00%	100,00%
251	100,00%	100,00%	100,00%	100,00%	100,00%
291	92,13%	100,00%	92,70%	91,02%	89,36%
294	100,00%	99,35%	80,71%	69,86%	72,68%
319	85,88%	99,74%	80,15%	82,28%	100,00%
329	82,25%	100,00%	83,93%	79,78%	77,47%

Figure 1 shows the Efficiency performance fluctuations of efficient DMUs for the period 2006-2010. In this figure the trend of most DMUs to reduce their Efficiency becomes even clearer given that the DMUs, with the exception of the four DMUs 115, 197, 247, 251

of a total of 30, throughout the duration of the study period achieved an Efficiency performance of 100%, whereas 10 DMUs exhibit a reduction of their Efficiency (13, 40, 41, 46, 76, 166, 178, 232, 245, 329).

Figure 1: Fluctuations of Efficiency performance of efficient DMUs for the period 2006-2010



Therefore, the reforms did not increase the Efficiency of the DMUs during the studied period.

Table 8 shows the VRS Efficiency scores of the first 10 inefficient health units from 2006 to 2010. From this table, a reduction in Efficiency scores is observed particularly from the beginning to the end of this time

period, for about 8 of the 10 DMUs. This demonstrates the negative impact of the implemented administrative reforms on the Efficiency scores during the studied period and at the same time the identification of the results of the Efficiency change when using the VRS model and when using the Super- Efficiency model.

Table 8: VRS Table of relevant Efficiency of inefficient Health Units for the period 2006-2010

DMU	2006	2007	2008	2009	2010
32	86,97%	84,29%	80,60%	79,76%	71,73%
65	89,76%	89,99%	85,91%	55,78%	46,11%
77	91,26%	86,14%	85,86%	80,66%	85,32%
107	79,32%	76,77%	86,03%	95,37%	87,86%
185	83,03%	84,05%	72,67%	78,01%	80,50%
202	86,75%	77,81%	81,01%	73,89%	80,15%
225	96,01%	44,44%	42,96%	45,21%	51,89%
255	89,06%	99,88%	83,47%	71,15%	76,01%
259	79,27%	73,38%	72,14%	70,87%	68,17%
276	87,74%	40,69%	43,76%	49,14%	44,59%

Figure 2 shows the fluctuations in the Efficiency performance of the first 10 inefficient DMUs during the years 2006-2010. The decrease in Efficiency for DMUs 32, 65, 77, 222, 225, 255, 259, 276 (80% of the total) can be observed. From this reduction in the Efficiency of the DMUs during the period being studied, it is concluded that the Government's implemented reforms had a

negative effect on the Efficiency performance of the first inefficient DMUs. So rather than push these DMUs to reach the Efficiency level, a profound decrease in Efficiency was caused distancing these DMUs from the Efficiency level, which is an effect totally opposite from the anticipated one.

Figure 2: Fluctuations in Efficiency performance of the first 10 inefficient DMUs

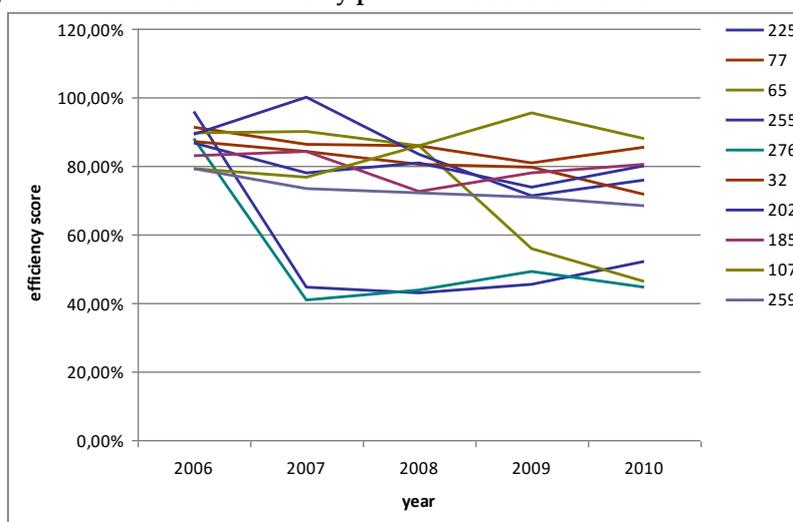


Table 9 shows the VRS relative Efficiency of the last 10 inefficient health units from 2006 to 2010. Note that out of a total of 10 DMUs, 5 of these (4, 74, 153, 176, 322) increased their Efficiency, while the remaining 5 maintained their Efficiency almost stable (after interim

fluctuations). It is concluded that the implemented reforms had little positive effect on the Efficiency score of the last DMUs, so the success of the reforms is only slight in this group of DMUs.

Table 9: Table of VRS relative Efficiency of the last 10 inefficient DMUs for the years 2006-2010

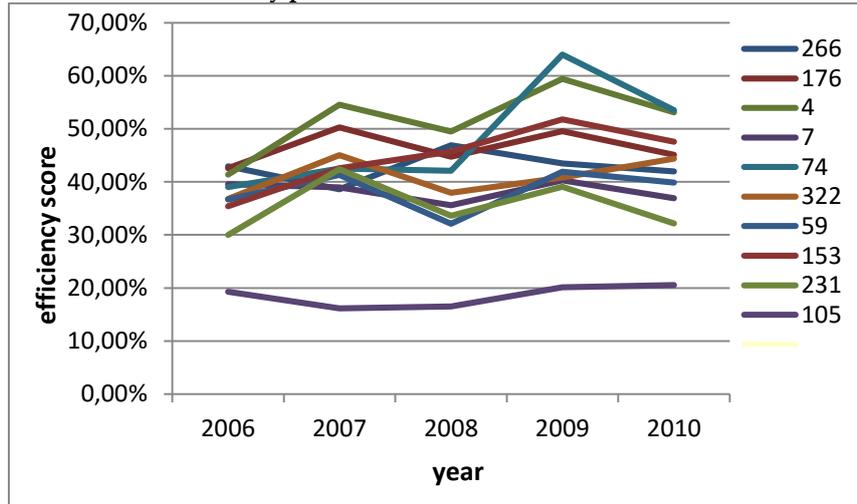
DMU	2006	2007	2008	2009	2010
4	41,39%	54,58%	49,51%	59,43%	53,11%
7	39,58%	38,96%	35,58%	40,30%	36,92%
59	36,66%	41,32%	32,13%	41,92%	39,85%
74	39,04%	42,55%	42,10%	64,01%	53,52%
105	19,29%	16,12%	16,54%	20,10%	20,56%
153	35,40%	42,56%	45,73%	51,78%	47,59%

176	42,58%	50,27%	44,76%	49,56%	45,12%
231	29,99%	42,42%	33,62%	39,09%	32,17%
266	42,97%	38,61%	46,94%	43,50%	41,99%
322	36,81%	45,03%	37,97%	40,81%	44,38%

Figure 3 shows a graphical illustration of the fluctuation of the Efficiency performance of the DMUs during the years 2006-2010. We observe the relative improvement in the Efficiency of 5 of the last 10 inefficient DMUs, which highlights the slightly positive effect of the implemented reform in this group of DMUs

and their improvement which brings them up to the Efficiency level. However, the problem of non-improvement of the relative Efficiency of the last 5 DMUs is observed, although they are in the group of the last inefficient DMUs, thus bringing back the failure to meet the reform goals.

Figure 3: Fluctuations in the Efficiency performance of the last 10 inefficient DMUs for the years 2006-2010



From table 10, the following are noted: the efficient DMUs are 13 in 2006 (a percentage of 12.38%), 18 in 2007 (a percentage of 17.14%), 14 in 2008 (a percentage of 13.33%), 10 in 2009 (a percentage of 9.52%) and 11 in 2010 (a percentage of 10.47%). There is a constant to slight downward trend in the number of efficient DMUs. The total Efficiency performance stands at 66.12% in 2006, 73.10% in 2007, 65.06% in 2008, 67.88%

in 2009 and 64.26% in 2010. There is therefore a constant to slight downward trend in the percentage of total Efficiency performance. Therefore, the realised administrative reforms have not resulted in increased Efficiency of the administration during the observed period, given that the overall Efficiency performance is decreasing.

Table 10: Efficiency score of Efficient DMUs (years 2006-2010)

Year	2006	2007	2008	2009	2010
Number of Efficient DMUs	13	18	14	10	11
Percentage of Efficient DMUs	12,38%	17,14%	13,33%	9,52%	10,47%
Total Efficiency Percentage	66,12%	73,10%	65,06%	67,88%	64,26%

Table 11 shows the Efficiency rating of the DMUs under consideration for the year 2006 and the weighting factors which have been linked to the DMU multiplied by the same inflows and outflows (absolute values of the weighting factors so that they are comparable).

this is expected since a certain freedom applies to the results, so each DMU is solved as to the importance of the inflows or outflows with the best performance. It is noted that I1 received the highest inflow scores, while O2 receives the highest outflow score, indicating the primary role of these coefficients in their effect on fluctuation of Efficiency.

From table 11 we can see that the solution is oriented to the maximum value for certain factors and

Table 11: VRS score of Efficient DMUs for the year 2006 (model X) and importance factors by reduction

DMU	Score	I1 {I} {V}	I2 {I} {V}	I3 {I} {V}	O1 {O} {V}	O2 {O} {V}
41	100,00%	0,02	0,98	0	0,99	0,01
46	100,00%	0	1	0	0,16	0,84
76	100,00%	0	0,89	0,11	1	0
115	100,00%	0	0	1	0	1

160	100,00%	0,25	0,75	0	1	0
178	100,00%	1	0	0	1	0
197	100,00%	1	0	0	0	1
232	100,00%	0	1	0	0,85	0,15
245	100,00%	1	0	0	0,35	0,65
246	100,00%	1	0	0	1	0
247	100,00%	1	0	0	1	0
251	100,00%	0	1	0	1	0
294	100,00%	0	0,65	0,35	1	0

4. Conclusions

This paper is a comparative study of the Relative Efficiency of Health Units over a five-year period preceding the start of the Greek Economic Crisis, taking into account the influence of implemented reforms undertaken by the Greek Government during this period, in order to increase Efficiency by eliminating inefficient practices and inefficiencies in the field of Health Units. Using free software, we perform the basic mathematical DEA's BCC and Super-Efficiency models, for Health Units of the Greek Health System (Public Sector). The results are presented in categories and graphic depiction is used in order to draw conclusions about the impact of implemented reforms on the change of the Efficiency of healthcare units during the period under consideration. A new application for the change of the Relative Efficiency of DMUs of the organisations which was developed for this purpose is used in this paper in order to extract easier and more specific conclusions. The change of Total Relative Efficiency proceeds randomly with a slight decrease during the studied period. The number of efficient DMUs shows a slight downward trend over the years. Many efficient DMUs exhibit random fluctuations in their Efficiency in the observed period. From the inefficient DMUs, as compared to those that show the greatest Efficiency scores, many of them remain stable regarding their Efficiency scores, whereas others exhibit significant decline in their Efficiency scores. Regarding inefficient DMUs occupying the last places in terms of Efficiency scores, an increase of the Efficiency scores is observed in some of them, while in others the scores are stable. The results of the study show no particular upward trend in the Efficiency scores of the DMUs participating in the study during the observed period, but on the contrary a random fluctuation with a slight downward trend of the Efficiency score is noted. This is interpreted negatively for the success of the reforms implemented by the Government aiming to increase the Efficiency of the DMUs, since no such increase has been achieved, but on the contrary a decline in the Efficiency of certain DMUs and a random fluctuation of the Efficiency of other DMUs has been observed. Therefore, the implemented reforms were unsuccessful as to their outcome. The limitation of the research is that the study refers to Public Health Units and not Private ones, so the conclusions cannot be extended to the Private Sector which operates on different criteria from the Public Health Sector. There is no geographical restriction on the investigation, but this one regards Public Health

Units throughout Greece. The study leaves room for further research on the efficiency of Private Health Units during a period of Economic Crisis.

This study leaves room for further study in other Public Sector bodies as to the change in relative Efficiency in a period before an Economic Crisis and the integration of the results into a comprehensive Crisis Management framework.

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The effect of perceived motivation of sports sponsorship: Evidence from basketball fans

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Abstract

Purpose – The purpose of this study is to single out the key variables in the sport sponsorship relationship, and more specifically to examine the impact of Team Achievement, Sponsor Recognition and Sponsor Altruism on two major behavioural outcomes, fans' purchase intention and word of mouth communication.

Design/methodology/approach – A quantitative method was adopted for the scope of this research and questionnaires were collected from fans of a prominent Greek basketball team. A total of 801 questionnaires were collected and interpreted by means of SPSS.

Findings – The proposed model was supported by the empirical evidence. All (with the exception of one) research hypotheses were confirmed, either fully or partially (all or some of the distinct dimensions of our independent variables have a significant effect on all or some of the distinct dimensions of the dependent variables).

Research limitations/implications – The sample used was predominantly individuals highly involved in the sports club and in basketball in general. As a result, the overall accuracy of the identified sponsors may have been different in case of a different population or sample, not so familiar with these two factors. Furthermore, the fact that the results came from only one type of sport and also from sport fans of a specific club, makes their generalization more sensitive.

Originality/value – This research tests an integrated sponsorship model, well known in the respective literature. Nevertheless, the results draw not on the general opinions of fans regarding sponsors but on their opinion about the actual sponsors of the team they support.

Keywords: Sponsorship, sports, sponsor recognition, purchase intention, word of mouth communication

JEL Classification: M3, Z20

1. Introduction

Sponsorship is not a contemporary phenomenon, but an acclaimed noteworthy development first used in 590 BC, when athletes of the Olympic Games were financially rewarded by the Greek state. From such a comparably moderate inauguration it has developed into an impressive industry (Smith, 2004). Sponsorship is a company's investment in cash or kind, for creating a business-to-business relationship with a sport team, in order to gain publicity and awareness in a specific target group, via the support of an activity, not directly associated to their business (Biscaia et al., 2013). The exchange theory - one of the preeminent theoretical views in the social sciences - is one of the principal notions of adjacent sponsorship, and it has two main tenets (Crompton, 2004): The first tenet of the exchange theory suggests the existence of at least two parts exchanging assets and second, the assets offered by each part must be equitably treasured by the interchanging parts (Kim et al., 2011). According to the first tenet of the exchange theory, sponsor and sponsee

have numerous assets to exchange. The sponsee may benefit the sponsor by increasing their awareness, enhancing their image, and boosting their sales. The sponsor in return, may benefit the sponsee by providing cash, publicity, or in-kind services. The second tenet of the exchange theory proposes that each part engaged in the exchange will mull this cooperation based on the assessment of what it will gain and what it will have to sacrifice (Crompton, 2004). A key aspect of the first tenet is that the exchange is anticipated as reciprocally profitable for both parts. In order to assure the reciprocally profitable outcome of the exchange, numerous researches have taken place, assessing the profits that a sponsor and a sponsee firm receive from the sponsorship agreement (Kim et al., 2011).

The growth of sponsorship as a marketing tool, is contemporary, impressive and omnipresent, being to a great extent a phenomenon of the last decade. Sponsorship has gathered exceptional funding in the latter decades. The universal sponsorship investments were estimated to be \$25.9 billion in 2003 and in ten

years this amount more than doubled, arriving at \$53.3 billion in 2013, in spite of the economic crisis of 2008-2009 (IEG, 2013). In Europe, sponsorship investments were estimated to be \$14.5 billion in 2012, with a 2.8% growth from the previous year (IEG, 2013). The unceasing upward tendency of sponsorship expenses demonstrates that firms recognize it as a proper investment (Kim et al., 2011).

Growth in sponsorship spending has been compelled by an array of factors, including firms' apprehensiveness about the efficacy of traditional marketing techniques, the competitive battle of firms in mature markets, as well as the rise of new mass media technologies (Internet, smart phones etc.) which has also contributed to the so-called globalization of sports. The emergence of these new technologies has not only expedited the spontaneous conveyance of sports events all over the world but has also engendered the spread of their popularity throughout the globe (Chih-Hung Wang et al., 2012). The commercialization and the globalization of sports –activities able to deliver spectator numbers – have increasingly provided favorable circumstances for sponsoring firms (Meenaghan and O'Sullivan, 2001).

As stated by the International Events Group (IEG, 2012), 68% of the worldwide sponsorship market in 2011, invested in sport properties, with sponsorship in the European football market reaching \$20.9 billion (IEG, 2012). Because of this growth and extensively delineated method, sport sponsorship depicts a significant marketing tool for sponsoring firms and an important income flow for sport clubs (Buhler et al., 2007).

Sport is an unforced domain for sponsorship, given that sponsors are more willing to invest in sport associations and clubs, which have a strong bond with a mass audience, as the goodwill that supporters feel towards their favorite club, is likely to be communicated to the sponsoring firm's brand or products (Madrigal, 2001).

By engaging in a sport sponsorship agreement, sport clubs obtain the essential financial assistance and/or other in-kind services in order to enhance their quality and various managerial aspects, whilst the sponsoring firms gain the tangible and intangible assets of being correlated with the sport club (Chen and Zhang, 2011). There are multiple goals and advantages that firms pursue when engaging in sport sponsorship programs, such as overcoming cultural obstacles (Cousens et al., 2006), developing relations with the mass media (Chadwick and Thwaites, 2004), strengthening relationships with society, enhancing brand awareness and creating positive brand attitude, entering new target markets, building brand loyalty, heightening sales and market share, distancing themselves from competitors, acquiring hospitality opportunities (Apostolopoulou and Papadimitriou, 2004), and even raising worker morale or expediting staff recruitment (Barros and Silvestre, 2006). Fundamentally, sport sponsorship has evolved into an influential marketing technique used by sponsors to interact with extensive external and internal audiences in order to distinguish

themselves from their rivals (Cornwall, 2008), with the utmost ambition being to align fan's inclinations toward sponsoring firms' goods (Barros and Silvestre, 2006).

By engaging in a sport sponsorship agreement firms boost not only their brand exposure but also the admittance of their goods amidst team supporters, and they have the chance to bring heretofore distant stakeholders into close proximity (Cunningham, et al., 2009). Previous studies have proved that supporters are emotionally attached when attending sports (Biscaia et al., 2012; Kwak et al., 2011), and multinational companies use this psychological attachment to sport to associate with sport fans (Santomier, 2008). In addition, Meenaghan (2001) proposes that firms' financing in sport clubs produces a good-will effect amidst supporters, which consecutively manipulates their attitudes and behaviors toward the firm. Similarly, Parker and Fink (2010) support that once the connection between a sport club and a sponsoring firm is formed, the sponsoring firm becomes a part of a close network of supporters.

Sport supporters are repeatedly displayed to various sponsoring firms from various sectors (Chavanat et al., 2009), as sport clubs serve as effective instruments used by companies to enhance relations with specific target groups (Henseler et al., 2011). Per se, the usage of actual sponsors engaged with sport clubs must be a key aspect in sponsorship research. Past research has shown that sponsoring firms desire to observe supporters having the same positive feelings concerning brand as they have toward their club (Shaw and McDonald, 2006). Nevertheless, supporters' reactions to sponsorship are dissimilar as a result of the knowledge formats they have (Roy and Cornwall, 2004). According to Wakefield and Bennett (2010), market eminence of the brand and its pertinence to the sport club are crucial factors in regulating how supporters react to the sponsorship. In the same way, research has shown that when sponsoring firms appear to be sincere, they have more chances of getting positive feedback than those which are engaged in an abundance of sponsorship agreements (Speed and Thompson, 2000). Based on the previous discussion, it is crucial to figure out the role of sport club loyalty in supporters' responses to actual sponsors of the club, and validate any differences among the sponsoring firms.

Notwithstanding the indisputable relevance of sport sponsorship and the abundant amount of research conducted about its effectiveness, there is no widely established theory and there is a necessity for further research (Walraven et al., 2012). Furthermore, academic research until now has mainly focused on the assessment of abstract corporate sponsorship rather than actual sports club sponsors (Biscaia et al., 2013). As such, the purpose of this study is to single out the key variables in sport sponsorship relationship by examining actual sport club sponsors. More specifically, the objective of the study is to develop a model which will examine the impact of sponsor recognition, sponsored club's achievement and perceived sponsor's

altruism on two major behavioral outcomes, fans' purchase intention and word of mouth communication, for each sponsor. As a result of this, the specific research tries to provide a better comprehension of the advantages of sponsorship agreements for both the sport clubs and sponsoring firms.

2. Theoretical Background

Given that indication and assessment of the investment outcome are among the major factors in a corporate transaction, sponsorship efficacy has accumulated consequential consideration in sport sponsorship literature (Ko et al., 2008). In accord with earlier researches, it is crucial to examine whether sport sponsorship provides any assets to sponsoring companies from the point of supporters' affective, cognitive, and behavioral responses, such as perceived quality, price, and intention to procure the sponsor's products (Walker and Kent, 2009). Previous studies have examined several factors influencing the effectiveness of sport sponsorship, such as attitude toward sponsor (Kim et al., 2011), purchase intentions of fans (Biscaia et al., 2013), congruence of sponsor firm and sport club, (Rifon et al., 2004), image creation & transfer, as well as media performance (Meenaghan, 2001). Nonetheless, hardly any of them have investigated how the relationship between fans and sport clubs affects sponsorship efficacy, and even fewer studies have developed an abstract basis for how the fan-sport club relationship affects fans' attitudes toward sponsorship and/or sponsor firms. Moreover, sponsor recognition, perceived sponsor altruism and team achievement are amidst the major antecedents factors which play a critical role in the forming of sponsorship outcomes and by extension in sponsorship efficiency (Tsiotsou and Alexandris, 2009). Regardless of its gravity and the abundance of research on sport sponsorship, the complexity of the association surrounding sponsorship and fans' buying objectives remains blurred, as the interactions betwixt the proposed variables are complicated and dynamic.

2.1 Team achievement

A series of research has examined the impact of sports team performance and its level of achievement on supporters' degree of identification with the team and by extension on their attitudes and behaviors toward the sponsors (Koronios et al, 2015a). Team achievement is defined as the success of the team relative to other primary competitors in objective terms (Wakefield and Bennett, 2010). Moreover, team achievement can also be defined as the spectator's perceived experience of the team's failures and successes and is directly connected with team identification (Ashforth and Mael, 1989). More specifically, fans tend to have a positive association with a winning team enhancing at the same time their self-image (Boen, et al., 2002).

The notion that people's social identification within groups is stagnant is implied in numerous researches of social identification (i.e. "strong qualifier" or "weak qualifier"). Although Cornwell and Coote (2005) stated that when people participate in different social groups

there is a potential debilitation of their social identification, they considered it a steady rather than a changeable affiliation. On the contrary, Haslam et al. (2000) support that human beings are constantly taking over numerous self-categories, emphasizing that the degree to which a person will be complaisant to determine himself by any one of these at any time, relies upon the interplay betwixt the person's current association with respect to the group and its anticipated regulative suit. Therefore, in the field of sport, social standing will probably be further noticeable when a club's competitive performance is perceived positively by its supporters, than when its performance is moderate or inferior (Lings and Owen, 2007). As a result, affective commitment has a greater effect on social standing and, by extension, social standing has a greater effect on purchase intentions of supporters of clubs with high competitive performance in comparison to those of moderate or inferior performance. This supports the case that if the club performs well, supporters will more easily and quickly make the transition from feeling positive about the club to embracing general standards and ethics related being a supporter; and the particular standards and ethics are certain to result in a greater desire to buy sponsors' goods, because this is an overt demonstration of devotion and standing with the winning club.

Furthermore, Wakefield and Bennett (2010), suggest that higher-performing clubs (e.g. champions and forerunners), stimulate more positive sentiments amidst their supporters, which in turn enhances the probability that they will meticulously recognize the affiliated sponsors of the sport clubs. When the supporters of a team anticipate its competitive performance as successful, the profits of the sponsorship program increase. Sponsors expect that the sympathy felt toward the team will be transmitted to their own brand. Admirably, companies try to associate themselves with teams that create the most affinity (Wakefield and Bennett, 2010). On the other hand, when supporters confront an underperforming sport club, they try to augment the distance between themselves and the sport club in order to conserve their dignity, as individuals try to affiliate themselves only with winners (Wakefield and Bennett, 2010). Lings and Owen (2007), indicate that team success is the most important factor concerning the recognition of supporters of a winning team, as well as their purchase intentions. More specifically, as far as unsuccessful clubs are concerned, team identification has a slight effect on the propensity to purchase and on the benefits to the club's sponsors. On the contrary, in cases of successful clubs, a high degree of team identification is shown to have a compelling influence on supporters' buying intentions, as far as sponsors' products are concerned.

2.2 Sponsor recognition

Sponsorship can enhance corporate image, and we can measure its effectiveness in terms of recall, recognition, and image changes (Bibby, 2011). Sponsor recognition is an extensively acknowledged factor for evaluating sponsorship effectiveness (Walsh et al., 2008). Nowadays, firms are increasingly recognizing

the creation of an effective sponsorship program as being a challenging task, in that it ensures that fans distinguish sponsors and non-sponsors in the right way, preventing any ambush marketing techniques by non-sponsors (Grohs et al., 2004). To achieve this goal, firms must recognize the factors which regulate sponsor recognition. The concept of sponsor recognition ascribes to one's capability to identify the trademark of the sponsor, under disparate circumstances, and it comprises brand recall and recognition effectiveness (Biscaia et al., 2013). The individual's identification of the sponsor is essential for further information searching about the sponsor. According to Crompton (2004), the first step as a prerequisite for sponsorship effectiveness in mass audiences is the concatenation of sponsorship benefits and the awareness of its existence. In other words, if recognition is not initially accomplished, sponsoring firms are unable to fulfill their consequent ambitions (Farrelly et al. 2005). Recognition of sponsors is crucial to accomplishing their strategic goals, as team supporters may appreciate the firm as a consequence of the effect generated through its exposure inside and outside the sport arena (O'Reilly et al., 2007). Moreover, the extent to which individuals are capable of recognizing a sponsorship, sponsor recognition is a decisive quantum of the sponsorship's efficacy (Rifon et al., 2004), while it also prompts crucial consumer conducts such as a positive stance towards the sponsor (Speed and Thompson, 2000), and a reason to acquire its goods (Madrigal, 2001).

2.3 Sponsor Altruism

Another series of research has examined the role of the construct of sponsor's altruism as a major factor enhancing sponsorship effectiveness (Olson, 2010; Alexandris et al., 2007; Rifon et al., 2004). This notion is mainly assigned to the attitude that sponsoring is a minor profit-making communication means (even charitable) in relation to advertisement, but this "feel-good" perspective is minimized when sponsors are considered less sincere/dishonest (Speed and Thompson, 2000). According to literature, there is a positive correlation between an individual's anticipated altruism of the sponsoring firm and his reaction to sponsorship (Speed and Thompson, 2000). In the event that team supporters anticipate a sponsoring firm to be a sincere associate of the team, rather than having the impression that a sponsor is just trying to exploit their love for the team in order to sell his goods, these supporters will probably show concernment and sympathy to the sponsoring firm, as well as an eagerness to think about its merchandise (Kim et al., 2011). Moreover, individuals have positive feelings and show a higher purchase intention when the motives of sponsoring firms are anticipated to be more charitable rather than merely commercial (Becker-Olsen and Hill, 2006). According to Rifon et al. (2004), individuals who estimate the sponsoring firm's motives as less altruistic or more financially oriented, may anticipate the firm to be less trustworthy. Sponsor's altruism performs a crucial role in forecasting an individual's stance towards the sponsor himself. Although altruism has

been found to be a crucial forecaster of higher-level sponsorship effects, essentially no previous research has sought to comprehend the foundation for altruism insight, with Rifon et al. (2004), being the only who has used altruism as a dependent variable.

Individuals' intention to purchase stems from two principal factors: first, a positive stance towards the firm and second firm intimacy which comes from prior exposure to the firm as well as prior utilization (Pope and Voges, 2000). From a sponsor's viewpoint, the purchase intention of fans constitutes the most important exponent of sponsorship effectiveness given its influence on sponsor's selling (Crompton, 2004).

