

THE APPLICATION OF A RISK MEASUREMENT TOOL IN GREEK PUBLIC SECTOR

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Abstract

How to cite this paper:

Eleftheriadis, I. M., & Vyttas, V. (2017). The application of a risk measurement tool in Greek public sector. *Corporate Ownership & Control*, 14(4-1), 240-248. doi:10.22495/cocv14i4c1art6

How to access this paper online:

<http://dx.doi.org/10.22495/cocv14i4c1art6>

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ISSN Online: 1810-3057

ISSN Print: 1727-9232

Received: 1.04.2017

Accepted: 4.06.2017

JEL Classification: H3, M10

DOI: 10.22495/cocv14i4c1art6

The present research aims to apply a valid and reliable tool (questionnaire) and examine how that can be used by Greek state organizations, in order to measure economic and operational. The methodology adopted in this research is the quantitative one, which will be based on the collection of primary data through a questionnaire. The research results showed that the measurement tool selected, applied, presented and proposed in this essay comprises three (3) scales: The economic risk scale, which consisted from fifteen items and the operational risk measurement scale, both present and future, which contained seventeen items. The concurrent and predictive validity analysis has shown that the economic risk scale and the present operational risk scale are useful tools for management risk issues. The study's academic contribution was the application of the aforementioned measurement instruments, which can now be utilised by researchers in the field of risk management to further advance the study of risk management in public organizations in Greece. On the empirical level, the implementation of these two scales can assist public organizations in Greece in assessing economic and operational risks easily and fast. This tool can help public organizations in Greece gain insight into the level of risk they face at any given point in time and plan their actions accordingly. At the same time, central state administration in Greece will have the necessary tools to monitor and support the organizations it evaluates.

Keywords: Risk, Economic Risk; Operational Risk; Greece; Public Sector Organizations

1. INTRODUCTION

Since very early Osborne and Gaebler have supported that in order for public administration to escape bureaucracy and to create those structures which will enable it to adjust quickly and effectively to change, it should not be abolished but rather modified and re-invented (Osborne & Gaebler, 1992).

This transformation, which should be achieved through a change in aims, incentives, responsibility, structure and culture (Osborne & Plastrik, 1997), will thereby lead to the creation of an entrepreneurial spirit and mindset.

The principles of New Public Management fall within the phenomenon of the "economization" of Public Administration (Chistonakis, 2009), according to which concepts and sizes from welfare economics as well as principles of utilitarianism infiltrate public administration arguments (Chistonakis, 2009).

Additionally, we should not overlook the fact that although today all the governments of OECD

countries agree with the need for deficit and debt curbing, improvements in the services provided, and an increase in efficiency, they do not always incorporate the New Public Management in their policies with the same meaning (Torres, 2004).

Greece is included among those countries where the dissemination and the adoption of New Public Management (NPM) methods in the Public Sector is still slow. Through a review of the relevant literature, one can see that the attempted reform efforts in the Greek Public Sector are still in progress while previous attempts to apply the NPM principles were only moderately successful or not at all (Philippidou, Soderquist & Prastacos 2004; Zeppou & Sotirakou, 2003; GIPA, 2014).

Our aim is to select and apply a scientific questionnaire which will address the executive members of Public Services and Organizations and which will potentially measure the levels of economic and operational risks in the Greek organizations under investigation. Next, we will examine a number of factors which influence the levels of risk in the Greek Public Sector. These

factors include variables such as the size of the organization, sources of finance, the extent to which it belongs to the core or the wider Public Sector etc. Therefore the research question of the study is: "Could economic and operational risk indexes be reliable and valid?"

In this context, the article contains the following sections: In the first section, the Greek Public Sector is described. The second section of the article presents the literature review on risk management. The third section, Method, includes an outline of the present study's aims, its contribution to current research, the description of the questionnaire methodology, the application of the measuring instrument, and a description of the research sample. The two final sections of the article are: the Findings where the reliability analysis is presented and the Conclusions.

2. THE GREEK PUBLIC SECTOR AND THE NEED OF INSTILLING A CULTURE OF RISK

The Greek public administration presents a strong pathology and bureaucratic dysfunction, the characteristics of which can be broken down into two main categories:

The first one is the trend of concentration of decisive force and influence in the political system and secondly, structural or structural failure, inadequacy or reduced ability of the administrative machinery of the country. Specifically, with respect to the first set of characteristics of administrative pathology observed are the tendency of concentration of the decisive power, influence and power grows in multiple successive levels (Ioannou, 2013):

- a) The executive administration, inside of the political system;
- b) The Prime Minister and the government, within the executive administration;
- c) The political leadership within the public administration;
- d) The leading managerial levels, in public services and organizations.

