CORRELATION BETWEEN THE PUBLIC SECTOR'S PERFORMANCE AND THE SOVEREIGN DEBT, IN THE CONTEXT OF THE CURRENT ECONOMIC CRISIS

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Abstract

The current economical situation determined by the effects of the crisis is causing the governments of the countries worldwide to streamline their processes in terms of collecting revenue from the state budget and then redistributing them on the principle of performance and economical efficiency. In this respect, we have studied the public sector performance through a scoring function, and especially the correlation that exists between the EU Member States public sector performance and budgetary outcome, the budgetary surplus or deficit.

Keywords: *public expenditure, efficiency, input, output, outcomes.*

JEL classification: H0, D61, G14

1. Introduction

In general sense, the efficiency can be achieved under the conditions of maximizing the results of an action in relation to the resources used, and it is calculated by comparing the effects obtained in their efforts. Measuring the effectiveness requires: a) estimating the costs, the resources consumed the effort in generally, found in the literature as the input; b) estimating the results, or the outputs; c) comparing the two. The efficiency is given by the relationship between the effects, or outputs such as found in the literature, and efforts or inputs. The relationship is apparently simple, but practice often proves the contrary, because identifying and measuring inputs and outputs in the public sector is generally a difficult operation.

In many cases the direct and immediate economical benefit is missing in the public sector. For example, if a school is built in a village the efforts involved in this investment can be easily identified: all costs incurred for the construction, the material basis, the salaries, etc. But under what form are the benefits in this case found? Can we identify direct economic benefits? The answer is "no"; in which case we meet only social benefits, such as: increasing literacy, ensuring better labor market, higher living conditions, difficult to quantify in cash. So, in conclusion, we can say that the economical efficiency of this investment is zero, starting from the definition of the efficiency (effects / effort), precisely because the effects are difficult

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to assess in money. When building a highway by the public sector the investment may be considered ineffective if we refer to the increased time of recovering the initial investment from the future cash flows generated by the collection of highway taxes, but the objective of the investment is not only one of economical nature (tax collection), but it considers reducing the number of road accidents and reduce traveling time. So in this case the calculated efficiency is much lower than the real one.

An important public benefit is the concern for human life and for quality of life. Providing insurance services for national defense, maintaining the public order, spatial planning, disaster prevention and control are one attribute of the state, without which no nation could exist. These types of public services needed, cannot be provided by the private sector because they don't have the economical power necessary for sustaining them, their majority brings no profit, so there is no interest for providing such services from the private sector, and not in the least it would be a too great risk for the people that these services belonged to the private sector (Scutaru, 2009). When we speak of efficiency, most analysts refer to the economic efficiency, taken from the private sector and subjected to analysis in the public sector, in order to illustrate the so-called inefficiency of the latter. The efficiency in the public sector must thus be seen as an amount between the economical efficiency and the social-environmental one.

As it is mentioned in a study by David Hall and Emanuele Lobina from The Greenwich University in 2005 it can not be said that there is a significant difference in efficiency between public and private organizations. Following a study conducted both in the developed countries but also in the ones that are developing and in transition, it can not be expressed a relevant conclusions in terms of efficiency in the two sectors, the ineffectiveness of an organization is not entirely influenced by their ownership (Hall D., Lobina E., 2005). Analyzing the processes of privatization in the UK, Massimo Florio concluded that they had no visible effect over an organization's performance and the net gain is zero, given the transfer of value from workers to owners (Florio, 2004). The efficiency in the public sector could be compared with that obtained in the private sector only when the objectives are identical; and even in this case it's not fully comparable because the public sector develops complex projects, which take into account not only the economical benefits but also social problems (Stoian M., Ene N.C., 2003).

