EVALUATION OF THE PARMM AS A STRATEGIC OPTION IN PERIODS OF PUBLIC ADMINISTRATION RESTRUCTURING: THE EXAMPLE OF GREECE

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Abstract

The purpose of the present study was to develop and implement a questionnaire addressed to executives that measures the performance of the organization, the perceived operational risks, present and future, and finally the financial risks of the public body. This research study evaluates the implementation and results of the performance and risk measurement model (PARMM) in the Greek public administration during the present financial crisis, based on a reliable and valid questionnaire. One hundred sixty-eight (168) questionnaires were sent to managers of public services (narrow and broader public sector) of the Thessaloniki Prefecture and neighboring prefectures. 71% of them responded positively and completed the questionnaire. As a result, a final sample of one hundred twenty (N = 120) questionnaires was collected for the statistical analysis. The analysis carried out showed that the financial risk, the present operational risk, the future operational risk, the responsibility index, the career strategy, the career adaptability, and the career identity were moderately assessed. In addition, employees rated their job satisfaction and self-efficacy at a satisfactory level while the organization's productivity and performance were rated below average.

Keywords: Risk, Performance, Financial Crisis, Greece

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1. INTRODUCTION

Nowadays, the Greek public administration operates in an unstable, fiscal environment (Loayza & Ötker-Robe, 2013). In today's volatile public environment, risk and performance management, as many scholars point out (Power, 2004; Walker, Di Sisto, & McBain, 2008; Harland, Knight, Lamming, & Walker, 2005; Mulgan & Albury, 2003; Niven, 2003), is a valuable tool for defining and complementing the operation of the public body.

A review of the literature suggests that efforts to manage risks and performance in public administration came as a result of governments trying to give value to public organizations in response to new environmental challenges (Ellis & Mitchell, 2002; Lampropoulou & Oikonomou, 2018). In the case of Greece, the first efforts to implement measurement systems were put in place at the beginning of 2000, with the attempt to transfer the Greek public administration to the new public

management (Karkatzoulis, 2004) and specializing in administrative reforms, which were promoted by the signing of loans.

In contrast, however, with the increasing research and attention at the organizational level, insufficient progress has been made in Greek public administration. As pointed out in the reports of official bodies (European Commission, 2012), the lack of reliable measurement systems in the Greek public administration may make it difficult for public organizations to fully exploit their potential and achieve their reconstruction.

In this context, the present study attempts to examine the implementation and performance of the proposed performance and risk measurement model (PARMM), providing a better understanding of the perceptions of Greek public organizations about the implementation of a common PARMM system. The PARMM is an emerging field of research and is being applied to public organizations that undergo a restructuring phase in an attempt to holistically monitor their performance and risk (Eleftheriadis & Vyttas, 2018). In particular, the attitude of the managers has been studied in relation to a number of factors. These factors have been found to influence the overall performance of the organization as well as the way managers perceive and respond to the risks faced by the organization (Hung & Tangpong, 2010; Fay, Lührmann, & Kohl, 2004; Frese, Fay, Hilburger, Leng, & Tag, 1997; Frese & Fay, 2001; Day & Allen, 2004; MacDonald & MacIntyre, 1997; Schwarzer & Hallum, 2008; Makrydemetres, Zervopoulos, & Pravita, 2016).

Thus, in this paper in Section 2 we provide a brief literature review, and we present the conceptual framework. Furthermore, in Section 3 we present the main elements of the research methodology, and in Section 4 the results of the analysis. In Section 5 we present and discuss the analysis' results and finally, in Section 6 the main conclusions of this work are given.

2. LITERATURE OVERVIEW

2.1. The construction of the PARMM

Performance measurement (Ricard, Devinney, Yip, & Johnson, 2009; Rojers & Wright, 1998; Venkatraman & Ramanujan, 1986; Vickery, Droge, & Markland, 1993; Wood & Walmsley, 2004) as well as risk measurement (Akerboom & Maes, 2007; Bell, Landsman, & Shackelford, 2001; Eilifsen, Knechel, & Wallage, 2001; Knechel, 2007; Mitchell, 1995) using the questionnaires in the literature, are well documented.

The purpose of the present study was to develop and implement a questionnaire addressed to executives that measures the performance of the organization, the perceived operational risks, present and future, and finally the financial risks of the public body.

The PARMM consists of two parallel pillars: performance measurement and the measurement of the financial and operational risks of the organization in the present and the future.

Risk management is at the heart of every organization's strategic management and is the first pillar of the proposed PARMM. More generally, it is referred to in the literature as the process by which organizations methodically approach the risks associated with their activities in order to achieve sustainable benefits for each activity and portfolio of all their activities (Manuj & Mentzer, 2008; McNeil, Frey, & Embrechts, 2015). Many methods and techniques have been suggested over the years to assess risk. However, most of them focus on the strict measurement of the financial risk such as the *RiskMetrics* by J. P. Morgan or the value at risk model (Jorion, 2007; Marshal & Siegel, 1996). These are quantified models (Artzner, Delbaen, Eber, & Heath, 1999) or focus on specific types of risks such as credit risk (Altman & Saunders, 1997), liquidity risk, or market risk (Bangia, Diebold, Schuermann, & Stroughair, 1998; Ifaistion, Ioannis, & George, 2017).

The second pillar of the PARMM is the measurement of the performance of the organization. Unlike in the business world, where performance is related to private value creation, in the public sector performance is related to public value creation (Moore, 1998). Research recognizes the critical role of performance and risk in today's environment. The risk assessment and public performance measurement approach proposed in this study is a combination of the above methods of assessing the performance and risk of public and private organizations and is applied to the Greek public administration for the first time.

3. RESEARCH METHODOLOGY

3.1. Type of research

The researcher chose to conduct quantitative research with the use of a close-ended questionnaire. The reason for this choice is that quantitative research is more appropriate for gathering a large sample of participants and also because it generates more reliable results. On the other hand, qualitative research using interviews could enhance the depth of the research understanding in relation to the relationships among the variables. However, since the aim of this study is not this, the researcher implemented only the quantitative research and not qualitative research at the same time (mixed approach).