2.4 Purchase intentions

Purchase intentions indicate the given intention of a fan to obtain a product/service (Spears and Singh, 2004). According to this proposal, purchase intentions display an indicator of a fan's incentive to show a particular buying behavior (Dees et al., 2006), especially when a sponsor engages in sport activities addressed to supporters who have a common identity (Ko et al., 2008). A supporter's reaction to the sponsoring firm comes across in a sequence of phases, with the first phase to being the awareness of the sponsoring brand, to eventually consenting purchase intentions and actions toward their merchandise (Kim et al, 2011). Therefore, prospective intentions to acquire are among the most suitable signals of what degree of influence a sponsorship may have on upcoming sales (Howard and Crompton, 2005). Supporters' awareness of the sponsoring firms concurs positively to their stance towards them, and purchase intention ensues from this positive stance (Schlesinger and Güngerich, 2011). From the supporters' viewpoint, recognizing a firm as an aid to their club, they may acquire the sponsors' goods as a form of altruism or to compensate the firm for sponsoring the club (Parker and Fink, 2010). Based on this variety of results, various researches have utilized purchase intentions as the decisive variable to assess sponsorship efficacy (Alexandris et al., 2007; Madrigal, 2001). Nevertheless, most researches bear upon general sponsors, instead of concentrating on present sponsors affiliated with a club (Hong, 2011). Hence, contemporary research contemplates purchase intentions as the endpoint of sponsorship efficiency.

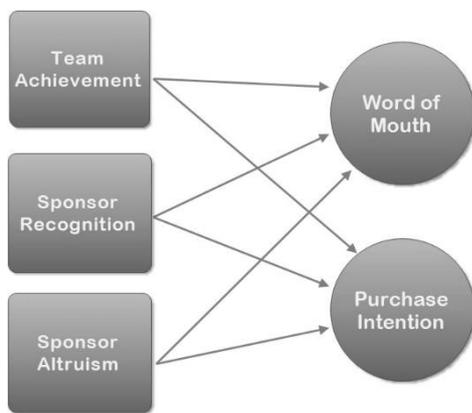
2.5 Word-of-Mouth communication

Although a main of research has identified purchase intentions as a main sponsorship outcome (e.g. Biscaia et al, 2013; Madrigal, 2001), word-of-mouth (w-o-m) communication has not been thoroughly investigated. Previous studies have indicated that word-of-mouth communication is a dynamic marketing means for firms (Laczniak, et al., 2001). Word of mouth communication can be described as a transmission of opinions and ideas between people, with regard to a product/service, which concerns the item of the communication (Laczniak et al., 2001). Word-of-mouth communication could be proposed as an extremely enticing sponsorship outcome, which will possibly have a more compelling impact on an individual's attitude than other promotion tools, as individuals perceive it as more approachable, trustworthy, and less biased

(Swanson et al., 2003). Moreover, utilizing information received by word-of-mouth communication is an efficient approach to eliminating any anticipated risk derived from the purchase-for the first time- of any product or service (Alexandris et al., 2007). This is specifically pertinent in the sport context, in the case of sport service organizations, in which supporters' anticipated risk is generally high, owing to the complications in the evaluation of the quality of services offered by sports clubs. The difficulties in the evaluation of services offered by sports clubs are caused by the high intangibility and inconsistency of the sport service product (Alexandris et al., 2007).

Based on the sponsorship literature, the following model is proposed. More specifically the role of team achievement, sponsor recognition & sponsor's altruism was investigated, in predicting supporters' purchase intention and word of mouth communication.

Figure 1: Research Model



All the hypothesized variables are displayed in the suggested model as presupposed in figure 1, which critically investigates the following hypotheses:

H1: Sponsor altruism is correlated with the intention to purchase the team's sponsors' products/services

H2: Sponsor recognition is correlated with the intention to purchase the team's sponsors' products/services

H3: Team achievement is correlated with the intention to purchase the team's sponsors' products/services

H4: Sponsor altruism is correlated with positive word of mouth communication.

H5: Sponsor recognition is correlated with positive word of mouth communication.

H6: Team achievement is correlated with positive word of mouth communication.

H7: Sponsor altruism is correlated with negative word of mouth communication.

H8: Sponsor recognition is correlated with negative word of mouth communication.

H9: Team achievement is correlated with negative word of mouth communication.

3. Methodology

The study was conducted in the setting of the first division of the Greek basketball league, with a prominent team and its actual sponsors to be selected. A quantitative questionnaire was selected as the predominant means of collecting the data.

3.1 Data Collection

A team of five researchers was responsible for distributing the questionnaires to the fans at the entrance to the stadium. Each spectator was randomly selected by the research team and politely asked to take part in the survey. Then the researcher moved to another fan and repeated the process. Particular circumstances on the field, such as the constant flow of people especially on their coming to the stadium, and queues that are sometimes created inside and outside of the stadium, favors the selected operation by the researchers. In order to increase the validity of their outcomes, researchers attended three home matches in a row. The procedure adopted may be described as quasi-random systematic sampling, with particular spectators at each gate being approached at fairly consistent time intervals (analogous to picking units from a production line periodically). That such a sampling method generates near random samples from which meaningful statistical inferences can be drawn is well established (Bennet, 1999)

Questions were assessed on a five-point Likert scale and the time needed for completing the survey was 10-12 minutes. A total of 801 questionnaires were completed and successfully used for the purpose of the study. Finally, the items gathered from the questionnaires were analyzed by means of the SPSS.

4. Findings

4.1 Sample demographics

The analysis was based on 801 responses coming from football fans. The great majority of the respondents were men (81%) between 19 and 45 years old (75%); specifically, 11% were younger than 18 years old, 29% were between 19 and 25 years old, 27% were between 26 and 35 years old, 19% were between 36 and 45 years old and 14% were older than 46 years old. Only 10% of the respondents were unemployed when the survey took place; 30% of whom were still in school and 60% worked full time. Moreover, 65.1% held an undergraduate or postgraduate degree, and 73% had a monthly income of less than 1,000 euro.

4.2 Definition of Key Variables

Team Achievement

Team Achievement measured the satisfaction of the participants with their team's performance. One continuous variable was computed as the mean of the five respective variables (5-point Likertscale) that were used in the questionnaire (Cronbach's $\alpha = 0.833$).

Sponsor Recognition

Sponsor Recognition measured the number of the particular sports club's sponsors that the participants were able to identify correctly among other well-known companies. For the purpose of the analysis one single variable was computed as the percentage of correct

answers that were given by each respondent (scale from 0 to 100%).

Sponsor Altruism

Sponsor Altruism referred to the degree that participants perceive a company as being altruistic in its motivation to become a sponsor. A PCA analysis was performed to identify the motives, which fans perceive as the driving force behind the sponsors' choices (KMO=0.874, Bartlett's test of sphericity was significant at $p>0.000$ and the total variance explained by the factors was 63.4%). The analysis resulted in four distinct factors: a) Legitimate business practice (Cronbach's $\alpha = 0.820$), b) Honest altruism (Cronbach's $\alpha = 0.790$), c) Strong corporate image (Cronbach's $\alpha = 0.764$), d) Exploitation of teams and fans (Cronbach's $\alpha = 0.669$).

Intention to purchase

Intention to purchase referred to the participants' intention to purchase the products and/or services sold by their team's sponsors. It was measured with a direct question for each sponsor; one single variable was computed as the mean value of the original values given by the respondents (scale 1 to 5).

Word of mouth

Word of Mouth Communication consisted of two dimensions: the communication in praise of the team's sponsors (Positive WoM) and the communication against the competitors of the team's sponsors (Negative WoM). The two respective variables were directly measured on a 5-point Likert scale.

Tables 1 and 2 show the variables and constructs used in the questionnaire. Table 3 shows the results of PCA.

4.3 Testing Hypotheses:

Intention to Purchase

To explore the research hypotheses, linear correlation analysis and multiple linear regression analysis were performed for each of the two dependent variables.

The first dependent variable of the proposed model (intention to purchase) was found to have a significant positive correlation with all the independent variables.

Furthermore, regression analysis was used to test the combined effect of the independent variables. The results supported as predicting variables of the intention to purchase the following variables: honest altruism, legitimate business practice, team achievement sponsor recognition and exploitation ($R^2=0.214$, $p<0.000$) Results are presented in Table 4.

The perceived motivation of sponsors had the greatest effect; when sponsors were perceived as honest and altruistic, intention to purchase their products was higher. As expected, when sponsors are perceived as being exploitive of the teams and their fans, the intention to purchase their products is lower.

Positive Word of Mouth Communication

The second dependent variable of the proposed model (positive word of mouth communication) was also found to have a significant positive correlation with all the independent variables.

Furthermore, regression analysis was used to test combined effect of the independent variables. The results supported as predicting variables of positive

word of mouth honest altruism, and team achievement (TA) ($R^2=0.181$, $p<0.000$). Results are presented in table 5. The perceived motivation of sponsors had again the greatest effect; when sponsors were perceived as honest and altruistic, intention to purchase their products was higher.

Negative Word of Mouth Communication

The third dependent variable of the proposed model (negative word of mouth communication) was found to have a significant positive correlation with team achievement and three of the sponsor altruism's dimensions; with honest altruism ($r=0.218$, $p<0.000$), strong corporate image ($r=0.112$, $p<0.000$), and exploitation of teams and fans ($r=0.115$, $p<0.000$).

Furthermore, regression analysis was used to test combined effect of the independent variables. The results supported as predicting variables of negative word of mouth only honest altruism (and team achievement ($R^2=0.055$, $p<0.000$), the same as in the case of positive word of mouth communication. Results are presented in table 6.

The perceived motivation of sponsors had again the greatest effect; when sponsors were perceived as honest and altruistic, intention to purchase their products was higher.

5. Discussion

The proposed model was supported by the empirical evidence. All (with the exception of one) research hypotheses were confirmed, either fully or partially (all or some of the distinct dimensions of our independent variables have a significant effect on all or some of the distinct dimensions of the dependent variables). The hypothesis that was not supported was the proposed effect of sponsor recognition to negative word of mouth communication (H_8). A plausible explanation may be that the decision of a fan to speak ill of the companies that support rival teams does not presuppose recognition of its own team's sponsors; it is more dependent on the individual's perception of competitive teams and their attitude towards them and their collaborators. Nevertheless, it was linked to both intentions to purchase and positive word of mouth communication. That is consistent with the literature on decision making, according to which the criteria of choice depend on the framing of the decision (positive or negative choice (Thaler, 2015).

In consistence with the current literature (Koronios et al., 2015b) honest altruism seems to be the main factor affecting intention to purchase as well as word of mouth communication, both positive in favor of the team's sponsors and negative against the rivals' sponsors. The intention to cultivate a strong corporate image through sport sponsorship was perceived as a legitimate motive by the participants; therefore, it was positively linked to both intentions to purchase and word of mouth communication.

It is interesting to note that although the perceived motivation of sponsors had a significant effect on all dependent variables, it was through different dimensions. It was different motives that contributed to different outcomes; in the case of honest altruism and

strong corporate image, the respective relationships differed in intensity.

The performance of the team was found to have a significant effect on all dependent variables. This could mean that sponsors take part of the credit as they are perceived as having contributed to the team's success.

6. Managerial Implications

Sponsor recognition, sponsor altruism and team achievement have all been recognized as having a significant effect on intention to purchase and word of mouth communication, which may indirectly lead to increased sales for a specific team's sponsor and decreased sales for its rivals. Therefore, all three should be of concern to managers when making decisions about sponsoring a sports team. More specifically, they should ensure that their motivation is or at least appears to be altruistic. The fans' perception that the sponsors' motivation is altruistic increases intention to purchase their products as does the respective word of mouth communication both in their favor and against their competitors.

The intention to create a strong corporate image through sponsorship was perceived as a legitimate motive with a positive effect on word of mouth communication as well as intention to purchase. This is evidence that sponsors would benefit from presenting a strong image of quality products and business practices, linked perhaps to the image of the team they support. The research showed that sponsor recognition also had an effect on intention to purchase and positive word of mouth. Therefore, sponsoring a team may not be enough for sponsors to reap benefits; separate promotion events to increase awareness may also contribute. Moreover, findings suggest that a specific link between the sponsorship and the team's performance would benefit the sponsor. Perhaps sponsors could consider separate promotional events or some other kind of publicity that would highlight such a connection; be a general support to the team may not sufficient.

7. Limitations - Further Research

The purpose of the study has been to identify the key variables in the sport sponsorship relationship, and

then explain theoretically how these variables influence fans future behaviors, concerning sponsoring firms' products & services. In doing so it has highlighted that despite the importance of sponsorship in developing fans' positive behavioral outcomes, much of the process remains poorly understood.

The analysis showed a positive correlation between negative word of mouth communication and attributing the intention to exploit teams and fans to sponsors. However, this paper addresses the relationship only of sponsors who support the rivals; this puts a limitation on the broader understanding of fans' intentions and behavior. Further research should cover the concept of negative word of mouth for the supporting team's sponsors as well.

Additionally, the predictive ability of the proposed model for the word of mouth was weak. Only two of the proposed variables showed a significant effect on it. Therefore, further research is needed to identify other constructs that would contribute to a better understanding of word of mouth.

The findings of this paper are based on the perceptions of a basketball team's fan base. Since basketball enjoys a significant share of the sponsorship money given to sports, these findings have implications that are of extended interest. Nevertheless, more empirical evidence is needed from other sports in order to acquire a better understanding of the relationship between sponsor motivation and results.

Finally, it should be noted that the sample consisted of individuals who are highly involved in the sports club and in basketball in general. Further research should explore the same hypotheses for fans who are less involved to identify potential differences.

To conclude, it is apparent that companies are spending increasingly large sums of money sponsoring sport clubs without fully understanding what they are paying for in brand image building terms. Hopefully this article will act as a spur to further research into the gaps in the knowledge identified. The role of sponsorships in developing positive future behaviors among sports club supporters remains huge. Only when this role is fully understood, will the true potential of sponsorships be realized.

Table 1: Descriptive Statistics

Constructs	Factors	Items	Mean	St.
Sponsor Altruism	Legitimate Business Practices Mean: 3.93 St.Dev: 0.713	LBP1: A company which sponsors an athletic club (through its sponsorship) is advertised	4.26	0.866
		LBP2: A company which sponsors an athletic club (through its sponsorship) is interested in enhancing its image	4.05	0.871
		LBP3: A company which sponsors an athletic club (through its sponsorship) is only interested in increasing its sales	3.63	0.963
		LBP4: A company which sponsors an athletic club (through its sponsorship) follows market trends	3.79	0.836

	Honest Altruism Mean: 3.17 St.Dev: 0.711	HA1: <i>A company which sponsors an athletic club (through its sponsorship) wants what is best for the team</i>	3.29	0.984	
		HA2: <i>A company which sponsors an athletic club (through its sponsorship) helps the team to achieve its goals</i>	3.52	0.956	
		HA3: <i>A company which sponsors an athletic club (through its sponsorship) is truly interested in the development of athletics</i>	2.98	0.980	
		HA4: <i>A company which sponsors an athletic club (through its sponsorship) responds to the needs of consumers</i>	3.03	0.874	
		HA5: <i>A company which sponsors an athletic club (through its sponsorship) shows its human side</i>	3.07	1.029	
	Strong Corporate Image Mean: 3.40 St.Dev: 0.730	SCI1: <i>A company which sponsors an athletic club (through its sponsorship) is developing</i>	3.53	0.839	
		SCI2: <i>A company which sponsors an athletic club (through its sponsorship) is financially powerful</i>	3.59	0.874	
		SCI3: <i>A company which sponsors an athletic club (through its sponsorship) has products of high quality</i>	3.08	0.891	
	Exploitation of teams and fans Mean: 3.45 St.Dev: 0.838	ETF1: <i>A company which sponsors an athletic club (through its sponsorship) is a "necessary evil"</i>	3.13	0.158	
		ETF2: <i>A company which sponsors an athletic club (through its sponsorship) takes advantage of /exploits supporters love for their team</i>	3.60	1.066	
		ETF3: <i>A company which sponsors an athletic club (through its sponsorship) simply wants to make a profit</i>	3.63	1.014	
	Team Achievement	Team Achievement Mean: 3.82 St.Dev: 0.742	TA1: <i>I am satisfied with my favorite club's results in the last year's athletic competition</i>	3.87	1.026
			TA2: <i>In the last year's athletic competition, my favorite club gave me many beautiful moments</i>	3.88	0.914
TA3: <i>I am satisfied with the money spent by my favorite club on support in relation to competition results</i>			3.95	1.013	
TA4: <i>I believe that my decision to purchase season tickets of my favorite club was correct/worth it</i>			3.87	1.087	

		TA5: <i>I intend to buy tickets and attend games of my favorite club for the rest of the current season</i>	3.88	1.080
Word of Mouth communication	Positive word of mouth Mean: 0.405 St.Dev: 0.196	PWM1: <i>I encourage friends/acquaintances to purchase the sponsor company's products simply because it sponsors my favorite club</i>	2.62	1.117
	Negative word of mouth Mean: 0.405 St.Dev: 0.196	NWM1: <i>I encourage friends/acquaintances NOT to purchase the sponsor company's products or use its services simply because it sponsors RIVAL teams</i>	2.54	1.175
Intention to Purchase	Intention to purchase Mean: 3.235 St.Dev: 0.608	IP1: <i>I would certainly purchase this company's products/services 1</i>	2.85	1.060
		IP2: <i>I would certainly purchase this company's products/services 2</i>	3.20	0.812
		IP3: <i>I would certainly purchase this company's products/services 3</i>	3.74	0.910
		IP4: <i>I would certainly purchase this company's products/services 4</i>	3.21	0.999
		IP5: <i>I would certainly purchase this company's products/services 5</i>	3.26	0.885
		IP6: <i>I would certainly purchase this company's products/services 6</i>	3.27	0.863
		IP7: <i>I would certainly purchase this company's products/services 7</i>	3.22	0.801
		IP8: <i>I would certainly purchase this company's products/services 8</i>	3.36	1.143
		IP9: <i>I would certainly purchase this company's products/services 9</i>	3.17	0.747
		IP10: <i>I would certainly purchase this company's products/services 10</i>	3.08	0.920
		IP11: <i>I would certainly purchase this company's products/services 11</i>	3.27	0.800

Table 2: Questionnaire constructs, factors and items

<u>Constructs</u>	<u>Factors</u>	<u>Items</u>	<u>References</u>
<u>Sponsor Altruism</u>	Legitimate Business Practices	4	Olson, 2010; Alexandris et al, 2007
	Honest Altruism	5	Olson, 2010; Rifon et al, 2004
	Strong Corporate Image	3	Rifon et al, 2004
	Exploitation of teams and fans	3	Rifon et al 2004
<u>Team Achievement</u>	Team Achievement	5	Boen, Vanbeselaere and Feys, 2002.

<u>Word of Mouth communication</u>	Positive word of mouth	1	Alexandris et al, 2007; Olson, 2010
	Negative word of mouth	1	Koronios et al, 2015
<u>Intention to Purchase</u>	Intention to purchase	11	Alexandris et al, 2007; Koronios et al, 2015; Olson, 2010; Rifon et al, 2004

Table 3: PCA Results

<u>Construct</u>	<u>Factors</u>	<u>Statistics</u>	<u>Items</u>	<u>Loadings</u>
Sponsor Altruism	Legitimate Business Practices	K.M.O.= 0.795 Bartlett's Sig = 0.00 (TVE) = 65.313 Cronbach (a) = 0.820	LBP1	0.847
			LBP2	0.831
			LBP3	0.759
			LBP4	0.792
	Honest Altruism	K.M.O.= 0.802 Bartlett's Sig = 0.00 (TVE) = 54.400 Cronbach (a) =0.790	HA1	0.740
			HA2	0.725
			HA3	0.809
			HA4	0.668
			HA5	0.738
	Strong Corporate Image	K.M.O.= 0.659 Bartlett's Sig = 0.00 (TVE) = 68.070 Cronbach (a)=0.764	SCI1	0.877
			SCI2	0.829
			SCI3	0.766
	Exploitation of teams and fans	K.M.O.= 0.621 Bartlett's Sig = 0.00 (TVE) = 60.969 Cronbach (a) =0.669	ETF1	0.668
			ETF2	0.836
			ETF3	0.827
Team Achievement	Team Achievement	K.M.O.= 0.804 Bartlett's Sig =0.00 (TVE) = 65.177 Cronbach (a) =0.833	TA1	0.688
			TA2	0.655
			TA3	0.668
			TA4	0.645
			TA5	0.603
Intention to Purchase	Intention to Purchase	K.M.O.= 0.925 Bartlett's Sig =0.00 (TVE) = 57.740	IP1	0.847
			IP2	0.676
			IP3	0.563

		Cronbach (a) =0.873	IP4	0.555
			IP5	0.763
			IP6	0.778
			IP7	0.798
			IP8	0.750
			IP9	0.795
			IP10	0.606
			IP11	0.818

Table 4: Linear Correlation and multiple regression analysis for the intention to purchase

	Intention to purchase		
	Regression Coefficients	Beta	T-value
Constant	1.519**		9.477
Team Achievement	0.162**	0.199	5.517
Sponsor Recognition	0.020**	0.098	2.797
Sponsor Altruism			
Legitimate Business Practices	0.134**	0.153	3.726
Honest Altruism	0.237**	0.270	7.682
Strong Corporate Image			
Exploitation	-0.081**	-0.110	-2.767
R ² =0.214, Adjusted R ² =0.208 F(5, 708) = 38.528			

**significant at p<0.01

Table 5: Linear Correlation and multiple regression analysis for the positive word of mouth

	Intention to purchase		
	Regression Coefficients	Beta	T-value
Constant	0.261		0.893
Team Achievement	0.267**	0.177	4.949
Sponsor Recognition			
Sponsor Altruism			
Legitimate Business Practices			
Honest Altruism	0.568**	0.351	9.890
Strong Corporate Image			
Exploitation			
R ² =0.181, Adjusted R ² =0.178 F(2, 711) = 52.357			

**significant at p<0.01

Table 6: Linear Correlation and multiple regression analysis for the negative word of mouth

	Intention to purchase		
	Regression Coefficients	Beta	T-value
Constant	0.909**		3.416
Team Achievement	0.182**	0.115	4.626
Sponsor Recognition			
Sponsor Altruism			
Legitimate Business Practices			
Honest Altruism	0.289**	0.175	3.044
Strong Corporate Image			
Exploitation			
R ² =0.055, Adjusted R ² =0.052 F(2,711) = 20.719			

**significant at p<0.01

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The added value of coaching compared to a friendly discussion: Insight from behavioral economics

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Abstract

Purpose – This paper addresses a criticism of coaching that is rather overlooked in the respective literature but highly discussed among clients. It is often claimed that coaching is nothing more than a chat among friends or colleagues and has, therefore, no added value for a potential customer.

Design/methodology/approach – The paper draws on the respective interdisciplinary literature to identify limitations and biases that are present in general discussions with friends or colleagues but professional coaches should be trained to overcome.

Findings – Questions and discussion are indeed at the core of a coaching session, thus bearing much resemblance to a friendly chat. However, the resemblance is superficial. In this paper ten main differences between a coaching session and a discussion with a non-expert are found and analyzed. They are grouped into three categories: Biases, Heuristics and Personal Limitations.

Research limitations/implications – Further research will be needed to test empirically the use of input from behavioural economics as a basis for coaching and also to enrich it with additional factors. Moreover, practitioners can use the proposed factors to increase their effectiveness as well as to create a unique selling proposition for their business.

Originality/value – The paper discusses specific skills and capabilities that a professional coach must have and provides significant implications for both researchers and practitioners.

Keywords: Coaching, Added Value, Behavioral Economics, Biases, Heuristics

JEL Classification: Maximum M12, M53, O15

1. Introduction

Coaching has developed a lot in the past decades and is already considered an emerging discipline with its own scientific literature. The primary purpose of professional coaching is to enhance wellbeing, improve performance and facilitate individual and organisational change (Grant, 2005). It has emerged from the area of sports in the '60s, then transferred to business through the '70s and '80s and moved to personal development in professional, social and personal life in the '90s (Bresser & Wilson, 2010). Nevertheless, it is still in its infancy, working to establish its foundations and boundaries.

Definitions are many and various; although, certain commonalities do exist among them, coaching still means different things to different people (Jackson, 2005). Different definitions refer to different methods, areas of expertise, results to be achieved or skills to be developed. For executive coaching (coaching that targets business executives) alone, Bartlett II et al. (2014) have identified 26 distinct keywords included in various definitions, 8 different models and approaches and 5 abilities based on which a coach's effectiveness can be evaluated. Hamlin et al. (2008) gathered more than 30 descriptions, definitions and variants of coaching.

In consistency with the abovementioned vagueness for the definition and the role of coaching, criticism has been vivid; it always is when a new field of study emerges (Argenti, 1996; Jensen & Bonde, 2011; Khazanchi & Munkvold, 2000). The main debate concerns the position of coaching among behavioral and cognitive fields (therapy, counselling, training, consulting, etc.) and has been extensive (Bluckert, 2005; Coutu & Kauffman, 2009; Garvey, 2004; Hart et al. 2001). It has even been suggested that coaching is not really different from other kinds of helping (Williams & Irving, 2001; Stalinski, 2003). Vaartjes (2005) claimed that coaching is far from meeting the basic requirements of a true profession because it lacks a holistic theoretical framework.

Although the debate is still ongoing, a significant part of the literature has addressed the criticism and supported the distinct position of coaching (Berman & Bradt, 2006; Clutterback, 2008; Griffiths & Campbell, 2008; Maxwell, 2009; Price, 2009; Sperry, 1993)

Williams (2003) distinguishes coaching from therapy in that the former "embodies the superior purpose of psychology... to study of human potential and possibility... rather than repair what has been damaged" and provides 15 main differences between the two. Seligman and Csikszentmihalyi's work (Csikszentmihalyi, 2014; Seligman, 2002) on positive

psychology has provided a strong foundation for defining coaching against therapy.

Moreover, coaching is often preferred rather than therapy or working with an industrial psychologist because of the more positive connotations it is associated with. Acknowledging to one's friends and colleagues to be seeing a coach may appear more desirable than admitting to be seeing a therapist (Cavanagh, 2005). Furthermore, McKelley and Rochlen (2007) have argued that coaching might fit with the cultural demands of men resistant to conventional sources of professional help.

This paper addresses a different kind of criticism, rather overlooked in the respective literature but highly discussed among clients and –most important- among potential clients. According to the latest ICF's Study (Global Consumer Awareness Study, 2014), 24.6% of the participants who have heard of coaching believe that they do not need it. Among other reasons, quite often people claim that they do not need professional help because they have good friends, thus implying that coaching has nothing more to offer than a friendly chat or –in the case of executive coaching- a chat with a colleague or the HR department. The distinction, nevertheless, is perhaps redundant, since for most executives work and life issues cannot be kept entirely separate (Coutu & Kauffman, 2009).

The abovementioned criticism is not new in the context of cognitive sciences; psychology was considered redundant when it first emerged as a separate discipline. Immanuel Kant argued that "psychology might perhaps never become a 'proper' science because its phenomena cannot be quantified, among other reasons" (Sturn, 2006).

In the case of coaching, the respective arguments derive mostly from the fact that questions and discussion are at the core of a coaching session, thus bearing –to the untrained eye- a resemblance to a general chat. However, any such comparison is superficial. To compare a coaching session to a random friendly discussion is like comparing a novel to a shopping list or a surgical incision to a random cut. If someone is illiterate or has no medical training, they may appear to be similar: both the shopping list and a novel are syntheses of words; both a surgical incision and a random cut are cuts of human tissue; both a friendly discussion and a coaching session are syntheses of questions and answers. However, with the appropriate expertise and a more careful examination, the differences in precision and added value become obvious and are critical. The discussion that takes place in a coaching session is normally based on motivational interviewing (MI), a technique originally proposed by William Miller (1983). MI is a counselling approach to help people with behavioral change (Lundahl et al, 2010). Life coaching offers a potential platform for facilitating individual, organizational and social change (Grant & Cavanagh, 2007) and executive coaching emerged as an intervention geared specifically to changing the behaviour of managers (Feldman & Lankau, 2005). Passmore (2011) was the first to consider

the use of MI in coaching while Simmons & Wolever (2013) explored the use of MI in health coaching.

