DIFFICULTIES CONCERNING PUBLIC SECTOR EFFICIENCY AND PERFORMANCE MEASUREMENT

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ABSTRACT
The ability to measure public sector performance is a necessity for policymakers as well as academics and citizens of a country. This article aims to identify ways of measuring public sector performance using the measurement applicable to all countries and outlining opportunities for comparability among them. Thus, the authors highlight opportunities for performance measurement and public sector efficiency using various methods of non-parametric and parametric analysis. The starting point of the analysis considers the concept of performance, encompasses the proposed terms of productivity, efficiency and effectiveness; therefore, the measurement of public sector performance requires an exhaustive analysis in multidimensional terms, covering all core areas of a country. Moreover, understanding and developing robust international comparison possibilities will give in practice a structural framework for measuring the performance of particular relevance. Study findings indicate that performance measurement and implicitly public sector efficiency is a complex and difficult task that goes beyond simply measuring of productivity and efficiency, and requires aggregation of several key areas related to the results of a state. In summary, the analysis framework of the performance and efficiency of public sector is outlined both in terms of relevance of indicators and the methodology used. It demonstrates that methods of non-parametric analysis work at their best when all aspects of the production process can be captured in a limited number of input and output dimensions.
KEYWORDS: *performance, efficiency, public sector, non-parametric methods, parametric methods.*

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Introduction

Policymakers must provide people with public goods and services and manage all public activities in a performant manner, in terms of productivity, efficiency and effectiveness. The sizing process of performance is imperative, both seeking to identify measures to improve and enhance it and also fulfil the obligation of public responsibility of public decision-makers.

Problem. In this regard, it is important to identify and select relevant methodologies and indicators for measuring performance in an objective and comprehensive manner so that to represent a barometer of the overall quality of the public sector. Considering that the context of globalisation and the information age are arguments to support a comparative and robust framework to analyse performance of countries, we try to

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highlight the most efficient research methodologies for to measuring both performance and efficiency. Even if there are several studies in previous literature, using as instruments different methods and indicators (composite ones) to measure performances and efficiency, there is only the consensus regarding the importance of non-parametric methods. In this paper we consider the well-known non-parametric methods because it can also highlight the inefficiency of public sector in terms of inputs, outputs and outcomes.

Purpose. The aim of this article is to outline a performance analysis framework and public sector's efficiency that can be universally available and applicable to all countries by virtue of ensuring comparability among them.

Object. The overall objective of the work involves highlighting a mechanism specialised in integrated research and strategic orientation of performance and efficiency of the public sector in a manner that is universal and homogeneous, by highlighting the most relevant methodologies for dimensioning them regarding inputs and outputs.

Tasks. The authors propose:

- to highlight opportunities for performance measurement and public sector efficiency using parametric and non-parametric different methodologies by framing frontier efficiency performance of production possibilities;
- to illustrate the need and to outline concrete possibilities to shape the composite indicators;
- to identify a number of international institutions that underpin the sizing performance and efficiency of the public sector.

Methods. We will use a method of qualitative analysis, from the theoretical perspective of the main methodologies for measuring the performance and efficiency of the public sector through parametric and non-parametric methods, a methodology that relates to the frontier production possibilities and the principles of the underpinning's constitution indicators the composite of their measurement.

The study is structured in three sections. The first section includes the contextualising of concepts of performance, efficiency, productivity and the presentation of methodologies for determining them, with applicability within the public sector. Methodologies for assessing the productivity, efficiency and performance, in general terms, are presented in summary in the second section of the article. The final section presents the conclusions of the study undertaken.

1. Literature

The ability to measure performance and efficiency of public sector is both a challenge and a necessity for policymakers, academia, and civil society in the context of participatory democracy. In the context of globalisation, the need for the existing measures of comparison between states, the information era represent just a few reasons that require the identification of instruments for measuring the quality of governance, in particular, and the quality of the public sector in general. The quality of the public sector is measured in terms of productivity, efficiency and effectiveness. These concepts applied to the public sphere involve a multidimensional analysis, which includes elements of the individual culture of each state reporting to a set of norms and values, and also a participatory approach towards citizens and facilitating access to public information on the management of public affairs.