2. Efficiency, effectiveness and performance of the public sector

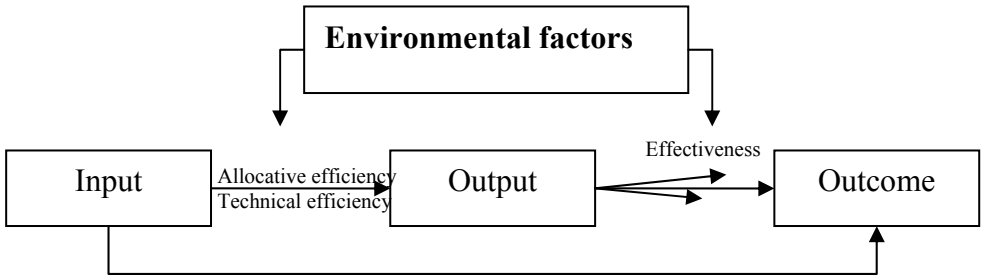
As seen in the previous subsection, the efficiency is an indicator that is obtained by reporting the outcome effects to the efforts made. ***The efficiency*** *of public expenses implies a relation between the economical and social effects resulted from implementing a program and the effort made to finance that program.* ***The effectiveness*** *is the indicator given by the ratio between the result obtained and the one programmed to achieve.*

Peter Drucker believes that there is no efficiency without effectiveness, because

it is more important to do well what you have proposed (the effectiveness) than do well something else that was not necessarily concerned (Drucker, 2001, p.147). The relationship between effectiveness and effectiveness is in part to a whole, the effectiveness is a necessary condition to achieving efficiency.

Ulrike Mandl, Adriaan Dierx and Fabienne Ilzkovitz in the paper "The effectiveness and efficiency of public spending" indicate that the efficiency and effectiveness analysis is based on the relationship between the inputs (entries), the outputs (results) and the outcomes (effects).

Figure 1: The relationship between the efficiency and the effectiveness



Source: Mandl U., Dierx A., Ilzkovitz F., (2008):"The effectiveness and efficiency of public spending", pg.3.

As it can be seen in Figure 1, the efficiency is given by the ratio between inputs and outputs. The authors mentioned above distinguish between the *technical efficiency* and the *allocative efficiency*. The technical efficiency implies a relation between inputs and outputs on the frontier production curve, but not any form of technical efficiency makes sense in economical terms, and this deficiency is captured through the allocative efficiency that requires a cost / benefit ratio. The effectiveness, in terms of this study, implies a relationship between outputs and outcomes. In this sense the distinction between the output and the outcome must be made. For example, for education, an output is represented by the degree of literacy, and the outcome can be the level of education of the active population from that country. So the effects resulted from the implementation of a program (outcomes) are influenced by the results (outputs), as well as by other external factors. Therefore, effectiveness, illustrating the success with which resources were used in order to achieve the objectives pursued, is harder to achieve than efficiency, since the latter is not influenced by outside factors (Mandl U., Dierx A., Ilzkovitz F., 2008).

The direct factors of influence of the efficiency are:

- *the inputs*. In the public sector the resources are much harder to quantify than in the private sector, because most of the times the public services overlap, and there are used resources from several sources. But in general the inputs are given by the expenses incurred for the project / service in matter.

- *the outputs*. These are more difficult to quantify in the public sector than the inputs, because they can have both an economical and a social dimension. In the private sector the outputs have a market value; they are easily evaluated, while in the public sector this process is cumbersome, and much more forecast. To evaluate the outputs from the non-market sector, which is the public sector, we must first define some indicators that will be evaluated, and through which there will be determined a level of efficiency. The mechanism is complicated and kind of vague in some areas.

The effectiveness has as influence factors the outputs, the outcomes and the environmental factors. The latter, the environmental factors (such as lifestyle and various socio-economic influences) exercise a major influence over the effectiveness. The effects covered by a project (the outcomes) are often achieved in a longer horizon, and more outputs are needed in order to achieve an outcome. For example, the economical growth, which is an outcome of the economic policy of a country, in order for it to be achieved several years and several results are required, such as low inflation, more investments.

