

THEORETICAL EVIDENCES REGARDING METHODOLOGIES OF CALCULATING EFFICIENCY OF PUBLIC SECTOR

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Abstract

This paper consists of the literature and practice investigation regarding measurements metrics of public sector performance. The proposed investigation begins with consideration of the features of the public sector and the difficulties to measure the performance due to multiple principals and multiple tasks. The analysis provides the limitations of performance measurement systems. Although a variety of performance measures exist, our investigation emphasizes need for creation of composite indicators (aggregate indicators) in the public sector used widely in infrastructure, health, social services, education, administration and other service areas. Despite the apparent simplicity of composite measures, our paper reveals that their use and interpretation raises several challenges: i) different methods and methodologies of constructing composite indicators (Data Envelopment Analysis (DEA), Free Disposal Hull (FDH) methodology, Principal Component analysis (PCA)); ii) the uncertainty influence on composite indicators; iii) the variation in performance due to factors beyond the control of managers or iv) the iterative consultative approach performance.

Key words: public sector, efficiency, performance, composite measures

JEL Classification: H11

1. Introduction

A proficient use of public resources and high-quality fiscal policies in dealing with economic growth and individual welfare had a place of utmost importance due to a considerable amount of developments achieved recently. Countries' scope for expenditure increases is hindered by macroeconomic constraints. Public spending is a difficult issue to tackle when addressed both empirical and theoretical. Nevertheless, from a practical point of view, the level of public expenditure must be decided on so as to increase social well-being. Each country has its own pace when it comes to dealing with expenditure levels and the impact that additional spending has on welfare gains is still in question. However, the specialized literature has proved over the years that when exceeding a certain threshold, benefits that come from larger public spending (calculated through better social and economic indicators) have a tendency to go down.

The objective of the paper is to provide empirical evidence and raise awareness regarding the effectiveness of some combination of the approaches, metrics, and processes used to assess the public sector performance, by extending and practice investigation regarding measurements metrics of public sector performance (PSP). The proposed investigation begins with consideration of the features of the public sector and the difficulties to measure the performance due to multiple principals and multiple tasks.

This study is composed of four sections, respectively: the opening part, the related studies analyzed in the second part in the field of semantics of the definitions, the third part comprises the methodology of the study regarding quantifiable and comparable performance measures, the fourth section includes the evaluation of the findings and finally the conclusions, limitations of the study and recommendations for further research in the final section of the paper.

2. Literature review

Assessing the qualitative and appropriately performance metrics is complex. There are at least four challenges that the public organizations face (Oracle, 2009):

1. Creating a truly transformational government;

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2. Meeting heightened constituent expectations;
3. Managing workforce transition;
4. Minimizing the risks of implementing new technologies;

Study done by Sánchez and Bermejo (2007) clarified the relationship between public sector structure, performance and innovation in Europe, the empirical results emphasized that the EU's innovation system needed to be thoroughly reformed if the EU was to make an important shift towards realizing the broad features of which had been laid out in the Lisbon 2010 agenda. A structural reform and institutional change, and an emphasis on competitiveness based on science and on knowledge was a requirement for the Union to catch up with the United States and the energetic Asian economies, and public sector had a key role in this process

In the study Tanzi and Schuknecht did (2000), they clarified the relationship between higher public sector expenditure and higher socio-economic indicators, used the macro approach but they did not reach any relation of higher benefits with higher public expenditure. For this study 18 industrialized countries were in sample. At the same time, the countries with lower public expenditure had good socio-economic indicators. In a later study, Afonso, Schuknecht and Tanzi (2010) evaluated the result of public policies and the relationship between the resources used to measure government performance and efficiency through the concepts of Public Sector Performance (PSP) and Public Sector Efficiency (PSE) applied, at first, to a sample of twenty-three industrialized countries and later on to a handful of developed economies. The conclusion was that small governments got better indicators and were at the same time more efficient than bigger governments. We also found in Hauner and Kyobe (2008) that the rich countries had better public sector performance and efficiency and the institutional and demographic factors also had an important role. Another finding was that higher government expenditure to GDP tended to be in relation with lower efficiency in the sector.