Among the immediate consequences and effects of the centralized voltage include limiting the transfer and devolution of responsibilities and powers, the politicization of almost all administrative decisions and actions, the reduction of functional differentiation and relative autonomy of the administrative system.

The concentration, moreover, of the decisive power and influence at the top of the executive political leadership is positively associated with increasing trends politicization of leading tier of the administrative pyramid.

Another facet of the leading party management is the transfer of targets (or substitution purposes). Any reform, in papers and in practice, can only proceed to the extent that it affects the party acquired. The reform objectives of universally identified purposes (promotion of general interest) are converted into instruments to promote party interests.

As regards the second set of characteristics, deficiency and the inadequacy of the administrative mechanism follow:

- a) The highly expanded, compared with the actual effects produced, organizational size of the

staffing of the public services, the latter characterized by the anachronistic and deformed structure due to uneven distribution of human resources;

b) The improper staffing, which almost always results from the simultaneous operation of either the patronage system of political favoritism regime or of reduced effectiveness of methods of recruitment;

c) By administrative under-development in the sense of lack of modern culture, methodology and management philosophy in almost all organizational levels and grades. Consistently maintaining maladministration and bureaucratic pathology events (legalism, diffusion of responsibility, low productivity, delays, substitution purposes), lack of procedures, knowledge and skills through feedback which shows the extent of the deviation from the desired goals and objectives and the necessary corrective measures identified;

d) Substantive failure and limited effectiveness reform measures and projects, which either accelerate the system's capacity, either fail to suspend and refocus.

In a broader context, therefore, public administration shows totally dependent on political fluctuations. It is characterized by discontinuity, centralization, lack of adaptability and flexibility, irrational and lengthy procedures, a small degree of focus on the result. From the perspective of the recipient weaknesses could be summarized as follows (Christopoulou & Monastiriotis, 2014):

- Lack of consistent and reliable standards (uncertainty, discontinuity)-Programming Lack of planning, coordination;
- Lack of orientation to the customer / citizen and to the result;
- Lack of flexibility, decentralization of powers and responsibilities;
- Lack of care application and excessive emphasis on formal legal arrangements.

These characteristics are found within structures, processes, and manners of recruiting that lead to unproductive public administration. Especially where service objects which are not suitable for measurement do not directly affect financial figures, indifference is displayed to each determination of objectives and evaluation of the degree of their achievement.

Another remarkable feature of Greek political-administrative system is the absence, deficiency, or lack of control mechanisms. This reveals the indifference towards the production results, the vagueness of set of objectives and the consequent diffusion of responsibility. The causes of the present unsatisfactory operation administration have historical roots. As a social institution, public administration is formed in a way that replicates features of the social environment and brings their mark. The analysis and understanding of the current situation inevitably refers to historical parameters (Ladi, 2014).

Recent studies demonstrate that our country suffers from maladministration and corruption. In order for these to be combated, we are in need not only of appropriate control mechanisms which will

run parallel to the effective operation of the justice system for the prevention and prosecuting of these cases but also of the more active support of the society (GIPA,2014).

Briefly reviewing the facts of the last four years, we can see that the Greek public sector is trapped in a debt crisis with no escape in sight. Because of its fiscal situation, the country is coming closer to collapse, while austerity measures push the economy further into recession and do not address the need for corrective action in the structural weaknesses of the Greek fiscal system (Argitis, Dafermos & Nikolaidi, 2011).

In this unstable environment, as the foundations of the state undergo intense shocks because of the long-term economic recession and the insecurity dominating the majority of its economic activities, an adequate framework for risk assumption which will contribute effectively to the facing up of macroeconomic imbalances and will create long-term prosperity is still sought after. Based on this new set of circumstances, risk estimation is necessary for all Greek public organizations (Tsirikas & Katsaros, 2014).

The risks countries are facing today are diverse. In the case of Greece, the risks faced today by Greek public sector organizations are due as much to the drastic cuts in funding for covering their needs (economic risk) as to the constant organizational and administrative restructuring of the public sector, which leads to staff reductions, changes in the composition of personnel, and jurisdiction or even to the termination of its operation (operational risk).