3.2. The survey

The survey was conducted in the period June-October 2018. In order to achieve high reliability, one hundred sixty-eight (168) questionnaires were sent to managers of public services (narrow and broader public sector) of the Thessaloniki Prefecture and neighboring prefectures. 71% of them responded positively and completed the questionnaire. As a result, a final sample of one hundred twenty ($N = 120$) questionnaires was collected for the statistical analysis. Eighty (80) men and forty (40) women participated in the final survey. In particular, the primary data collection was carried out through personal interviews and e-mails. Sixty-eight (68) questionnaires were collected through interviews. Fifty-two (52) questionnaires were collected via e-mail. Executives were contacted by telephone and questionnaires were then sent by e-mail. The methodology adopted in this study was quantitative, which is based on the collection of primary data through a closed-ended questionnaire. The data analysis was performed using SPSS 22.0.

3.3. Questionnaire development

A pilot test was conducted before the main survey was carried out, also to determine the reliability of the questionnaire. Cronbach's alpha showed that the reliability of the survey scales was satisfactory as all values were above 0.7 (Farazmand, 2018). Also, in a previous survey, the Kendall tau-b index (Eleftheriadis & Vyttas, 2017) was used to test the validity of the questionnaire. The final questionnaire consisted of seven (7) parts/sections. Each of the seven (7) sections consisted of a different number of questions and focused on a specific feature of the PARMM (see Appendix. The questionnaire used the 7-point Likert scale).

The PARMM that was studied is presented schematically in Figure 1 (in Table A.1, Appendix, it can be seen as more analytical).

Figure 1. Performance and risk measurement model (PARMM) in public organizations
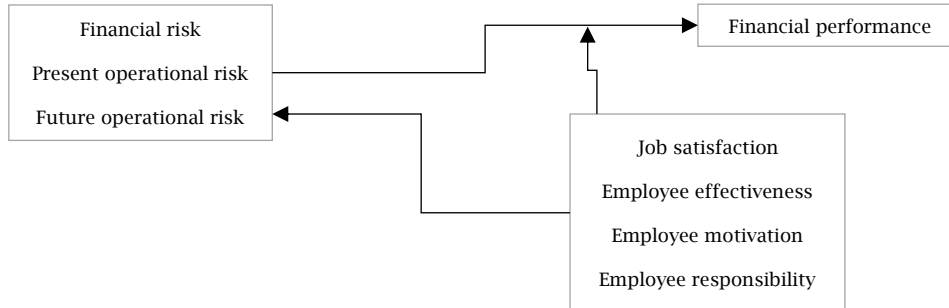
3.4. Research hypotheses

The study aims to answer the following research hypotheses:

H1: There is a negative correlation between performance index and financial risk.

H2: There is a negative correlation between the performance index and the present risk.

H3: There is a negative correlation between performance index and future risk.

H4: There is a negative correlation between job satisfaction and financial risk.

H5: There is a negative correlation between job satisfaction and present risk.

H6: There is a negative correlation between job satisfaction and future risk.

H7: There is a negative correlation between employee responsibility and financial risk.

H8: There is a negative correlation between employee responsibility and present risk.

H9: There is a negative correlation between employee responsibility and future risk.

H10: There is a negative correlation between employee effectiveness and financial risk.

H11: There is a negative correlation between employee effectiveness and present risk.

H12: There is a negative correlation between employee effectiveness and future risk.

H13: There is a negative correlation between employee motivation and financial risk.

H14: There is a negative correlation between employee motivation and present risk.

H15: There is a negative correlation between employee motivation and future risk.

H16: There is a positive correlation between employee motivation and the performance of the organization.

H17: There is a positive correlation between employee satisfaction and the performance of the organization.

H18: There is a positive correlation between employee effectiveness and the performance of the organization.

H19: There is a positive correlation between employee responsibility and the performance of the organization.

H20: There is a negative correlation between financial risk and the performance of the organization.

H21: There is a negative correlation between the present risk and the performance of the organization.

H22: There is a negative correlation between future risk and the performance of the organization.

3.5. Statistical analysis

Descriptive and inductive statistics were used in the present study. Descriptive statistics captured the characteristics of the respondents and their responses to the main part of the survey. Correlation analysis was also performed (Pearson's *r*, although the data did not follow the normal distribution, Shapiro-Wilk, Table A.8 (Appendix) their deviation was not significant as the values of the skewness and curvature index were within the limits of "+"-"-" 2, Table A.9, Appendix) and the linear regression to test the hypotheses. The analysis was performed using SPSS 22.0 statistical software.

4. RELIABILITY-VALIDITY OF THE PARMM

The questionnaire in its final form was tested for validity and reliability. For this purpose, construct validity and Cronbach's alpha coefficient were used. Principal components analysis (PCA) was performed to investigate the structural validity for the questionnaires with more than one subscale, the career questionnaire and the operational risk questionnaire.

Career scale

From the Kaiser criterion, we observe a value of .673, over .5 which is considered very satisfactory and means that the data are suitable for factorial analysis. In addition, we do not observe any sphericity problem as .00 < .05. According to Table A.2 (Appendix), we observe high loadings of questions with the resulting factors. The loadings are above .4 except in two cases so it is not necessary to remove any question from the analysis.

Table 1. KMO and Bartlett's test

Kaiser-Meyer-Olkin measure of sampling adequacy		.673
Bartlett's test of sphericity	Approx. Chi-square	2817.296
	Df	210
	Sig.	.000

Table 2. Total variance explained

Component	Initial eigenvalues			Extraction sums of squared loadings			Rotation sums of squared loadings		
	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %
1	6.703	31.918	31.918	6.703	31.918	31.918	4.932	23.485	23.485
2	4.480	21.333	53.251	4.480	21.333	53.251	4.432	21.105	44.590
3	2.603	12.397	65.648	2.603	12.397	65.648	4.422	21.058	65.648
4	1.573	7.491	73.140						
5	.986	4.694	77.834						
6	.797	3.794	81.627						
7	.703	3.346	84.973						
8	.682	3.248	88.221						
9	.595	2.835	91.056						
10	.454	2.160	93.216						
11	.441	2.100	95.317						
12	.231	1.099	96.415						
13	.200	.954	97.370						
14	.156	.741	98.111						
15	.133	.632	98.744						
16	.090	.430	99.174						
17	.070	.332	99.507						
18	.040	.192	99.699						
19	.032	.154	99.853						
20	.019	.090	99.943						
21	.012	.057	100.000						

Note: Extraction method – principal component analysis.