A comprehensive analysis of the public sector requires special consideration, comparative and complementary to the concepts of productivity, efficiency and performance. The starting point of the proposed analysis considers productivity in terms of output/input. We note that measuring productivity does not entail such a comparison or reference to a set of values considered as a reference. Efficiency, in turn, provides a much more complex framework of analysis, offering the possibility of reporting the results to the production possibilities frontier. O. Lobont and O. Kristmundsson (2016: 70) stress the importance of quality and resource allocation in the efficiency analysis, considering the political prerogative of the government as a factor influencing the results of public sector efficiency. We retain our attention on the fact that performance encompasses both productivity and efficiency and in addition, according to A. Worthington and B. Dollery (2000: 4) includes efficacy, which refers to the extent to which the objectives are achieved.

The investigation of the literature and specific practices to the public sector reveal that at the basis for assessing public sector through various methodologies and indicators, are data shaping the inputs, outputs and results. Thus, a consistent and objective assessment forces the consideration of all factors that influence a phenomenon studied, by the exogenous and subjective ones to the incorporating in the analysis elements of quality of results or outputs. The results of an assessment lose their consistency without a minimum degree of homogeneity. The importance of the proposed study derives from the need to identify a set of comparative indicators and methodologies for measuring the quality of the public sector, allowing comparison between countries, and between organisational units, as well as reporting to certain values. This comparison can be made in terms of productivity, efficiency and performance.

Productivity ratio calculated through the classical output/input report presents difficulties on account of external factors of influence and on treating a subjective dimension of data. Depending on the number and complexity of inputs and outputs, the procedure for processing and interpretation must also be adapted. However, a significant number of inputs and outputs cannot be treated by the simple ratio output/input. The solution proposed by M. J. Farrell (1957: 253–281) for this situation lies in consideration of weight or importance assigned to inputs and outputs. Obtaining a conclusive result imposes that the denominator and numerator of the ratio output/input to be expressed in the same unit. One way of achieving this is to calculate partial productivity, which does not require relations with residual factors or association of inputs and outputs prices. However, this approach involves a number of shortcomings because it neglects the influence of exogenous factors and does not take into account consumer satisfaction or quality of outputs.

Starting from the model proposed by M. J. Farrell (1957: 253–281), A. Charnes, W. Cooper and E. Rhodes (1978: 429–444) develops the methodology named *Data Envelopment Analysis* (DEA), a non-parametric method based on a mathematical linear programming technique used to measure the effectiveness of an organizational unit (Decision Making Unit, DMU). Using the benchmarking process and identifying the most effective organisational unit, DEA can determine border efficiency, deviation of inefficient border units and even development opportunities of inefficient units. At least one organisational unit will be located on the border of efficiency, and it will envelop the others. With this methodology as a basis, J. Zhu (2003: 513–529) develops a more complex DEA model, capable of handling both measurement errors and distribution of values instead of a single value for variables. This model is called the DEA *imprecise* or *IDEA*. Compared to the standard model, which requires inputs and outputs values exactly known, IDEA can work with variables as bounded data.

Alternatively, L. Simar and P. W. Tulkens (1984: 243–267) suggest another non-parametric analysis model for determining the efficiency as an alternative to DEA, called *Free Disposal Hull* (FDH). Unlike DEA, FDH does not require the assumption of convexity and is recommended as an efficient tool for analysing public sector efficiency. In terms of technical and empirical units, FDH involves a small number of assumptions concerning production technology of a unit, when determining technical efficiency. However, we note a weakness of this method, namely its sensitivity to the number of distributions from the set of observations and the number of inputs and outputs. The more the set of observations is larger or more complex, the greatest the possibility of dominating a comment. This is due to the partial sequencing caused by the dominant vector. Thus, FDH measures the effectiveness of a given point to the limits of a set of observations.

We note a methodology commonly used in studies of production, costs, revenues and overall achievement, i.e., *Stochastic Frontier Analysis* (SFA). Starting from the idea of stochastic frontier introduced by D. J. Aigner, C. A. Lovell and P. Schmidt (1977: 21–37), SFA is a method of economic modeling. The initial version of the model was to create a production function for a data set with an error term consisting of two components: one on stochastic effects and the other to the technical inefficiency. An extension of the initial model is introduced by S. W. Polacheck and B. J. Yoon (1987: 296–302) who involve a third component of the tool, aiming to measure the impact of infrormation inefficiency, represented by incomplete or imperfect information.