In this paper the distinctive elements of the discussion that takes place during a coaching session are identified and discussed drawing mainly on the literature of behavioral economics. More specifically, the biases and heuristics, that non-experts commonly use –but coaches should not- when discussing a potential change, are addressed and the barriers that they cause, thus depicting the added value of a coaching session. The significance of this paper lies mainly in the attempt to show the linkage between coaching and behavioral economics, thus providing a more complete foundation for the former. It is true that coaching has psychology at its backbone; nevertheless, the value of combining it with the rational economic theory can help coaches to better address some of their clients' needs that are closer to decision making.

For the purposes of this paper, there is no need to distinguish between the different areas of coaching (life, executive, etc.). The scope is broad and has implications for all types professional coaching.

2. Effectiveness of coaching

Coaching is a rapidly growing industry. In 2006, it was estimated to worth \$2bn (Fillery-Travis & Lane, 2006); 9 years later, in the US only, it produces revenue of \$12bn with an annual growth of 6.8% between 2010 and 2015 (IBIS World, 2015). An increase of the academic interest in the field has also been noticed; academic publications during 2001-2005 increased by 266% in comparison to 5 years before (Grant, 2006). The increasing popularity of coaching has often led to the argument that "it has been around too long to be a management fad" (Fillery-Travis & Lane, 2006). However, no-one could seriously argue that popularity is a meaningful measure of value or effectiveness (Kearns, 2006). It is therefore, essential to look at the results of coaching.

Most of the respective research has been focused on executive or business coaching; that means coaching that targets business executives, entrepreneurs and companies. One reason for that is that executive coaching is the most lucrative part of the coaching industry; in the US the median hourly fee is \$500 (fees range from \$200 to even \$3,500) (Coutu & Kauffman, 2009) while life coaching (targeting individuals) costs on average \$100 (ranges vary across different countries and sources; \$300 is usually the highest end) (George, 2013; Association for Coaching, 2016). Additionally, executive coaching is usually paid by the company (Sherman & Freas, 2004), thus requiring measurement of results, qualitative or quantitative.

Regardless of the unquestionable need to evaluate the role and the effectiveness of coaching, the academic research on the topic is still in its infancy (al., 2014; Beets & Goodman, 2012) and further theoretical and empirical work is needed (Bartlett et al., 2014; Grant, 2014).

Change, development and transformation are mentioned as goals of coaching (Cox et al., 2014; Curly, 2001; Evered et al., 1989; Ives, 2008; Longenecker &

Neubert, 2005; Whitworth et al., 2007). The Executive Coaching Handbook (Ennis et al., 2012) defines executive coaching as “an experiential and individualized leader development process that builds a leader’s capability to achieve short- and long-term organizational goals”. Coutu & Kauffman (2009) have found that the primary reason a company hires a coach is to develop high potentials or facilitate transformation.

Empirical research has identified a number of benefits that are in consistency with the abovementioned goals (Colombo & Werther, 2003).

For individuals, life coaching has been associated with enhanced mental health, quality of life, goal attainment, decreased levels of self-reflections, increased levels of insight (Grant, 2003). Another study (Green et al., 2006) found that participation in a life coaching group program was associated with significant increases in goal striving, well-being and hope. Grant (2011) reviewed 634 scholarly publications and found that stress reduction and goal attainment have been often associated with life and executive coaching.

For managers, executive coaching has been found to have a positive effect in focus, motivation, personal and professional development, working relationships, learning and advancement (Longenecker & Simonetti, 2001). MacKie (2007) identified potential improvement for managers in 13 domains; notably, skills, strengths, goals, job performance, wellbeing, insight, quality of life, promotion, critical incidents, positive affect, retention, self-efficacy, business performance. In a randomised controlled study, Grant et al. (2009) found that coaching enhanced goal attainment, increased resilience and workplace well-being, reduced depression and stress, increased the participants’ self-confidence and personal insight, built management skills and helped participants deal with organisational change.

For the organization, coaching has been found to facilitate organizational learning and problem solving (Redshaw, 2000). Nevertheless, Longenecker & Newbert (2005) found that the higher a manager rises in an organization, the less likely they are to engage in a coaching relationship. Findings that most managers think of themselves as coaches (Zenger & Folkman, 2014) may be a plausible explanation of why this happens. It may also create a notion that discussions with other top executives (also seen as qualified coaches) provide all the necessary feedback, thus leaving no perceived need for professional coaching. Overconfidence is a significant obstacle to effective decision making, especially among top managers and executives (Bussenitz et al., 1997; Hammond et al., 1998; Heath & Heath, 2013; Kahneman et al., 1982; Klayman et al., 1999).

Nevertheless, bad coaching exists and all parties of the relationship -the coach, the client, (and the company, in the executive coaching)- can contribute to failure (Sherman & Freas, 2004). This paper is focused on the coach. The literature proposes certain characteristics/skills that a good coach must have in

terms of the way a session is conducted and the content of it (Marsh, 1992): openness to new ideas, creating a good and supportive atmosphere, empowering the client, offering specific balanced feedback, demonstrating personal interest and involvement, setting clear targets, establish trust and intimacy with the client, etc. (Barry, 1994; Marsh, 1992; Popper & Lipshitz, 1992; Stober et al., 2006)

This paper discusses the question from a somewhat different perspective; what a professional coach should not do in order to be effective and to add more value to the discussion with the client than a discussion with a non-expert would have for the latter.

3. Behavioral Economics and the added value of a professional coach

To achieve their goals, coaches borrow on both consulting and therapy (Coutu & Kauffman, 2009), combining thus the fields of economics and management with the field of psychology. In terms of research, this field is already known as behavioral economics.

The field of behavioral economics studies the effect of psychological, cognitive and sociological factors on decision making and is based on Prospect Theory (Kahneman & Tversky, 1979). It studies the boundaries of rationality in decision making (Gigerenzer & Goldstein, 1996; Kahneman, 2003; Simon, 1982). Initially, it was focused on economic decisions. Today, however, the cognitive biases and the heuristic methods, which were first studied in economic decisions, are now observed in other areas of human behavior (Ariely, 1998; Bazerman et al., 2002; Bertini et al., 2009; Carmon & Ariely, 2000; Fox, 2014; Hitsch et al., 2010; Sustein et al., 2002). Coaching uses a range of cognitive and behavioral techniques in order to help the client achieve their goals (Kilburg, 1996). Rekalde et al (2015) note that “the professional literature adds the personal dimension to the perspective suggested by the academic literature, considering that through executive coaching, clients deepen their learning and improve their performance in the organizational area, while in turn they enhance the quality of their personal life.” Therefore, there is obviously common ground between behavioral economics and coaching; nevertheless, a connection between the two has yet to be directly proposed in the literature.

This paper builds significantly on the findings of behavioral economics, especially on the areas of framing choices and making decisions. We, therefore, propose a new definition for coaching: *It is the process of acknowledging personal limitations and biases as well as behavioral patterns in order to make conscious choices and decisions about the strategy that will lead to the desired goal.*

The abovementioned process sets the frame of analysis in the following sections of this paper. Consequently, *a professional coach is someone who has the ability to identify and overcome cognitive biases, is familiar with decision making methods (rational choice theory and heuristics) and strategic planning.*

We propose ten differences between friendly discussions (meaning discussions with a non-expert)

and coaching sessions. They are grouped in three distinct categories: Biases, heuristics and personal limitations.

3.1 Cognitive Biases

Cognitive bias refers to a systematic pattern of deviation from norm or rationality in judgment, whereby inferences about other people and situations may be drawn in an illogical fashion (Haselton et al., 2005).

Non-experts don't listen actively

People rarely listen to the details of what their friends or colleagues say. Most people are thinking or rehearsing about what they are going to say as soon as there is a break in the conversation (Knippen et al., 1994).

People often believe that they know their colleagues or friends too well already; they have a pre-formed opinion of them and certain expectations of their thoughts. When talking to them, they fill in potential blanks themselves instead of asking for further information. They make assumptions, which most of the time are less than accurate. By some estimates, 60% of the errors made in business can be directly or indirectly linked to poor listening (Wheless, 1998). Purdy and Borisoff (1997) have discussed the limitations in listening in everyday life as well.

A number of studies have indicated that advice is a common way for individuals to respond to other people's problems (Cowen, 1982; Cutrona et al., 1990; D'Augelli & Levy, 1978; Reisman & Shorr, 1980). When someone encounters family, friends, coworkers, or even acquaintances who are upset about something, a typical response is to give advice (MacGeorge et al., 2008). Nevertheless, advice is not always perceived as helpful (Cutrona & Suhr, 1994; Dunkel-Schetter et al., 1992; Goldsmith, 1994; Pearlin & McCall, 1990). Perceived helpfulness depends on a variety of contextual factors as well as the motivation for asking advice (Goldsmith & Fitch, 1997). People are more likely to consider advice as "butting in" when it came from people close to them, non-experts or when advice was unsolicited (Goldsmith & Fitch, 1997).

A professional coach addresses the above biases. They will make no assumptions and will try to discover what the client thinks through active listening. A coach assumes nothing about the client except for the information they give. This requires the client to describe who they are, what they want, what they need, and what they believe. Most of the times, it requires them to reflect on all these and increase self-awareness (Aronson et al., 1994) Therefore, while a friendly talk will hardly address such issues, a coaching session will force clients to achieve a better understanding of themselves (Joo, 2005).

Non experts confirm one's bias

Research has shown that friends share attitude and behavioral similarities (Verbrugge, 1977; Wernin & Parmele, 1979). Regardless of the superficial differences, friends and co-workers who enjoy a good relationship tend to have similar preferences, similar values and beliefs, similar way of thinking and similar perceptions. Therefore, they are most likely to enhance

the human tendency for confirmation bias, which is one of biggest problems in decision making (Heath & Heath, 2013). Confirmation bias refers to the tendency to develop a belief or form an opinion about a situation and then seek on information that supports that belief. Friends are an excellent source of such information (Kenny & Kashy, 1994).

Moreover, for those who hold a position high in the hierarchy, it is quite hard to find people to disagree with them. CEOs have the need for unbiased information more than anyone else in an organization (Nadler, 2005). The respective research has repeatedly identified managerial overconfidence and hubris as a strong bias, which is hardly ever challenged by the manager's environment. It is difficult for people to disagree with their boss; they are guarded and unwilling to raise difficult topics (Nadler, 2005).

A coach is not subject to such bias; they share no interest in the company, have few or no similar characteristics to the executives assigned to coach and are usually paid by the company. Quite often a coach is consciously hired to provide such unbiased feedback.

A coach will provide the right feedback, will challenge assumptions, identify and address biases and prejudices (Turner, 2006), and ask the uncomfortable questions in order to reveal the entire truth rather than fractions of it (Hieker & Huffington, 2006; Sherman & Freas, 2004; Turner & Goodrich, 2010). A coach will insist on getting an answer to the "How do you know?" question when the client has a belief without proper documentation. Through this process, if the belief is incorrect, the client will realize it; if it is correct, they will acquire a deeper understanding.

Non-experts overanalyze and justify

A significant problem in everyday decisions and the respective discussions with friends and acquaintances, is that people tend to overanalyze; they analyze everything as if they were of equal importance. Even trivial details are analyzed and valued as being extremely significant. This phenomenon is -among others- explained by the theory of cognitive dissonance (Festinger, 1957). People engage in it to lessen psychological tension and distress; adding new cognitions and ignoring or denying any information that conflicts with existing beliefs are two of the methods Festinger (1957) described.

A classic illustration of cognitive dissonance is expressed in the fable "The Fox and the Grapes" by Aesop. Many discussions among friends and colleagues resemble it when people are trying to avoid the blame of a goal not reached, a failure or a lesser welcome outcome. A promotion that didn't happen is rarely because the candidate lacked the qualifications; it's almost certainly because the boss was biased, promoted his own people or felt threatened by the abilities of the candidate in discussion. It is assumed that people seek positive self-regard (Heine et al., 1999) and friends provide significant support for it. They provide feedback that is decisively self-enhancing (Campbell et al, 2000), discuss each other's positive rather than negative traits (Blumberg, 1972), report good but not bad news (Tesser & Rosen, 1975).

This over-analysis or over-thinking is known as “analysis-paralysis” and usually leads to stagnation (Kurien et al., 2014); unless one realizes their own limitations and weaknesses and changes something in their behavior, they will repeatedly face the same undesirable outcome.

A coach will not allow this kind of excuses or justification. They should be able to separate the important pieces of information from the clutter and focus on them. They should allow the difficult pieces of truth to be discussed; they will challenge the client’s comfort zone. “Clearing the clutter not only exposes those things that you know are there; it can reveal the otherwise invisible essence of the situation” (Burger & Starbird, 2012).

Non-experts support a narrow frame

Individuals use frames of reference to make sense of their reality (Du Toit, 2007). However, they tend to define their choices too narrowly; they often see them as binary choices (Heath & Heath, 2013). They often think of a decision as a situation where one must choose between two options (Burger & Starbird, 2012). This kind of cognitive bias is called “narrow framing” and has consistently proven to be one of the strongest biases in decision making (Thomas & Millar, 2011), growing stronger with age. Prospect Theory (Kahneman & Tversky, 1979) explains in detail how the adoption of different frames can lead to different choices, different decisions and different behavior.

The simplest case of framing is “attribute framing” in which one single attribute within any given context is the subject of the framing manipulation (Levin et al., 1998). Empirical evidence shows that people over-estimate the degree to which their personal behaviors are common and appropriate (Ross et al., 1977). Advisors –sometimes even professionals– may prefer to rely on their personal beliefs and preferences when giving advice (Hadar & Fischer, 2007). Following this bias, non-expert will often focus on an oversimplified dilemma presented to them or frame a situation as a dilemma themselves, relying upon subjective impressions and intuitions (Ross et al., 1977). Coaching provides a broader frame to enable the client to explore more options. Coaching operates at the level of values and beliefs (Du Toit, 2007) linking thus, a decision to variables that escape the obvious short-term perspective. During a coaching session, issues like values, beliefs, long-term goals and opportunity cost will be discussed providing new insight.

3.2 Heuristics

For the purpose of this paper, we adopt the definition of Katsikopoulos (2011) that heuristics are simple decision models people use, which:

- a) rely heavily on core human capacities,
- b) do not necessarily use all available information and process the information they use by simple computations,
- c) are easy to understand, apply and explain.

Non-experts stereotype

Stereotypes function as resource-preserving devices in mental life (Macrae et al., 1994). Verbally or non-verbally, explicitly or non-explicitly, individuals use

stereotypes to label information or actions, and consequently other individuals. Labeling can be useful for communication purposes and can also be used as a persuasion technique (Cornelissen, 2007). Labeling theory (Lemert, 1951; Becker, 1973; Mead, 1934) has been extensively studied in sociology. It shows how the individual’s identity and behavior are affected by the perceived opinion of others.

Moreover, the literature suggests that men are less expressive with their male friends out of concern that they will appear weak (Aries, 1987; Winstead et al., 1984) and that they generally prefer talking about rather impersonal topics (Bischoping, 1993) or primarily flattering things (Dolgin & Minowa, 1997).

Thaler (1999) proposed the idea of mental accounting to describe how individuals organize, evaluate, and keep track of their financial activities. Nevertheless, this cognitive operation far exceeds economic decisions; people use different “accounts” for a number of resources. The same applies to tendencies, opinions, preferences and behaviors others express; they are put in different accounts (labels/stereotypes) in order to be managed more effectively (Andersen et al., 1990; Sherman et al., 1998).

Providing supportive feedback requires knowing what to say and when to say it as well as focusing to the other person as opposed to the self (Leaper et al, 1995), all characteristics a professional coach must have.

Coaches refrain from criticizing, verbally or otherwise. They are trained to listen patiently without placing judgment. This creates a more appropriate environment for the client to express freely feelings, thoughts or concerns they may have, to discuss ideas and intentions (Grant & Cavanagh, 2007).

Non-experts focus on the symptoms

Discussions among friends and colleagues are generally limited to symptoms; they do not address the problem itself or its causes. Not very successful organizations act similarly; they tend to address symptoms that are immediately apparent rather than seek root causes (Coulson-Thomas, 2003). This is not always a conscious choice to avoid dealing with the causes; it can be lack of understanding of the differences between correlation and causation (Greenhalgh, 1997; Velickovic, 2015). Often individuals tend to believe that similar symptoms have similar or identical causes (Kim & Keil, 2003), which leads to an approach rather superficial that fails to identify key situation dependent variables.

Moreover, non-experts carry their own assumptions, experiences, traumas and fears when facing a situation. Belsky and Gilovich (1997) introduced the “hybrid of sorts” notion, according to which people place too much value on what they know from personal experience simply because it is from their own experience. Quite often, therefore, they will take a single example (personal experience or of someone they know), make it the rule and perceive themselves as being experts on the subject.

Non-experts, therefore, offer advice based on the symptoms for just about anything; from personal

relationships to medical problems. The following examples are common:

- “My brother-in-law had the same pain, took Pill A, and feels great. You should take it too.”
- “I once said that to my boss and she fired me. Don’t argue, just be patient.”

A coach should not oversimplify; rather they would help identify true from pseudo-correlations, direct from indirect relationships and causes from effects.

Non-experts give answers

“It is said that the three hardest words in the English language (in any language) are ‘I love you’; they are not, the hardest are ‘I don’t know’” (Levitt & Dubner, 2014). Individuals feel obliged to provide an answer even when the honest reply would be “I don’t know” followed by an exploratory question. It is not by accident; people are educated to provide answers. Questions during education are reserved for people with authority and people who do not understand or do not know. However, the opposite is true. Questions are the most fundamental attribute of scientific research and the right questions are the basis for all progress and knowledge.

It was the Greek philosopher Socrates who first acknowledged the importance of asking the right questions and introduced the dialectic method, which is linked to critical thinking (Rud, 1994). This is the method many coaches use nowadays to enable their clients to discover the correct answer themselves after they obtain a full understanding of their situation, thus making the answer/decision easier to follow. A coaching relationship is not about providing a quick fix or a recipe for success (Bearwald, 2011). No matter which coaching approach one takes, questions are in the core of it (Ives, 2008).

3.3 Personal Limitations

For this purpose of this paper, personal limitations refer to attributes that non-experts bring in a friendly discussion that are beyond their control and cannot be managed or eliminated. These attributes derive from their relationship with the interest party and the role they assume towards them.

Non-experts are personally involved

Friends and colleagues are personally involved, directly or indirectly, in people’s lives and thus somehow affected by their choices, decisions and changes. It would be impossible for both parties to have a discussion with a friend or a colleague without taking the relationship into consideration, even subconsciously. In forming and maintaining friendships, individuals develop expectations about how friends ought to be and ought to behave (Hall, 2012). This puts a restriction to the freedom of expression one enjoys in a situation like this. Both parties should pay attention to how much information they reveal, how the other party might feel or how they might be affected personally by each option, what associations may be formed, whether their opinion is biased because of personal interest, etc.

Furthermore, trust becomes an issue when such discussions take place at the workplace where most relationships exist in a co-opetitive framework

(simultaneous collaboration and competition). There are abundant research findings on the value of collaboration in every line of work and in every scientific field. Yet, despite the importance of workplace collaboration, competition is an inevitable part of organizational life (Kinduff et al., 2010).

Trust is even harder to find at the top levels of hierarchy; top executives rarely get straight feedback or bad news. Even at a formal, confidential evaluation, subordinates may inflate ratings to avoid retribution and limit interpersonal conflict, or they may deflate ratings to retaliate against a supervisor who has disciplined or given a low performance rating to them (Smith & Fortunato, 2008).

Furthermore, for those in the higher ranks of the hierarchy, it is hard to allow themselves to be vulnerable and to just “think out loud” because they feel (and may be true) that others are waiting for their words of wisdom so they can react (Hall et al., 1999). On the other hand, doubts, uncertainties, mistakes and generally issues that show vulnerability and create discomfort are at the core of a coaching session; it is exactly those issues that need to be addressed in order for people to develop and change. The mere presence of a co-worker may pose a barrier to this process.

Non-experts don’t know what they are doing right

The predisposition to imitate is deeply rooted in humans and social observers have long recognized imitation as important in human society (Bikhchandani et al., 1998). It is, therefore, expected that people often ask friends or colleagues who seem to be “best-practice” cases at something (work, social life, personal life, parenthood) to give away the recipe, to tell them what to do in order to become equally successful. However, hardly any secret is revealed in such quests because people fail to distinguish between declarative knowledge and procedural knowledge. The former refers to the content of cognition (know “what”) while the latter presents the process that act on declarative knowledge (know “how”) (Smith, 1994). Recent studies have argued that it is possible for procedural knowledge to be obtained without previous declarative knowledge (Lewicki et al., 1988; Sun et al., 2001). Moreover, Smith & Branscombe. (1988) showed that people who make repeated social judgments learn to apply generic rules somewhat independently of the content.

It is possible, therefore, that people who seem to be doing the “right things” do so intuitively rather than consciously. Therefore, the typical answer when asked for the “recipe of success” is “I am just being myself”, which implies that being one’s self is enough to achieve any desired outcome and assumes that all serves are the same and act the same way. It is remarkable the importance that people have attached to the notion of “being yourself” (Knobe, 2005). Obviously, not all “selves” are the same. On the contrary, being oneself is a fundamentally different kind of value (Knobe, 2005). Moreover, even if “being yourself” was the solution to every problem, people’s perceptions of their one personalities contain important omissions (Vazire & Carlson, 2011), which would prove a conscious

challenge to be oneself (Zink, 2010). Peter Drucker (1999) observed that achieving goals, presupposes the cultivation of a deep understanding of oneself; thus it is not something to be taken for granted or well known.

Moreover, the advice to “just be yourself” does not encourage effort or change, especially when individuals have an inaccurate image of themselves (Batson et al., 1999). It does not motivate people to evolve or try to become truly self-aware; rather it leaves them doing the same things that brought them in a situation to need advice for. Moreover, it leaves them to believe that there is nothing more or different to be done. On the contrary, Hutton & Baumeister (1992) found that self-aware individuals showed greater resistance to weak persuasive arguments than to strong arguments, unlike subjects who were not made self-aware.

Another typical answer is “I do X”, referring to only one behavioral trait. It is difficult for most people to identify true causal relationships and their complexity, especially when it concerns their own behavior. Therefore, it is not necessary that the trait identified is one of critical importance to the desired outcome. Nevertheless, even if that were true, this kind of answer remains incomplete since declarative knowledge does not mean procedural knowledge as well. “Do this” does not include “how” or “why” or “when” or “where” it is appropriate to “do this”. Without fully understanding exactly how “this” works, one cannot perform it in a way that will actually work (Nettler, 1972; Nuttley et al., 2003; Platts & Tan, 2004; Schrag, 1981; Snowdon, 2004). Furthermore, just because something does work for someone, it does not necessarily work for someone else as well. Different people have different characteristics and live in different contexts. Different people can support and/or defend different behaviors and/or choices. It is not uncommon that people find themselves in situations where they claim to have tried everything and still not achieving their goals (Horton-Deutsch & Horton, 2003).

Non-experts don't teach a long-term approach

Coaching is the process of equipping people with the tools, knowledge and opportunities they need to develop themselves (Peterson & Hicks, 1996). One of the unwritten goals of coaching is to ensure enduring learning and development for the client that can be sustained long beyond the end of the coaching intervention (Cox 2013). To paraphrase the old saying, “A friend will offer you food; a coach will teach you how to cook”.

Non experts in coaching are not trained to enable such a learning process, not in a systematic way. They often provide opinions or knowledge without explaining how they formed or acquired them. They provide ready answers; they say what they would do in someone else's place, usually without any further justification. Moreover, experts in some field who provide advice as prescriptive are frequently found to disagree with one another (Harvey et al., 2000). Good coaches help their students learn how to rely on an “inner coach”; self-coaching can be done in any field (Ericsson et al., 2007).

4. Discussion and implications

Drawing on interdisciplinary literature –mainly psychology, behavioral economics, and decision making-, this paper contributed to the ongoing debate regarding the positioning of coaching among the various cognitive and behavioral fields. The combination of these fields –rather than using psychology alone as the basis of coaching- provides new insight about the distinct role of coaching and the cases when it is preferred over therapy. Positive psychology has provided coaching with an evidence-based framework and a defined scope of practice (Seligman, 2007) but it is an illusion to assume that optimism alone can help all individuals achieve their goals (Miller, 2008).

This paper analyzed the particular type of discussion that takes place during a coaching session (motivational interviewing) and the elements that distinct it from friendly chats or conversations between co-workers or other non-experts in the MI.

More specifically, it highlighted ten main differences between coaching sessions and ordinary discussions, showing thus not only the significant added value of coaching, but also the gap between the two. The paper provided evidence that non-experts have certain limitations (biases, use of heuristics and personal limitations) that can be overcome by proper training; the kind of training that professional coaches should receive.

The inclusion of decision making theory and behavioral economics in the ongoing research to develop a theoretical foundation for coaching provides a new research agenda to identify antecedents of the goals that the profession of coaching claims to be achieving (eg. change, goal-attainment, increased levels of insight, self-efficacy, personal and professional development). Moreover, the limitations of non-experts that were discussed in this paper can be used as evaluation criteria of professional coaches as well as potential antecedents of customer satisfaction and intention to continue with coaching.

The practical implications of this paper are also of significance. It offers professional coaches with new insight on the limitations they need to address during a coaching session and certain skills that would help them become more effective in their role. Moreover, it explains the way in which these skills serve the clients' interest and the requirements they satisfy. It proposed additional fields that could provide a scientific basis for their work, complementing the principles of positive psychology.

Additionally, practitioners can draw on this paper's findings to address criticism and provide their clients or potential clients with a more solid presentation of the service they offer and its added value.

5. Limitations and Further Research

The identified differences do not cover the subject exhaustively. More biases, heuristics and personal limitations present in everyday discussions can be identified, thus offering additional input to exploring further the relationship between coaching to the fields

of decision making and behavioral economics. Additional input is needed to explore the relationship between coaching and other fields that have been linked with change.

Further research is also needed to provide empirical evidence that explore the proposed relationships. Empirical research is needed to explore the relationship between the differences proposed in this paper and three key factors in any profession: the added value perceived by the clients, the overall satisfaction of the clients and their intention to continue coaching.

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The relation between the effects of testimonials' sources and the cognitive, affective and behavioural changes

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Abstract

Purpose – Endorsement strategies have a well-known potential of generating good results and there are various studies which refer to the endorsement sources as either a contextually effective or ineffective strategy.

The present study is a new approach on this topic and it aims at identifying whether there are significant attitude changes towards the service category after the exposure to different types of service brand testimonials or not. The service category is represented by cosmetic treatments. The attitude structure in this study specifies three distinct components: the affective, the behavioural and the cognitive one.

Design/methodology/approach – The study was conducted on a sample of 426 males and females from Romania. Each subject was exposed to testimonials coming from experts, celebrities and satisfied customers who were endorsing a branded cosmetic treatment. Measurements included endorsers' perceived credibility and changes in affective, cognitive and behavioural attitudes towards the service category.

Findings – Credibility derived from brand testimonials has an impact on the service category, as all three changes have been significant. The change in behavioural attitude was the most affected by perceived credibility, closely followed by the change in affective attitude and the change in cognitive attitude. Gender differences were also discussed.

Research limitations/implications – The measurement of the endorsement's effect was performed only through the instrumentality of credibility. Another limitation is the survey context in which subjects got in contact with testimonials.

Originality/value – This research is useful for both academics and practitioners, offering insights for those who are interested in attitude research and for those activating in the field of beauty service industry.

Keywords: Testimonials, Affective, Behavioural, Cognitive, Attitudes

JEL Classification: M31 Marketing, M37 Advertising

1. Introduction

The aim of the study is to explore the endorsements' effects of a branded service on the changes in behavioural, affective and cognitive attitudes towards the service category.

In the first section of this article, a brief overview of the current research on attitudes and the use of testimonials in advertising are provided. The second section offers a description of the methodology used. The main results can be found in the third section, while the fourth section provides a summary of the main findings, including limitations and future research directions.