Without question, to attain a healthy system of entrepreneurial risk management, managers as well as top management need to ensure that the risk management framework is integrated in the culture, procedures and structures of the company or organization (IRM, 2012).

3. RISK MANAGEMENT

Risk management is a central core of strategic management of each organization. It is the process whereby organizations methodically approaching the risks associated with their activities, in order to achieve sustainable benefits to each activity and for the portfolio of all activities (Manuj & Mentzer, 2008; McNeil, Frey & Embrechts, 2015; Bessis & O'Kelly, 2015).

The focus of successful risk management is the identification and handling of these risks. The objective is to add maximum sustainable value to all the body's activities. The scope is the understanding of the potential benefits (upside) and threats (downside) of all those factors which can affect the organization. It increases the likelihood of success, and reduces both the probability of failure and the uncertainty of achieving the overall objectives of the organization (Power, 2004; Drennan et al., 2014; Bannerman, 2008).

The definitions of the term 'risk' vary mostly due to the multiple techniques used to approach and overcome risk. However, a common denominator in its definition is the notion that risk is a combination of the probability of an event occurring, and its consequences (Harland,

Brenchley & Walker, 2003). According to Borge (2008), risk is finding oneself exposed to the possibility of an unfavourable outcome. A more comprehensive approach to the term maintains that risk is the potential variation of an event which could result in either a positive or a negative outcome. Alternatively, risk can be defined as a state in which every alternative aspect of the activity of an organization or business leads to a cluster of consequences, each of which is, in all probability, known to the person making that specific decision (Kiohos et al.,2003; Power, 2004).

No country on its own can deal effectively with risks that cross national. The increasing interconnectedness of the world—which has fostered economic growth and opened opportunities for the developing world—also amplifies the impact of these risks and complicates their management. For instance, financial crises can spread through the complex interlinkages among financial systems around the world (World Bank, 2013).

In the context of the current study, economic and operational risks are examined as having a multidimensional effect on Public Organizations and as being among the risks which countries are called to face (Harland, Knight, Lamming & Walker, 2005). Thereafter, the choice of a proper risk management model is proposed. This model will contribute primarily to the assessment of the aforementioned risks and to a lesser extent to the prevention of potential future crises. At the same time, this model could have a direct impact on the organizations' macroeconomic risks to which it applies.

After a review of the relevant literature, pilot tests of the model were conducted in a number of services and organizations of the public and quasi-public sector, which were chosen randomly. Thus, the model is now ready to use.

Concerning economic and operational risk, definitions and references vary greatly. In economics, economic risk is bound with market risk (currency, interest rates, prices, credit) and with liquidity risk (Pomonis, 2008; Alexander, 2009). Operational risk is defined by the Basel Committee as "the risk of loss resulting from inadequate or failed internal processes, people, and systems, or from external events" (BFIS, 2006).

It is becoming widely accepted that risk management deals with and engages in both the positive and negative aspects of risk and of human behaviour (Rothstein et al., 2006; Kyriazoglou et al., 2007). Risk management lies at the core of every organizational policy (Gander et. al., 2011). It is the process of consistently approaching the dangers that are intrinsic in their operation, while it also tries to achieve a sustainable profit in every action and portfolio of activities (Kyriazoglou, et al., 2007). Furthermore, risk management is inextricably linked to efficiency. Inadequate or ineffective risk management jeopardizes the performance and outcomes of any organization (Oestreich, Buytendijk & Hatch, 2011).

Risk management is a procedure which aims to measure or assess risk and is followed by the development of strategies to contain it (Vaughan, 1997); see also Rothstein (Rothstein, Huber & Gaskell, 2006). Comprehensive management of risk

guarantees that 'all necessary steps and measures (are taken) so as to address the uncertainty of the future' (Elefteriadis, 2011). 'Risk', as a term, can also refer to the volatility of performance, in which case, risk management strives to reduce low performance (Slywotzky & Drzik, 2005).