However, as emerges from the very beginning of the analysis undertaken, to determine public sector performance requires the inclusion of results obtained in evaluating the efficiency and in shaping composite indicators, of higher complexity, able to treat a more consistent set of data. Consistent, homogeneous methods of determining public sector performance will ensure a robust framework of opportunities for international comparability. We identify the main international institutions that shaped the possibilities for international comparability, such as European Central Bank (2006), World Bank (2005), OECD (2007), Inter-American Development Bank (2013). It is a complex concept; performance requires an aggregate analysis of several basic areas of a state. Also, it needs to be considered the most relevant indicators in the construction of composite indicators so that public sector analysis to be judicious and representative.

These institutions and international organisations, with real concerns within the sizing of public sector performance, come to support efforts of research of several groups dedicated to this cause. Among them, we note the efforts made by A. Afonso, L. Schuknecht and V. Tanzi (2006: 16–20), who, by aggregating a set of indicators of opportunity and musgravien indicators, sized a set of composite indicators at the level of a comparative international study for the European Central Bank. They determined the indicators Public Sector Efficiency and Public Sector Performance, considering seven components essentially important for the public sector: public administration, health, education, infrastructure, income distribution, economic stability and economic performance. The first four components are dimensions of opportunity indicators, while the other three are from the sphere of the musgravien indicators. Thus, the efficiency of the public sector is analysed from the perspective of public sector performance relative to public spending. The authors distinguish clearly between performance and efficiency of the public sector, considering the performance as results of policies and efficiency as performance relative to spending.

Using the same concepts of Public Sector Performance (PSP), Public Sector Efficiency (PSE) and Data Envelopment Analysis (DEA), A. Afonso, A. Romero and E. Monsalve (2013: 12–18) performed a study for another international body, i.e., the Inter-American Development Bank. They measured the efficiency and global performance of 23 countries in Latin America based on opportunity indicators and of some musgravien indicators.

An approach of the World Bank suggests, according to the studies of D. Kaufman, A. Kraay and M. Mastruzzi (2005: 4), analysing public sector performance by reference to the six dimensions of quality of governance: voice and responsibility, political instability and violence, government effectiveness, quality of regulations, rule of law and control of corruption.

OECD (2007: 46, 78, 186) propose another research instrument, which classifies incoming data analysed by four guidelines, on results, inputs, processes and outputs. Performance analysis from the perspective of OECD (1995) is achieved at the expense of measuring the effectiveness and efficiency of the public sector, public service quality, costs and resources of the economy, and the overall financial performance. All these contribute to the expression of an overall performance of the public sector.

Thus we note that efforts to measure the efficiency and effectiveness of public sector converge to determine some composite indicators, by the aggregation process, specific to the methodology Principal Component Analysis (PCA). Discovered by K. Pearson (1901: 559–572), this methodology involves grouping several individual indicators to form composite indicators, able to exploit a more complex set of information. PCA links a set of variables with a small number of latent dimensions and allows the use of multiple variables to analyse a phenomenon. Mathematically speaking, PCA is defined as an orthogonal-linear transformation, transposing data in a coordinate system so that the largest variance of projection data becomes the first coordinate, i.e., the first principal component, the second largest variance becoming the second main component, etc.

The methodologies of evaluation proposed must be assimilated and applied in an attempt to measure the performance and efficiency of the public sector. Performance measurement is performed after making a careful analysis of efficiency and productivity. Areas less effective or performant must be subjected to careful analysis in the scope of sizing and shaping the most adequate decisions of future improvement. We bear in mind that public sector performance results are relevant only if the data processing input and output are accurate, current and truthful to the studied phenomenon. AT the level of the public sector there should always exist the necessary data to achieve such an assessment.