1.1 Affective, cognitive and behavioural attitudes

The basic affective, cognitive and behavioural dimensions of attitude were established by Rosenberg and Hovland. Affective attitudes have an emotional base. These attitudes are relatively short lasting and form rapidly as subjects are exposed to stimuli. Cognitive attitudes last longer than the affective ones and are formed based on the rational facts of the stimuli presented. Behavioural ones include thoughts about future plans, about the service or the products and are

often formed based on the cognitive and affective components of attitudes (Rosenberg and Hovland 1960). Classically, it is considered that attitudes have three distinct components – affective, cognitive and behavioural (Ostrom, 1969). Breckler assessed the validity of a prevalent model of attitude structure and did an empirical validation of affect, behaviour, and cognition as distinct components of attitude (Breckler, 1984).

The emotion - cognition duality is widely debated in the scientific area and there are three major different perspectives. Firstly, there are the scholars who suggest that emotions form separately from cognition (Zajonc, 1980; Izard, 1992); secondly, there are authors who state that emotions do not depend on cognition (Ashforth and Humphrey, 1995) and the last perspective is that emotions and cognitions are antagonistic (Weber, 1946). Another perspective is offered by Lazarus who states that there is a bidirectionality of this relationship – it is impossible to have emotions without cognition and cognition triggers an emotional response (Lazarus, 1991). Behavioural change is considered by some

authors to be the result of cognitive and affective changes of structure (KarkSmollan, 2006).

1.2 Testimonials

Testimonials, long used in marketing communication, are considered to be impactful on audiences, being viewed as experience-based information (Hoch, 2002). The importance of the endorser's perceived credibility, in attitude changes, is highlighted in numerous studies. Since 1973, McGinnies has examined the interactive effects of source credibility and the subjects' initial attitudes on persuasiveness (McGinnies, 1973). The existing literature suggests that an endorser's credibility significantly influences respondents' attitudinal and behavioural reactions. There are studies that claim that the effect of a third-party's endorsement, for instance a customer's testimonial, is stronger than the endorsement coming from a company spokesperson, as measured by perceived credibility of information (Howes and Sallot, 2013). Both effects are positive, but the one that was triggered by an external source was the most intense. Many researchers have demonstrated that endorsers, such as celebrities or customers, play significant roles in persuading consumers (Misra and Beatty, 1990; Gotlieb and Sarel, 1992). Particularly, when these spokespersons display credibility in the ads they endorse, they positively influence recipients' attitude towards the respective ads. (Yoon, Kim and Kim, 1998).

Braverman studied the differences between testimonials and persuasive information and conducted her work especially in the healthcare industry. She defines testimonials as scenes where the main characters tell stories of successful personal experiences and directly or indirectly encourage the public to follow their example (Braverman, 2008). Upon completion of the study, Braverman concluded that testimonials are convincing because they appeal to emotions and not only to rational thinking. It is easy for the public to identify with the main character of a testimonial even if he or she may not be the most reliable source of information. Braverman also concluded that the testimonial messages were well received by less involved participants (Braverman, 2008).

The message sent by a testimonial may be more persuasive, since the status of an uninvolved third party adds credibility to the statement (Wang, 2005). Wang's study showed that 64.9% of those exposed to an endorsement from a third party showed willingness to buy. He also illustrates that consumers will typically consult others and thus would reassess their own positions when a risk or potential risk occurs. Therefore, testimonials are not just convincing, but they can also help overcoming the problems related to perceived risks (Wang, 2005). Velour, Heuvelman and Verhagen have found that viewers are becoming more emotionally opened if the content enhances social interaction with others. Once viewers are emotionally open, they become more susceptible to mood and attitude changes. (Verleur, Heuvelman, Verhagen, 2011).

This study offers insights for practitioners activating in the field of beauty service industry. In this industry, advertising plays a vital role in attracting customers. Faced with increased competition, cosmetic treatment producers constantly strive to develop effective advertisements in order to promote their brands.

2. Methodology

360 females and 66 males from Romania participated in an online survey. Initially, only the attitudes related to cosmetic treatments have been evaluated. Then, each subject was exposed to testimonials, in which experts, celebrities and satisfied customers recommended *Intraceuticals* - a branded cosmetic treatment (Intraceuticals, 2015).

There was a total number of 12 testimonials. Two international and two Romanian celebrities were used for the celebrity endorsement strategy (Madonna, Justin Timberlake, Antonia and Andreea Marin). For the experts' endorsement, 2 dermatologists and 2 plastic surgeons were used, of which one was Canadian, one from the USA and 2 were Romanian. The typical satisfied consumer was represented by 3 females and one male, of different age groups. All testimonials were real - the respondents could very simply check them with a quick search on the Internet and were selected to minimize the importance of the message, as we wanted to separate the effect from the source.

A pseudo-experimental method was used, as the subjects participated in an online survey. In the beginning, the initial affective, cognitive and behavioural attitudes towards the cosmetic treatments were measured. Afterwards, each subject was exposed to all three endorsement strategies. Then, the final attitudes were measured, along with the perceived credibility and demographics. Approximately 10 minutes were necessary for completing this online survey.

The endorsements' effects were measured by a Credibility scale with 12 items on a 9 point Likert scale. The scale was adapted from Ohanian and it integrated sincerity, honesty, trustworthiness and credibility (Ohanian, 1990). Behavioural attitudes towards the service category were measured by 3 items on a 9 point semantic differential scale (Would you have a cosmetic treatment in the next 4 months? *unlikely/likely*; Would you have a cosmetic treatment in the next 4 months? *definitely/not definitely*; Would you recommend a cosmetic treatment to a friend, regardless if you use it or not? *definitely /not definitely*). Affective attitudes were measured by 1 item on a 9 point semantic differential scale (What is your opinion on cosmetic treatments? *negative/positive*). Cognitive attitudes were measured by 2 items on a 9 point semantic differential scale (What is your opinion on cosmetic treatments? *not worth the money/worth the money, bad for the skin/good for the skin*). Initial and final attitudes (measured before and after the exposure to endorsement sources) were measured through cognitive, affective and behavioural attitudes. After the mean values have been calculated, changes in cognitive, affective and behavioural attitudes were

computed by subtracting the initial score from the final one.

3. Analysis and Results

Scales were found to be internally consistent, according to Cronbach's Alpha coefficient. For Credibility scale (12 items) $\alpha = 0.969$. For Initial cognitive attitudes (2 items) $\alpha = 0.879$, for Final cognitive attitudes (2 items) $\alpha = 0.942$, for Initial behavioural attitudes (3 items) $\alpha = 0.975$, for Final behavioural attitudes (3 items) $\alpha = 0.915$. Using a Wilcoxon test, it was concluded that the cognitive, affective and behavioural changes were significant ($p = 0.000$ for behavioural change, $p = 0.005$ for affective change and $p = 0.000$ for cognitive change).

As Table 1 indicates, most of the subjects (225/426) did not change their affective attitudes towards the service category, but positively changed their cognitive attitudes (255/426) and their behavioural attitudes (189/426). The mean rank for those who negatively changed their cognitive attitude is 132.17 and for those who positively changed it, the mean rank is 182.46. The mean rank for those who negatively changed their affective attitude is 100.20 and for those who positively changed it, the mean rank is 102.29. The mean rank for those who negatively changed their behavioural attitude is 149.66 and for those who positively changed it, the mean rank is 156.71.

Table 1: Ranks for changes in behavioural, affective and cognitive attitudes

		N	Mean Rank
Final behavioural - Initial behavioural attitudes	Negative Ranks	118	149.66
	Positive Ranks	189	156.71
	Ties	119	
	Total	426	
Final affective - Initial affective attitudes	Negative Ranks	124	100.20
	Positive Ranks	77	102.29
	Ties	225	
	Total	426	
Final cognitive - Initial cognitive attitudes	Negative Ranks	84	132.17
	Positive Ranks	255	182.46
	Ties	87	
	Total	426	

Through a Mann - Whitney Test, significant differences ($p < 0.05$) were observed only regarding the initial and the final behavioural attitudes between male and female respondents. Depending on the respondent's gender, there are no significant differences for behavioural change. While the mean rank for female respondents' initial behavioural attitudes was 222.71, for male respondents' was 163.24. It was similar for the final behavioural attitudes (221.84 and 168.00).

Both initial and final affective attitudes ranks are higher for women (216.35 compared to 197.95 and 217.96 compared to 189.17), although the difference is significant only for the change ($p < 0.05$). Men scored higher in affective change (242.21 compared to 208.24) and the difference is significant ($p = 0.037$).

Females have higher scores regarding initial and final cognitive attitudes towards the service category (222.71 compared to 163.24 and 219.17 compared to 182.59) and the differences are significant ($p < 0.05$). Also significant is the difference between genders as for the cognitive change ($p = 0.046$) and males scored higher (241.15 compared to 208.43). The demographic variable *Age* did not significantly influence any of the attitudes.

Non parametrical correlations were calculated using Spearman's rho coefficients. Credibility has a weak correlation with all the changes (Cohen's effect size - 0.10 small, 0.30 moderate, 0.50 large) (Cohen, 1988). The behavioural change ($r_s = 0.203$, $p < 0.05$) has the strongest link, it follows the affective change ($r_s = 0.190$, $p < 0.05$) and the cognitive change ($r_s = 0.161$, $p < 0.05$) - see Table 2.

Table 2: Correlations between perceived credibility and changes in behavioural, affective and cognitive attitudes

		Behavioural change	Affective change	Cognitive change
Credibility	Correlation Coefficient	.203	.190	.161
	Sig. (2-tailed)	.000	.000	.001
	N	426	426	426

As Table 3 illustrates, from 426 respondents, 118 negatively changed their behavioural attitudes, 119 did not change their behavioural attitudes at all and 189 positively changed their behavioural attitudes.

For those who positively changed their behavioural attitudes there is a moderate correlation between behavioural change and perceived credibility ($r_s =$

0.349). For those who negatively changed their behavioural attitudes there is a weak correlation between credibility and behavioural change ($r_s = 0.232$). The endorsers' perceived credibility had a larger effect on those who positively changed their behavioural attitude.

Table 3: Correlations between credibility and changes in attitude according to how the behavioural attitude changed

Neg/Neut/Pos Behavioural change				Credibility	Behavioural change
Negative	Spearman's rho	Credibility	Correlation Coefficient	1.000	.232
			Sig. (2-tailed)	.	.011
			N	118	118
Neutral	Spearman's rho	Credibility	Correlation Coefficient	1.000	.
			Sig. (2-tailed)	.	.
			N	119	119
Positive	Spearman's rho	Credibility	Correlation Coefficient	1.000	.349
			Sig. (2-tailed)	.	.000
			N	189	189

From 426 respondents, 64 negatively changed their affective attitudes, 116 did not change their affective attitudes at all and 246 positively changed their affective attitudes.

For those who positively changed their affective attitudes there is a weak correlation between affective

change and perceived credibility ($r_s = 0.267$). The endorsers' perceived credibility had an effect on those who positively changed their affective attitude. There is no correlation between credibility and affective change for those who negatively changed their affective attitudes (see Table 4).

Table 4: Correlations between credibility and changes in attitude according to how the affective attitude changed

Neg/Neut/Pos Affective change				Credibility	Affective change
Negative	Spearman's rho	Credibility	Correlation Coefficient	1.000	.237
			Sig. (2-tailed)	.	.060
			N	64	64
Neutral	Spearman's rho	Credibility	Correlation Coefficient	1.000	.
			Sig. (2-tailed)	.	.
			N	116	116
Positive	Spearman's rho	Credibility	Correlation Coefficient	1.000	.267
			Sig. (2-tailed)	.	.000
			N	246	246

As Table 5 illustrates, from 426 respondents, 84 negatively changed their cognitive attitudes, 87 did not change their cognitive attitudes at all and 255 positively changed their cognitive attitudes.

For those who positively changed their cognitive attitudes there is a weak correlation between cognitive

change and perceived credibility ($r_s = 0.209$). The endorsers' perceived credibility had an effect on those who positively changed their cognitive attitude. There is no correlation between credibility and cognitive change for those who negatively changed their cognitive attitudes.

Table 5: Correlations between credibility and changes in attitude according to how the cognitive attitude changed

Neg/Neut/Pos Cognitive change				Credibility	Cognitive change
Negative	Spearman's rho	Credibility	Correlation Coefficient	1.000	.119
			Sig. (2-tailed)	.	.282

			N	84	84
Neutral	Spearman's rho	Credibility	Correlation Coefficient	1.000	.
			Sig. (2-tailed)	.	.
			N	87	87
Positive	Spearman's rho	Credibility	Correlation Coefficient	1.000	.209
			Sig. (2-tailed)	.	.001
			N	255	255

4. Conclusions and discussions

Although there are various studies that link the source credibility to positive changes in attitudes (Hovland and Weiss, 1951; Harmon and Coney, 1982; Pornpitakpan, 2004), there is not a focus on the effects of a specific ad towards the perceptions of the whole category.

The changes in affective, cognitive and behavioural attitudes were significant, thus credibility derived from brand testimonials has effects on the whole service category. All three changes were positive and while the behavioural and affective attitudes were just slightly changed, the cognitive attitudes considerably improved.

This could mean that a strong endorsement strategy for one brand would benefit the entire category in terms of rational reasons for buying. In this particular case of cosmetic treatments, the data suggest that the exposure to the testimonials of one brand could induce the idea of health benefits and reasonable expense towards all the cosmetic treatments on the market. This is an interesting finding for the beauty industry and it implies that the vendors could collaborate if a change in the perception of the services they sell is needed.

There are also other important dimensions of endorsement, besides credibility, that could explain the changes in attitude, especially the change in the attitudinal cognitive component. Therefore, a limitation of this research is the measurement of the endorsement's effect only by the instrumentality of credibility. At the same time, even though measures have been taken in this regard, there could be other components of testimonials which could influence the changing in attitude besides the sources of endorsement. Future research could investigate the relation between changes in attitudes and perceived credibility of endorsers in other context or using other stimuli than testimonials. Another limitation is the survey context in which subjects got in contact with testimonials.

For the subjects that positively changed their affective and cognitive attitudes there is a link between perceived credibility and these changes, while for those who negatively changed their affective and cognitive attitudes, such a link could not be identified. Therefore, once again, credibility appears as an important factor when a change in attitudes is desirable.

For the respondents that negatively changed their behavioural attitude there is a weak correlation between change and perceived credibility, but there is a moderate correlation between change and perceived credibility for those who positively changed their

behavioural attitude. Therefore, perceived credibility generally improves all three components of attitude and it is mostly connected with the behavioural one.

There were significant gender differences regarding the behavioural and cognitive attitudes, and females have higher scores. This was predictable bearing in mind the nature of the service. However, there were significant gender differences regarding the cognitive and affective changes and men scored higher in both situations. Females know more about cosmetic treatments and have more experience in using these types of services. Males have considerably less knowledge and experience in this area, but they are likely to easily change their cognitive and affective attitudes towards the service category, than females. There were no significant differences between genders and age regarding perceived credibility. The subjects' age did not significantly influence any of the attitude components.

The links between perceived credibility and changes in attitudes revealed that endorsers' credibility affects all three changes, the most affected being the change in behavioural attitude followed by the change in affective attitude and the change in cognitive attitude. This means that when a company wants to increase sales and the word of mouth, a greater effort has to be put in an extensive research on the credibility of the endorsers that will take part in the campaign.

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Creating a culture of risk in the Greek public administration. A brief retrospect on the memorandum era

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Abstract

Purpose -The recent financial crises in America and Europe have shown emphatically that the findings of the relevant risk management literature concluding that lurking risks can be converted into opportunities have unfortunately not informed policy. The assumption of the risk as a burden, often leads economies to crises that undermine the development and prosperity of states and citizens.

In this context, this article aims at highlighting risk characteristics and presentation of basic management principles which should govern the operation of public service organizations. The aim of the present paper is also to highlight the dual nature of risk. Risk is frequently uni-dimensionally perceived by people. Usually, its usefulness in effecting change and making the most of the manifold opportunities of the contemporary volatile environment is ignored.

Design/methodology/approach -There has been an extensive literature review on risk culture (organizations and personnel). Elements of the Greek Economy were used as well.

Findings -The significance of developing a risk culture in organizations and governments. However, the unsuccessful attempt which was made by the Greek state so as to deal with the risks, shows that minimal preparation and progress has been achieved. Based on literature review of the economic facts of the 2008-2015 period in Greece, the fact that emerges is that effective risk management is a necessary condition for the survival of public organizations in today's global environment.

Research limitations/implications-In relation to risk-taking by employees as well as their financial and operational risks in Public Administration and Economics, is ascertained that there are few studies, as opposed to the interest in the importance of taking risks in the strategy, which has risen sharply in recent years.

Originality/value- The provision of the theoretical framework for the development of a risk management culture in organizations since the States are under restructuring scheme.

Keywords: Risk, financial crises, culture of risk

JEL classification: H3, M10

1. Introduction

Nowadays, effective public administration constitutes an integral part of economic and social activity, while at the same time it is a determining factor of a country's competitiveness. Without disputing the contribution of the Greek public sector, it is believed that it must be adapted to contemporary global developments with specific interventions. The necessity to bring the Greek state to the era of efficiency emerges against a backdrop of intense political, environmental and economic risk. On the other hand, the recent financial crises have revealed that states are insufficiently prepared to deal with them. Treating risk as a burden frequently leads economies to crises that undermine growth and prosperity at both an individual and state level (WorldBank, 2014).

In order to achieve this, the paper is organized as follows: In the first section we approach risk from a theoretical perspective. The section focuses attention on individual as well as organizational behavior in a

risk situation. In the second section we highlight the importance of risk-taking in present times, we stress the need to instill risk culture in organizations and analyze the role contemporary managers must have in risk-management. The third section, through an extensive review of the literature focuses on the case of Greece and its failed attempt to manage financial risk. In the fifth section, finally, we briefly mention the conclusions of the paper.

2. Theoretical Background

2.1 Risk and doubt

Risk is neither a uni-dimensional, nor a sufficiently defined concept. It is, rather, a concept whose meaning varies according to the context in which it is used. Risk is not always a burden, as it is frequently perceived, but rather the necessary condition to bring about change and make the most of opportunities.

In most dictionaries, risk involves a potential adverse outcome. In Oxford English Dictionary the

definition offered is "the possibility of loss, injury, or other adverse or unwelcome circumstance; a chance or situation involving such a possibility". In everyday language, risk typically refers to "exposure to adversity", while, at the same time, is it associated with uncertainty and insecurity (Borge, 2008). A more comprehensive definition of risk is provided in ISO 3000 standards. The ISO 31000 (2009) definition of risk is the 'effect of uncertainty on objectives'. In this definition, uncertainties include events (which may or may not happen) and uncertainties caused by ambiguity or a lack of information. It also includes both negative and positive impacts on objectives. Many definitions of risk exist in common usage, however, the value of this definition lies in the fact that it was developed by an international committee representing over 30 countries and is based on the input of several thousand subject matter experts.

The literature contains numerous, frequently contradictory definitions of uncertainty. This weakness is considered to be due to 'lack of information', and incomplete or erroneous knowledge and information (Marais, 2005; Mitchel, 1995). According to Mitchel (1995), uncertainty must be examined in relation to the potential losses the organization may suffer as well as their extent for the organization. Uncertainty is considered the source of risk. Had there been no uncertainty, there would be no risk. As Marais (2005, p:22) puts it: "we would have known with absolute certainty what would go wrong, when it would happen, and what the consequences would be. With the proper investment in time and resources, we would be able to make fully substantiated decisions regarding our acceptance or not of future events."

In recent years, risk has emerged as a significant variable for businesses and organizations alike. In the relevant literature we find a host of references and analyses related to the impact of risk on managerial decisions and organizational performance. Many researchers focus on managers' effort to avoid risk (Bromiley et al, 2001), others emphasize the multiple dimensions of organizational risk (Bromiley, 1991; Miller and Bromiley, 1990; Miller and Leiblein, 1996), while a number of studies refer to industrial risk and its impact (Lubatkin MH, Chatterjee, 1994) as well as enterprise performance (Todd and Raihan, 2006).

2.2 Behaviors of organizations and individuals under risk

Organizations and individuals can attach different interpretations to the impact of risk. More specifically, what is seen as loss by an individual or an organization can at the same time be considered a benefit for the other side. Furthermore, tolerance for loss due to a possible risk varies from person to person and across organizations.

In the relevant literature, a number of variables that influence risk-taking behavior have been identified, such as self-confidence, perceived competence and risk propensity (Klein and Kunda, 1994; Krueger and Dickson, 1994; Mano, 1994). As regards perceived competence, Klein and Kunda (1994) observed that individuals' perceived ability to be in control,

influenced their decision to be involved in a risk-taking endeavor.

Employees who explore and implement creative ideas accept not only the risk involved but also, due to the high possibility of failure, the concomitant responsibilities (Klein and Sorra, 1996; Madjar et al., 2011). Yet, there is research that indicates that many employees prefer to participate in controlled risk rather than events or situations well beyond control, in which the risks involved are significantly greater (Klein and Kunda, 1994). In both cases, organizational culture may encourage or discourage risk-taking on the part of the manager (Sitkin and Pablo, 1992). Other research studies on decision-making in organizations have indicated that the behavior of individuals in the process of decision-making is partly determined by the extent of possible risk and have attempted to empirically explain what this risk is influenced by (Sitkin and Weingart, 1995).

There are few studies on risk-taking by employees in organizations. In their thorough study of the relevant literature, Neves and Eisenberger (2013) found only two other studies (other than their own) on risk-taking by employees. And yet, interest in the importance of risk-taking has increased dramatically in recent years (Aaker and Jacobson, 1988), with emphasis placed on the managers' propensity to assume or avoid risk. Risk propensity, or rather, orientation to risk, is defined as a general tendency to prefer a risky alternative (Pablo et al., 1996; Sitkin & Pablo, 1992; Sitkin, & Weingart, 1995). Risk propensity is influenced by whether a certain level of risk can be considered acceptable by an organization, by the overall risk tolerance (Walls & Dyer, 1996) and tolerance of failure (Danneels, 2008). Risk orientation influences the extent to which organizations perceive a situation as an opportunity or as a threat, the kind of decisions that will be made, and, finally, investments made in order to redistribute resources within an organization (Phathak, 2013).

2.3 Risk-taking in organizations

The field of risk management emerged in the 1990s. In recent years, interest in the field has exploded for a number of reasons. Some factors conducive to the rising research interest are the changes in the competitive international arena, as well as the trend for increasing complexity and unrest (Chapman & Ward, 2003; Giddens, 2003; Rahman & Kumaraswamy, 2002). This became evident after a series of severe economic and corporate scandals of the 80s and 90s (Beck, 1992).

Successful risk-taking in organizations includes the actions that have uncertain outcome, but potentially high returns (Chiles & MacMackin, 1996). In order to be able to cope with constantly increasing competition on a global scale, and to maximize profits, organizations demand of managers and employees to take initiatives and manage increased risk which may significantly damage the organization in case of failure. Organization risk-taking can be successful in some cases, while in other cases unsuccessful, or even utterly catastrophic. In both cases, the examples are numerous. Neves and Eisenberger (2013) indicatively mention as examples of both successful and unsuccessful risk-

taking. Examples of the former are changes brought about by (internet) technology in consumer habits, exchange of information and formation of relationships, while examples of failures caused by excessive risk-taking are 'the bust of the dotcom bubble of the 1990's and the recent massive bankruptcies in the home mortgage and banking industries' (Neves and Eisenberger, 2013: p.188).

A significant parameter that determines the effort of a risk-bearing organization to survive to a large extent is the ability of managers who bear the responsibility of risk management to understand risk as a source of danger for the organization and to comprehend how significant it is to avert it. For Keough, high-level executive of Coca-Cola Co, risk-taking should be actively pursued by organizations (Keough, 2008).

2.4 Risk management and culture of organizations

Levy, Lamarre and Twining (2010, p.3) defined risk culture as "the norms of behavior for individuals and groups within an organization that determine the collective ability and understand, openly discuss and act on the organization's current and future risks". Standard & Poor's (2008) highlighted the significance of an organization developing risk culture, advising "risk-bearing" companies "to look beyond the technology, and create risk management culture throughout the organization" and proposing that ERM (enterprise risk management) "must be introduced into existing practices, the behavior of individual managers and the daily decisions they make."

Every organization demonstrates a different culture that can lead it to exceptional performance. Shahzad, Luqman, Khan and Shabbir (2012) argue that organizational culture has significant consequences for employees' performance, which can increase productivity and enhance overall organizational performance. Kefela (2010) adds that, organizational culture has a significant effect on the way an organization implements its business strategy and achieves its goals.

However, literature is divided concerning the compatibility of organizational and risk management culture. The adoption and implementation of enterprise risk management (ERM) is influenced by various factors. A number of studies point out that risk culture is one of the significant aspects of risk management that members of the Board must comprehend. The reason behind this is that risk management implementation will fail if the risk management culture is not understood by all levers of the enterprise (Roslan and Dahan, 2013). When it comes to implementing ERM, previous studies consider organizational culture an obstacle and limitation (Kleffner et al., 2003). Kimbrough (2009) concurs, as the results of his study showed that organizational culture had a negative impact on the efficiency and speed of deployment of the enterprise risk management.

It is essential that there should be consensus as regards the necessity of instilling a risk culture in organizations. In order to implement a healthy enterprise risk management system, the Board of Directors, as well as management, should make sure

that the risk management framework is embedded in the company culture, procedures and structures (IRM, 2012).

2.5 Risk management and the managers' role

Enterprises have acknowledged the possibility of occasional risk within them and have launched manager training programs. There is extensive literature on the subject, in the fields of economics, finance, strategy and international management (Jutner, 2003). Since last decade, risk management has been included in Executive training programs, changing the perception that its use is limited and localized to insurance experts only (Canivato, 2004).

The basic underlying principle of studies in organizational risk is that the behavior of the enterprise is a reflection of the behavior of its managers. Thus, the conceptual framework behind the analysis of different results observed in enterprises in the process of decision making is primarily based on an understanding of human behavior. According to Fiegenbaun and Thomas (1988), it is most important to address the question of the extent to which the different behavior of managers in the face of risk can be translated into organizational behavior.

The way a manager perceives risks defines the way he then assesses them. In the literature, there are frequent references to multiple risk assessment methods that identify and focus on the social construction and dimension of risk (Reith, 2004; Mairal, 2008). It is frequently acknowledged, that risk assessment procedures should take more systematic account of the psychological, social, cultural and political dimensions of risk (Slovic, 1999).

2.6 Risk Assumption

Recent years have seen a revival of interest in risk management (Scapens and Bromwich, 2009). In the literature the assumption of risks includes the actions which may have uncertain results but potentially high performance. Publishing houses, corporate websites and official organization reports usually include special units with instructions on how organizations should manage risks. A wide array of risks is considered, including financial exposure, information system interruptions, fraud, client bankruptcies and regulatory changes.

The assumption of risk has been extensively studied in contexts such as entrepreneurship (Stewart and Roth, 2001), strategic management (Latham and Braun, 2009), consumer behavior (Mitchell and Nygaard, 1999), sexual behavior (Kirby, 2002), decision making processes, and investigation of motives for their assumption (Tversky and Fox, 1995). To effectively participate in international competition, which has recently increased, and to effectively increase their profits or citizens' benefits, organizations require from their managers and employees to show initiative and manage increased risks despite the fact that these risks may incur serious economic losses to the organization in case these initiatives fail.

The optimal (level of) danger that maybe assumed by an organization differs significantly depending on the line of work and type of organization (Molina-

Morales et.al, 2011). However, risks managers should seriously consider that very low as well as very high risk assumption maybe equally dangerous for the long-term prosperity of the organization (Wicks et.al, 1999). As Neves and Eisenberger (2013) add, when organizations and employees assume very low or very high risk, there are serious repercussions for the employees as well as for the organizational effectiveness. Having said that, when risk assumption is used wisely, it can be useful for both new and well established organizations.

2.7 A brief outline of the financial crisis worldwide

The first phase of the global financial crisis began in August 2007. It was then that the ECB started providing liquidity to European banks to help them cope with their losses due to their large exposure to the US market, the support they provided to the dollar and the purchase of American mortgage securities. The global crisis reached its climax in September 2008 with the collapse of Lehman Brothers. The severe global financial crisis at the end of 2008 and the beginnings of 2009 shocked Europe as well as the US (Lane, 2012).