In the opinion of Profiroiu M., ***the performance*** in the public sector implies a relationship between objectives, means and results, so performance *is the result of the simultaneous pursuit of efficiency, effectiveness and a corresponding budget* (Profiroiu M., 2001, p.8)

In the paper "Cadrul de analiză a performanţelor sectorului public" ("The analysis of public sector performances"), Profiroiu A. and Profiroiu M. have illustrated possible performance evaluation methods of a public organizations. Establishing a public organization's performance is difficult, caused by the difficulties that exist in the definition of performance: the first difficulty appears from the meaning of the concept of performance; the second appears from the way the performances are obtained, and the third from evaluating the performance. ***Measuring the public sector performances***, in the conception of the authors, implies taking into consideration the distinction between: the means used (inputs), the process (throughput), the product (output) and the effect achieved (outcome). ***Performance assessment*** can be achieved through some measurement categories (Profiroiu, M., Profiroiu, A.):

1. *Measuring the resources economy*, which can be determined by comparing the purchase price of the inputs with the designated value.

2. *Measuring the costs*, which involves measuring in monetary expression the resource consumption in order to provide a particular product or service.

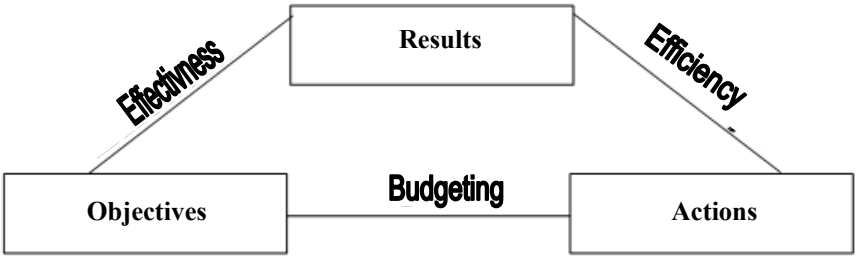
3. *Measuring the efficiency*, which takes into account the obtained result in relation to the resources used, and a project is effective if the maximum results are achieved with a given level of resources, or if it uses the minimum resources for a certain level of the result.

4. *Measuring the effectiveness*, its quantifying is given by the ratio between the actual result and its expected level. The process of measuring the effectiveness faces difficulties concerning the assessment and the quantification of the results, which often have no physical form, and cannot be directly measurable. The results of the

public projects can have both economical and social nature.

5. *Measuring the quality of services*, is designed to follow the degree to which the public product / service satisfies the requirements of the citizens. In this sense, the quality includes the effectiveness of a project. The deficiency of this method consists in the fact that the quality is a vague concept and far too complex that is not sufficiently reflected by indicators. The concept of quality encompasses not only the quality of the product / service offered, but also the quality of the production process and the quality of the system.
6. *Measuring the financial performance*
7. *Measuring the overall performance*