2. Methodology

Exceeding the simple calculation of productivity and using the ratio output/input, M. J. Farrell (1957: 253–281) suggests a way of measuring the relative effectiveness when there should be assessed more inputs than outputs. The proposal starts from the classical method of the output/input and proposes a weighted sum of outputs / weighted sum of inputs. In this way it results that the efficiency of a unit (j) can be measured according to the formula:

$$\text{Efficiency of unit j} = \frac{u_1 y_{1j} + u_{2y_{2j}+\cdots}}{v_1 x_{1j} + v_{2x_{2j}+\cdots}} \tag{1}$$

Where:
u_1 = share allocated to output 1;
y_{1j} = quantity of output 1 from unit *j*;
v_1 = share allocated to input *i*;
x_{1j} = quantity of input from unit *j*;

Data Envelopment Analysis develop the concept of M. J. Farell (1957: 253–281) and allows efficiency analysis by using a set of more complex data. Thus we identify two approaches of DEA application: CCR named by the authors of the model, A. Charnes, W. Cooper and E. Rhodes (1978: 429–444), represents the first model of DEA application. This model focuses on inputs and considers constant return to scale. The equations of the model are:

$$E_0 = \frac{\sum_r u_r y_{rj_0}}{\sum_i v_i x_{ij_0}} \to max \tag{2}$$

$$E_0 = \frac{\sum_r u_r y_{rj_0}}{\sum_i v_i x_{ij_0}} \leq 1 \tag{3}$$

$$u_r \geq 0 \tag{4}$$

$$v_i \geq 0 \tag{5}$$

u_r și v_i represents weights or the importance associated to each output and input. Identifying and applying a universally available common set of weights, valid in the assessment of all units is difficult to identify, perhaps even impossible. In addition a subjective side needs to be considered in determining the weights used by each unit, each unit appreciating differently the inputs and outputs importance. A measure of compromise, accepted by A. Charnes, W. Cooper and E. Rhodes (1978: 429–444), was to allow each unit the possibility to set its own sets of weights that put the unit in a favourable light by the results recorded. The deficiency of this approach is that we can identify a more subjective rather than judicious means of granting weights, which may indicate a false efficiency of the units. The opposite situation in which the result ratio indicates inefficiency offers reassuring to the result, given that inefficiency was determined in the context of choosing the most favourable indicators.

The BCC model, named by its authors R. D. Banker, A. Charnes and W. Cooper (1984: 1078–1092) considers variable returns to scale; this is why it applies, in addition, the deviation dimension from the constant return to scale, q_0.

$$E_0 = \sum_r u_r y_{rj_0} + q_0 \rightarrow \max \quad (6)$$

$$\sum_i v_i x_{ij_0} = 1 \quad (7)$$

$$-\sum_i v_i x_{ij_0} + \sum_r u_r y_{rj_0} + q_0 \leq 0 \quad (8)$$

$$u_r \geq 0 \quad (9)$$

$$v_i \geq 0 \quad (10)$$

$$q_0 \in R \quad (11)$$

The concept of return to scale is connected to the production function. If the output increases with the same proportion with which all inputs increase, we then identify a constant return to scale. Thus an evolution of different proportions implies a variable return to scale. The orientation towards input of output refers to the improvement measures of unit efficiency through ways of increasing or decreasing inputs or outputs.

The IDEA model suggested by J. Zhu (2003: 513–529) presents certain particularities compared to the classical model. Thus, starting from the ratio $E_0 = \frac{\sum_r u_r y_{rj_0}}{\sum_i v_i x_{ij_0}}$ of measuring the efficiency of an organizational unit, IDEA presents the following particularities:

$$\underline{y_{rj}} \leq y_{rj} \leq \overline{y_{rj}} \quad (12)$$

$$\underline{x_{ij}} \leq x_{ij} \leq \overline{x_{ij}} \; 9 \quad (13)$$

Where, $\underline{y_{rj}}$ represents the minimum limit of outputs distribution;
$\overline{y_{rj}}$ represents the maximum limits of outputs distribution;
$\underline{x_{ij}}$ represents the minimum limit of inputs distribution;
$\overline{x_{ij}}$ represents the maximum limit of inputs distribution;
r ∈ Bounded Output;
i ∈ Bounded Input.