In light of the above exploration of the term 'risk' and its management, one can safely assume that risk management should be an integral part of any state organization policy as it can greatly assist the leadership's continuing efforts to evaluate the organization's efficiency and performance (Brown & Osborne, 2013; Chen & Bozeman, 2012). An organised state must be able to appropriately measure the risk levels of its public organizations in order to be able to safeguard them and their ability to provide services to the citizens (Rouillard, 2004). This is further accentuated in the last decades since the trend towards privatization has led many public organizations to outsource some or all of their operations to private sector organizations, usually in an effort to decrease costs (Pongsiri, 2002; Hodge & Greve, 2007). Having said that, this may lead to increased risks that need to be measured and controlled (Farneti & Young, 2008).

As an effective risk measurement system together with an effective policy and teamed with the managers' operation programme, risk management can serve as a valuable tool in defining and supplementing the operation of a public organization (Power, 2004; Walker, Di Sisto & McBain, 2008; Harland et al., 2005; Mulgan & Albury, 2003). Although it would be unattainable for managers to monitor every possible risk factor, they could try to contain risk effectively; the latter target could be reached through adaptation and modification of organizational culture, through internal processes, and the use of technology (Elefteriadis, 2011; Kimbrough & Compton, 2009).

There are many different approaches in the international literature toward risk measurement. However, most of them focus on strictly measuring financial risk like J.P. Morgan's RiskMetrics™ or the Value at Risk model (Jorion, 2007; Marshal & Siegel, 1997). These are mathematical in nature (Artzner, Delbaen, Eber & Heath, 1999) or focus on specific types of risk such as credit risk (Altman & Saunders, 1998), liquidity risk or market risk (Bangia, Diebold, Schuermann & Strouhair, 2001). These models are not suitable for measuring risk in the Greek public sector due to their characteristics and limitations. First, the accuracy of these models largely depends on the existence of specific and accurate financial data, which are often difficult to find in a Greek public sector organization. Second, those models primarily focus on private organizations, which display characteristics that differ from those of the Greek public organizations. Moreover, they focus on specific types of risk and are not able to measure general operational risk, which is essential for Greek public organizations. Finally, these models cannot produce risk scores comparable among the diverse kinds of public organizations which range from tax collecting authorities, schools, and hospitals to even public services.

Therefore these models are not suitable for the needs of measuring risk in a Greek public sector organization. Instead, a social sciences approach that measures risk perceptions of public organization managers can measure financial or operational risk without the need for hard financial data and can provide results comparable among all the diverse types of Greek public organizations. As the study of international theoretical literature and research reveals, one can safely assume that risk measurement through the use of questionnaires is a well-documented practice and yields reliable results (Akerboom & Maes, 2006; Bell et al., 2001; Eilifsen et al., 2001; Knechel, 2007; Mitchell, 1995; Ciavarelli et al., 2001). Specifically the aforementioned researchers utilised quantitative questionnaires to measure perceived risk in a variety of contexts. The results of these studies indicated that the collected data exhibited good reliability and validity. Therefore, one can safely assume that the closed type questionnaire can be a reliable instrument to measure risk perceptions.

4. METHOD

The methodology adopted in this research was the quantitative one, which is based on the collection of primary data through a questionnaire. The choice of the questionnaire is based on two reasons: First, the questionnaire is characterized by an exceptional balance between cost, validity and effectiveness in data collection. Second, experiments and observation have important limitations. In the field of management, the scientific questionnaire is clearly dominant in frequency as well as in effectiveness.

In this context and according to the literature on the issue under investigation, it follows that the most suitable research methodology for the measurement and management of risk in the Greek Public Sector is the quantitative method for the following reasons:

- a) the large data bank that can be accessed;
- b) possibility for standardization of the data;
- c) the suitability of the data for statistical processing;
- d) the objectivity and generalizability of the conclusions;
- e) the potential for further analysis by other researchers.

In particular, our aim was to apply a scientific questionnaire which addresses the executive members of Public Services and Organizations and potentially measures the levels of economic and operational risks in the organizations under investigation. Next we have examined a number of factors that influence the levels of risk in the Public Sector. These factors included variables such as the size of the organization, sources of finance, and the extent to which it belongs to the core or the wider Public Sector etc.

Then we have examined the concurrent validity of the two scales by using the statistical package SPSS. This package allows the application of an exceptionally wide variety of statistical analyses and can cover all the needs of research in the field of Public Management.

4.1. Aims and contributions of the present research

The present research aimed to present a tool (questionnaire) that can be used by Greek state organizations, in order to measure economic and operational (present and future) risks. The measurement is a key area of interest in social research because the quantification of the studied phenomena is required. This means that the measurement tool must be selected carefully otherwise there is a possibility the data that will emerge will not be accurate and may lead to wrong planning and interventions (DeVellis, 2016).