In 2008 and 2009, there was relatively little concern about a European sovereign debt crisis. Instead, the focus turned to the ECB's actions to address the global financial crisis. For its part, the ECB proceeded directly to the following initiatives: along with other major central banks it cut interest rates on short-term deposits in order to secure extensive liquidity of the common currency, and entered into currency swap agreements in order to facilitate European banks' access to liquidity in dollars. But the global economic crisis had asymmetric effects across the euro area. Financial flows between banks ran dry at the end of 2008, with investors repatriating their capital to domestic markets and reassessing their exposure on a global level (Milesi et al, 2011). This fact had direct consequences on those countries (including Greece) that relied heavily on international short-term debt markets and triggered a broader reassessment of asset values and growth prospects, especially for countries that displayed macroeconomic imbalance (Lane, 2012). The domino effect had been set in motion.

2.8 The Greek Public Sector

Greek public administration is a big and complex system consisting of organizations of different types and sizes, which provide all kinds of state services to the citizens (e.g. health services, education, insurance, social services, financial services, development services, culture services, etc.). The central government as well as most of the public organizations are based on the nation's capital even though the "Kapodistria Law" provides the possibility of decentralizing public administration and transferring its jurisdiction to regional and local authorities.

According to the authors of the operational programme "Politeia", in the 21st century Greek Public Administration is still characterized by the well-known pathologies: absence of collective action, lack of meritocracy, irrational management of limited available resources, corruption, inertia, legalism, administrative leveling down, atrophy of disciplinary law, mentality of

putting in little effort, duplication of effort, lack of a rational approach to job design (GSPAEG, 2005). For the reversal of the current situation, that is, for the transformation of the public sector from a rigid and bureaucratic type of organization to a modern and flexible one, the Greek State is taking action.

2.9 The economic crisis in Greece

Throughout its history, even from the years of the Ottoman Empire, Greece has been linked with severe public debt problems. In fact, it has spent more than half of the years since its 1832 independence from the Ottoman Empire in heavy debt. Economists highlight the deeply rooted characteristics of the Greek economy and society which have prevented sustainable economic growth and have created the conditions for the current crisis. Key characteristics of these conditions are: a wasteful state, large and ineffective public administration, widespread tax evasion, extensive clientelism (Nelson et.al, 2011).

Two additional factors incrementally contributed to the creation of the new post-war economic crisis. First, the dramatic decrease of borrowing costs for Greece since its (preparation for the) adoption of the euro currency. Second, the EU member states are committed to the regulations of the Stability and Growth Pact dictating restriction of budget deficits (to 3% of GDP) and levels of public debt (to 60% of GDP) for each state. Lenience in the EU audits, however, led to unrestricted borrowing by the Greek government.

The massive inflow of capital with low interest rates during the 2000's and the international financial crisis of 2008-2009 further deteriorated the structural problems of the Greek economy resulting in non-sustainable public finances. The Greek government took advantage of access to cheap credit to pay state expenses and to counterbalance low tax revenues (Nelson et al, 2011) while borrowed capital was not channeled to productive investments. Instead, capital flow was used to fund current consumption (Nelson et al., 2011).

2.10 Parameters that led to the Greek recession

The Greek crisis is a combination of the financial market upheaval and domestic weaknesses (chronic fiscal and commercial deficits). In order to understand the reasons that led to this unprecedented financial crisis we distinguish two periods: the pre-EMU accession period and the post-EMU accession one.

Greece, between 1993 and 1999, decreased its budget deficit by nine percentage points (of GDP) in order to be able to join the EMU. The country was forced to correct its fiscal imbalances as, due to failure to adapt to a series of hard budget constraints, it faced the risk of being excluded from joining the monetary union. In contrast to the harsh conditions of the pre-accession period, being in the EMU was characterized by the implementation of the Stability Pact, which allowed Greece to violate the letter and spirit of the Pact. In fact, for nine years, between 2000 and 2008, Greece violated consistently the 3% budget deficit ceiling (Katsimi & Moutos, 2010). These large gaps between pre- and post-accession budgets jeopardized the credibility of Greece in the European context. As Katsimi and Moutos (2010)

explain, a series of domestic and foreign factors combined with cumulative effect to account for the deplorable condition of the Greek economy. Regarding the negative consequences, they focus on the following:

Firstly, the Maastricht criteria (prerequisites for EU accession) exclusively focused on numerical targets, without paying due attention to the quality of the fiscal adjustment of the accession country. The Greek experience confirms the ephemeral nature of the adjustments that rely excessively on tax increases. From 1993 to 2000, the ratio of tax revenues to GDP increased by about eight percentage points, while the ratio of public spending to GDP remained intact. During the EMU period, and until the time when the global crisis started to affect Greece (2008), the total expenditure was kept between 43% - 45% of GDP, while tax revenue was on a downward path (42,9% in 2000 to 39.6% in 2007).

Secondly, Greek politicians were slow to implement cuts in expenses, contrary to measures of income tax increase that clearly carried less political cost. Thirdly, the increasing influence of labour unions and employer associations, in combination with the politicization and weakening of the autonomy of the bureaucratic apparatus after 1974 (and especially after 1981), which paved the way for the gradual transformation of Greek state administration from an almost "developing state" to "a state in limbo".

2.11 The cost of the Greek crisis

The risks faced by Greek state organizations are economic as well as operational. In general, risks faced by a country are multiple and may come from the external (primarily financial) or the internal environment. The current crisis has given rise to new risks and serious consequences. The impact of the fiscal crisis in Greece is profound and has contributed to the deterioration of the operation of the public sector and its responsiveness to the citizens' needs. This deterioration is not only reflected on the personnel working in the public sector but also has broader implications concerning its social mission and productivity, in a juncture when, due to the economic crisis, there are intense negative consequences on society. In this section, the effect of contractionary policy on expenditures, employment and benefits is examined. Some features of this period are as follows:

a) In terms of public spending: Over the 2001-2006 period, general government expenses in Greece were on average 45,4% of GDP as against 46,4% of the EU average and 47,2 of the Eurozone average. In the following three years and until the beginning of the current crisis, there followed a dramatic increase of public expenses in most EU countries, as well as in Greece. Thus, in 2009 general government public expenses rose at 51.0% of the GDP for the EU-27 average (Eurozone: 51.2%) and at 54.0% for Greece. In the memorandum period for Greece (2010-12) public expenses on the GDP were restricted to the EU average (2012: 49.3%), (Kouzis et al., 2013)

b) In terms of employment: According to the Ministry of Administrative Reform and E-Governance, in the years 2009-2012, employment in the broad civil sector (including state-owned enterprises as well as

uniformed personnel of the military, police, port authority, firefighters, etc.) decreased by 20,8 %. Specifically, it has been reduced by 221.143 employees, that is, 194.586 in the narrow public sector and 26.457 in Public Utility companies. Total employment in the civil service dropped from 1.066.729 employees (of whom approximately 125.000 uniformed officers) in 2009, to 776.954 (of whom 68.732 in Public Utility companies) in the first months of 2013. This amounts to 18% of total employment, diverging from the European average (Kouzis et.al 2013).

c) In terms of social welfare: During the period 1995-2009 the general government in Greece spent smaller amounts (as percentage of the GDP) as compared to the EU-15 average on health, education and social welfare. "This fact reflects the lack of adequate emphasis on public sector functions that are at the center of public policy in other EU-15 states." (Argitis et al. 2011) What is noteworthy, however, is that there is a striking gap between Greece and EU-15 as regards the amount spent on general public services: 11% of the GDP for Greece, as opposed to 7.1% of the GDP, which is the EU-15 average.

3. Conclusions

The present paper attempted a theoretical approach to the double dimension of risk and the positive externalities that may be produced for an organization given the opportunity. In this light, we highlighted the basic characteristics of risk and its intricate relation to uncertainty in the context of the fiscal crisis in Greece. We also stressed the significance of investigating the impact of risk on organizational strategy, daily decision-making in organizations and performance. A study of the literature showed that organizations may be subject to different kinds of risks, the extent of which and the gravity of their consequences may vary.

The next section investigated the behavior of managers as well as of organizations according to the different definition one may attach to risk, as well as its influence on organizations. Furthermore, we studied variables that affect managers' risk-taking behavior. From recent studies it is revealed that individuals' perceptions regarding their competence to be in control of events affected their decisions to participate in a risk-bearing act. In these cases, organizational culture may encourage or discourage risk-taking on the part of managers and, ultimately, generate the type of company that "knows a lot and does a lot." However, regarding risk-taking on the part of employees, little research has been produced, despite the rising interest in risk-taking as part of strategy.

The last section is a brief account of the unsuccessful attempt of Greece to cope with the risks of exogenous (financial) and endogenous risks (financial, operational, etc.). In support of the above, we mentioned the factors that led to the Greek crisis and the impact it has had on the economy and citizens. Finally, treating creditors as an 'inexhaustible purse' leads contemporary interdependent economies to over-borrowing, which then gives rise to financial crises that undermine the growth and prosperity of states and citizens around the world.

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Determinants of Egyptian Banking Sector Profitability: Time-Series Analysis from 2004-2014

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Abstract

Purpose - The purpose of this paper is to examine the determinants of banking sector profitability in Egypt to shed light on the most influential variables that have a significant impact on the performance of this vital sector.

Design/methodology/approach - The analysis includes a time series model of quarterly data from 2004 to 2014. The model utilizes Cointegration technique to investigate the long-run relationship between the return on equity as a proxy for bank profitability and several bank-specific variables including liquidity, capital adequacy, and percentage of non-performing loans. In addition, Vector Error Correction Model (VECM) is utilized to explore the short-run dynamics of the model and the speed of adjustment to reach the long-run equilibrium.

Findings - The main findings of this work show that banking sector profitability is inversely related to capital adequacy, the percentage of loan provisions and the ratio of deposits to total assets. On the other hand, it is positively related to the size of the banking sector which implies that the banking sector exhibits economies of scale.

Research limitations/implications - The implications of this work is that it helps reveal the major factors affecting bank performance in the short-run and long-run, and hence provide bank managers and monetary policy makers with beneficial insights on how to enhance bank performance. Since the banking sector represents one of the main engines of financing investment, enhancing the efficiency of this sector would contribute to economic growth and prosperity

Originality/value - The Vector error correction model showed that about 4% of the disequilibrium is corrected each quarter to reach the long run equilibrium. In addition, all bank specific variables were found to affect profitability in the long-run only. This study would serve as a base that further work on Egyptian banking sector profitability can build on by incorporating more variables in the analysis or investigating other types of econometric models.

Key words: Bank Profitability- Bank Performance- Determinants- Egypt- Time Series Analysis

JEL Classification: G21, C22

1. Introduction

Banks play a crucial role in the performance of the economy as a whole. This is particularly relevant in Egypt where the banking sector plays a significant role in the financial system. The Egyptian banking system represents one of the main channels of household savings. It is also a major source of financing public and private investments. Total deposits in local currency at banks reached 1009674 Million L.E. in 2014 as opposed to 255283 Million L.E. in 2004 with a growth rate of 295%. Similarly, domestic credit increased by 285% during the same period to reach 1625141 Million L.E. in 2014 as opposed to 422040 Million L.E. in 2004. These figures show the significant expansion of the banking sector activities as a major financial intermediary that channels household savings into investments. That said, the flourishing of the banking sector is necessary for macroeconomic stability and growth.

The study of bank profitability is crucial for several reasons. First, the study of bank profitability is a crucial determinant of employment and growth opportunities in the banking sector. An increase in profitability improves the financial status of banks making it easier

to access sources of finance. This enables expansion of scale of operations and market growth which results in enhancing productivity, employment and growth of the banking sector (Ayanda et al., 2013).

Accordingly, it is crucial to identify the main variables that affect bank profitability in order to provide bank managers and monetary policy makers with beneficial insights on how to enhance bank performance. Since the banking sector represents one of the main engines of financing investment, enhancing the efficiency of this sector would contribute to economic growth and prosperity.

In addition, empirical findings prove that bank profitability is one of the early signals of financial crisis. Moreover, given imperfect capital markets, the fluctuations in banking sector profits affect the ability of banks to issue loans and finance investment, thereby depressing economic growth. In other words, a decline in profits will make it too costly to issue new shares due to transaction costs and tax disadvantages. As a result, banks will reduce lending to be able to meet regulatory reserve requirements. This is known as "bank capital

channel hypothesis" (Albertazzi and Gambacorta, 2009).

Given the importance of the study of profitability, this paper attempts to investigate the determinants of Egyptian banks profitability using time series analysis of quarterly data from 2004 to 2014. This will help determine the most influential variables that affect bank performance and hence provide insights on how to formulate policies and procedures to enhance bank profitability.

2. Literature Review

The study of the determinants of bank profitability dates back to Short (1979) and Bourke (1989). Short (1979) examined the relationship between commercial bank profits and bank concentration in addition to other explanatory variables. He found that greater market power lead to an increase in bank profits. Bourke (1989) continued to investigate the determinants of bank profitability based on Short's study. He found that capital ratios, liquidity ratios and interest rates are all positively related to the return on assets that was used as a proxy for profitability. While staff expenses were shown to have a negative impact on profitability. Finally, he reached similar findings to Short (1979) with respect to the positive impact of concentration on profitability. He further noted that higher levels of concentration are associated with lower levels of loan portfolio risks.

Following that, a number of empirical studies have been conducted to investigate the determinants of bank profitability. The existing literature divides the factors that affect bank profitability into endogenous variables that are related to bank specific characteristics and exogenous variables that are related to the macroeconomic environment. This work, however, focuses on bank-specific variables because it aims at identifying the impact on endogenous variables that are under the control of bank managers in order to provide policy implications at the bank level to maximize profits.

Another classification in literature is based on the number of countries investigated. Some studies on bank profitability used a panel of different countries while others focused on the banking sector of a single country. Examples of Panel data studies include Molyneux and Thornton (1992), Staikouras and Wood (2004), Goddard et al. (2004), Athanasoglou et al. (2006), Pasiouras and Kosmidou (2007), and Brissimis et al. (2008). The empirical findings of these studies are mixed. However, most of these studies found out that there is a significant positive relationship between equities/assets ratio and bank profitability implying that well-capitalized banks are more profitable. The ratio of loan loss provisions to total loans was found to be significantly negative as suggested by theory. As for liquidity, the results were mixed. Abreu and Mendez (2002) found that loans to assets ratios have a positive impact on profitability, while the results of Staikouras and Wood (2003) indicate that that loans to assets ratio is inversely related to banks' profitability. This implies that banks which

invest in non-loan earning assets are more profitable than banks which rely more on loans.

Flamini et al. (2009) examined the factors affecting commercial bank profitability in Sub-Saharan Africa using a sample of 389 banks in 41 Sub-Saharan countries. They found that higher profitability is associated with larger bank size supporting the economies of scale hypothesis. Capital ratio also has a positive impact on profitability but only after a substantial lag indicating that any increase in capital is not reinvested immediately but takes some time to be reflected in profits. In addition, banks with more diversified activities tend to have higher levels of profits. Finally, they found that a stable macroeconomic environment represented in low inflation and output growth has a positive effect on bank performance.

Since this work focuses on a single country, namely Egypt, this survey of literature will present similar work in order to explore their findings and compare the empirical results. Numerous single country studies focused on the determinants of banking sector profitability in emerging countries as cited in Ben Naceur and Goaid (2008).

Most of these studies were conducted in Tunisia (Ben Naceur and Goaid, 2008), Nigeria (Ayanda et al., 2013), Columbia (Barajas et al., 1999), Malaysia (Guru et al., 2002) and Brazil (Afanasiyev et al., 2002). Some of these studies investigated the impact of financial liberalization on bank profitability, and showed that liberalization measures affect profitability indirectly by influencing the variables behind interest rate spreads. Other studies focused on the endogenous and exogenous determinants of bank profitability. The results are similar to the findings of the studies conducted in developed economies. Macroeconomic variables represented in inflation rates, economic growth and required reserves are important determinants of bank profitability. As for endogenous factors, profitable banks were those who were able to increase their equity, had higher levels of deposits to asset ratios and who had more efficient internal management.

To conclude, the existing literature on bank profitability is comprehensive and has tackled different endogenous and exogenous variables related to profitability. However, to our knowledge, no study has investigated the profitability of Egyptian banking sector. The studies on the Egyptian banking system (Mohieldin, 2000, El-Shazly, 2001; Nasr, 2012; Herrera and Youssef 2013) focused on the market structure of the banking sector and sector developments and restructuring rather than the determinants of their profitability. Thus, this study attempts to fill this gap by investigating the determinants of profitability to provide insights to policy makers in order to enhance the performance of this vital sector. This study would also serve as a base that further work on Egyptian banking sector profitability can build on by incorporating more variables in the analysis or investigating other types of econometric models.

3. Model Specification

3.1 Data and Methodology

This study relies on quarterly data of banking sector indicators collected from various issues of monthly statistical bulletin published by the Central Bank of Egypt. The descriptive statistics of the selected variables is shown in Table 1. The variables that are included in the econometric model are:

Dependent variable: Return on Equity (ROE). ROE is defined as the ratio of net profits to total equity, expressed as a percentage. This measures the return to shareholders on their equity. Normally in literature, there are three variables that are used to measure profitability: return on average equity (ROE), return on average assets (ROA) and net interest margin (NIM). ROA measures the ratio of net profits to total assets, while NIM is defined as net interest income divided by total assets. In our analysis, we will rely on ROE as a measure of profitability. At first, pilot trials of the model were run using ROA as the dependent variable, however due to repeated observations in the available data set, near singular matrix error was found. Thus, ROE was selected to be the dependent variable in our model especially that empirical research findings (Goudrean and Whitehead (1989) and Uchendu (1995) as cited in Ayanda et al., 2013) show that the three proxies of profitability yield similar results, thus any one of them can be used as the dependent variable.

Independent variables: Bank specific characteristics

EQ: The ratio of equities over total assets. This variable is used as a proxy for capital adequacy. A higher value of this ratio implies that the bank is more capable to absorb shocks since higher equity reduces the need to external funding. Moreover, well-capitalized banks face a lower risk of bankruptcy. Thus, it is expected that the higher the value of this ratio, the more profitable the banking sector is (Dietrich and Wanzenried, 2011; Kosmidou, 2008). On the other hand, some authors argue that higher equity to assets ratio suggest lower risk-taking by banks and hence lowers the expected return on equity and decreases profitability (Molyneux, 1993 as cited in Staikouras and Wood, 2004). Moreover, higher equity to assets ratio decreases tax shield provided by the deduction on interest payments and hence lowers after tax profits.

LOANPROV: This variable is defined as the percentage of loan provisions to total loans. This ratio denotes the banking sector asset quality. A higher value of this ratio means that the credit risk is higher and hence assets quality is poor. From one perspective, the

risk-return hypothesis implies that the higher the risk, the higher the return. Thus, according to this hypothesis, it is expected that there is a positive relationship between this ratio and bank profitability. On the other side, poor asset quality increases the costs of financing and increases the possibility of default which results in a reduction of the interest and installments income paid to the bank. Hence, it is expected that a higher value of this ratio has a negative impact on profitability (Kosmidou, 2008; Dietrich and Wanzenried, 2011).

DEPASSETS: The ratio of deposits to total assets. This variable denotes the impact of funding source on bank profitability. In general, a higher volume of deposits leads to higher profitability as long as these deposits are channeled to interest-earning loans and profitable investments. However, if the deposits are not directed to loans, more deposits can depress profitability because in this case it will represent idle money (Vong and Chan, 2006).

LOANSDEPOSITS: the ratio of loans to total deposits, which is used as a proxy for liquidity. A higher value of bank loans to total deposits denotes less liquidity because the bank is holding less reserves or liquid assets (Kosmidou, 2008; Vong and Chan, 2006). Banks tend to hold liquid assets to be able to meet liquidity requirements. However, liquid assets have a lower rate of return. Thus, a higher level of liquidity implies a lower level of loans to deposits ratio and hence lower level of interest bearing assets and lower profitability.

BRANCHES: This variable shows the total number of branches of banks operating in Egypt. It is used to measure banking sector size. It is expected that this variable will have a positive effect on profitability since the larger number of branches enables the banking sector to benefit from economies of scale and improve managerial operations.

To proceed with the analysis of the determinants of Egyptian banking sector profitability, a number of steps are taken. First, we will test for stationarity of the variables to avoid spurious regression resulting from using nonstationary variables entered at their level form. If all variables were found to be non-stationary but integrated of the same order, we will proceed to investigate whether there is a long run relationship between variables through Johansen test of cointegration. Finally, the Vector Error Correction Model (VECM) will be utilized if the variables are cointegrated to capture the short run dynamics of the model as illustrated in the next section.

Table 1: Summary statistics of the variables

<i>Variable</i>	<i>ROE</i>	<i>EQ</i>	<i>DEPASSETS</i>	<i>LOANSDEPOSITS</i>	<i>LOANPROV</i>	<i>BRANCHES</i>
<i>Mean</i>	13.14	5.82	73.16	52.43	12.84	3326.273
<i>Median</i>	13.70	5.70	73.25	52.65	13.70	3451.500
<i>Maximum</i>	17.70	7.10	79.40	65.70	16.50	3743.000
<i>Minimum</i>	9.10	4.80	67.40	40.40	8.60	2771.000
<i>Std. Dev.</i>	1.88	0.79	2.99	6.21	2.47	329.1380

Source: Author's calculation based on CBE data, Monthly statistical bulletin, different issues

3.2 Econometric modeling

3.2.1 Stationarity tests of the variables

To test for stationarity, the Augmented Dickey Fuller test is utilized. This test takes the form shown in equation

$$\Delta Y_t = \alpha + B_t + \rho y_{t-1} + \sum_{j=1}^p \delta \Delta Y_{t-j} + E_t \quad (1)$$

where Y_t is replaced by each variable of the model. In this equation the first difference of the variable is regressed on a constant, linear trend and first lag as well as other lags of the dependent variable. The null hypothesis of the ADF test is $B=0$, and $\rho = 1$ indicating that the variable is non stationary. If the absolute value of the ADF test statistic is greater than Mackinnon critical values, the null hypothesis is rejected indicating that the variable is stationary (El-Kawaga et al., 2013).

3.2.2 Johansen test of cointegration

If all variables are integrated of the same order, we can proceed to apply the cointegration test. If the variables are cointegrated, this implies that a linear combination of the variables is stationary. In this case, they can be used in regression at their level form without leading to spurious regression. In addition, cointegration implies that there exists a long-run relationship between the variables. There are numerous tests to test for the presence of cointegration among variables including the Engle-Granger procedure and the Johansen Maximum Likelihood test of cointegration. However, the Johansen test has been reported in literature to be more powerful than the Engle-Granger procedure (Shintai, 1994 as cited in Nazier and Essam, 2012). Moreover, it has the advantage of taking into account the presence of more than one cointegrating vector (El-Baz, 2014).

3.2.3 Vector Error Correction Model

If all variables are cointegrated, it will be useful to proceed with VECM model. VECM model gives information about the short run dynamics of the model and the speed of adjustment at which the dependent variable reaches the long run equilibrium after a change in independent variables. Thus, VECM shows the short run properties of the cointegrated series. The VECM model can be represented by equation

$$\Delta Y_t = \alpha_0 + \sum_{i=1}^p \alpha_{1,i} Y_{t-i} + \sum_{i=1}^p \alpha_{2,i} X_{t-i} + \theta ECT_{t-1} + E_{1t} \quad (2)$$

where: $\alpha_{1,i}$ and $\alpha_{2,i}$ measure the short run relationship between the variables X and Y, the term ECT_{t-1} refers to the error correction term which indicates the speed of adjustment towards equilibrium and the coefficient θ should be negative and significant (El-Baz, 2014).

4. Empirical Results and Discussion

4.1 Stationarity results

All variables were found to be non-stationary at level since the ADF test statistic was found to be lower than the critical values at all levels of significance. Thus, we cannot reject the null hypothesis of the presence of

unit roots. However, after taking the first difference, the variables became stationary. This implies that all variables are integrated of order 1 as shown in Table 2.

Table 2: Augmented Dickey Fuller test of stationarity

Variable	At level		First Difference	
	ADF Test statistic	Critical values*	ADF Test statistic	Critical values*
ROE	-2.71	-3.52	-8.5	-3.52
Equities/Deposits	-2.96	-3.52	-7.16	-3.52
Deposits/Assets**	0.66	-1.95	-2.45	-1.95
Loan provisions/total loans	-2.44	-3.52	-9.20	-3.52
Loans/Deposits	-2.93	-3.52	-6.4	-3.52
Branches	-1.91	-3.52	-4.62	-3.52

* The table shows critical values at 5% level of significance

**Trend and constant were not significant for deposits/assets variable

4.2 Johansen Cointegration test

Since all variables are integrated of the same order, we can proceed to apply the Johansen cointegration test to determine the number of cointegrating vectors. To identify the lag length of this model, the Schwarz information criterion and the Hannan-Quinn information criterion of the Unrestricted Vector Auto Regression model (VAR) were adopted. These two criteria recommend using 1 lag in the model.

In the Johansen cointegration test, two tests are utilized to determine the number of cointegrating equations: the trace test and the maximum Eigen Value test. The results, presented in Table 3, show that there is one cointegrating vector according to the trace test¹.

Table 3: Johansen Cointegration Trace test results

Hypothesize d No. of CE(s)	Eigen Value	Trace Statistic	0.05 Critical Value	Prob .**
None *	0.60041	98.8691	95.7537	0.03
At most 1	0.40765	60.3417	69.8189	0.23
At most 2	0.30987	38.3478	47.8561	0.29
At most 3	0.27062	22.7712	29.7971	0.26
At most 4	0.14391	9.51777	15.4947	0.32
At most 5	0.06876	2.99208	3.84147	0.08

Trace test indicates 1 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

ROE= 181.7 -32.1 EQ -2.5 DEPASSETS

¹ When running the Johansen Cointegration test, it has been found that the trace test and the maximum Eigen Value test give different results. It has been suggested in literature (Alexander, 2001 as cited in Asari et al., 2011), that in these

cases, the trace test results are preferred. Thus, the analysis presented relies on trace test results.

$$-4.4 \text{LOANPROV} + 0.34 \text{LOANDEPOSITS} + 0.064 \text{BRAN} \quad (3)$$

(-4.48) (-2.40) (0.497) (4.23)

(-3.6) (0.497) (4.23)

Equation (3) represents the cointegrating equation. The numbers in parenthesis show the t-statistic for the cointegrating coefficients. At 5% significance all coefficients are significant except the ratio of loans to deposits.

Bank profitability was found to be inversely related to capital adequacy. Although this result contradicts most empirical research findings, it is consistent with economic theory that states that maintaining high capital levels is associated with lower risk taking activities and hence lower profitability. This implies that Egyptian banks do not manage their capital efficiently. This is also consistent with the results of Ayanda et al. (2013) and Berger and Mester (1997) who argued that the amount of equity capital requires a number of decades to be used to expand the asset portfolios of banks. Bank profitability was also negatively related to the percentage of loan provisions as consistent with other studies findings. As for the ratio of deposits to total assets, it is negatively related to profitability implying that there is a large volume of deposits that are not channeled to investments. The banking sector also exhibits economies of scale in the sense that expanding banking operations and increasing the number of branches lead to higher profits.

4.3 Vector Error correction Model

The results of the VECM are shown in equation (4) below.

$$\Delta \text{ROE} = -0.346 \Delta \text{ROE}_{(t-1)} - 0.606 \Delta \text{EQ}_{(t-1)} - 0.126 \Delta \text{DEPASSETS}_{(t-1)} - 0.045 \Delta \text{LOANPROV}_{(t-1)} + 0.008 \Delta \text{BRANCHES}_{(t-1)} - 0.04 \Delta \text{EC}_{(t-1)} \quad (4)$$

where $\text{EC}_{(t-1)}$ is the error correction term. It is statistically significant at 5% level of significance and has the correct negative sign indicating that any short term fluctuations between the independent variables and the dependent variable are automatically corrected in the long run to provide a stable long run relationship. The error correction term shows that about 4% of the disequilibrium is corrected each quarter to reach the long run equilibrium. The remaining short term coefficients were found to be insignificant which implies that all bank specific variables affect profitability in the long-run. This is quite reasonable since it takes time for any change in those variables to be reflected in the profitability indicators.