The alternative for using DEA, suggested by D. Deprins, L. Simar and H. Tulkens (1984: 243–267) functions according to the following principle: considering a set of p inputs and q outputs, organisational production can be defined as a set of points, where Ψ represents the set of production defined in the Euclidian space as R_+^{p+q}. FDH measures the efficiency of one given point (x_0, y_0) in accordance to the limits of the task X = $\{(X_i, Y_i), i = 1, \ldots\ldots, n\}$,

$$\widehat{\Psi_{FDH}} = \left\{(x, y) \in R_+^{p+q} \mid y \leq Y_i; x \geq X_i, \left(X_i, Y_i\right) \in \mathrm{X}\right\} \quad (14)$$

Conditions for the estimated set of inputs and outputs and the corresponding set of outputs is:

$$\hat{C}(y) = \left\{x \in R_+^p \mid (x, y) \in \widehat{\Psi_{FDH}}\right\} \quad (15)$$

$$\hat{P}(x) = \left\{y \in R_+^q \mid (x, y) \in \widehat{\Psi_{FDH}}\right\} \quad (16)$$

Efficiency associated conditions are:

$$\partial\hat{C}(y) = \{x \mid x \in \hat{C}(y), \theta_x \notin \hat{C}(y)\ \forall\ 0 < \theta < 1\} \quad (17)$$

$$\partial\hat{P}(x) = \{y \mid y \in \hat{P}(x), \lambda \notin \hat{P}(x)\ \forall\ \lambda > 1\} \quad (18)$$

Thus, estimated efficiency of input for the point $(x_0, y_0) \in \Psi$ is:

$$\widehat{\theta_{FDH}}(x_0, y_0) = inf\{\theta \mid \theta_{x_0} \in \hat{C}(y_0)\} = inf\{\theta \mid (\theta_{x_0}, y_0) \in \widehat{\Psi_{FDH}}\} \quad (19)$$

And the output efficiency is given by the relationship:

$$\widehat{\lambda_{FDH}}(x_0, y_0) = \sup\{\lambda \mid \lambda_{y_0} \in \hat{P}(x_0)\} = sup\{\lambda \mid (x_0, \lambda_{y_0}) \in \widehat{\Psi_{FDH}}\} \quad (20)$$

Where:
x = input vector
y = output vector
C(y) = set of input vectors that can produce the output vector $y \in R_+^q$
P(x) = all output vectors that can be produced with an input vector given $x \in R_+^p$

$\widehat{\theta_{FDH}}(x_0, y_0)$ = efficiency calculated by FDH through input from the point $(x_0, y_0) \in \Psi$

$\widehat{\lambda_{FDH}}(x_0, y_0)$ = efficiency calculated by FDH for the associated output to the point (x_0, y_0)

When studying costs, revenue, profits, we use a stochastic frontier model analysis. The economic modeling method Stochastic Frontier Analysis starts from a frontier production model without a random component that can be written:

$$y_i = f(x_i; \beta) \cdot TE_i \quad (21)$$

Where:
y_i output scalar observed of the producer *i*;
x_i vector of N inputs used by producer *i*;
$f(x_i;\ \beta)$ = production frontier;
$\beta =$ vector of technologic parameters of estimate;s
TE_i = technical efficiency, maximum admitted value is of 1, indicating the largest quantity of outputs admitted.

Considering in our evaluation a random stochastic component to describe the shock affecting production, (i.e. economic crisis, weather change or population changes, etc.) noted as $exp\{v_i\}$, the frontier production becomes:

$$y_i = f(x_i; \beta) \cdot TE_i \cdot exp\{v_i\} \quad (22)$$

Supposing that TE_i is a stochastic variable with a certain distribution function common to all producers, we can note it exponentially $TE_i = exp\{-u_i\}$, $u_i \geq 0\ si\ TE_i \leq 1$. Thus, we get the equation:

$$y_i = f(x_i; \beta) \cdot\ exp\{-u_i\} \cdot exp\{v_i\} \quad (23)$$

Supposing that $f(x_i;\beta)$ has a are Cobb-Douglas linear form, the model can be:

$$\ln y_i = \beta_0 + \sum \beta_n ln x_{ni} + v_i - u_i \quad (24)$$

Advancing to the determination of public sector performance, according to A. Afonso, L. Schuknecht and V. Tanzi (2006), we remember the following:

$$PSE_i = \frac{PSP_i}{Chp_i} \quad (25)$$

We can write in a linear form as follows:

$$PSP_i = PSE_i x Chp_i \quad (26)$$

Where:
PSE_i represents efficiency of sector i; Public Sector Efficiency;
PSP_i represents performance of sector *i*; Public Sector Performance;
Chp_i represents public spending from sector *i*;

The aggregation of opportunity and musgravien indicators suggested by A. Afonso, L. Schuknecht and V. Tanzi (2006) on the seven basic directions may be represented under the form of a function:

$$f(x) = \alpha_1 \cdot x_1 + \alpha_2 \cdot x_2 + \alpha_3 \cdot x_3 + \alpha_4 \cdot x_4 + \alpha_5 \cdot x_5 + \alpha_6 \cdot x_6 + \alpha_7 \cdot x_7 \quad (27)$$

Where:
α_i is the coefficient of given importance;
x_i is the indicator of Public Sector Performance on the seven directions proposed by the authors.