4.2. Construction of the risk measurement tool

The application of the risk measurement tool for Greek state organizations follows the demands of quantitative research methodology, which is based on collecting primary data via a properly structured questionnaire.

In order to choose the proposed questionnaire, the relevant literature was studied extensively to pinpoint the principles governing risk assessment and select the most appropriate and reliable scales to measure economic and operational risks for Greek state organizations. An effort has been made to choose a questionnaire with the goal of reliably measuring economic and operational risks in the public sector based on previous risk perception theories (Bell et al., 2001; Eilifsen et al., 2001; Knechel, 2007) and risk perception measurement questionnaires (Akerboom & Maes, 2006; Ciavarelli et al., 2001). This measurement scale aims to be implemented and tested by managers of Greek state organizations and other public or parastatal bodies, to address the issues that result from the ever-changing global economic environment.

The principal aim of this research was to apply a measurement tool that will be used by managers of state organizations to measure day-to-day risks and the viability of public services.

Questionnaire Outline: The outline and structure of the questionnaire is presented in Part Two below, while the original risk measurement scale has been described in Part One.

Part One: The first part of the questionnaire recorded demographic information of the sample and is divided into two units. The questions in the first unit aimed to collect data on staff training, skills, advancement in grade and promotion of state organization managers. The questions in the second unit are structured in such a way as to help gain insight into how the organization is structured and how it operates. Additionally, information on the function and type of the organizations is collected, so as to categorize them.

The classification of public bodies of Greek State Administration, which comprise the Greek public sector, is based on the Services and Institutions Registry of the Greek State, as outlined by the Ministry of Administration Reform and e-Governance.

Aside from demographic information, senior administrative staff is also asked to express their opinion on the cost and expenditures of the

organization surveyed, as well as on how beneficial the organization is to citizens.

Part Two: This part attempts to examine and assess the previously mentioned two types of risk faced by the organization: economic and operational risk.

Operational Risk: The proposed scale aimed at assessing operational risk by measuring the manager's perception of it. This "Perceived operational Risk" scale is an instrument that aims to help organizations' risk assessment while at the same time it will provide valuable insight into the manager's sense of risk. Measuring risk with the help of a questionnaire survey is a concept that has been tested with significant success in the past (Akerboom & Maes, 2006; Ciavarelli et al., 2001). The basis for the development of this instrument was the work of (Akerboom & Maes, 2006), which had proposed a questionnaire capable of assessing the respondent's perceptions of organizational risk factors.

More specifically, the scale aims at measuring a manager's sense of organizational risk by asking him/her to rate the course of 17 organizational variables; whether they have increased, decreased or have remained as they were. More specifically the questionnaire uses a scale of possible answers ranging from -3 (= decreased considerably) to +3 (= increased considerably). It is a seven-point scale, specifically designed to match the questions and measure the concepts outlined above. This scale has been selected precisely because it accurately categorizes the answers; it is more flexible and provides a better opportunity to draw multiple conclusions.

The respondents are called to rate the course of these organizational variables two times: one during the recent years and a second one on how they expect these variables to evolve (increase, decrease or remain as they were) in the years to come. Therefore, there are two operational risk scales, the first that measures "present risk" by recording how key organizational variables have evolved during the recent years and the second that measures "future risk" by recording how the managers think that those variables will evolve in the future.

The initial concept of the operational risk scale included 17 organizational variables, which were selected after studying Akerboom & Maes' work, (2006), as well as a series of other publications focusing on organizational risk perceptions (Bell et al., 2001; Eilifsen, et al., 2001; Knechel, 2007; Mitchell, 1995; Ciavarelli et al., 2001).

The Organizational Risk Factor Questionnaire (ORFQ) of Akerboom and Maes (2006) includes 52 items split into 6 factors: Staffing Resources, Communication, Social Hindrance, Job Skills, Training Opportunities, and Material Resources. Because these questions and factors were designed to fit the private business sector, they would not be suitable for measuring risk factors in organizations of the Greek public sector without large scale adaptation and customization. It was therefore deemed as more productive to use Akerboom and Maes' (2006) scale as a general basis upon which to base a largely prototypical

scale. In order to create the measurement instrument, the following process was followed:

A group of 5 Greek Public sector managers with good knowledge of the English language was drafted via random sampling from a list of 30 Greek Public Sector managers

The managers received a copy of Akerboom and Maes' (2006) publication as well as summaries of other relevant publications (Bell et al., 2001; Eilifsen et al., 2001; Knechel, 2007; Mitchell, 1995; Ciavarelli et al., 2001) and were given one week's time to study the material.