According to Kaiser's criterion, we observe 4 factors with eigenvalues above 1 that explain 73.140% of the data volatility. Because this questionnaire has 3 theoretical factors, we present the rotation table below for 3.

Based on Table A.3 (see Appendix), it is observed that there is a complete verification of the theoretical distribution of the questions to the three factors by looking at the loadings of the questions per factor.

Specifically, for the first factor related to the career strategy/image, high loadings are observed for the following questions: "I have a specific plan to achieve my career goals" (.742); "I have changed or reconsidered my career goals based on new information about my situation or myself" (.674); "I have tried to take on responsibilities and obligations in my work that will help me achieve my work goals" (.768); "I have clear goals for my career (- .793); "I have realistic goals for my career" (.873); "I know my strengths (things I can do well)" (.731); "I know my weaknesses (things I cannot do well)" (.776). For the second factor representing career adaptability, high loadings are observed for the following questions: "I can adapt to changing conditions" (.773); "I am willing to take risks (to take actions with uncertain results)" (.650); "I welcome the changes in my work and organization" (.875); "I can handle the problems I encounter" (.702); "I believe when other people tell me I did a good job" (.623); "I have devised more efficient ways to do my job" (.770); "I have found ways to get the job done without waiting for approval from senior executives" (.700). Finally, for the third factor representing career identity, there are high loadings on the following questions: "I deal a lot with my job" (.514); "I consider myself as a true professional" (.755); "I spend part of my free time on activities that help my work" (.538); "I have attended classes

exclusively to improve my work" (.849); "I stay on the cutting edge of developments related to my job" (.858); "I have volunteered to undertake significant tasks with the intention to improve my chances of furthering my career" (.889); "I have asked my supervisors to consider my promotion opportunities" (.685).

Operational risk

According to Table A.4 (Appendix), we observe high loadings of questions with the resulting factors. The loadings are above .4 except in some cases, but the questions were not removed from the analysis as the questionnaire has already been weighted in previous surveys (Farazmand, 2018).

According to Kaiser's criterion, Table A.5 (Appendix) we observe 7 factors with eigenvalues above 1 which explain 82.638% of the data volatility. These factors are the proposed number of factors in which the questionnaire questions can be distributed according to the Kaiser criterion. But because this questionnaire has 2 theoretical factors we present below the rotation table for 3 factors, that is, the distribution of the questions into only two factors. In this case, the rate of volatility explained by the two factors will be 53.016%.

Based on Table A.6 (Appendix), it is observed that we have complete confirmation of the theoretical distribution of the questions on the 2 factors by looking at the loadings of the questions per factor. Specifically for the first factor regarding future operational risk, high loadings are observed for the following questions: "The number of citizens served by the organization" (.892); "The importance of the operation/services provided by the organization for public administration" (.914); "The importance of the operation/services to the general public" (.898); "The possibility of outsourcing certain operations/services to a private organization or assigning activities/services to another

public organization" (.689); "The range of operations/services provided by the organization" (.601); "The total number of people employed in the organization" (.397); "The adequacy of the total revenue of the organization to cover its operating expenses" (.694); "The debt of the organization to third parties (reverse coding)" (.320); "The adequacy and quality of capital equipment (machinery, computers, etc.)" (.662); "The availability of supplies (stationery, medicines, etc.)" (.554); "The adequacy of facilities available" (.723); "The amount of government funding" (.485); "The extent to which the goals and objectives set in the organization are achieved" (.725); "The quality (education, training, effectiveness) of staff members" (.798); "The speed with which management decisions are made and the speed with which they are executed" (.546); "The efficiency and functional adequacy of the administrative organization" (.554); "The public opinion about the organization, that is, whether the public considers that the organization is useful, valuable and effective" (.764).

Regarding the second factor that relates to the present operational risk, high loadings are observed for the following questions: "The number of citizens served by the organization" (.750); "The importance of the operation/services provided by the organization for public administration" (.647); "The importance of operation/services to the general public" (.820); "The possibility of outsourcing certain operations/services to a private organization or assigning activities/services to another public organization" (-.567); "The range of operations/services provided by the organization" (.706); "The total number of people employed by the organization" (.652); "The adequacy of the organization's total revenue to cover its operating expenses" (.780); "The debt of the organization to third parties (reverse coding)" (.512); "The adequacy and quality of capital equipment (machinery, computers, etc.)" (.759); "The availability of supplies (stationery, medicines, etc.)" (.766); "The adequacy of facilities available" (.644); "The amount of government funding" (.440); "The extent to which the goals and objectives set in the organization are achieved" (.838); "The quality (education, training, effectiveness) of staff members" (.694); "The speed with which management decisions are made and the speed with which they are executed" (.614); "The efficiency and functional adequacy of the organization" (.578); "The public opinion about the organization, that is, whether the public considers the organization useful, valuable and effective" (.762).

Finally, the Cronbach's alpha reliability test showed very satisfactory values (above .7) and an acceptable value (.6-0.7) only in one case (Table 3).

Table 3. Reliability

	N	*Cronbach's alpha*
Financial risk	15	.815
Present operational risk	17	.91
Future operational risk	17	.927
Performance index	5	.825
Employee satisfaction	10	.858
Self-efficacy index	6	.908
Career strategy	7	.743
Career adaptability	7	.854
Career identity	7	.856
Responsibility index	5	.617

5. RESULTS

This section presents the results of descriptive and inductive statistics.