Generally speaking, the Public Sector Performance indicator can be determined according to the formula:

$$PSP_i = \sum_{j=1}^{n} PSP_{ij} \text{, with i = 1,...n} \quad (28)$$

And
$$PSP_{ij} = f(I_k) \text{, with k =1,...n} \quad (29)$$

Where $f(I_k)$ is a function with k socio-economic aggregated indicators.

Knowing the construction model of PSP and PSE, we consider that these indicators represent an efficient and comprehensive way of establishing the quality of the governance and of the public sector in its fullness.

A widely used and effective method of construction of composite indicators is represented by the Principal Component Analysis. Mathematically speaking, PCA is defined as an orthogonal-linear transformation transposing data in a system of coordinates so that the greatest variance of projection data becomes the first coordinated, i.e. the first coordinated, and the second largest variance becomes the second main component, etc. Considering a matrix of data, X, with n rows and p columns, PCA transforms a p-dimensional set of weight vectors $w_{(k)} = (w_1, \dots w_p)_{(k)}$ into a new set of vectors of main components $t_i = (t_1, \dots t_m)_{(i)}$ cu $t_{k(i)} = x_{(i)} \cdot w_{(k)}$ so that individual variables from t of the data set comprise the maximum variation from x with each w vector, unit vector.

First vector $w_{(1)}$ satisfies the relation:

$$w_{(1)} = \underset{||w||=1}{\arg max} \left\{\sum_i (t_1)^2_{(i)}\right\} = \underset{||w||=1}{\arg max} \left\{\sum_i \left(x_{(i)} \cdot w\right)^2\right\} \quad (30)$$

Equivalent as matrix:

$$w_{(1)} = \underset{||w||=1}{\arg max} \{||Xw||^2\} = \underset{||w||=1}{\arg max} \{w^T X^T X w\} \quad (31)$$

And $w_{(1)}$ is defined as unit vector, it results the relation:

$$w_{(1)} = \arg\max \left\{\frac{w^T X^T X w}{w^T w}\right\} \quad (32)$$

The k component is determined by the removal of the first k-1 main components of X:

$$\widehat{X_k} = X - \sum_{s=1}^{k-1} X w_{(s)} w_{(s)}^T \quad (33)$$

Then it is identified the vector that removes the maximum variation from the new data matrix:

$$w_{(k)} = \underset{||w||=1}{\arg max} \{||\widehat{X_k} w||^2\} = \arg\max \left\{\frac{w^T \hat{X}_k^T \widehat{X_k} w}{w^T w}\right\} \quad (34)$$

$X^T X$ is proportional with the covariance matrix of the X data set, and the covariance Q between the two main components is:

$$Q\left(PC_{(j)}, PC_{(k)}\right) \propto \left(Xw_{(j)}\right)^T \cdot \left(Xw_{(k)}\right) \quad (35)$$
$$= w_{(j)}^T X^T X w_{(k)}$$
$$= w_{(j)}^T \lambda_{(k)} w_{(k)}$$
$$= \lambda_{(k)} w_{(j)}^T w_k$$

Eigenvectors w_i and w_k that correspond to the eigenvalues symmetric matrix are orthogonal.
The covariance matrix of the original variables can be thus written:

$$Q \propto X^T X = W \Lambda W^T \quad (36)$$

The covariance matrix between the two main components becomes:

$$W^T Q W \propto W^T \Lambda W^T W = \Lambda \quad (37)$$

Where Λ is the eigenvalues orthogonal matrix $\lambda_{(k)}$ of

$$X^T X \text{ și } \lambda_{(k)} = \sum t_{k(i)}^2 = \sum\left(x_{(i)} \cdot w_{(k)}\right)^2 \quad (38)$$

Non-parametric methods of analysis of public sector efficiency and performance share the common element of reporting at the efficiency frontier and can cause inefficiency as a deviation from the frontier. Performance measurement methodologies considered allow treating a subjective dimension of the data analysed, being able to treat to certain limits even economic and cultural privileges specific to the country analysed.