An open discussion session ensued in which each manager was free to report variables that he/she thought were indicative of a public organization's operational risk. All variables on which more than 50% of the participants agreed were included in the new instrument.

The final list included 17 items. The exact wording of each was agreed upon by all participants.

More specifically, the 17 variables whose evolution the questionnaire respondents were called to rate are:

Table 1. Perceived operational Risk scale. Akerboom and Maes (2006): Modified

The number of citizens served by the organization.
The importance of the operation / services provided by the organization for the general public administration
The importance of operations / services for the general public.
The likelihood of outsourcing some operations / services to a private organization or reassigning operations / services to another state organization.
The range of operations / services provided by the organization.
The total number of people employed by the organization.
The adequacy of the comprehensive income of the organization to cover its running costs
The debt of the organization to a third party (reverse coding)
The adequacy and quality of the capital equipment (machinery, computers, etc.)
The availability of consumables (stationery, medicine, etc.)
The adequacy of available facilities.
The amount of state funding.
The degree to which aims and targets set for the organization are met.
The quality (education, training, efficiency) of the members of staff.
The promptness with which managerial decisions are met and the speed with which they are executed.
The efficiency and operational adequacy of administrative organization.
General Public opinion of the organization i.e whether the public feels that the organization is useful, beneficial and efficient

Economic risk: In order to measure economic risk, the questionnaire uses the scale which was proposed by the AGA (Association of Government Accountants in the United States of America). AGA is an official body which established the Partnership for Intergovernmental Management and Accountability, with the purpose of detecting and prioritising critical economic issues or threats, and suggesting measures or actions to approach these issues (AGA, 2009). Because the AGA scale was specifically tailored for the USA public sector it was again deemed necessary, as in the case of

operational risk, to modify the instrument to fit the Greek public sector. In order to do so, the same methodology was followed as in the case of operational risk.

It must be noted that this is the same group of managers utilized in the creation of the organizational risk instrument described before. The two open discussion sessions which led to the creation of both instruments took place on the same day. Therefore, the economic risk assessment scale comprised of the following fifteen (15) questions:

Table 2. Economic Scale. AGA (2007)

Annual state funding is sufficient to cover the running costs of the organization (reverse coding).
Expenses exceed the budget.
"Expenditures exceed tolerable rates.
The organization has resorted to other funding programmes or loans to cover its needs for cash.
The organization's financial reports reveal that cash flow is problematic.
The organization's financial reports (eg budget) has undergone a series of corrections, reforms or changes.
The organization has failed to meet set goals as far as collecting revenue needed to cover its running costs. (eg fees, taxes, deposits)
The income of the organization is less than that predicted in the budget.
The debt of the organization to third parties has grown.
The organization's fixed assets performance has decreased.
The value and performance of the organization's intangible assets (shares, bonds, income on interest) has decreased.
At the end of the fiscal year, there is an amount of budget carryover, with funds and resources returned to the State, or transferred for utilisation in the next year.
The organization's ability to raise funds through borrowing or loans has grown.
The funding of the organization is below tolerance levels.
The organization is timely in submitting its financial statements.

Note: The answers ranged from 1 (= never) to 7 (= always) (seven-point scale).

Sampling. In the final stage of the evaluation of the present questionnaire, seventy-three (73) questionnaires were distributed to managers of Greek state organizations and other public or parastatal bodies. Of the seventy-three (73) questionnaires, sixty (60) were answered and

returned (forty-five after a face-to-face interview and fifteen via e-mail), the response rate was 82.19%. Forty of the sixty were supervisors, nine general manager and the rest eleven department head.

5. STATISTICAL ANALYSIS

In this research descriptive and inferential statistics were used. Descriptive are used in order to present the participants answers on the two scales described above. Inferential statistics are used in order to test the concurrent validity of the economic risk and the operational risk; these scales should correlate with each other. In order to examine this, the Kendall's tau-b index has been used, this test is suitable for very small number of observations (Field, 2005). In addition regression analysis was used in order to predict the economic risk (dependent variable) using as independent variables the present and future operational risk. This analysis was chosen in order to examine the predictive validity of the two scales.