Figure 2: The triangle of the performance

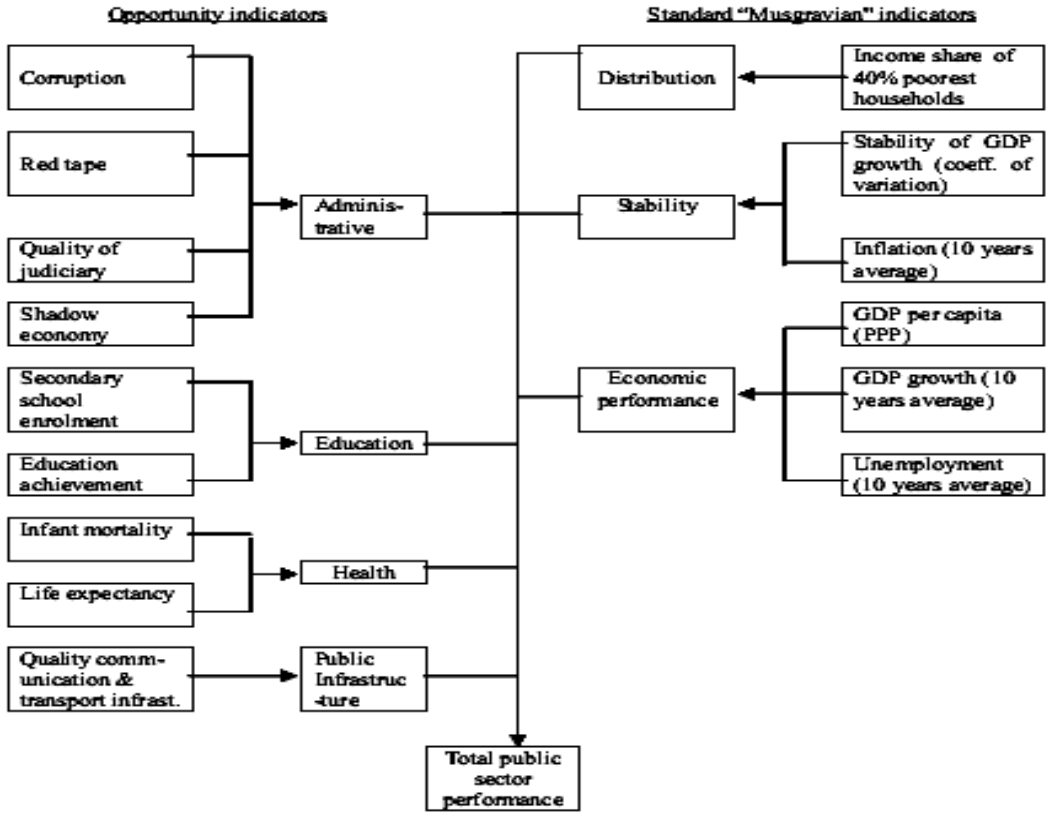


Source: Florişteanu E., "Eficienţa şi eficacitatea în sectorul public" pg.1

Afonso A., Schuknecht L., Tanzi V., in his paper "Public sector efficiency: an international comparison", proposes for measuring the overall public sector performance an indicator (PSP), obtained on the basis of a set of seven sub-indicators, each of them developed themselves on indices, as can be seen in Figure 5.

It is noted that he proposed four sub-opportunity indicators: the performance indicator in education, health, public infrastructure, administrative performance of the government, and took three sub-indicators from Musgrave, that reflect the goals which should be pursued by any government: stability, distribution, economical performance. Applying the non-parametrical method: Free Disposable Hull (FDH) on a total of 23 industrialized countries over a 10 years period, from 1990 to 2000, for the seven sub-indicators, the authors of the study mentioned above have achieved the overall public sector performance indicator (PSP), presented in Table 1 shown below:

Figure 3: Public sector performance indicator



Source: Afonso A., Schuknecht L., Tanzi V., (2003): "Public sector efficiency: an international comparison", European Central Bank, Working Paper no.242/July 2003, pg.10.

Table 1: The public sector performance indicator

Country	Opportunity indicators				Standard "Musgravian" indicators			Total public sector performance (equal weights 1/)
	Administration	Education	Health	Infrastructure	Distribution	Stability	Economic perform.	
Australia	1.17	1.02	0.94	1.00	0.87	1.31	1.00	1.04
Austria	1.21	1.00	0.98	1.10	1.22	1.28	1.01	1.12
Belgium	0.73	1.00	0.94	0.91	1.17	1.10	0.83	0.95
Canada	1.11	1.05	0.95	1.16	0.92	1.00	0.92	1.02
Denmark	1.16	1.00	1.03	1.03	1.19	1.10	0.91	1.06
Finland	1.26	1.07	1.04		1.18	0.75	0.73	1.01
France	0.72	1.03	1.03	1.01	0.90	1.12	0.70	0.93
Germany	1.02	0.98	1.01	1.01	0.98	0.91	0.81	0.96
Greece	0.60	0.94	0.93	0.81	0.97	0.55	0.69	0.78
Iceland	1.02	0.98	1.25			0.59	1.29	1.03
Ireland	1.06	0.94	0.88	1.00	0.89	1.22	1.40	1.05
Italy	0.52	0.96	0.93	0.84	1.10	0.76	0.69	0.83
Japan	0.87	1.09	1.12	1.09	1.20	1.40	1.18	1.14
Luxembourg	1.05	0.81	0.95			1.22	2.04	1.21
Netherlands	1.16	1.04	0.97	1.09	1.00	1.42	1.06	1.11
New Zealand	1.18	1.03	0.89		0.62	0.99	0.84	0.93
Norway	0.97	1.04	1.09	0.94	1.17	1.45	1.26	1.13
Portugal	0.54	0.94	0.90	0.75	0.92	0.64	0.92	0.80
Spain	0.77	1.00	1.10	0.86	1.02	0.82	0.67	0.89
Sweden	1.16	1.07	1.19	1.10	1.17	0.69	0.91	1.04
Switzerland	1.32	0.97	1.14	1.23	0.95	0.79	1.09	1.07
United Kingdom	1.00	1.05	0.91	0.99	0.79	0.78	0.84	0.91
United States	1.15	1.00	0.82	1.08	0.76	1.14	1.20	1.02
Average	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Small govs 2/	1.11	1.01	0.98	1.08	0.94	1.17	1.17	1.07
Medium govs	0.93	0.98	1.00	0.93	0.92	0.89	1.03	0.97
Big govs	0.99	1.02	1.01	1.01	1.12	1.03	0.85	1.01
EU 15 3/	0.88	1.00	0.99	0.98	0.98	0.93	0.80	0.94
Euro area 3/	0.84	0.99	1.00	0.97	1.00	0.96	0.78	0.93