Table 4. Demographic characteristics of the sample

		N	*%*
Sex	Male	80	66.7%
	Female	40	33.3%
Age	35-45	39	32.5%
	46-55	75	62.5%
	55+	6	5.0%
Position in the organization	Manager	30	25.0%
	Supervisor	66	55.0%
	Executive	24	20.0%

According to Table 4, the proportion of men and women in the sample was 66.7% and 33.3%, respectively. Still, 62.5% of the employees were 46-55 years old, 32.5% were 35-45 and 5% were over 55 years old. Finally, 55% of employees had a supervisor position in the organization, 25% were managers and 20% were executives.

Table A.7 (see Appendix) shows that financial risk ($M = 3.62$, $TA = .78$), present operational risk ($M = .03$, $TA = .88$), future operational risk ($M = .20$, $TA = .80$), responsibility index ($M = 3.65$, $TA = .64$), career strategy ($M = 3.85$, $TA = .98$), career adaptability ($M = 4.40$, $TA = .92$) and career identity ($M = 4.23$, $TA = .89$) were assessed at a moderate level. In addition, employees rated job satisfaction ($M = 4.59$, $TA = .87$) and their self-efficacy ($M = 4.89$, $TA = 1.03$) as satisfactory. Finally, the productivity and performance of the organization were evaluated below average ($M = 3.27$, $TA = .51$).

Table 5. Correlations

	Financial risk	Present operational risk	Future operational risk	Productivity and performance index	Job satisfaction	Self-efficacy index	Responsibility index	Career strategy	Career adaptability	Career identity
Financial risk	1	.934**	.554**	- .525**	- .197*	- .491**	.135	- .075	.009	- .501**
Present operational risk	.934**	1	.542**	- .554**	- .241**	- .554**	.137	- .122	-.045	- .533**
Future operational risk	.554**	.542**	1	- .550**	.178	- .158	.234*	.029	.016	- .462**
Productivity and performance index	- .525**	- .554**	- .550**	1	- .082	.187*	- .113	.217*	.165	.969**
Job satisfaction	- .197*	- .241**	.178	- .082	1	.678**	.493**	.328**	- .071	- .055
Self-efficacy index	- .491**	- .554**	- .158	.187*	.678**	1	.256**	.151	- .051	.210*
Responsibility index	.135	.137	.234*	- .113	.493**	.256**	1	.449**	.256**	- .131
Career strategy	- .075	- .122	.029	.217*	.328**	.151	.449**	1	.524**	.157
Career adaptability	.009	- .045	.016	.165	- .071	- .051	.256**	.524**	1	.141
Career identity	- .501**	- .533**	- .462**	.969**	- .055	.210*	- .131	.157	.141	1

Table 5 shows that there is a statistically significant positive correlation between financial risk with present operational risk ($r = .934$, $p < .01$) and future operational risk ($r = .554$, $p < .01$). It is also observed that there is a statistically significant negative correlation between financial risk with productivity and performance index ($r = - .525$, $p < .01$), the self-efficacy index ($r = - .491$, $p < .01$), and career identity ($r = - .501$, $p < .01$). In addition, there is a statistically significant positive correlation between present operational risk and future operational risk ($r = .542$, $p < .01$). It is also observed that there is a statistically significant negative correlation between the present operational risk with the productivity and performance index ($r = - .554$, $p < .01$), job satisfaction ($r = - .241$, $p < .01$), the self-efficacy index ($r = - .554$, $p < .01$) and career identity ($r = - .533$, $p < .01$).

In addition, there is a statistically significant positive correlation between future operational risk and responsibility index ($r = .234$, $p < .01$). It is also observed that there is a statistically significant negative correlation between future operational risk with the productivity and performance index ($r = - .550$, $p < .01$) and career identity ($r = - .462$, $p < .01$). It was also found that there was a statistically significant positive correlation between productivity and performance index with career strategy ($r = .217$, $p < .01$) and career identity ($r = .969$, $p < .01$). There was also a statistically significant positive correlation between job satisfaction with the self-efficacy index ($r = .678$, $p < .01$), the responsibility index ($r = .493$, $p < .01$), and career strategy ($r = .328$, $p < .01$). In addition, there was a statistically significant positive correlation between the self-efficacy index and the responsibility index ($r = .256$, $p < .01$) and career identity ($r = .210$, $p < .01$). There was also a statistically significant positive correlation between the responsibility index and the career strategy ($r = .449$, $p < .01$) and career adaptability ($r = .256$, $p < .01$). Finally, there was a statistically significant positive correlation between career adaptability and career strategy ($r = .524$, $p < .01$).

Table 6. The linear financial risk forecasting model

Model		Unstandardized coefficients		Standardized coefficients	t	Sig.	Collinearity statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	3.292	.398		8.282	.000		
	Present operational risk	.833	.048	.940	17.431	.000	.377	2.655
	Future operational risk	.060	.048	.062	1.265	.209	.460	2.172
	Productivity and performance index	.022	.259	.015	.087	.931	.039	25.775
	Job satisfaction	.010	.052	.011	.186	.853	.323	3.098
	Self-efficacy index	.033	.042	.043	.778	.438	.357	2.805
	Responsibility index	- .057	.054	- .047	-1.051	.295	.547	1.830
	Career strategy	.016	.038	.020	.409	.684	.474	2.110
	Career adaptability	.046	.036	.054	1.280	.203	.617	1.621
	Career identity	- .009	.136	- .011	- .069	.945	.046	21.970
8	(Constant)	3.582	.026		136.092	.000		
	Present operational risk	.794	.034	.897	23.073	.000	.706	1.416
	Future operational risk	.066	.038	.068	1.741	.084	.706	1.416

Note: Dependent variable – financial risk.

In Table 6 above we observe a linear model with the financial risk being the dependent variable and the independent variables being the present operational risk, the future operational risk, the productivity, and performance index, job satisfaction, the self-efficacy index, the responsibility index, the career strategy, career adaptability, and career identity. The table shows the first model and the final model that the backward method has resulted in. The Model 8 was statistically significant $F(2,117) = 410.058$, $p = .000$, $R^2 = .875$. Statistically significant predictor variables were the present operational risk ($b = .794$, $p < .01$) and the future operational risk ($b = .066$, $p = .084$, at 10% significance level). In addition, it should be noted that the model had no multicollinearity problem as the *VIF* values were below 10 while there was little autocorrelation problem as the Durbin Watson index value = .902 (acceptable 1-3). In addition to Figures A.1 and A.2 in the Appendix, there is no significant deviation from the normal distribution or a problem of heteroskedasticity.