The multitude of measurement possibilities confers special variants of adaptability to special and particular multiple cases while maintaining a uniform framework for comparison.

Nowadays, in public economics research there have been developed different kinds of computer software which operates with the methodologies mentioned above, being modern instruments that facilitate empirical analysis with reference to production–possibility frontier. Some examples are IBM SPSS Software, DEA Software - DEA Frontier Microsoft Excel Add-In, PCA using the XLSTAT Statistical software. These software programs use a certain database and evaluate the performance and efficiency of the public sector.

Conclusions

The present study intended to identify ways in determining universal public sector performance applicable to all countries and highlighted the existence of a variety of sizes measuring dimensions, applied at several levels of performance.

The analysis also revealed that public sector evaluation is a complex task and can be achieved in terms of productivity, efficiency, effectiveness and performance. Following the steps of determining the productivity and efficiency of all important areas at the country level, allows subsequent shaping of the global performance indicators of a country. Assimilation of assessment methodologies and relevant development of composite indicators are necessary to conduct comparative studies at international level, and also to reflect specific reality of each public sector. Both globalisation and the information era are arguments to support the creation of homogeneous methods for determining performance of public sector and creation of values and norms of internationally recognised best practices.

We noticed the existence of international institutions that are in charge in the field of sizing instrumentation of public sector sizing performance and it proves that the uniform performance measurement process has started and must be continued. We state that use of these evaluation methods will enhance the possibility to create a set of benchmarks applicable to all countries and suggest that it will encourage the effective assimilation of this set in practice.

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VIEŠOJO SEKTORIAUS VEIKSMINGUMO IR VEIKLOS VERTINIMO SUNKUMAI

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Santrauka

Įstatymų leidėjai, akademikai ir šalies piliečiai turi gebėti pamatuoti viešojo sektoriaus veiksmingumą. Straipsnyje siekiama pateikti būdus, kaip tai būtų galima padaryti įvairiose šalyse, aptarti galimybes tai palyginti. Taigi siekiama aptarti viešojo sektoriaus veiksmingumo vertinimo galimybes, taikant kelių arba vieno kriterijaus analizę. Kriterijai įvairūs, nes lyginant tarptautiniu lygiu bendrus kriterijus išskirti sudėtinga.

Tyrimo rezultatai atskleidė, kad atliekamo darbo ir viešojo sektoriaus veiksmingumo vertinimas yra sudėtingas dalykas, būtina įdėti nemažai pastangų ne tik vertinant produktyvumą ir efektyvumą verslo organizacijose, tam reikia surinkti kelių skirtingų sričių, susijusių su valstybės valdymu, duomenis. Viešojo sektoriaus veiksmingumo analizės struktūroje svarbu tiek išskirti rodiklius, tiek taikyti atitinkamą metodologiją. Tyrimas atskleidė, kad geriausiai veikia neparametrinės analizės metodai. Vertinimo metodologijų ir plėtros sudėtinių rodiklių asimiliacija būtina, norint ne tik atlikti lyginamuosius tyrimus tarptautiniu lygiu, bet ir atskleisti situaciją kiekviename viešajame sektoriuje. Todėl vertinant svarbu atkreipti dėmesį tiek į globalizacijos aspektus, tiek į nacionalinius duomenis. Pastebėjome, kad internacionalinės institucijos stengiasi įvertinti viešojo sektoriaus veiksmingumo procesus. Tai būtina daryti ir toliau. Taikant mūsų vertinimo metodus yra daugiau galimybių nustatyti aiškius kriterijus, kurie tiktų visoms valstybėms. Turime vilties, kad tai paskatins kokybiškesnį ir įvairiapusiškesnį viešojo sektoriaus vertinimą ir bus pritaikyta įvairiose šalyse.

PAGRINDINIAI ŽODŽIAI: *našumas, veiksmingumas, viešasis sektorius, neparametrinis metodas, parametriniai metodai.*

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