Source: Afonso A., Schuknecht L., Tanzi V., (2003): "Public sector efficiency: an international comparison", European Central Bank, Working Paper no.242/July 2003, pg.12.

It may be noted that there are not recorded notable performance differences among the states analyzed. However, the countries with a low level of public expenses below 40% of GDP have superior performance to those with a wider public sector, over 50% of GDP (Afonso A., Schuknecht L., Tanzi V., 2003).

The authors mentioned above have subsequently used for public sector performance measurement the method "Data Envelopment Analysis" (DEA) as an alternative to the non-parametric method FDH, but the results were similar (Afonso A., Schuknecht L., Tanzi V., 2006).

3. Analysis of the correlation between public sector performance and the budgetary deficit / surplus at the European Union level

In order to accomplish an analysis of how the budgetary result is influenced by the performance of the public sector in the EU member states (except Malta), two indicators were chosen, namely: PSP score (performance of public sector), and the average budget result registered by member states during 2000-2009. PSP score is the result of a polynomial function applied to the EU states, built in a previous paper by the authors of this article.

Score function of the public sector in EU is:

PSP_{UE} SCORE= 1,0848 x X_1 + 1,9045 x X_2 + 3,3264 x X_3 + 1,414 x X_4 + 0,857 x X_5 + 0,6253 x X_6 + 2,9896 x X_7

and will measure the performance of the public sector based on proposed indicators by Afonso A., Schuknecht L., Tanzi V.

So, X_1 = administrative; X_2 = education; X_3 = health; X_4 = public infrastructure; X_5 = income distribution; X_6 = economic stability; X_7 = economic performance.

The following table shows the PSP values for EU member states, and also the deficit/surplus average level, based on results from 2000 to 2009 inclusive.

Table 2: PSP score and budgetary surplus/deficit in EU

UE COUNTRIES	PSP SCORE	PUBLIC surplus/ deficit 2000-2009
LUXEMBOURG	**9.873**	**2.080**
SWEDEN	**9.483**	**1.460**
FINLAND	**9.184**	**3.440**
NETHERLANDS	**9.022**	**-0.930**
SLOVENIA	**8.935**	**-2.500**
AUSTRIA	**8.856**	**-1.560**
FRANCE	**8.784**	**-3.250**
DENMARK	**8.750**	**2.230**
IRELAND	**8.634**	**-0.970**
GERMANY	**8.486**	**-2.100**
CYPRUS	**8.442**	**-2.490**
BELGIUM	**8.240**	**-0.990**
CZECH REPUBLIC	**8.070**	**-4.120**
GREAT BRITAIN	**7.924**	**-3.010**
ESTONIA	**7.898**	**0.560**
PORTUGAL	**7.437**	**-4.110**
SPAIN	**7.309**	**-1.300**
GREECE	**7.108**	**-6.130**
SLOVAKIA	**7.045**	**-4.950**
LITHUANIA	**7.011**	**-2.560**