5.1. Results

According to Table 3 the average value of the economic risk was 3.91 (SD = .76) which means that the participants evaluated in a mediocre level the economic risk in the organization. Also, the average present operational risk was 3.96 (SD = .77) and the future operational risk was 4.30 (SD = .60). Thus, the operational risk in the organization was evaluated in a mediocre level.

Table 3. Descriptive statistics

	<i>Minimum</i>	<i>Maximum</i>	<i>Mean</i>	<i>SD</i>
Economic risk	1.80	5.40	3.91	.76
Present operational risk	2.64	5.00	3.96	.77
Future operational risk	3.06	5.29	4.30	.60

According to Table 4 there was a statistical significant negative correlation between the economic risk (higher values indicate higher economical risk) and the present operational risk ($r = -.438$, $p = .000$) (higher values indicate lower present operational risk) and the future operational risk ($r = -.279$, $p = .004$) (higher values indicate lower future operational risk). This means that when the present operational risk increases (operational the organization is improving) then the economic risk also decreases. Also, when the future operational risk increases then the economic risk also decreases.

Table 4. Correlation

<i>Kendall's tau_b</i>	<i>Economic risk</i>	<i>Present operational risk</i>	<i>Future operational risk</i>
Economical risk	1,000	-,438*	-,279**
Present operational risk	-,438*	1,000	,243*
Future operational risk	-,279	,243	1,000

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

Therefore, when either present or future operational risk decreases, this means that operationally the organization is improving, then the economic risk decreases. Thus, by reducing the operational risk the organization is more efficient compared to the initial state. This means that all

procedures are conducted in less time than before, with fewer mistakes and therefore with lower operational cost.

Table 5. Regression Analysis

	<i>B</i>	<i>Std. Error</i>	<i>Beta</i>	<i>t</i>	<i>p</i>
(Constant)	6,733	,649		10,371	,000
Present operational risk	-,411	,121	-,414	-3,391	,001
Future operational risk	-,277	,155	-,218	-1,781	,080

In Table 5 a multiple regression analysis can be seen. The model was statistical significant $F(2, 57) = 11.802$, $p = .000$, $R^2 = .293$. This means that the present and future operational risk explain 29.3% of the economic risk. It is trivial to mention that they are other factors that influence the economic risk and explain the remaining volatility. From the two independent variables only the present operational risk had a predictive value ($B = -.411$, $p = .001$) while the future operational value did not have any statistical significant predictive value ($B = .277$, $p = .080$). The former means that for one unit increase of the present operational risk the economic risk decreases by $-.411$.

6. CONCLUSIONS

The measurement tool that was chosen and presented in this essay comprises three (3) scales: The economic risk scale, which contained from fifteen items, and the operational risk measurement scale, both present and future, which contained seventeen items. The concurrent validity analysis resulted that there was a statistical significant negative correlation between the economic risk and the present operational risk and also between the economic risk and the future operational risk. This suggests that when the present operational risk increases (operational the organization is improving) then the economic risk also decreases. Also, when the future operational risk increases then the economic risk also decreases. In addition the result of the concurrent validity was enhanced from the result of the predictive validity in relation to the present operational risk and the economic risk. The predictive validity analysis resulted that the present operational risk had predictive value towards the economic risk.

The findings of this research suggest that the present, future operational risk scale and economic risk scale are useful tools for the risk management in Greek public organizations. Of course in the future a larger sample is needed in order to confirm in a more reliable level our results.

Thus, the study's academic contribution was the choice and applying of the aforementioned measurement instruments, which can now be utilised by researchers, with the proper modifications, in the field of risk management to further advance the study of risk management in Greek public organizations. On the empirical level, the implementation of these two scales can assist

public organizations in assessing economic and operational risks easily and fast. This tool can help Greek public organizations gain insight into the level of risk they face at any given point in time and plan their actions accordingly. At the same time, Greek central state administration will have the necessary tools to monitor and support the organizations it evaluates.

As far as the limitations of the study it is imperative to mention the small number of the sample, it was only 60 employees. Therefore, it would be appropriate in future research to test the validity and the reliability of the research questionnaire in a larger sample of employees. For the moment we have constructed a very good questionnaire but it needs further testing in order to confirm that it is reliable and valid to any department of government organizations.

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