Table 7. Linear forecasting model of productivity and performance

	Model	Unstandardized coefficients		Standardized coefficients	t	Sig.	Collinearity statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	1.105	.154		7.166	.000		
	Present operational risk	- .021	.034	- .037	- .621	.536	.100	9.953
	Future operational risk	- .082	.016	- .130	-5.186	.000	.565	1.771
	Job satisfaction	- .025	.019	- .043	-1.309	.193	.328	3.051
	Self-efficacy index	- .016	.015	- .033	-1.050	.296	.358	2.792
	Responsibility index	.025	.020	.032	1.271	.207	.549	1.821
	Career strategy	.048	.013	.093	3.588	.000	.529	1.892
	Career adaptability	- .012	.013	- .022	- .918	.360	.612	1.633
	Career identity	.506	.013	.889	37.585	.000	.630	1.587
	Financial risk	.003	.035	.005	.087	.931	.121	8.290
6	(Constant)	1.064	.073		14.603	.000		
	Future operational risk	- .086	.014	- .135	-6.320	.000	.760	1.315
	Job satisfaction	- .023	.012	- .039	-1.955	.053	.863	1.159
	Career strategy	.049	.010	.094	4.656	.000	.858	1.166
	Career identity	.507	.012	.890	41.552	.000	.756	1.322

Note: Dependent variable – productivity and performance index.

In Table 7 above we observe a linear model with the productivity and performance being the dependent variable; and present operational risk, future operational risk, financial risk, job satisfaction, self-efficacy index, responsibility index, career strategy, career adaptability, and career identity being the independent variables. The table shows the first model and the final model that the backward method has resulted in. The Model 6 was statistically significant $F(4.115) = 692.063$, $p = .000$, $R^2 = .960$. Statistically significant predictor variables were the future operational risk ($b = - .086$, $p < .01$), the career strategy ($b = .049$, $p < .01$), the career identity ($b = .507$, $p < .010$), and job satisfaction ($b = - .023$, $p = .053$, 10% significance level). In addition, it should be noted that the model had no multicollinearity as the *VIF* values were below 10 while there was little autocorrelation problem as the Durbin Watson index value = .737 (acceptable 1-3). In addition to Figures A.3 and A.4 in Appendix, there is no significant deviation from the normal distribution or a problem of heteroskedasticity.

6. CONCLUSION

The analysis carried out showed that the financial risk, the present operational risk, the future operational risk, the responsibility index, the career strategy, the career adaptability, and the career identity were moderately assessed. In addition, employees rated their job satisfaction and self-efficacy at a satisfactory level while the organization's productivity and performance were rated below average.

From the correlation analysis, it was found that the financial risk is positively affected by the future and present operational risk. It has also been found that financial risk is reduced when either productivity and performance or self-efficacy or career identity are increased. A positive correlation was also found between the future and present operational risk. Indeed, the present operational risk is reduced when either productivity and performance or job satisfaction or self-efficacy or career identity increase. Future risk has been found to increase when employee responsibility increases. This is probably due to the fact that as the level of responsibility of executives increases, their exposure to problems/risks increases. This results in a higher rating of future operational risk. At the same time, it has been found that the future operational risk is reduced when either productivity and performance or career identity increase. In addition, a positive correlation was found between productivity and performance with career strategy and career identity. Job satisfaction has been found to increase when either self-efficacy or responsibility or career strategy increase. In addition to self-efficacy, it has been found to improve when either responsibility or career identity improve. It was also found that there is a positive correlation between the responsibility index with career strategy and career adaptability. Finally, there was a positive correlation between career adaptability and career strategy.

Regarding the results of linear regression, it was found that the financial risk is positively affected only by the present and future operational risk. Finally, productivity and performance were found to be negatively affected by future operational risk, marginally by job satisfaction, and positively by career strategy.

This research aims to create a reliable framework for measuring and managing the performance and risks of public organizations. Despite the enlightening views of this study, future research should aim at removing certain limitations.

Given the dynamic structure of the PARMM, changes in its design (i.e., the dimensions of the behaviors of the executives it assess), could take place over time. Thus, the model should be updated periodically, taking into account other factors that influence managerial behavior, such as fatigue, stress, level of pay, etc.

The establishment of a systematic and standardized procedure for diagnosing the PARMM strategy, which will enable it to be more effectively evaluated including the factors to measure the experience of employees with the implementation of the PARMM over a long period of time, e.g., a continuous three years, is considered that will bring multiple benefits to the organization's management. In this case, it would be interesting to compare the degree of PARMM of a public organization as assessed by internal information, e.g., managers' responses to questionnaires (such as this survey) at the level of PARMM, as perceived by citizens, competing for public services and businesses that came into contact with the public organization.

Periodical measurement using the PARMM by other public organizations could help managers monitor the changes in the organization over time.

Given that, this research was conducted during the financial crisis in Greece, future research studies should examine the impact of other factors (e.g., restriction of recruitment, expenditure reduction) that alter the PARMM/performance relationship. Although there was an attempt to cover all relevant aspects of the PARMM with a careful study of the relevant literature, it should be noted that there may be specific aspects of the PARMM that have been overlooked or others that could be added (as new trends), such as, for example, the fiscal deficit. In order to keep up with the changing fiscal conditions and the complex changing public environment, future research is recommended to incorporate the relevant aspects into the proposed model.