5. Conclusion and Policy Implications

This paper investigated the determinants of Egyptian banking sector profitability using quarterly time series data from 2004 to 2014. The study utilized Cointegration technique and vector error correction model to explore the long-run relationship among banking sector variables in addition to the short-run dynamics. The results of this work show that bank profitability, as measured by the return on equities, is inversely related to capital adequacy, the percentage of

loan provisions and the ratio of deposits to total assets. On the other hand, bank profitability is positively related to the size of the banking sector as measured by the number of branches which implies that the banking sector exhibits economies of scale. The Vector error correction model showed that about 4% of the disequilibrium is corrected each quarter to reach the long run equilibrium. In addition, all bank specific variables were found to affect profitability in the long-run only.

As a matter of policy implications, several procedures can be taken at the bank level to improve the profitability of the Egyptian banking sector. First, bank managers need to diversify their portfolios, enter new markets and increase their managed risk-taking activities instead of maintaining high capital ratios since our findings suggest that a higher equity to assets ratio lowers risk and hence lowers the return on equity. Second, banks need to maintain efficient credit departments to evaluate the credit risks associated with their loans since higher ratios of loan provisions to total loans has a negative impact on profitability. Finally bank managers should seek to channel deposits into profitable investments and enter as partners with investors, and benefit from economies of scale by increasing bank size.

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Social capital at the outburst of the economic crisis in Greece, 2008-2010

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Abstract

Purpose – Social capital and its core components of social trust and associational activity are widely acknowledged as a core feature of strong and active civil societies that promote effective democratic governance and economic prosperity. Within this context the present study sets out to explore two important research questions. The first one relates to the stock of social capital characterizing Greece and its change during a highly sensitive era, that of the outburst of the economic crisis. The second research question relates to analyzing the group of civil servants as carriers of higher or lower levels of social capital compared to the other citizens.

Design/methodology/approach – Based on the available knowledge in the field social capital is measured via the measurement of six main constructs comprising the soft and hard attributes of the concept, namely social trust, social altruism, equality, tolerance, humanitarianism and civic participation. Data are drawn from the European Social Value round 4 (2008) and round 5 (2010) surveys for Greece.

Findings – Overall, empirical analysis indicates that the country experiences a statistically significant decline in its social capital level while public servants hold higher levels of social capital albeit also declining as for the rest of the country's citizens.

Research limitations/implications – Important policy implications arise as a result of these findings related to issues of democratic legitimation and social participation.

Originality/value – the research questions analysed here are important as they can help us sketch the country's profile with regard to the important concept of social capital that is highly associated with civil empowerment, democratization and increased civic participation levels.

Keywords: Social capital, social trust, civic participation, public servants.

JEL Classification: A13; D71; H83

1. Introduction

Social capital is the 'newest' concept of capital that has come to use alongside the traditional concepts of financial, physical and human capital (Westlund, 2006). Despite that the connotations currently associated with the concept are traced back to Hanifan (1916) it took several decades until the works of Jacobs (1961) and Hannerz (1969), in the USA, and the works of Bourdieu (1980) and Bourdieu and Wacquant (1992), in Europe, have made social capital a familiar concept. The emergence of the concept initiated a longstanding discussion about its content and the sphere of its identification (see indicatively, Westlund, 2006; Koniordos, 2006). Largely drawing from an anthropological and sociological background, the early works in the field have provided definitions of the concept that have focused on the individual (Jacobs, 1961; Hannerz, 1969; Bourdieu, 1980; Bourdieu and Wacquant, 1992; Loury, 1977; 1987). Bourdieu and Wacquant (1992: 119) for example define social capital as "... the sum of the resources, actual or virtual, that accrue to an individual or a group by virtue of possessing a durable network of more or less institutionalized relationships of

mutual acquaintance and recognition". Later on, the works of Coleman (1988; 1990) and Putnam (1993) have come to place the concept on the sphere of *relations* rather than the individual sphere. Thus, while the early definitions study social capital as the product that networks offer to individuals, later contributions argue that social capital is the links within and between networks and groups (Westlund, 2006). According to Coleman (1990: 315) social capital is "... an attribute of the social structure in which a person is embedded ... [and thus it is] ... not the private property of any of the persons who benefit from it". Similarly, Putnam (1993) suggests that social capital might be characterized as a predominantly public good embedded in social organizations such as networks that are built and maintained in order to facilitate the coordination and cooperation of individuals for their mutual benefit.

Research regarding the concept of social capital continuously increases with much theoretical debate and controversy focusing upon the facets, forms, and manifestations of the concept of social capital. In that context, social capital and its core components of social trust and associational activity are widely

acknowledged as a core feature of strong and active civil societies that promote effective democratic governance and economic prosperity (Westlund, 2006). This follows the widespread acknowledgement that social capital is a phenomenon that can appear in multiple regimes following a country's specific socio-cultural relations and associational forms, while in addition, it can be found in all types of organizations, i.e. both public and private (Westlund, 2006). Within this context the present study sets out to explore two important research questions. The first one relates to the stock of social capital characterizing Greece and its change during a highly sensitive era, that of the outburst of the economic crisis. The second research question relates to analyzing the group of civil servants as carriers of higher or lower levels of social capital compared to the other citizens. Both these questions are important as they can help us sketch the country's profile with regard to the vital concept of social capital that is highly associated with civil empowerment, democratization and increased civic participation levels. Based on the available knowledge in the field social capital is measured via the measurement of six main constructs comprising the soft and hard attributes of the concept, namely social trust, social altruism, equality, tolerance, humanitarianism and civic participation. Data are drawn from the European Social Value round 4 (2008) and round 5 (2010) surveys for Greece. Overall, empirical analysis indicates that the country experiences a statistically significant decline in its social capital level while public servants hold higher levels of social capital albeit also declining as for the rest of the country's citizens. Important policy implications arise as a result of these findings related to issues of democratic legitimation and social participation.

The rest of the paper is organized as follows: part two is devoted to a brief discussion over the importance of social capital in civil societies and to a presentation of available knowledge regarding social capital in Greece. Part 3 is devoted to methodological issues and in particular to a discussion of the data and the statistical analysis method used in the study. Part 4 presents the empirical analysis results while Part 5 concludes the paper with a discussion over the significance of these findings in terms of democratic representation, social cohesion and stability in the country.

2. Theoretical context

2.1 Social capital in civil society

Research regarding the concept of social capital continuous to increase in a number of related disciplines and fields of analysis (Westlund, 2006). Much theoretical debate and controversy among theorists and researchers from various fields has focused on the facets, forms, and manifestations of the concept of social capital (see indicatively, Coleman, 1988; 1990; Brewer, 2003; Westlund, 2006; Koniordos, 2006). Today, it is common ground that social capital is an important economic concept and, as a phenomenon it can be found in all types of organizations, i.e. both public and private (Westlund, 2006). As suggested by Putnam (1993: 167) social capital relates to "... features

of social organization, such as trust, norms, and networks, that can improve the efficiency of society by facilitating coordinated actions". In that sense, it is widely acknowledged that the presence of social capital is linked to a vigorous civil society that promotes effective democratic governance and economic prosperity (Putnam, 1993; Brewer, 2003). The importance of the concept is acknowledged and manifested by the definitions that global institutions adopt. The OECD (2001) for example adopts a wide definition of social capital as "... networks together with shared norms, values and understandings that facilitate co-operation within or among groups" (OECD, 2001; p. 41).

Alongside with recognizing the important economic effects of the phenomenon, research has also come to agree upon a number of key findings as regards to the concept of social capital. The first one, relates to that social capital is commonly acknowledged as a stock variable that exists in relations among persons, while it is positively related to the presence of dense and closed social structures that experience continuity over time (Coleman, 1988; 1990). The second key finding relates to that the basic elements of social capital are social trust and civic participation (Brehm and Rahn, 1997). The third key finding relates to that social capital is inexorably linked to voluntary organizations wherein norms of cooperation and reciprocity are strengthened (Fountain, 1998). Finally, the fourth key element relates to the acknowledgement that social capital is an extremely complex concept carrying multiple manifestations and effects ranging from beneficial to negative (Stiglitz, 2000; Portes, 1998; Putnam, 2000).

Given the above, the ways in which social capital develops from within social relations that spill over the society and contribute to improved social efficiency and economic growth, has been a core issue in the research agenda of many fields (Norris, 2001; Christoforou, 2005). According to Norris (2001) social networks and social trust, i.e. the two core components in Putnam's definition of social capital, are significantly related to multiple interrelated indicators of socioeconomic development and to institutional indicators of democratization. Other contributions link the society's attitudes and value judgments, i.e. culture and institutions (Tabellini, 2007) to generalized morality and trust suggesting that high levels of such variables denote high social intelligence societies (Fukuyama, 1995; Yamagishi, 2001). In that sense, trust is seen as the most prominent characteristic of a society (Platteau, 2000) and a 'positive cultural feature' (Tabellini, 2007, p. 9) which supports the development and stability of democratic societies and the orderly conduct of social and economic affairs (Knack and Keefer, 1997; Hardin, 2001; Yamagishi, 2001). The relationship between trust and economic prosperity has attracted much attention, while today the positive effect of trust on economic activity is well recognized. Reviewing the empirical literature on social capital and economic performance Knack (2002) also finds that social capital is important for economic growth and poverty reduction. Arrow (1972) suggests that the lack of mutual confidence leads to increased protection and monitoring costs of

economic transactions. In contrast, higher levels of trust are associated with a stable and supportive environment to investment and economic activity (Knack and Keefer, 1997). Trust, in that sense, is linked to the fundamental issue of legitimacy, i.e. the right of a venture to exist and perform its economic activity in a certain way (Suchman, 1995; Krueger et al., 2000; Bruton et al., 2010). In turn, legitimacy suggests that the strategies, practices and goals pursued by any new organization must pass the rules of cognitive and moral legitimacy set forth by the institutional environment in which they wish to operate (Bruton et al., 2010). Indeed, democracy and legitimation issues relate to long standing research debates regarding institutions and their enforcement (Peltzman, 2007) and the distribution of incomes generated within specific institutional regulations and arrangements, both formal and informal (Ferrera, 1996; Habermas, 1984).

At the empirical level research evidence increasingly indicate the complexity of the notion of social capital, regarding its content and the groups of people where we most likely track high levels of it. Bjørnskov (2006) uses cross-country data to test Putnam's claim that social capital is a unitary concept, and finds that social capital consists of three orthogonal components corresponding to social trust, social norms and associational activity. Similarly, Norris (2001) disentangles the twin components of Putnam's definition of social capital, and finds that the relationship between democratization and social capital is much driven by the social trust dimension, compared to the associational network dimension. In addition, Pichler and Wallace (2007) look at the relationship between two important types of social capital, namely formal associations and informal social relations (networks) and suggest that, regions in Europe can be grouped into two groups depending on first, whether they are high on both forms of social capital (complementarity) or secondly, whether informal social capital substitutes for formal social capital (substitution) (Pichler and Wallace, 2007). As they argue we better speak of 'social capital regimes' in order to more fully understand the various cultures of participation and cohesion across Europe (Pichler and Wallace 2007). In the same line, Gesthuizen et al. (2009) analyze the extent to which national-level characteristics, such as ethnic diversity, actually affect dimensions of social capital of individual citizens in European countries. As they argue, Putnam's hypothesis on ethnic diversity must be refuted in European societies, while they found that economic inequality and the national history of continuous democracy in European societies are the more important factors for explaining cross-national differences in social capital in Europe (Gesthuizen et al. 2009).

Finally, to the extent that social capital is found in all parts of a society, i.e. in the public, private as well as the civic sectors of the society, a strand of research has focused on the study of different groups of people as potentially holding higher or lower levels of social capital (Westlund, 2006; Brewer, 2003). Analyzing the

relationship between public service motivation and civic attitudes and behaviors of different groups of employees, Taylor (2010) finds that high public service motivation employees were found to have higher confidence in key national public and private institutions, while they place more importance on citizens' rights, and engage in more non-electoral political and prosocial acts than low public service motivation employees. This is important as it supports Putnam's argument on the positive association between social capital and effective public administration (Putnam, 1993). Similarly, Brewer (2003) analyses the civic attitudes of public servants against all other citizens and finds that public servants are more active in civic affairs compared to other citizens and they appear to be catalysts for the building of social capital in society at large. Indeed, available studies of political and civic engagement reveal that different types of participatory behaviors exist (Ekman and Amnå, 2012; Talò and Mannarini, 2015). Recently, Talò and Mannarini (2015) proposed a participation typology, named the Participatory Behaviors Scale (PBS), to analyze four dimensions of participation, namely: 1) formal political participation, 2) activism, 3) civil participation and 4) disengagement. Their findings agree with the argument proposed earlier by Ekman and Amnå (2012), i.e. the argument that disengagement is a genuine and active style of participation. The methodological and theoretical implications of these findings are important as a great amount of complexity related to personal psychometric attitudes is found to underlie the behavior of individuals and in particular voters and civil citizens.

2.2 Social capital in Greece

Greece along with other Mediterranean countries is reported or, grouped, as a low social capital country. A recent example is the study of Marozzi (2015) who uses data from the European Social Values Survey - Round 6, and finds that Scandinavian countries are the most trustful European countries in public institutions, whereas former communist countries as well as Iberian and Mediterranean ones are much less trustful.

Overall, there exist very few studies that explicitly deal with the level, determinants and effects of Greece's stock of social capital. Christoforou (2005) approximates social capital by an index of individual group membership and finds that Greece reports relatively low level of group membership, compared to the other EU countries. She goes on to argue over the country's low levels of civiness as a result of low social capital (Christoforou 2005). Similarly, Jones et al. (2008) analyze the components of aggregate social capital in Greece and conclude that social capital in the country may be characterized as weak, compared with other European countries. Demertzis (2006) utilizes both qualitative and quantitative methodological tools and reports that young people in Greece show low levels of social capital and social trust, following the trends observed for the general population of the country. Pantazidou (2013) studies civic practices in Greece to argue that the economic crisis caused an unprecedented number of citizens to move away from traditional,

representative, recognized forms of citizen organization. As she argues citizen-led, anti-hierarchical, horizontal networks that resist the consequences of the economic crisis and create alternatives to the current democratic and economic model have emerged and nurtured by both small, diverse citizen initiatives, and mass protest and participation (Pantazidou 2013). Finally, analyzing the level of generalized trust in Greece and its various demographic and socio-economic determinants, Rontos and Roumeliotou (2013) reveal a significant association of generalized social trust with higher education, marital status (divorced, widowed or those living in cohabitation) and age, with the youngest and the oldest individuals exhibiting higher levels of distrust, while they find no significant effects for other control variables, i.e. gender, employment status and income.

Analyzing the wider economic structure of the country, its performance and the associated reforms over the past several decades Kazakos (2006) argues that low institutional trust is one core element for which structural impediments such as rent-seeking and public-private clientilistic relationships are observed in the country. Similarly, Paraskevopoulos (2006) also argues that the low level of social capital in Greece is linked to dominant role of the rent-seeking behavior of small and strongly-tied interest groups that inhibit the reform process in several public policy areas. More recently, Petrou and Daskalopoulou (2014) use a model of individuals rewards' satisfaction and find that Greece might be characterized as a rent-seeking society in the sense that it lacks widespread societal responsibility as manifested by the existence of income externalities (i.e. individuals care about their relative income position) and widespread support over the value of unproductive entrepreneurship.

Within this context the present study explores two important research questions. The first one relates to the stock of social capital characterizing Greece and its change during a highly sensitive era, that of the outburst of the economic crisis. The second research question relates to analyzing the group of civil servants as carriers of higher or lower levels of social capital compared to the other citizens. In particular, the following two research questions are formulated and tested here:

H1. Has the outburst of the economic crisis affected the level of social capital in Greece? [Or else, Did the country experience social capital accumulation or decline during the 2008-2010 period?]

H2. Are civil servants carriers of higher or lower levels of social capital compared to the other citizens?

Both these questions are important as they can help us sketch the country's profile with regard to the vital important concept of social capital that is highly associated with empowered democratization and increased participation levels.

3. Measuring social capital in Greece: data and statistical analysis methods

3.1 Data and variables

Following the theoretical conceptualizations of Putnam (1993; 2000) and Brehm and Rahn (1997) and the operationalization of Brewer (2003), we measure people's level of social capital via the measurement of six closely related constructs referring to social trust, social altruism, equality, tolerance, humanitarianism and civic participation. Available knowledge categorizes these six main constructs as comprising the soft and hard attributes of the concept (Brewer, 2003). In particular, Brewer (2003) distinguishes between the various attributes of the social capital concept and highlights social trust, social altruism, equality, tolerance, and humanitarianism as soft evidence of social capital whereas civic participation is hard behavioral evidence of social capital.

In particular, the six main constructs used here to measure the level of social capital in the country are composed as follows:

- 1) *social trust*, is approximated here by the sum of 7 items including generalized trust and trust in important institutions such as the country's parliament, the legal system, the police, the politicians, the political parties and the European Parliament;
- 2) *social altruism*, is approximated here by the sum of 2 items including participation in social activities and general perceptions of helpfulness characterizing people;
- 3) *equality*, is approximated here by the sum of 3 items including general perceptions of people's fairness, perceptions on the importance that people are treated equally and have equal opportunities and perceptions over the importance to understand different people;
- 4) *tolerance*, is approximated here by the sum of 3 items referring to effects of immigrants on the country's economy, cultural life and living conditions;
- 5) *humanitarianism*, is approximated here by the sum of 2 items referring to perceptions over the importance to care for others well-being and time devoted to friends and people close; and, finally,
- 6) *civic participation*, is approximated here by the sum of 12 items including interest in politics and political behavior (voted, contacted politician, interest in politics, feel closer to a political party, member of political party, worked in political party) and other social activities including work in another organization, worn or displayed badge, signed petition, taken part in lawful public demonstration, boycotted certain products and being an active member of a union.

Data are drawn from ESV Surveys 2008 and 2010 waves. Table 1 presents the definitions and basic descriptive statistics of the variables used in the analysis.

Table 1. Basic definitions and descriptive statistics of used variables.

Variable name	Definition and measurement	2008		2010	
		Mean	St. dev.	Mean	St. dev.
Social trust	The sum of the 7 items used to approximate social trust	26.40	12.10	19.75	11.69
Social altruism	The sum of the 2 items used to approximate social altruism	5.17	2.35	4.87	2.47
Equality	The sum of the 3 items used to approximate equality	4.34	2.36	4.54	2.37
Tolerance	The sum of the 3 items used to approximate tolerance	10.14	6.55	9.05	6.16
Humanitarianism	The sum of the 2 items used to approximate humanitarianism	0.50	0.97	0.37	0.80
Civic participation	The sum of the 12 items used to approximate civic participation	3.81	1.82	3.29	1.81

Source: Author's calculations. Notes: Variables are defined and coded as in Appendix A4 (Variables lists) of ESS4-2008 ed.4.0. The same variables have been used from the ESS5-2010 wave. Descriptive statistics are based on non-missing observations.

3.2 Empirical hypotheses testing

In order to test the hypotheses H1 and H2 formulated here, or else in order to test for the empirical validity of our research questions, we: first, measure the level of social capital in the country for 2008 and 2010 and analyze the statistical significance of the observed difference, and second, we measure the level of social capital held by civil servants against other citizens and analyze the statistical significance of the observed difference for 2008 and 2010. We use standard statistical analysis tools, and in particular, we use the two sample t-test for comparing two means in order to test whether the observed difference in the means of the social capital variables of interest are statistically significant or not. In a general form, we test the null hypothesis that the two means are equal against the alternative that they are not equal:

$$H_0 : \mu_1 = \mu_2 \quad (\text{or } H_0 : \mu_1 - \mu_2 = 0)$$

$$H_a : \mu_1 \neq \mu_2 \quad (\text{or } H_a : \mu_1 - \mu_2 \neq 0)$$

At first, we compare the changes in the levels of social capital variables between the 2008 and 2010 periods, and thus the μ 's represent the mean value of each variable of interest as measured for the whole sample. That is, μ_1 represents the population's mean for 2008 and μ_2 represents the population's mean for 2010. At the second step of the analysis where we compare the changes observed in the case of civil servants against all other citizens, the μ 's represent the mean value of each variable of interest for the group of public servants and for the group of all other citizens. This analysis is performed twice for the 2008 and 2010 period. In all cases, standard statistical significance

levels are used in order to decide on whether or not to reject the null hypothesis of equality of means. In general, for high t-stats we reject the null hypothesis of equality of means and thus, the observed differences are statistically significant.

4. Results

Table 2 summarizes the results of the analysis regarding the change of the level of social capital in the country during the 2008 – 2010 period. All estimations are based on non-missing observations. Overall, a sample of N=2,072 observations has been used for 2008 and a sample of N=2,715 observations for 2010. The mean values of the six social capital constructs are also reported. As shown in the table all constructs apart from equality decline. In particular, social trust shows a decline of 6.652 points from a mean value of $\mu=26.398$ in 2008 to a mean value of $\mu=19.746$ in 2010. Social altruism declines slightly by 0.303 points from a mean value of $\mu=5.168$ in 2008 to a mean value of $\mu=4.865$ in 2010. Tolerance declines by 1.093 points from a mean value of $\mu=10.139$ in 2008 to a mean value of $\mu=9.046$ in 2010. Humanitarianism declines by 0.132 points from a mean value of $\mu=0.503$ in 2008 to a mean value of $\mu=0.371$ in 2010. Civic participation declines 0.523 points from a mean value of $\mu=3.808$ in 2008 to a mean value of $\mu=3.285$ in 2010. Finally, as regards equality which is the only construct showing an increase during the crisis period, data show a slight increase by 0.199 points from a mean value of $\mu=4.338$ in 2008 to a mean value of $\mu=4.537$ in 2010. Importantly, all these changes in the absolute values of these constructs are highly statistically significant (at 0.5% level).

Table 2. Social capital change in Greece during the 2008-2010 period: main constructs.

	Mean 2008 (N=2,072)	Mean 2010 (N=2,715)	2010 – 2008 change	t-test
Social trust (7 items)	26.398	19.746	-6.652	18.737****
Social altruism (2 items)	5.168	4.865	-0.303	4.249****
Equality (3 items)	4.338	4.537	0.199	-2.863****
Tolerance (3 items)	10.139	9.046	-1.093	5.840****
Humanitarianism (2 items)	0.503	0.371	-0.132	5.170****
Civic participation (12 items)	3.808	3.285	-0.523	9.772****

Source: Author's calculations. Notes: all estimations are based on non-missing observations. Asterisks **** indicate significance at the 0.5%.

Table 3a summarizes the results of the analysis regarding the difference in the level of social capital held by public servants in contrast to all other citizens in the country for 2008. Of the total sample of N=2,072 observations for 2008, a sub-sample of 269 public servants (almost 13% of the population) has been identified based on the reported employment classification of respondents in the ESV survey - Round 4. Overall, results show that in 2008 civil servants score higher in terms of social trust, social altruism, equality and civic participation. In particular, the mean value of the social trust construct for civil servants is $\mu=28.045$ whereas for other citizens a mean value of $\mu=25.588$ is recorded. A statistically significant difference of 2.457 points is observed. Also, for civil servants a mean value

of social altruism that is equal to $\mu=5.487$ is recorded whereas the corresponding mean value for other citizens is $\mu=5.052$. Again a statistically significant difference of 0.435 points is observed. As regards the equality construct the mean value for civil servants is $\mu=4.468$ and for all other citizens the mean value is $\mu=4.215$. Again this small difference of 0.253 points is recorded as statistically significant. Finally, civil servants score quite higher in terms of civic participation compared to the other citizens as the mean values of $\mu=4.766$ for civil servants and $\mu=3.806$ for other citizens show. A statistically significant difference of 0.96 points is observed. The two sub-groups do not present statistically significant differences in the mean values of the tolerance and humanitarianism constructs.

Table 3a. Social capital of public servants and other citizens - 2008 data difference of means: main constructs.

	Mean - Public servants (N=269)	Mean - Other citizens (N=1,803)	t-test
Social trust	28.045	25.588	-3.065***
Social altruism	5.487	5.052	-2.777***
Equality	4.468	4.215	-1.613*
Tolerance	10.743	10.237	-1.140
Humanitarianism	0.429	0.486	0.903
Civic participation	4.766	3.806	-7.892***

Source: Author's calculations. Notes: all estimations are based on non-missing observations. Asterisks****, ***, **, * report significance at the 0.5%, 1%, 5% and 10%, respectively.

Table 3b summarizes the results of the analysis regarding the difference in the level of social capital held by public servants in contrast to all other citizens in the country for 2010. Of the total sample of N=2,715 observations for 2010, a sub-sample of 391 public servants (almost 14.4% of the population) has been identified again based on the reported employment classification of respondents in the ESV survey - Round 5. Overall, results show that by 2010 the differences between civil servants and other citizens are less compared to 2008, albeit civil servants continue to score higher in terms of the two most important constructs,

that of social trust and civic participation. In particular, the mean value of the social trust construct for civil servants is $\mu=21.213$ whereas for other citizens a mean value of $\mu=19.481$ is recorded. A statistically significant difference of 1.732 points is observed. Also, for civil servants a mean value of civic participation that is equal to $\mu=3.995$ is recorded whereas the corresponding mean value for other citizens is $\mu=3.294$. Again a statistically significant difference of 0.701 points is observed. The two sub-groups do not present statistically significant differences in the mean values of the social altruism, equality, tolerance and humanitarianism constructs.

Table 3b. Social capital of public servants and other citizens - 2010 data difference of means: main constructs.

	Mean - Public servants (N=391)	Mean - Other citizens (N=2,324)	t-test
Social trust	21.213	19.481	-2.522***
Social altruism	5.013	4.847	-1.209
Equality	4.538	4.487	-0.382
Tolerance	9.557	9.217	-0.962
Humanitarianism	0.331	0.367	0.828
Civic participation	3.995	3.294	-6.733***

Source: Author's calculations. Notes: all estimations are based on non-missing observations. Asterisks****, ***, **, * report significance at the 0.5%, 1%, 5% and 10%, respectively.

5. Conclusions

The present study analyses the changes in the level of social capital in Greece during the 2008-2010 period. The concept of social capital is operationalized via the identification and measurement of six main components, namely: social trust, social altruism, equality, tolerance, humanitarianism and civic participation. The empirical analysis focuses on two important questions. The first one relates to the stock of social capital characterizing Greece and its change during a highly sensitive era, that of the outburst of the economic crisis.

The second research question relates to analyzing the group of civil servants as carriers of higher or lower levels of social capital compared to the other citizens.

With regard to the first research question, overall, empirical analysis indicates that the country experiences a statistically significant decline in its social capital level during the 2008-2010 period. With the exception of the equality construct that increases during the period of our analysis, all other constructs decline. With regard to the second research question analyzed here, overall results show that public servants hold higher levels of social capital albeit also declining, as for

the rest of the country's citizens, during the 2008-2010 period. In particular, in 2008 civil servants score higher in the attitudes of social trust, social altruism, equality and civic participation while in 2010 civil servants score higher only in the attitudes of social trust and civic participation. In addition, during the 2008-2010 period the mean values of the social capital main constructs, held by civil servants, decline, following the trend observed for the general population.