HUNGARY	**6.981**	**-5.950**
ITALY	**6.910**	**-3.090**
LATVIA	**6.556**	**-2.410**
POLAND	**6.384**	**-4.530**
ROMANIA	**5.572**	**-3.250**
BULGARIA	**5.538**	**0.370**
AVERAGE	**7.863**	**-1.925**
PEARSON COEFFICIENT	**0.523**	
SPEARMAN COEFFICENT	**0.564**	

Source: personal computation

It should be noted that the average public sector performance in the EU, according to the authors proposed score function, is 7.863 and the highest values were obtained by Luxembourg, Sweden, Finland and Netherlands, while the lowest were recorded by Poland, Romania And Bulgaria.

Analysis of correlation between the two indicators was performed using Pearson and Spearman correlation coefficients and the results are presented in the following section. The Pearson coefficient is used to measure the degree of correlation between two variables. The lack of correlation is indicated by values close to 0, the "positive" correlation is indicated by a coefficient value close to 1, while the "negative" correlation is indicated by a coefficient value close to -1; as in the case of the Spearman coefficient.

Table 3: Pearson Correlation

Correlations

		Score	Result
Score	Pearson Correlation	1	.523**
	Sig. (2-tailed)		.006
	N	26	26
Result	Pearson Correlation	.523**	1
	Sig. (2-tailed)	.006	
	N	26	26

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

Table 4: Spearman Correlation

Correlations

		Score	Result
Score	Correlation Coefficient	1.000	.564**
	Sig. (2-tailed)	.	.003
	N	26	26
Result	Correlation Coefficient	.564**	1.000
	Sig. (2-tailed)	.003	.
	N	26	26

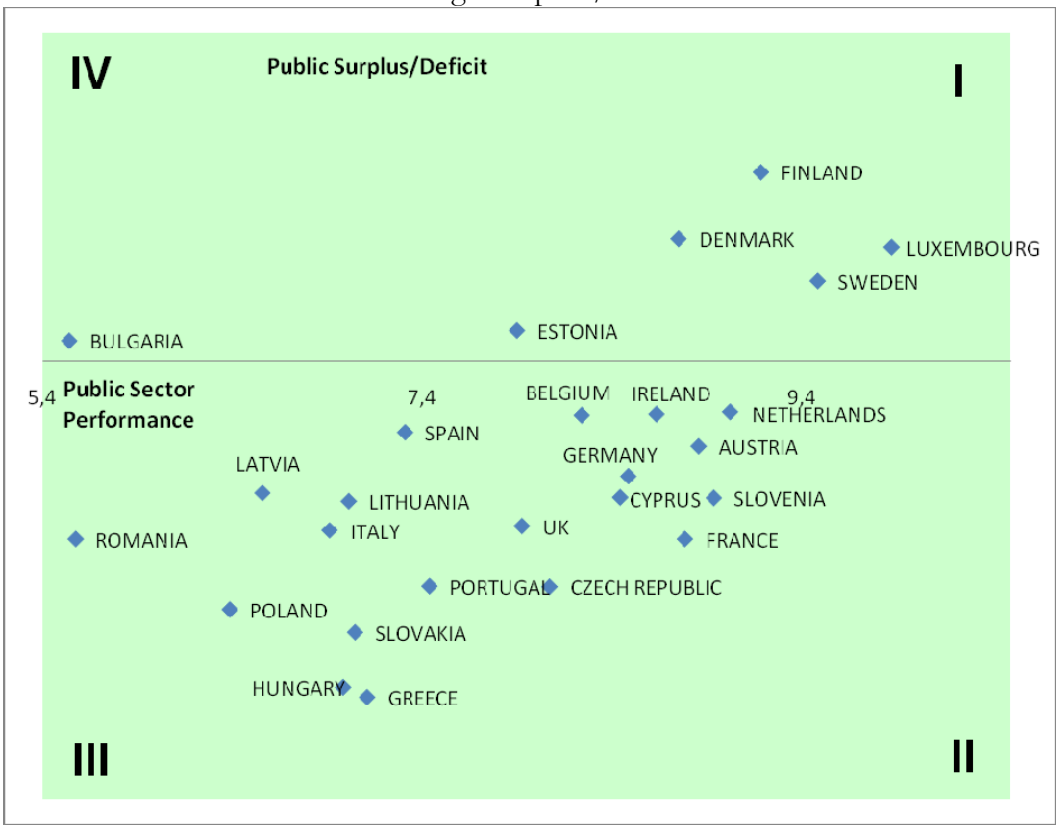
**. Correlation is significant at the 0.01 level (2-tailed).