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APPENDIX

Table A.1. Structure of the questionnaire

Section No.	Section's description	No. of questions	Subsections/Factors	Section's description
I	PARMM Productivity and performance	5	-	To measure the performance of the organization, the scale proposed by Spangenberg and Theron was used (Spangenberg & Theron, 2011; Spangenberg & Theron, 2004).
II	PARMM Financial risk	15	-	In this section of the questionnaire, we investigate the level of financial risk of the organization. To measure the financial risk, the AGA scale was used (2009).
III	PARMM Operational risk	17	-	In this section of the questionnaire, we evaluate the perception of senior executives of organizational risk in the present and the future (perceived risk). For the measurement of operational risk (present and future), the scale developed by Akerboom and Maes (2007) was used.
IV	PARMM Career motivation	21	3	In this section of the questionnaire, we reveal the relationships between mentoring, professional confidence-desire, career motivation, and career success of a public-sector executive. To measure career motivation, the scale suggested by Day and Allen (2004) was used.
V	PARMM Self-efficacy	6	-	This section of the questionnaire seeks to answer why some groups of public servants manage to be good while others cannot live up to the expectations that are imposed on them and tend to collapse under the weight of everyday stress. To measure self-efficacy the scale proposed by Schwarzer and Hallum, (2008) was used.
VI	PARMM Job satisfaction	10	-	To measure satisfaction, the scale proposed by MacDonald and MacIntyre (1997) was used.
VII	PARMM Responsibility	5	-	In this section of the questionnaire, in line with the research of Fay et al. (2004), the main purpose of the scale that was used was to test the interaction between the characteristics of managers and the work environment, based on performance. The effectiveness of initiatives and behaviors has proven to depend on the environment in which managers operate. The scale suggested by Fay et al. (2004) was used to measure responsibility.

Table A.2. Communalities

	Initial	Extraction
I have a specific plan to achieve my career goals.	1.000	.773
I have changed or reconsidered my career goals based on new information about my situation or myself.	1.000	.697
I have tried to take on responsibilities and obligations in my work that will help me achieve my work goals.	1.000	.827
I have clear goals for my career.	1.000	.683
I have realistic goals for my career	1.000	.792
I know my strengths (the things I can do well).	1.000	.535
I know my weaknesses (the things I cannot do well).	1.000	.619
I can adapt to changing conditions.	1.000	.771
I am willing to take risks (take actions with uncertain results).	1.000	.597
I welcome the changes in my work and organization.	1.000	.812
I can handle the problems that I encounter.	1.000	.641
I believe when other people tell me I did a good job.	1.000	.534
I have devised more efficient ways to do my job.	1.000	.832
I have found ways to get the job done without waiting for approval from senior executives.	1.000	.576
I deal a lot with my job.	1.000	.309
I consider myself as a true professional.	1.000	.600
I spend part of my free time on activities that help my work.	1.000	.341
I have taken classes exclusively to improve my work.	1.000	.751
I stay on the cutting edge of developments related to my job.	1.000	.778
I have volunteered to undertake significant tasks with the intention of improving my chances of furthering my career.	1.000	.824
I have asked to consider my promotion opportunities.	1.000	.495

Note: Extraction method – principal component analysis.

Table A.3. Rotated component matrix

	Component		
	1	*2*	*3*
I have a specific plan to achieve my career goals.	.742	.427	
I have changed or reconsidered my career goals based on new information about my situation or myself.	.674	.488	
I have tried to take on responsibilities and obligations in my work that will help me achieve my work goals.	.768	.411	
I have clear goals for my career.	- .793		
I have realistic goals for my career	.873		
I know my strengths (the things I can do well).	.731		
I know my weaknesses (the things I cannot do well).	.776		
I can adapt to changing conditions.	- .390	.773	
I am willing to take risks (to take actions with uncertain results).		.650	- .415
I welcome the changes in my work and organization.		.875	
I can handle the problems that I encounter.	.314	.702	
I believe when other people tell me I did a good job.		.623	.328
I have devised more efficient ways to do my job	.470	.770	
I have found ways to get the job done without waiting for approval from senior executives.		.700	
I deal a lot with my job.			.514
I consider myself as a true professional.			.755
I spend part of my free time on activities that help my work.			.538
I have attended classes exclusively to improve my work.			.849
I stay on the cutting edge of developments related to my job.			.858
I have volunteered to undertake significant tasks with the intention of improving my chances of furthering my career.			.889
I have asked my supervisors to consider my promotion opportunities.			.685

Notes: Extraction method – principal component analysis; Rotation method – varimax with Kaiser normalization. Rotation converged in 6 iterations.

Table A.4. Communalities

	Initial	*Extraction*
Questions about the present operational risk		
The number of citizens served by the organization.	1.000	.682
The importance of the operation/services provided by the organization for public administration.	1.000	.457
The importance of operation/services to the general public.	1.000	.713
The possibility of outsourcing certain operations/services to a private organization or assigning activities/services to another public organization.	1.000	.409
The range of operations/services provided by the organization.	1.000	.675
The total number of people employed in the organization.	1.000	.487
The adequacy of the organization's total revenue to cover its operating expenses.	1.000	.609
The debt of the organization to third parties (reverse coding).	1.000	.262
The adequacy and quality of capital equipment (machinery, computers, etc.).	1.000	.756
The availability of supplies (stationery, medicines, etc.).	1.000	.610
The adequacy of the facilities available.	1.000	.434
The amount of government funding.	1.000	.268
The extent to which the goals and objectives set in the organization are achieved.	1.000	.755
The quality (education, training, effectiveness) of staff members.	1.000	.594
The speed with which management decisions are made and the speed with which they are executed.	1.000	.486
The efficiency and functional adequacy of the administrative organization.	1.000	.344
The public opinion about the organization, that is, whether the public considers that the organization is useful, valuable, and effective.	1.000	.661
Questions about the future operational risk		
The number of citizens served by the organization.	1.000	.801
The importance of the operation/services provided by the organization for public administration.	1.000	.835
The importance of operation/services to the general public.	1.000	.824
The possibility of outsourcing certain operations/services to a private organization or assigning activities/services to another public organization.	1.000	.481
The range of operations/services provided by the organization.	1.000	.406
The total number of people employed in the organization.	1.000	.167
The adequacy of the organization's total revenue to cover its operating expenses.	1.000	.502
The debt of the organization to third parties (reverse coding).	1.000	.155
The adequacy and quality of capital equipment (machinery, computers, etc.).	1.000	.457
The availability of supplies (stationery, medicines, etc.).	1.000	.324
The adequacy of the facilities available.	1.000	.571
The amount of government funding.	1.000	.279
The extent to which the goals and objectives set in the organization are achieved.	1.000	.768
The quality (education, training, effectiveness) of staff members.	1.000	.758
The speed with which management decisions are made and the speed with which they are executed.	1.000	.401
The efficiency and functional adequacy of the administrative organization.	1.000	.454
The public opinion about the organization, that is, whether the public considers that the organization is useful, valuable, and effective.	1.000	.638

Note: Extraction method – principal component analysis.