Important research and policy implications arise as a result of these findings. As mentioned earlier, the concept of social capital is related to issues of economic prosperity, democratic legitimation and social participation. As Marozzi (2015) argues, improving trust in public institutions is central to improve social capital, participation in civic activities and law-abiding behavior and then governmental legitimacy. This is a critical aspect of Greece's efforts to overcome the severe economic crisis experienced by the country from 2009 onwards. The country is in need of institutional interventions in virtually all parts of the economy if entrepreneurial efforts and developmental reconstruction are to be successfully promoted (Bitros and Karayiannis, 2010). As Spanou (2014) argues for example, despite constant administrative reforms undertaken in view of the economic crisis the senior civil service is in a stronger position, having a symbiotic relationship with the world of politics, which permits it to escape the toughest measures affecting the rest of the civil service. Thus, the challenge remains regarding the need to rebalance the relationship between the public administration and politics (Spanou, 2014). In addition, analyzing the content of institutional and economic reforms in Greece, as well as the attention paid towards their successful implementation, Spanou and Sotiropoulos (2011) argue that despite of the presence of enhanced reform dynamics in the country, the issue remains that managerial reforms towards achieving economic competition are mixed with democratization and modernization reforms. Analyzing how changes to the institutional environment in the crisis-hit economy of Greece impact on entrepreneurial activity, Williams and Vorley (2015) suggest that changes to institutions have served to limit entrepreneurial activity rather than enhance it, and that this has worsened in the midst of the crisis. As they argue, this will detrimentally impact Greece's ability to navigate out of the crisis and regain competitiveness in the longer term (Williams and Vorley, 2015). Thus, analyzing ways of empowering social capital in an era of reforms would enrich our knowledge over strengthening not only economic prosperity but also social cohesion and democratic representation and legitimation in the country. On the other hand, further research in the field might focus on a number of related issues for which limited knowledge is available. We might mention here the need to sketch the socio-demographic and economic profile of citizens holding higher social capital levels, and the need to analyze the interplay between the soft and the hard evidence of social capital in Greece.

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**The effect of innovative activity in firm performance and development:
Analysing data from eurozone**

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Abstract

Purpose – The purpose of this paper is to examine the effect of Innovative Activity on firm performance and growth. Active Research and Development is considered to be directly related with development, prosperity and growth, in micro and macro level and a key factor in hindering economic recession.

Design/methodology/approach – We analyse economic data from listed firms of selected eurozone country-members in order to associate Research and Development with performance indicators in firm and country level. For that purpose, several firm data were collected from WorldScope data base and macroeconomic data from Worldbank database. The period examined is between 2002 and 2012, with a special focus on current financial crisis (after 2007). The empirical process includes, descriptive statistics and logistic regression analysis.

Findings – Findings indicate the crucial effect of innovative process in economic performance and development in firm and country level. The latter highlights the urgent need for public support in order to spur innovative activity and high-tech exports, especially in countries that were heavily affected by recession.

Research limitations/implications – Some research limitations are the large number of missing cases in WordScope database, as many firms after the beginning of current crisis exit stock market. Furthermore, the other part of the economy, the Small and Medium Enterprises does not exist in the analysis, as listed firms are mainly large and mature companies.

Originality/value – The results tend to highlight the need for common policy measures in eurozone, in regard to such issues, instead of imposing horizontal budgetary constraints in specific countries (like Southern Europe), hindering the vicious recessionary circle.

Keywords: Innovative Activity, Development, Firm Performance, Eurozone

JEL Classification: M2110, O390, O470

1. Introduction

In this work, we attempt to examine the role of innovative activity in hindering the impact of economic crisis. Characteristics of firms performing Research and Development are compared with those of non-innovative firms, from selected countries of two different groups of Eurozone: The southern European countries (Greece, Italy, Portugal and Spain), that were (and still are) heavily affected by current crisis, and the most representative countries of central Europe (also called as “European North” or the “core of eurozone”), Germany and France, which ‘manage’ recession in a much different way. Our main scope is first to identify possible differences between innovative and non-innovative firms and then to attempt to disclose similar differences between innovative firms (only) from different countries. The main scope is not only to confirm the (prospected) significant effect of innovation in development but also to highlight the different impact (if any) of macroeconomic performance and infrastructure, in R&D outcome. Before the empirical process will be analysed, two main questions should be answered: i) why we are interested in innovative

activity and ii) why we analyse group of countries of eurozone.

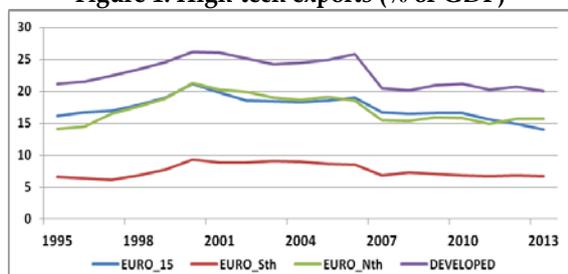
Innovative activity is considered to be a crucial factor for prosperity and growth. It seems to affect economic process directly (improving turnover and profitability) or indirectly (increasing employment, diffusing new technologies etc. (OECD 2013). Thus, Research and Development appears in various surveys to be the major factor of spurring technological and economic progress (for a short literature review, see Makris, 2015; Ferguson and Olafson, 2007; Tselekidis et al., 2003; Makris, 2008). Hashi and Stojcicc (2013), find that investment in innovation activities result in better productivity, while Koelinger (2008) claims that R&D increases the level of sectoral and national economic performance, diffusing innovative products (p.990), Furthermore, Kafouros (2005) finds that R&D process is positively correlated with productivity growth and sales, especially in high-tech sectors (p.492). In their research, Autio and Parhankangas (1998) highlight the ability of those firms to survive and grow even during economic crises. In regard to European firms, Koellinger (2008) concludes that the innovators are

more likely to grow than non-innovative firms. Apart from financial performance, innovative activity seems also to affect positively firms' competitiveness, increasing exporting activity (see indicatively Bleaney and Wakelin, 2002; Filatotchev et al., 2009; Hashi and Stojcic, 2013).

Adversely to the importance of innovative activity, in European Union, no common strategy seems to exist concerning R and D activity and technological infrastructure. Especially in the core of EU, the Eurozone, a clear segregation appears. From the one hand, the countries of European south (euro-periphery), after a period of prosperity and growth (until 2005), present poor performance, decreasing the (already low) R&D expenditures and the high-tech exports (two of them, Portugal and Greece, are in the last place). Due to the dramatic cuts in public spending, the austerity measures and the lack of FDI (as a result of the unstable economic conditions), those countries suffer from various economic restrictions in liquidity, exports, imports of intermediary goods, etc.

On the other hand, countries of the core of Eurozone (like Germany and France), continue to increase investment in R&D, establishing a national system of innovation that is focused on technologically intensive sectors, while at the same time, they highly support even during the economic distress, production of high-tech products and services. As a result, the existed gap in technological intensity between the two groups of countries (of the same union), seem to become larger after current financial crisis. It is interesting enough, that fifteen years after the ambitious project of economic union, no real integration between countries-members that have joined it (for further analysis see also Makris and Nikolaidis, 2015) seem to exist. Adversely, the gap between prospering "North" and the struggling "South" is highlighted. The latter is clearly presented in figures 1 and 2. Figure 1 presents the average percentage of high-tech exports, and Figure 2 the R&D expenses the last 20 years in EURO-15 countries¹, in the two groups of countries analysed and in selected representative large developed economies (Germany, US, China and Japan).

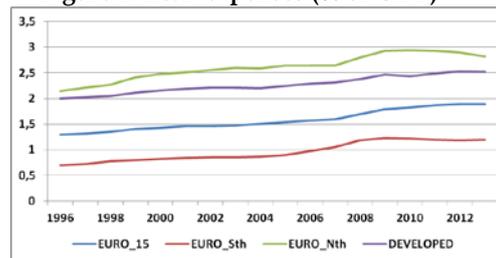
Figure 1: High-tech exports (% of GDP)



Source: World data bank, Eurostat and personal calculations

¹ We excluded countries that joined eurozone after the beginning of economic crisis

Figure 2: R&D expenses (% of GDP)



Source: World data bank, Eurostat and personal calculations

As it is clear, from both figures, innovative activity is rather low in countries of European South, while the stability or even slight increase in R&D expenses or high-tech exports after 2007, is actually a huge reduction (in absolute values), because they are expressed as a percentage of GDP which has been dramatically reduced in those countries. Adverse is the picture in countries of European North where GDP increases

2. R&D Performance in Eurozone²

After a period of slight convergence in the field of innovation and R&D intensity in the beginning of common currency project (2002-2005), expenditure in R&D differs significantly after 2007 across economies and sectors, resulting in different policy measures, performance and development, both in firm and macroeconomic level.

More specific, in euro periphery, the basic characteristic of firms is the small or medium size along with the low and medium technologically intensive production processes and products. Those countries, at the beginning of euro project (2002-2005), significantly improved their scientific quality, increasing public funding in supporting innovative process and achieving higher private investment in Research and Technology. After 2008 however, all targets concerning R&D intensity (to be achieved by 2020) were cancelled. Countries of southern Europe were heavily affected by the global financial crisis, mainly due to their inability to manage sovereign debt. The result of debt crisis was the implication of harsh austerity measures and dramatic cuts in public spending resulting in a large reduction in GDP and in a violent burst in unemployment. The vicious circle of recession is generally admitted to be the most crucial problem for those economies and specific policy measures and reforms are necessary in order to spur development and growth. The overall economic condition affects investment in R&D, impairing recession. On the other hand, totally different is the picture concerning the two countries of Eurozone North, which were not affected seriously by financial crisis (especially Germany), and they were not obliged to apply cuts in budgets and high taxes in companies. The countries of the core of Eurozone, are research intensive, and innovation has a strong impact in performance, in Micro and Macro level. Private sector's R&D expenditures progressed

² Sources: European Commission 2013, OECD 2013, European Union 2014

during the economic crisis (2007-2011) in those countries, while public funding in R&D has also grown substantially, helping them to maintain a strong exporting performance. As a result, those countries succeed a strong positive contribution of high and medium-tech products to the trade balance (2002-2012), adversely to the negative trend of total trade.

3. Sample and Methodology

In this work, we attempt to analyse the effects of innovative activity in development and growth in firm level. Our sample consists of firm data from listed data from seven eurozone countries-members, Germany and France ('core' of eurozone'), Italy, Spain, Greece, Portugal and Ireland (euro periphery). From an initial sample of 650 listed firms, data from 441 (after excluding missing and extreme values) were collected and classified in two different groups that will next be compared to each other:

- Firms that present continuous and high level of R&D expenditure and introduce new patents in products and services (taking value 1).
- Firms that do not perform any innovative activity (R&D expenses and patents) during the period examined (taking value 0).

The number of firms included from each country in the final data set, was attempted to be in accordance with the average number of the listed firms of each one in the period examined, as recorded by Worldscope databank. Some country-specific data that were included in the analysis, were collected from World Bank databank.

In order to analyse the differences between firms performing innovative activities, we select several widely used characteristics, indicating performance and growth. For most of those indicators (apart from categoricals), percentage change between the period examined were calculated. The main question that we attempt to analyze, is whether significant differences between innovative and non-innovative firms exist, relative to several performance indicators and firm characteristics. In the rest of the section, all the variables included in the analysis, are described, along with a brief theoretical justification and some descriptive statistics.

i) Firm size and Investment Activity (Investment-SIZE) is one of the most commonly used measures of growth. However, it is a rather ambiguous factor in regard to its contribution to economic performance. Empirical findings conclude that SMEs and mainly NTBFs, are important drivers of growth and innovation, affecting positively employment (Majumdar, 1997, Makris, 2008). On the other hand, larger businesses typically have the competitive advantage due to economies of scale, cheaper credit and direct access to global value chains. Concerning Europe, innovators are more likely to grow than non-innovative firms (Koellinger, 2008) and because of that, a positive relation between rates of growth and innovation is prospected. Various measures have been used in literature in order to quantify firm size (number of employees, profitability, total assets etc.) (Coad, 2007).

In this work, employment, economic growth (profitability) and Total Assets are directly or indirectly included in the analysis and because of that, net Fixed Assets' growth is used as a measure of firm size (implying that the more a company invest, the larger it became). Investment activity is a major factor of economic development. SMEs increase employment, while larger firms appeared also to affect positively growth and employment (it depends on the sample used). In order to calculate that measure, the natural logarithm of the average change in investment in Fixed Assets is used. Figures 3 and 4 present investment performance for two sub periods: 2002-2012 (the whole period examined) and 2007-2012 (current financial crisis).

Figure 3: Investment Activity (2002-2012)

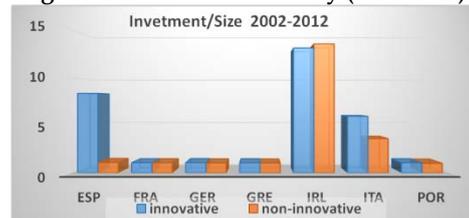
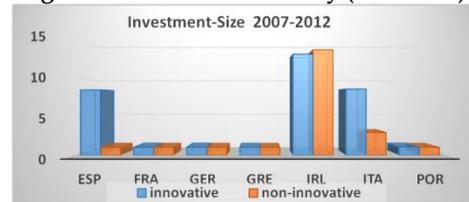


Figure 4: Investment Activity (2007-2012)



Findings confirm the ambiguous findings literature highlights. For both periods examined, little differences appear in investment activity, among innovative and non-innovative firms for the vast majority of the firms analysed. Thus, no clear relation between size and innovative activity seem to exist.

ii) Financial Performance is a crucial factor of growth and prosperity. Firms with strong economic performance could resist in recession, retaining or increasing employment and enjoying less financial and commercial constraints indoor and outdoor. Innovative firms due to the competitive advantage of innovative products and processes, are expected to affect positive firms' financial outlook. In order to test that hypothesis, three widely used indicators of financial performance are included in the analysis: *Profitability, Debt Accumulation and Liquidity*.

Profitability (PROF) is a crucial factor in regard to firm growth. As a measure of profitability, EBIT-to-Total Assets ratio was selected (also called as Basic Earning Power), as it has been included in various similar researches (see indicatively Wang et al. 2009 and Makris 2015). Due to their competitive advantage, innovative firms are expected to present higher profitability than non-innovative. Thus, a significant effect relation with R&D is expected. Figures 5 and 6 highlight that assumptions for most of the countries examined and for both periods analyzed.

Figure 5: Profitability (2007-2012)

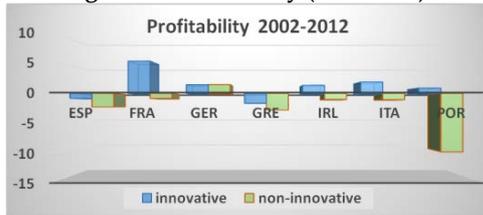
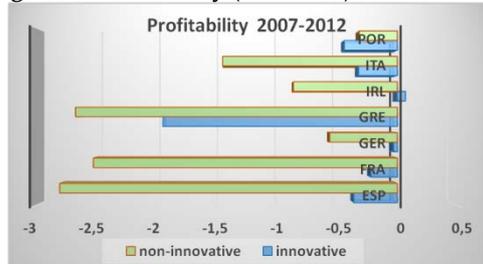


Figure 6: Profitability (2007-2012)



iii) **Debt Accumulation (DRBR)** indicates firms' financial health. It is crucial for a firm to manage successfully and reduce (if possible) liabilities, especially during economic distress. A high debt ratio may restrain economic performance, generating worries for firm's ability to make interest and loan payments (see for example Wang et al 2009). As an indicator of debt accumulation, the financial leverage ratio is used (Total Debt to Total Assets). The fast growth that (according to literature) innovative firms usually enjoy, may affect positively market share and turnover, resulting in a better financial performance and thus a lower debt ratio. A negative relation with R and D activity is thus, prospected, however a positive relation could also be possible, due to fast growth and high investment rates that innovative firms may follow.

Figure 7: Debt ratio (2007-2012)

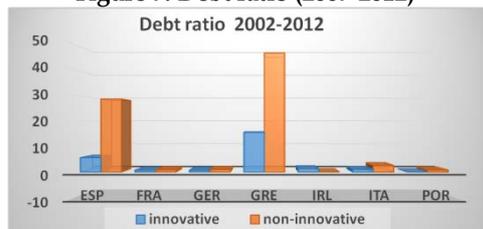
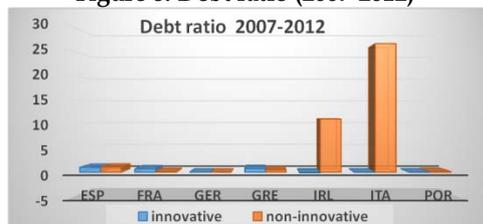


Figure 8: Debt ratio (2007-2012)



Descriptive statistics do not present a clear picture, with most countries to appear similar percentages of debt accumulation during the periods examined. However, in countries affected most by recession, innovative firms seem to perform much better, with lower debt ratio than non-innovative.

iv) **Liquidity** is a measure of viability and financial health. Firms presenting high liquidity ratio, are able to reduce liabilities (debt). Furthermore, adequate liquidity during a distress period provides firms with a strong competitive advantage in national and mainly in global market, diminishing constraints from suppliers, financial institutions and creditors. One of the various indicator implying ability of a firm to repay its short-term liabilities is Net working Capital ratio (=Current Assets - Current Liabilities). A positive relation with innovation is prospected as innovative firms are expected to be more profitable and fast growing as already discussed. However, a negative effect could also be possible, as due to higher growth rates, those firms could present new investments and asset's growth and as a result, shortage of cash.

Figure 9: Liquidity ratio (2002-2012)



Figure 10: Liquidity ratio (2007-2012)



As findings indicate, innovators seem to perform better for the whole period examined (2002-2012). During current crisis however, results are not so clear, with non-innovative firms to present better liquidity ratios in some countries.

v) **Employment growth (EMPL)**. A crucial factor concerning development, growth and social cohesion is employment growth. As already mentioned, many research works conclude in a strong positive effect of innovative performance in employment (Makris et al. 2014-IJBG), even during recessionary periods (Autio and Parhankangas, 1988). Thus, several policy measures have been established in order to spur job creation. Innovative firms that follow faster growth rates could support such policies, as long as public support to R&D is also established and grow. A positive effect of innovation in employment is expected.

Figure 11: Employment ratio (2002-2012)

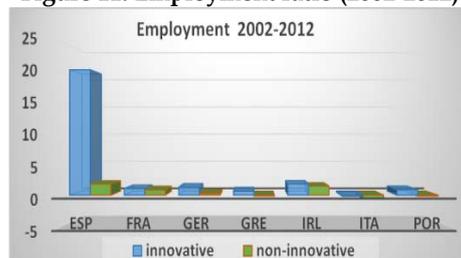
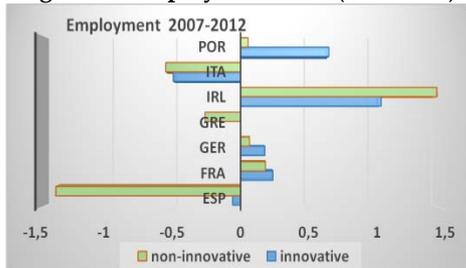


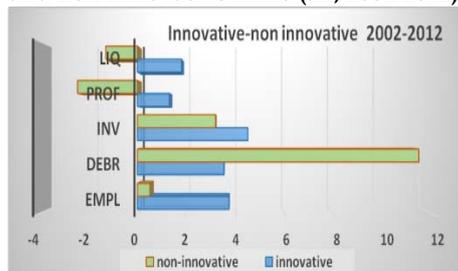
Figure 12: Employment ratio (2007-2012)



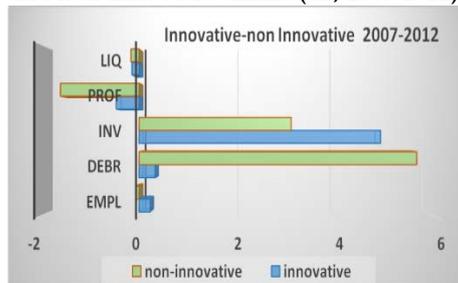
In almost all countries, for both periods examined, innovative firms present higher rates of employment growth, confirming literature. Especially in the years after 2007, findings (apart from Ireland) are even more clear. Thus, R and D activity is positively related to employment and budgetary constraints should not affect investment in that.

Summarizing findings, Figure 13 and 14 present innovative and non-innovative firms from all countries and variables used, highlighting the better performance of innovators in all indexes.

Figures 13: Performance of Innovative and non-Innovative firms (all, 2002-2012)



Figures 14: Performance of Innovative and non-Innovative firms (all, 2007-2012)



Those descriptive findings will then be tested through an empirical analysis in order to be statistically confirmed (or not). For the econometric analysis that will follow, IBM SPSS statistics v.19 will be used and a logistic regression model will be used, appropriate for binary dependent variables (0=non innovative, 1=innovative firms). As data from different countries (with different characteristics) of eurozone are analysed, a segregation is necessary, in order to disclose possible differences. Thus, a categorical country-specific interpreter will be included in the model (COUNT), consist of six classes (taking values from 1=poor performance to 7=best performance). That indicator is a weighted result of performance, in several macroeconomic indicators (debt accumulation, R&D

intensity, GDP growth and unemployment rate). Country's economic conditions and innovation system (public funds, infrastructure, debt etc.) is expected to affect strongly innovative activity and performance. Thus, a positive relation is expected.

Table 1 presents the summarized results of logistic regression process.

Table 1: Regression Results

Regression's Results			
Explanatory	Model Results		
	B	Sig.	Exp(B)
Country	.150	.008	1.162
Liquidity	.052	.008	1.053
Investment-Size	.054	.058	1.055
Debt Ratio	-.001	.518	.999
Profitability	.061	.040	1.063
Employment	.106	.071	1.112
* Model Performance			
Chi-square=44,842. df=6 , sig. = .000			
Cox & Snell R Square: .197, Nagelkerke R Square: .229			
Predicted cases: 0=56.2, 1=73.2, overall=64.9			

Findings strongly confirm descriptive statistics, with innovative activity to be positively related to most indicators already discussed, while model's performance seem to be quite adequate. Thus, the direct relation of innovative activity with performance, growth and development (investment, employment etc) is more than obvious.

4. Conclusions

In this work we attempted to associate firm performance and development with innovative process. Findings indicate that innovators appear to increase profitability, assets and employment, even during a severe economic crisis (after 2007). Thus, specific policy measures should be applied, in order to support innovative activity, especially in countries that are heavily affected by economic distress.

However, a clear differentiation between countries seems also to exist (which is also confirmed by the empirical analysis), with most of the euro periphery countries to impose budgetary cut-offs in public spending, even in sectors that could alleviate the consequences of the crisis (like innovation), impairing thus, the vicious recessionary circle. At the same time, countries of northern Europe foster innovative activity establishing supporting mechanisms and public funding, increasing thus the gap between the two parts of the same union.

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Impact of value chain governance on the development of small scale shrimp farmers in Vietnam

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Abstract

Purpose of this paper is to identify the tendency of shrimp value chain development and impact of its governance on the small scale shrimp farmers in Vietnam.

Design/methodology/approach - Data from the shrimp farmers surveys in Mekong delta, Vietnam from 2008-2010 with the update information in 2014 were taken to analyse by the value chain analysis method.

Findings - Traditional governance type of the shrimp value chain in the early state (before 2004) showed the different levels of coordination of farmers with collectors, among collectors, and collectors with processing plants. In this type of governance, trust and linkages are inextricably linked. However, they are not strong. The processing plants determine shrimp prices and quality requirement in the market while many collectors do not seem to be highly responsible for the quality of their products. To avoid this limitation, with the governmental support policy to improve farmers' income, the processing plants set up a direct buying from farmers under contracts. These contracts led to a new governance type with an expectation of improving farmers' position. However, this model was broken due to several reasons including un-controlled shrimp raw material from small scale and individual farmers. Consequently, processors now tend to establish their own raw material zone to comply shrimp quality assurance, and eject the existence of farmers. This will lead small scale farmers to very difficult problems in finding the market. Poverty and social problems of small scale farmers might appear.

The result recommends a greater strengthening and tightening of the value chain. Re-organizing shrimp farmers into legal teams or groups that help farmers to re-participate in the game with others actor in the chain is crucial.

Research limitations/implications - The research mainly follows inductive approach in which qualitative methods are dominant due to the difficulties of data collection for the quantitative analysis.

Keywords: value chain governance, shrimp farmers, Vietnam.

JEL Classification: Q19

1. Introduction

Shrimp is one of the most important export products of Vietnam in the recent years. In the world market, Vietnam ranks fourth in farm-raised shrimp production behind China, Thailand, and Indonesia (Tran, 2013). In Vietnam, black tiger shrimp dominates in small scale individual but commercially oriented farmers (Ho, 2012; Tran, 2013). In terms of value chain, shrimp chain in Vietnam is known as a very complicate structure where farmers are always in the weakest position compared to other actors such as collectors and processing plants. The relations of farmers with the rest of actors show the type of value chain governance and its movements from time to time since the development of shrimp sector.

This paper will discuss the impact of value chain governance on the development of farmers and propose suitable policies.

Though shrimps have many different species, this paper focuses only on black tiger shrimp (*P. monodon*), the major shrimp cultivated in Vietnam.

2. Black tiger shrimp value chain and shrimp farmers in Vietnam

2.1 Shrimp value chain

The value chain includes primary and secondary actors. The main primary actors are considered as input suppliers (input dealers, hatcheries and nurseries), shrimp producers (farmers), collectors and processing plants. The main secondary actors comprise aquaculture Extension Services, Vietnam Association of Seafood Exporters and Producers (VASEP), Department of Agriculture and Rural Development (DARD), National Agro-Forestry-Fisheries Quality Assurance Department (NAFIQAD), banks, and research institutions.

Figure 1 shows the value chain of shrimp in the Mekong River Delta (MRD) where almost 90% of black tiger shrimp areas are situated in Vietnam.

The shrimp value chain in Vietnam starts from input suppliers namely input dealers and hatcheries to supply inputs to farmers such as post larvae, feed stuffs, chemicals, fuels, and net.

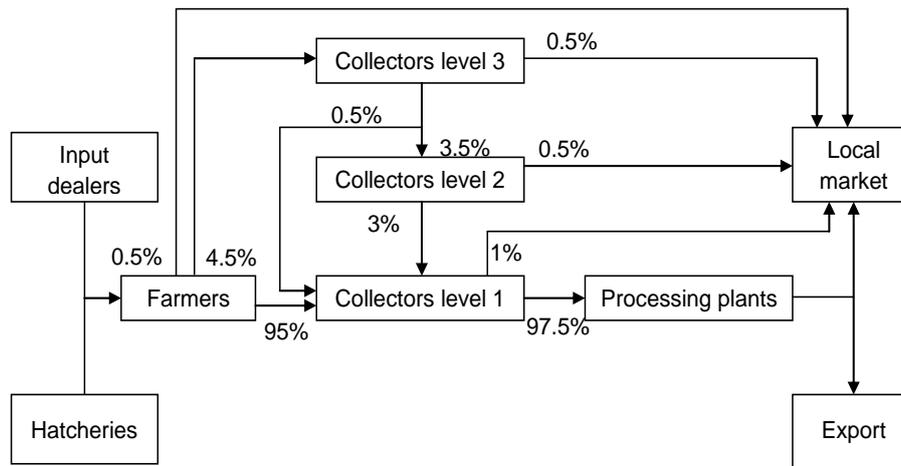
The main flow of shrimp raw material is from farmers to collectors at level 1 with about 95% of the total shrimp raw material production. These collectors will buy shrimp from other collectors at level two and three to supply the processing plants at a volume about

97.5%. Only one percent of shrimps of collectors level 1 was sold to the local markets.

Other flow of shrimp raw material from farmers to collectors level 3 accounts for about 4.5% of the total shrimp production. From collectors level 3, shrimp will be sold to collectors level 2 and 1, and local markets with the percentage of 3; 0.5; and 0.5 respectively.

Shrimps sold directly from farmers to the market were found in both extensive and semi-extensive cultivations of which the harvest volume is low. Some other cases of selling directly shrimp to the markets are failure farms when their shrimps are dead at the mid-season.

Figure 1: Shrimp value chain in MRD Vietnam



Flows of shrimp in the Figure 1 also show the actors who hold the main powers in the shrimp value chain, namely collectors level 1 and processing plants. These two actors are the leaders in the shrimp value chain where they play a key role to determine shrimp prices and have significant influences on other actors.

The above three flows of shrimps from farmers to markets illuminate the complicated value chain in general and its governance in particular where farmers always get impacts due to their lowest position in the value chain.

2.2 Shrimp farmers in Vietnam

Farmers are important actors in the shrimp value chain where they play their role as raw materials to the shrimp market. Farmers buy inputs from input dealers and post larvae at hatcheries or nurseries for their shrimp cultivation. At the end of the season, farmers will sell their output to collectors near their cultivated area.