After the calculations, two values were obtained, the Pearson coefficient with a value of 0.523 and the Spearman coefficient (calculated upon ranks) of 0.564, which suggests a close and direct correlation between the two indicators, namely a high performance public sector leads to budget surplus (or low budget deficit, see Luxembourg, Sweden, Finland, Denmark), and a low performance of public sector (a small PSP score) leads to budget deficits (see the case of Romania, Poland, Hungary and Greece). The significance level of the correlation, calculated by chi square test, is 99%, a very high level, for which it can be stated the fact that the performance of the public sector has a notable implication upon budget deficit.

Afterwards, we plotted the relationship between the score measuring public sector performance and the budgetary surplus / deficit in the EU, and through this analysis we obtained the following situation at the EU level, presented in the chart below.

Positioning countries on the graph shows the risk in terms of budget balance and public sector performance. The countries positioned closer to the upper right corner point of the graph have a higher performance and their risk of entering into a sovereign debt crisis is lower.

Chart 1: Relationship between the score measuring public sector performance and the state budget surplus / deficit in the EU



From the chart above, four quadrants can be distinguished with the following meaning:

QUADRANT	CHARACTERISTICS	COUNTRIES
I	High performance of the public sector Reduced risk of budgetary imbalances	Finland, Luxembourg, Denmark, Sweden, Estonia
II	High performance of the public sector Medium risk of budgetary imbalances	Belgium, Ireland, Netherlands, Austria, Germany, Slovenia, France, Czech Republic, Cyprus, Great Britain
III and IV	Performance of the public sector below the EU average High risk of budgetary imbalances	Spain, Portugal, Slovakia, Lithuania, Italy, Greece, Latvia, Poland, Hungary, Romania, Bulgaria

As it can be observed from the chart, there is a strong connection between the public sector performance (measured with the PSP score) and the sovereign debt situation of the Member States.

Thus, states in quadrant I are countries which, due to appropriate programs that have met requirements for the efficient use of budgetary instruments and a high performance public sector, have the ability to keep control of sovereign debt.

Countries in quadrant II are countries with a high performance of the public sector, but due to the implementation of the government's massive recovery programs to overcome the financial crisis, sovereign debt has increased.

Quadrants III and IV consist of the countries with medium or low performance of the public sector and which are affected at the moment by the problem of the sovereign debt, due to inefficient public management policies; this problem has been discovered in this unfavorable economic circumstances that characterizes the world's economy in general and Europe's in particular. These are the countries that have lost the control over public spendings and have the highest risk of entering a sovereign debt crisis.

4. Conclusions

To resolve the existing unfavorable situation, caused by the existence of high sovereign debt, the solution should help balancing the state budget by reducing government costs, and the medium-term solution is to reduce the state personnel while reducing taxation (reducing the tax burden), so that the economy could be released by private sector.

Finally, we can state that efficiency in the public sector is a problem which most governments have to face, and which is determined, mainly, by the existence of some major deficits, a bureaucracy that makes it hard to collect money to the budget and their redistribution as soon as possible, but also as a result of implementing some public programs which are based on some performance objectives. Thus, the optimal dimensioning of the public sector's management and staff is the starting point for obtaining real performances that have an impact over the private sector (which also contributes to the state budget with taxes and may lead to increasing the state's revenue). First, this optimum sizing should be done by considering the performance criteria given by various models and methods to measure the performance in the public sector. In this way, major important performances could be obtained and this will have a positive impact on medium and long term over the private sector and hence over the entire economy.

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