Table A.5. Total variance explained

Component	Initial eigenvalues			Extraction sums of squared loadings			Rotation sums of squared loadings		
	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %
1	12.854	37.807	37.807	12.854	37.807	37.807	9.057	26.639	26.639
2	5.171	15.209	53.016	5.171	15.209	53.016	8.968	26.377	53.016
3	3.548	10.435	63.451						
4	2.173	6.391	69.842						
5	1.858	5.464	75.306						
6	1.382	4.065	79.371						
7	1.111	3.267	82.638						
8	.944	2.777	85.416						
9	.847	2.492	87.908						
10	.765	2.251	90.159						
11	.656	1.928	92.087						
12	.600	1.765	93.852						
13	.458	1.347	95.199						
14	.372	1.094	96.293						
15	.266	.783	97.076						
16	.248	.728	97.804						
17	.229	.674	98.478						
18	.167	.492	98.970						
19	.158	.465	99.436						
20	.091	.267	99.702						
21	.072	.213	99.915						
22	.029	.085	100.000						
23	3.075E-15	9.045E-15	100.000						
24	2.046E-15	6.017E-15	100.000						
25	1.937E-15	5.696E-15	100.000						
26	1.338E-15	3.934E-15	100.000						
27	5.953E-16	1.751E-15	100.000						
28	2.640E-16	7.763E-16	100.000						
29	-2.937E-16	-8.640E-16	100.000						
30	-5.207E-16	-1.531E-15	100.000						
31	-9.737E-16	-2.864E-15	100.000						
32	-1.207E-15	-3.550E-15	100.000						
33	-2.172E-15	-6.389E-15	100.000						
34	-2.458E-15	-7.231E-15	100.000						

Note: Extraction method – principal component analysis.

Table A.6. Rotated component matrix

	Component	
	1	*2*
Questions about the present operational risk		
The number of citizens served by the organization.	.345	.750
The importance of the operation/services provided by the organization for public administration.		.647
The importance of operation/services to the general public.		.820
The possibility of outsourcing certain operations/services to a private organization or assigning activities/services to another public organization.		- .567
The range of operations/services provided by the organization.	.420	.706
The total number of people employed in the organization.		.652
The adequacy of the organization's total revenue to cover its operating expenses.		.780
The debt of the organization to third parties (reverse coding).		.512
The adequacy and quality of capital equipment (machinery, computers, etc.).	.424	.759
The availability of supplies (stationery, medicines, etc.).		.766
The adequacy of the facilities available.		.644
The amount of government funding.		.440
The extent to which the goals and objectives set in the organization are achieved.		.838
The quality (education, training, effectiveness) of staff members.	.336	.694
The speed with which management decisions are made and the speed with which they are executed.	.329	.614
The efficiency and functional adequacy of the administrative organization.		.578
The public opinion about the organization, that is, whether the public considers that the organization is useful, valuable, and effective.		.762
Questions about the future operational risk		
The number of citizens served by the organization.	.892	
The importance of the operation/services provided by the organization for public administration.	.914	
The importance of operation/services to the general public.	.898	
The possibility of outsourcing certain operations/services to a private organization or assigning activities/services to another public organization.	.689	
The range of operations/services provided by the organization.	.601	
The total number of people employed in the organization.	.397	
The adequacy of the organization's total revenue to cover its operating expenses.	.694	
The debt of the organization to third parties (reverse coding).	.320	
The adequacy and quality of capital equipment (machinery, computers, etc.).	.662	
The availability of supplies (stationery, medicines, etc.).	.554	
The adequacy of the facilities available.	.723	
The amount of government funding.	.485	
The extent to which the goals and objectives set in the organization are achieved.	.725	.492
The quality (education, training, effectiveness) of staff members.	.798	.349
The speed with which management decisions are made and the speed with which they are executed.	.546	.321
The efficiency and functional adequacy of the administrative organization.	.554	.384
The public opinion about the organization, that is, whether the public considers that the organization is useful, valuable, and effective.	.764	

Note: Extraction method – principal component analysis.
Rotation method – varimax with Kaiser normalization.

Table A.7. Employees' views

	M	*TA*	*Scale range*
Financial risk	3.62	.78	1-7
Present operational risk	.03	.88	-3-3
Future operational risk	.20	.80	-3-3
Productivity and performance index	3.27	.51	1-7
Job satisfaction	4.59	.87	1-7
Self-efficacy index	4.89	1.03	1-7
Responsibility index	3.65	.64	1-7
Career strategy	3.85	.98	1-7
Career adaptability	4.40	.92	1-7
Career identity	4.23	.89	1-7

Table A.8. Tests of normality

	Kolmogorov-Smirnov[a]			*Shapiro-Wilk*		
	Statistic	*df*	*Sig.*	*Statistic*	*df*	*Sig.*
Financial risk	.154	120	.000	.923	120	.000
Present operational risk	.121	120	.000	.932	120	.000
Future operational risk	.082	120	.046	.967	120	.005
Production and efficiency index	.221	120	.000	.932	120	.000
Job satisfaction	.130	120	.000	.952	120	.000
Self-efficacy index	.140	120	.000	.937	120	.000
Responsibility ratio	.251	120	.000	.892	120	.000
Career strategy	.153	120	.000	.904	120	.000
Career adaptability	.178	120	.000	.914	120	.000
Career identity	.136	120	.000	.967	120	.005

Note: Lilliefors significance correction.