Most of shrimp farmers in Vietnam are small individual scale and converted from rice producers. They apply primarily traditional and some modified practices such as extensive, improved-extensive, semi-intensive, and intensive cultivation.

The cultivation duration of shrimp in small farms is about 4-5.5 months depending on the climate and technical skill of farmers and market demand of shrimp size.

Most of shrimp farmers have low education, low financial capital, low technical skills, a lack of market

information, and low power of negotiation with other actors in the shrimp value chain. They stay at the weakest position in the shrimp value chain compared to other actors and therefore it is likely that they could get strong impacts, positively or negatively, from other actors in the value chain depending on the level of their governance and partners' behaviours.

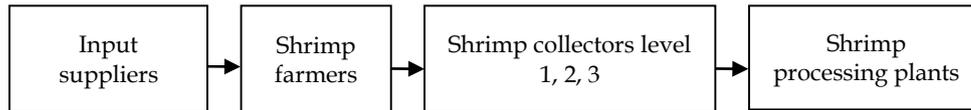
3. Shrimp value chain governance in Vietnam

Value chain governance in the shrimp sector in Vietnam refers to the relationships among the primary and secondary actors namely input suppliers, farmers, collectors, processing plants and governmental institutions. Since the development of the shrimp sector in Vietnam in early 2000s, the value chain governance has been compounded by different types from traditional, as a market, to higher level management, as a hierarchy, which will be addressed below:

3.1 Traditional type of value chain governance in shrimp sector

Value chain governance in the shrimp sector in Vietnam refers to the relationships among the primary and secondary actors namely input suppliers, farmers, collectors, processing plants and governmental institutions. Since the development of the shrimp sector in Vietnam in early 2000s, the value chain governance has been compounded by different types from traditional, as a market, to higher level management, as a hierarchy, which will be addressed below:

Figure 2: Traditional type of shrimp value chain governance in Vietnam



At farmers' position, their back step suppliers are post-larvae suppliers, feed and chemicals providers. Their first forward customers are three level collectors and their second one is processing plant. Farmers coordinate with the suppliers as a buyer-seller relation where they can get inputs for their cultivation. In some cases, input suppliers play a role as an informal credit provider to farmers to whom they sell and from whom they are post-paid.

Farmers sell their outputs to collectors who are nearby their places. The shrimp farm gate prices are given by collectors based on the size of shrimps. The collectors' capabilities themselves are limited. They lack capital, quality awareness and equipment to inspect and maintain shrimp materials, and they have a too low education level to understand and apply quality knowledge. Particularly, they do not seem to be highly responsible for the quality of their products in relation to the quality of the final products traded in the world market, and have used chemicals and other substances to maintain shrimp materials before selling them to the processing plants (Vo, 2006). However, processing plants still need the existence of collectors because most of farmers are small scale farmers and practice the individual production form, so that they prefer to buy their raw material from collectors than from farmers. They do not want to hire many workers for this activity and spend a lot of money for transaction cost to buy directly from individual farmers.

In this type of governance, processing plants are the leader in the chain who almost decides the shrimp price in the market.

As mentioned above, the value chain governance refers to the relation among the actors in the chain, in other words this relation presents the linkage among them.

The traditional shrimp value chain in Vietnam shows that the linkage among actors in the shrimp value chain is not strong both in vertical and horizontal directions.

Both spot market and persistent network relations exist in the shrimp value chain. Spot market relations appear between input suppliers and farmers, and collectors and farmers. The main reasons of the existence of this linkage is the ensuring of farmers' input supply and output in order to have better prices. This linkage can change from time to time according to the volume of supplying products.

Linkages between farmers and input dealers as well as between farmers and collectors are not tight enough. The choice of farmers for their input suppliers is based on their financial capacity. Normally they keep the relation with input suppliers to buy material in case of financial limitation.

Linkage between farmers and collectors is the same as with input dealers. Farmers keep contact with

collectors in order to have better information. They can decide to sell their output to the collectors who give a better price. In this linkage, the farmers are free with their decision.

Linkage among collectors level 1, 2 and 3 remains as a network that was created on the basis of a long relation over years. Normally, collectors level 1 establish their own network to buy shrimp on the market. They are the ones who give information on prices and sizes to the collectors level 2 and 3. The linkage between collectors level 1 and 2 is quite strong when most of collectors level 2 sell their shrimp to the collectors level 1.

Linkages between collectors and processors in the shrimp value chain seem strong when the reality shows that most of collectors sell their shrimp to the same processors in the different crop seasons. Collectors usually sign a contract with processors to supply shrimp with an expected volume at market price.

In brief, the linkages in the shrimp value chain are not through all actors. However, among backward and forward actors, the linkages are maintaining at the spot and persistent network relations. Most of linkages are unofficial when actors only have oral agreements. The official linkage appears in the relation between collectors and processors, the two having the strongest power in the shrimp value chain. The current linkage in the shrimp value chain is not strong enough to apply the traceability system that is required by the importers. Therefore, the food safety standards seem not completely fulfilled.

3.2 Value chain governance under contract farming as a captive

In the traditional form of value chain governance, the processing plants did not satisfy quality requirements of shrimp materials because, firstly, their plants are located far from sources of shrimp materials, and secondly, they are lacking the conditions to control quality of shrimp materials. The processing plants realised that quality of shrimp materials is a very important factor that affects to quality of final products. Therefore, the company's reputation in terms of business success and flexible price policies and quick payment are important elements that the processing plants have used to maintain the suppliers' loyalty. Besides, almost all processing plants are in a cut-throat competition of buying shrimp materials (93.8%) with internal and external processing plants of the region. As a result, uncontrolled shrimp materials are still distributed popularly (Vo, 2006).

In order to control the shrimp quality, processing plants looked forward to set up a direct buying from farmers under contract farming. With the support of Vietnam government, Ben Tre Forestry-Aquaculture Import Export Company (FAQUIMEX) established its relationship with farmers through contract farming.

With a mobilizing campaign based on voluntary participation, it created in three districts of Ben Tre province (Binh Dai, Ba Tri and Thanh Phu) a model of nine shrimp farmer groups who had production area of two to three hectares. These shrimp farmer groups established a linkage through annual farming contracts established. The provincial Agriculture and Rural Development Bank (AgriBank) participated in the linkage chain by providing capital loans through FAQUIMEX.

The main operating contract farming procedures were as follows: 1) Farmers: annual contract signing at floor price, selling product to FAQUIMEX at market price; free inputs purchase; after 75 days of shrimp production, farmers were supplied with funds provided that FAQUIMEX technicians assessed they complied with technical requirements; farmers were allowed to sell shrimps to parties offering a higher price than FAQUIMEX, but would have to pay back their loan to FAQUIMEX with the Bank interest rate; technical supports are provided by Aquaculture Extension Service throughout the shrimp crop season; product must be compliant with food safety requirements. 2) FAQUIMEX: establishing contract farming with farmers; as the legal entity to borrow fund from the bank; inspecting and monitoring the whole shrimp crop production; quantifying fund for farmers' loans.

FAQUIMEX wanted to establish a stable input network that guaranteed the raw shrimp food safety because it is a delicate export product that must comply with traceability and food safety requirement such as HACCP issued by the importing countries. Farmers participating in the contract wanted to have opportunities to increase their access to financial support advancement and confirm the product consumption market at the shrimp harvest crops. However, objectively, the main aim of both sides participating in the linkage model was to "maximize their profits". The processing plant maximized its profits through the reduction of transaction costs (decrease of collecting and negotiating expenses) due to stable input supplies. Participant farmers maximized their profits through a stable price at the end of shrimp crop season and gained an access to fund after 75 days of shrimp production.

The coordination among farmers and the processing plant, as FAQUIMEX, created a captive type of value chain governance (according to Gereffi et al., 2005) in Vietnam where the shrimp is codified, such as more specific products. In this type of value chain governance, both farmers and processing plants could reduce their transaction cost due to the limited number of buyers-sellers in the market where trust and commitment might be less risky. Hence, the shrimp value chain was upgraded.

3.3 New tendency of value chain governance

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4. Discussion

According to Gereffi et al. (2005), the traditional type of shrimp value chain governance in Vietnam is a market linkage which does not have to be completely transitory as it is typical of spot market. Shrimp material for processing is not a product specification. Information exchanged among input suppliers, collectors and processing plants is relative low. Therefore, the transactions might be governed with little explicit coordination. Farmers respond to shrimp quality and prices that are set by collectors, directly, and by processing plants indirectly. Hence their bargaining power is low compared to collectors and processing plants.

In the captive type of value chain governance where farmers and processing plants signed a contract to sell-buy shrimp material at the end of season, trust and linkages are inextricably linked among them. The trust created among farmers and processing plants in the shrimp value chain would be better if there was a linkage in an organisation. However, the coordination through contract farming shows that farmers are transitionally dependent where the degree of monitoring and control is led by the processing plant.

The movement of shrimp value chain governance and its impact on farmers are shown in the Figure 3.

The shrimp value chain in Vietnam is very sensitive and complicated with the existence of many small, individual farmers; small and commercial-oriented collectors; processing plants and support institutions.

The movement of value chain governance in shrimp production develops new structures and shows its dynamism in Vietnam. However, the tendency of creating raw material zones of processors will lead small scale farmers to very difficult problems in finding the market for their output. Poverty and social problems of small scale farmers might appear.

The above study result recommends a greater strengthening and tightening of the value chain through improved organization, particularly among farmers. Re-organizing shrimp farmers into legal teams or groups that help farmers to re-participate in the game with other actors in the chain is very important. Further researches to find down better policies to improve farmers' situation are needed.

The Figure 3 shows that the number of farmers participating in the shrimp value chain reduces from the structure (1) to (3). In the traditional structure, as spot market chain governance, both small and large

scale farmers can join in the value chain to supply their shrimp to the processor through a link with collectors. In the structure (2), as captive value chain governance, only medium and large scale farmers could join in the value chain to supply their shrimp to processors through a farming contract. The structure (3), a hierarchy, excludes all farmers when processors cultivate and supply shrimp raw material by themselves.

The movement of shrimp value chain governance created the problems of poverty reduction and social aspect. In the structures (2) and (3) of the shrimp value chain governance, processors do not need the supply of small farmers who account about 80% of producers in Vietnam. Consequently, small farmers are faced to the challenges of finding a market for their outputs. On one hand, poverty might rise up due to the number of farmers being in debt because they cannot sell their output to the market when all the production costs are already spent. On the other hand, unemployment also increases due to the giving up of small farmers in shrimp production while there is no other job for them to join in. The same problem could happen with collectors when contract farming is established. The dark future of small farmers and other actors in the shrimp value chain seems very obvious.

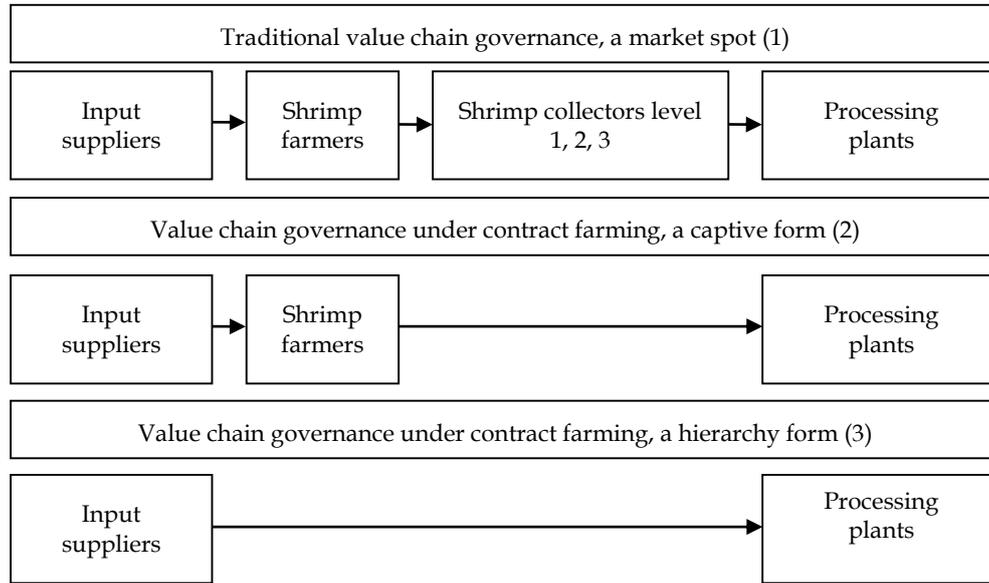
Generally, it is not all of small farmers who are excluded from the shrimp value chain. The traditional structure always exists and small farmers can sell their shrimp to processing plants through collectors. However, what is the market share of their shrimp when the customers' requirements of high quality in shrimp have been rising and their production status still remains? Due to the requirements of high shrimp quality from customers, the processors will have two options. They might remain or even expand their market if all requirements are met or they might lose their strict market and turn to the easier one. In the first option, processors need to create their own raw material zone to ensure the input quality or they might have a linkage with other actors.

The reality in Vietnam shows that there is a tendency in creating raw material zones of processors. If a processing plant does not have a closed production process from raw material to final products, it must depend on the raw material supplied by farmers or other sources and will not have the initiative to decide on the quantity of shrimp for export due to the excess or lack of inputs. Consequently, the production cost will increase, the prices of shrimps will be very fluctuant, and the competitiveness of processing plants will decline. If a processing plant had a production capacity about 300 tonnes/day but due to lack of raw material, can produce only 50 tonnes/day, its production cost will be tripled. In order to have production efficiency, at least 50% of the total input demand must be satisfied. Therefore, processing plants in Vietnam have a tendency to create their own raw shrimp material zone.

In the second option, processors will be lost and give their market to other competitors who meet customers' requirements. Demand for shrimp will be reduced. In both options, small farmers will have a limited market

if there is no change in their production techniques as well as organisational structure.

Figure 3: The movement of shrimp value chain governance in Vietnam



5. Conclusions

The shrimp value chain in Vietnam is very sensitive and complicated with the existence of many small, individual farmers; small and commercial-oriented collectors; processing plants and support institutions.

The movement of value chain governance in shrimp production develops new structures and shows its dynamism in Vietnam. However, the tendency of creating raw material zones of processors will lead small scale farmers to very difficult problems in finding the market for their output. Poverty and social problems of small scale farmers might appear.

The above study result recommends a greater strengthening and tightening of the value chain through improved organization, particularly among farmers. Re-organizing shrimp farmers into legal teams or groups that help farmers to re-participate in the game with other actors in the chain is very important. Further researches to find down better policies to improve farmers' situation are needed.

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Clusters and regional development: the dynamics of agglomeration processes and its contribution to the development of North East region of Romania

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Abstract

Purpose – This paper aims to analyze the dynamics of agglomeration processes in the North East region of Romania and to connect the results with the process of deepening of Romania's European integration.

Design/methodology/approach - The research method includes an analysis in dynamic of two economic sectors: agriculture and IT&C. Firstly, I analyzed the transformation of the GDP from 2000 to 2011 so as to gain insights from the evolution of the North East region during the EU accession and economic crisis. Secondly, I used the Location Quotient method in order to assess the agriculture and IT&C sectors in the North East in comparison with the other regions of Romania.

Findings – The results show a strong specialization degree in agriculture, where the North East region has the higher value of the Location Quotient in comparison with the other regions, and a weak specialization in IT&C, where the region ranked 5 from 7 in 2011. At the same time, regarding the IT&C we can see a positive tendency during the years, possibly explained by the presence of one of the most important university centers from the country and by the multinationals that have started to come after the EU accession. The over-representation of the agriculture in the regional economic structure is not specific for the North East region; other four Romanian regions had in 2011 a strong relative specialization in this field.

Research limitations/implications - The analysis can be completed using more quantitative indicators like the export value of the sector as compared to total regional export value. The limitation is that in Romania there are no data on exports at the regional level.

Originality/value - This analysis uses Location Quotient method in order to compare the levels of specialization across the Romanian regions.

Keywords: Regional development, clusters, cluster policies

JEL Classification: R110

1. Introduction

The economic agglomeration processes have been studied over time with the aim to explain why production and commercial activities tend to concentrate in some areas. The cluster concept derives from Alfred Marshall's theory about the economic space around London where companies were interconnected by three elements: labor force, specialized suppliers and accessible knowledge. The theoretical base comprises traditional: trade theories where the regional specialization is brought on by the comparative advantages; regional economics' polarization theory that emphasize the potential cumulative causation or factor agglomeration in the center and backwash effects for peripheral regions; and New Economic Geography explains the concentration through transaction costs and economies of scale (Stirboeck, 2002). In the 90s, the concept of cluster was brought by Michael Porter through his "diamond economic model". He demonstrates that in order to

explain the economic success of a country or region is not enough to just analyze the factors of production, it is also necessary to assess the interaction between the following factors: demand, business strategy and competition, factors of production, supply chains and horizontal integration. Porter describes the concentration of economic activities as a result of the competitive advantages of companies to identify new ways to compete in an industry and to bring innovation to market (Porter, 1998).

The industrial clustering has become a subject for more and more studies after the success of some industrial groups like Silicon Valley. Observing the phenomenon of geographical concentration of economic activities caused discussions about the impact that public sector can play in stimulating innovation and economic growth. Although clusters are structures that occur spontaneously due to market forces, public sector recognized the potential that they have, especially for the regional economies, and decided to

intervene in order to facilitate their establishment and spread best practices. This activation of the cluster public sector came largely due to the expansion of regional development field where the concern is to find ways and opportunities for economic and social development of the regions.

Cluster development model is based on a comprehensive approach, involving all relevant actors to increase the region's competitiveness. Clusters have the potential to become forums for collaboration between the private sector, public authorities and universities in order to create constructive dialogue mechanisms for finding the problems and solutions. Moreover, in the context of public policy, the concept of cluster represents a good model for economic organization of the regions. The cluster policies have the capacity to reorient economic policies from industries or individual firms to groups of firms linked around a common field, which contributes to regional specialization. However, there is a risk related to the flexibility of the concept, which can be used in an inappropriate manner by policy makers. Thus, especially in Romania, the academia needs to pay more attention for the research of industrial clustering. The international literature focuses mainly on developed countries, where clusters are the subject of public policy for a long time. For Romania and its regions, the approach must be specific and adjusted to the national and regional characteristics.

Thus, the article aims to explore the attempts of analyzing the potential clusters in the North East region and to use the Location Quotient method in order to assess the dynamics of the agglomeration in two economic areas selected to be specialization sectors: agriculture and IT&C. These two sectors were selected due to their inclusion in the Smart Specialization Strategy of the North East Region from 2014-2020.

2. Clusters and regional development in Romania

In the literature about Romania's agglomeration processes there are papers focusing on the exploration of the changes in the spatial agglomeration across Romanian regions after the communist period. Some results show a strong decline of the industrial sector and a growing proportion of employment in agriculture during the 1990s (Dirzu, 2013). A number of studies have tried to identify potential clusters in Romania. The first serious attempt was a study coordinated by the International Centre for Entrepreneurial Studies from Bucharest in 1998 that used a methodology based on the diamond model of Michael Porter. The results showed three potential clusters in software production, marine industry and wood industry. Another research in this field was the paper of Marco Riccardo Ferrari from 1999 that analyzed companies at the county's level and identified also three clusters in the early form: wood, textiles and ceramics industries. Also, there was a project between 2003 and 2004 that had the aim to realize an analysis of the potential clusters. The methodology was based on using macroeconomic data about the industrial structure of the country. As a result, the project has identified potential clusters in textiles

(North East region and West region), software (West region and Bucharest), chemical industry (Centre region), etc. The WEID project has represented another attempt to analyze clusters from Banat-Crişana and Arad-Timişoara.

North East region is the largest of the eight development regions of Romania, both in terms of territory and population. At the same time, it ranks last in terms of GDP per capita, due to low productivity and weak infrastructure development. The overall objective of the North East Regional Strategy is to reduce the gap compared to the developed regions of Romania by increasing regional competitiveness and attractiveness. The most important regional actor is the Regional Development Agency of North East that has undertaken a number of measures in order to analyze the region's potential and to create strategies and development plans. The Agency has identified in 2013 few potential clusters in agro-food, IT&C, textiles and health. The problems of the clusters development are related to the lack of companies that would complete the value chain and weak interaction between companies.

There were several studies that aimed to identify specialization fields and potential clusters in the North East region. The Center for Strategy and Competitiveness from the Stockholm School of Economics has realized in 2011 a report about the potential clusters in Romania. The research methodology focused on three factors: the size of clusters, the level of specialization and the extent to which the region is dependent on the activity of clusters. For the North East region, the selected specialization sectors were clothing, agriculture, furniture production and textiles. Also in 2011, the project "Support for management authority in formulating and implementing policies on competitiveness operation" funded by European Commission had the aim to analyze the situation on existing and potential competitiveness poles in the regions of Romania. After a qualitative analysis at regional level, the researchers had identified the following fields as specialization areas in the North East region: textiles, tourism, agro food, and automotive.

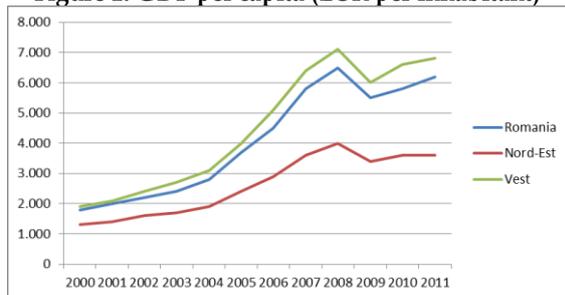
More recently, the Regional Development Agency has selected the economic sectors relevant to the development of clusters in the context of the regional economy. Thus, the Regional Development Strategy for 2014-2020 has included the action "support for the creation of new clusters that may lead to increased regional competitiveness: IT&C, food industry, creative industries, tourism". In this context, the existing clusters require a process of expansion and development and the potential clusters have to be assisted. The responsibility for the implementing and monitoring of the strategy is assumed by the Regional Development Agency, but this institution has serious limitations that can be overcome only through a process of decentralization that can empower the agency in terms of broadening the prerogatives that can create effective policies at regional level for the public sector intervention in the field of clusters development.

CLUSTERS FROM NORTH EAST REGION

In the socialist period, the planned industrial structure of Romania didn't allow a development of dynamic industrial agglomeration and subsequently led to a less efficient spatial allocation of economic activities at regional level. (Dirzu, 2013)

Firstly, we'll look at the transformation of the GDP from 2000 to 2011 so as to gain insights into the process of becoming member of European Union and confronting the economic crisis. The North East region had the smallest GDP per capita during the years, increasing to 4.000 Euro in 2008, and decreasing during the economic crisis to 3.600 Euro in 2011. When we compare the North East region with the West region and with the average of Romania, we can see that the growth rate of the poorest region from the country was smaller, possibly showing that the effects of European economic integration was disproportionate. The fall of the GDP per capita during the crisis show us the poor connection between the economy of North East region and the global market that, in comparison the fall of the same indicator at the West region and national level was higher.

Figure 1: GDP per capita (EUR per inhabitant)



Source: Eurostat

Secondly, I'll use the Location Quotient indicator in order to assess the agriculture and IT&C sectors in the North East in comparison with the other regions. Location Quotient (LQ) allows us evaluating the relative degree of concentration of a given activity in a given region. The rationale underlying this index is that if $LQ > 1$, the industry is „over-represented” in the case study region compared with the rest of the regions. If $LQ < 1$, the sector is „under-represented” in the region.

Change in LQ over a period of time is seen as a valuable insight in regional economic activity and provides information about the growing or declining of a regional clusters compared with other regions (Sambidi, 2008).

Figure 2: Location Quotient formula

$$LQ_i = (e_i/e) / (E_i/E)$$

where,

LQ_i = location quotient for sector in the regional economy

e_i = employment in sector i in the regional economy

e = total employment in the local region

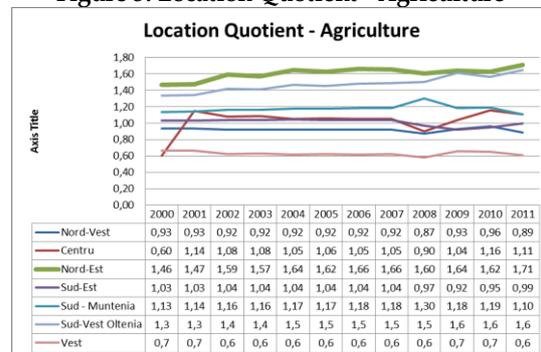
E_i = employment in industry i in the national economy

E = total employment in the national economy

In order to diagnose the position of the North-East region in the national structure in terms of differences in investment and employment structure, indices of relative specialization were calculated for each region and each year. The sectorial investment and employment shares are analyzed in relation to the national average.

The results of LQ calculations show the variation of spatial agglomerations in terms of employment change in two individual sectors between 2000 and 2011. Measuring an average location quotient index helped us in providing an overview of the transformations regarding the evolution of regional industrial agglomerations. The period was selected due to the availability of data and allows us to analyze the fluctuations during two major events: the European accession and the global crisis.

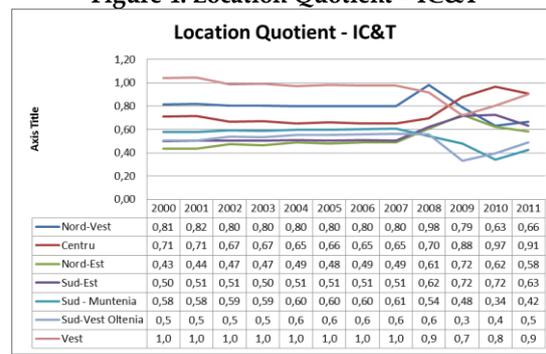
Figure 3: Location Quotient - Agriculture



Source: own calculation based on Eurostat data

According to this specialization index, the agriculture is „over-represented” in the North-East region. Even if it is a traditional sector and there were some critics related to its inclusion in the Smart Specialization Strategy, we can't ignore the weight that it has for the region. The agro-food topic is recognized as a specialization regional sector in five Romanian regions. In this field there is one cluster present in the region, IND-AGRO-POLE (Food & Agricultural Cluster). In 2011, there were 2.060 firms and 18.173 employees in agriculture. Also, at the North East level the share of employees in agriculture from total population is 42% higher than at the national level (Strategy for Smart Specialization of the North East Region).

Figure 4: Location Quotient - IC&T



Source: own calculation based on Eurostat data

The Location Quotient in IT&C is „under-represented” in the North-East region, but still, in 2011 the region ranked 5th from the 7 analyzed regions, while in 2000 was the last one compared with the other regions. The evolution of this indication over time is due to the presence of a university center in Iași, the biggest city of the region. Another possible explanation is that after the European economic integration the multinational came in the Romanian cities with more IT graduates. The problems claimed in this field are related to a weak cooperation between the universities and business, the knowledge is not with the labor market demands (Rotaru, 2015). In this field the region has two clusters, ICONIC (Interactive Cluster of New-media Industry City of Iași) and EURONEST IT&C HUB (IT&C Regional Innovative Cluster).

The analysis can be completed using more quantitative indicators like the numbers of firms in the sector relative to total number of firms in region and export value of the sector as compared to total regional export value. Also, the analysis can be realized at the county level (NUTS III) in order to have a better image of the clusters position inside the region.

3. Conclusions

The aim of this paper was to explore the agglomeration processes in the North East region of Romania. The agriculture and IT&C sectors were selected because they are two of the specialization sectors proposed in the Smart Specialization Strategy of North East region for 2014-2020. The used indicator was Location Quotient that allows us to measure the relative specialization using the employment data. The analyzed period was 2000-2011, a period with two significant events: the EU accession and the economic crisis. The specialization indicator was calculated for the North East region and for the other six regions of Romania, except Bucharest, year by year.

The results show a strong specialization degree in agriculture, where the North East regions has the higher value of the Location Quotient in comparison with the other regions, and a weak specialization in IT&C, where the region ranked 5 from 7 in 2011. At the same time, regarding the IT&C we can see a positive tendency during the years, possibly explained by the presence of one of the most important university centers from the country and by the multinationals that have started to come after the EU accession. The over-representation of the agriculture in the regional economic structure is not specific for the North East region; other four Romanian regions had in 2011 a strong relative specialization in this field.

In the future works, the analysis will be extended in order to include more economic sectors and also, other indicators as the number of firms and the export value.

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