Table A.9. Skewness-Kurtosis

		Financial Risk	Present operational risk	Future operational risk	Production and efficiency index	Job satisfaction	Self-efficacy index	Responsibility index	Career strategy	Career adaptability	Career identity
N	*Valid*	120	120	120	120	120	120	120	120	120	120
	Missing	0	0	0	0	0	0	0	0	0	0
Mean		3.6211	.0324	.2015	3.2717	4.5917	4.8875	3.6517	3.8452	4.3976	4.2310
Median		3.6667	- .0882	.1176	3.0000	4.7000	4.6667	3.6000	4.1429	4.2857	4.0000
Std. Deviation		.77914	.88015	.79856	.50663	.86797	1.03468	.64064	.97606	.91823	.88977
Skewness		- .111	.004	.199	.020	- .153	.032	.571	- .508	- .045	.304
Std. Error of skewness		.221	.221	.221	.221	.221	.221	.221	.221	.221	.221
Kurtosis		.464	-1.344	- .662	- .496	- .023	- .736	- .900	- .936	.180	- .519
Std. Error of kurtosis		.438	.438	.438	.438	.438	.438	.438	.438	.438	.438
Minimum		1.80	-1.41	-1.18	2.20	2.70	3.00	2.80	2.14	2.29	2.71
Maximum		5.33	1.53	2.06	4.20	6.40	6.67	5.00	5.14	6.00	6.57

Figure A.1. Histogram (dependent variable – financial risk)
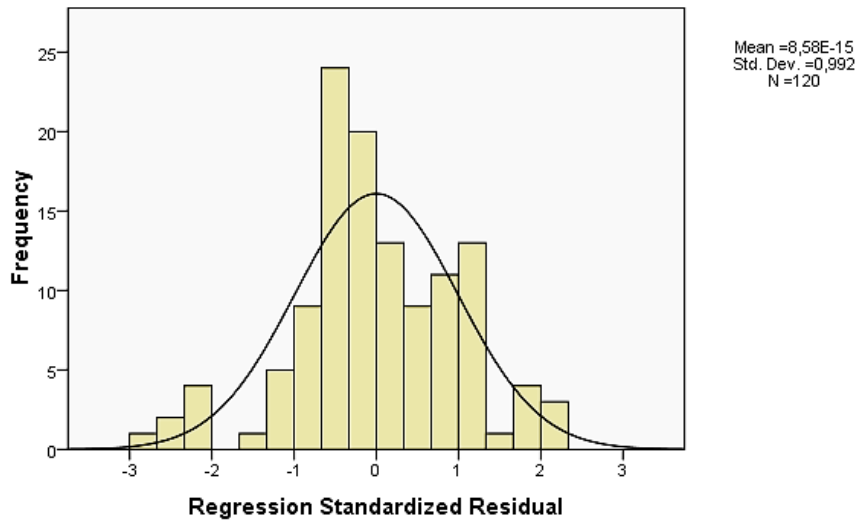
Figure A.2. Scatterplot (dependent variable – financial risk)
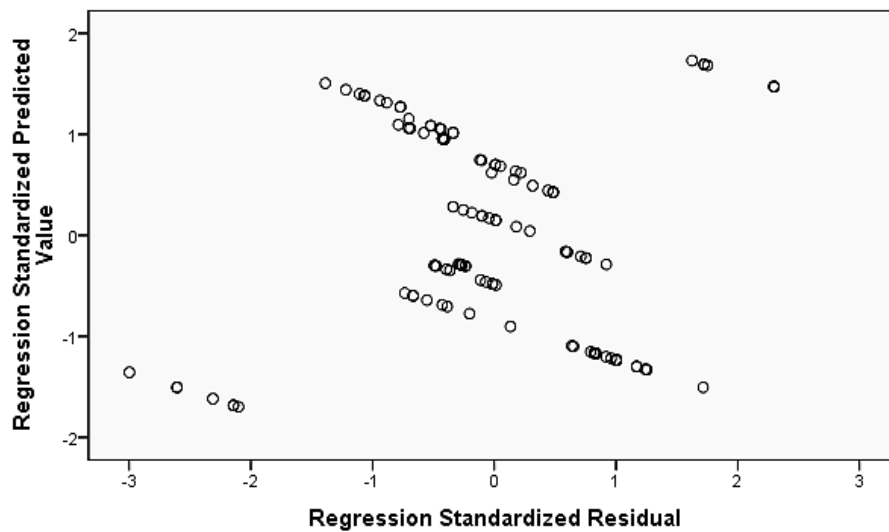
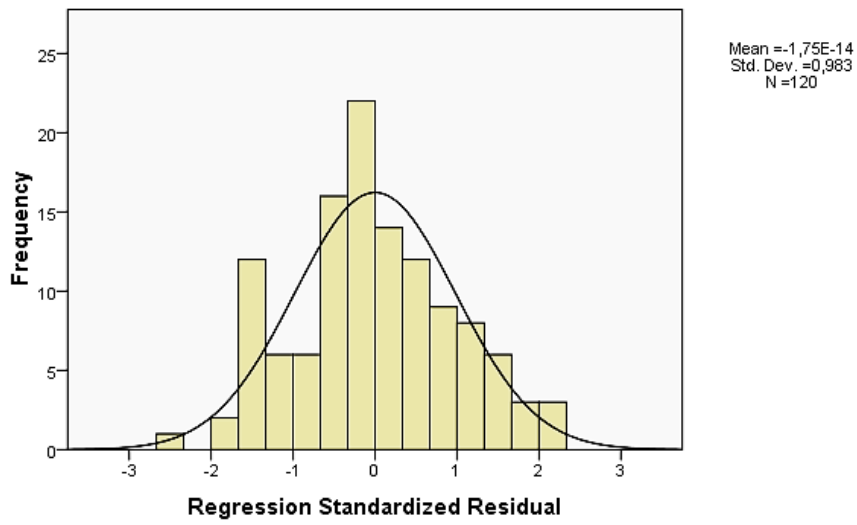**Figure A.3.** Histogram (dependent variable – production and efficiency index)

Figure A.4. Scatterplot (dependent variable – production and efficiency index)