When it came to measuring efficiency, an estimation of costs, an estimation of output and a comparison between the two would be required. The productiveness of this concept, applied to the spending activities of government was seen when, given the amount spent, it produced the largest possible benefit for the country's population. This comparative sense of efficiency could be applied to total government expenditure or for expenditure related to functions such as health, education, poverty alleviation, building of infrastructures etc. The comparison implied that costs as well as benefits should be measured in acceptable ways. It might have been easy with machines but difficult with governmental activities. As far as the benefits from a governmental expenditure were concerned, it was most difficult to measure them appropriately: 1. deficient budgetary classifications; 2. lack of reliable data, 3. difficulties in allocating fixed costs to a specific function; and 4. failure to impute some value to the use of public assets used in the activity, could also hamper the determination of real costs.

In both profit and non-profit organizations, efficiency and effectiveness were the central terms in assessing and measuring their performance (Mandl, 2008; Hájek, Stejskal, 2014). However, there was confusion in determining the conceptual meaning of what effectiveness, efficiency and the overall performance meant.

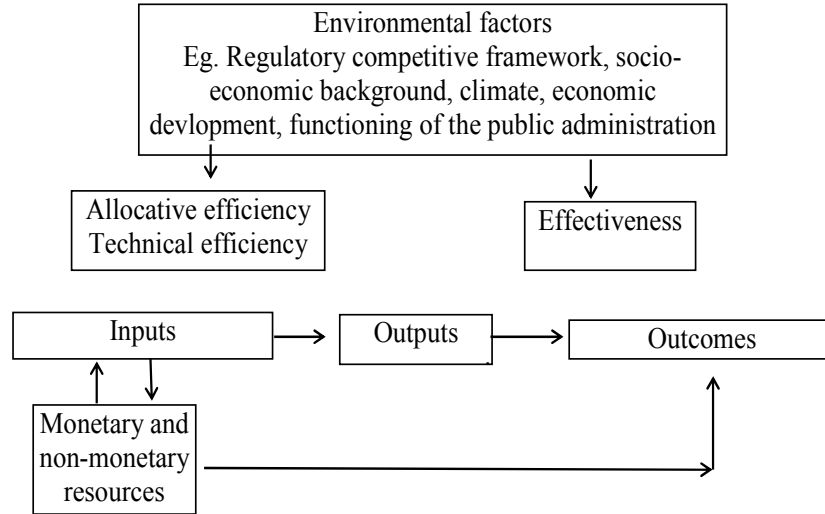


Figure no. 1 Conceptual framework for efficiency and effectiveness

Source: Mandl, 2008

Figure 1 depicts input, output and outcomes. Inputs consist of monetary and non-monetary resources used in the public sector to produce an output (e.g. health expenditure affects the health care system) consequently the input-output ratio is the basic measure of efficiency.

Efficiency and effectiveness are the two mutually exclusive components of the overall performance measure yet they may influence each other more specifically; effectiveness can be affected by efficiency or can have an impact on efficiency as well as have an impact in overall performance (Kumar, 2010).

Methods for measuring efficiency and effectiveness of the public sector and then the overall performance have a common point how to calculate and measure the sharp of the efficiency frontier (Keh, 2006) and this may be possible by using both parametric and non-parametric methods.

3. Data and Methodology

As was mentioned by Afonso, Schuknecht and Tanzi, (2006, 2013), public sector performance was assessed by composite indicators based on measurable socioeconomic variables which the pursued public policies had as a result. Thus, the PSP for country i with j areas was determined by:

Where $f(I_k)$ was a function of k observable socio-economic indicators.

While Afonso et al, (2006) defined at least seven indicators of public performance, we define these indicators as two main parts, the first part includes four indicators: administrative, education, health, and infrastructure. All these indicators tried to reflect quality of the action between fiscal policies and market process and the influence on individual opportunities. The second part had three indicators reflecting the Musgravian tasks for government, these three indicators were distribution, stability and economic performance. All these (three) indicators tried to measure the outcomes of the interaction and reactions to the market process by government. The public sector performance depended on the value of economic and social indicators (I). For example there are i countries and areas j of government performance which together determine performance in country i , PSP_i :

$$PSP_i = \sum_{j=1}^n PSP_{ij} \quad (2)$$

With $PSP_{ij} = f(I_k)$

Table no. 1 World governance indicators

International Organization Authors	Indicators	Description	Website
World Bank	1. Voice and Accountability	“Captures perceptions of the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and a free media”.	http://info.worldbank.org/governance/wgi/index.aspx#home
World Bank	2. Political Stability and Absence of Violence	“Terrorism measures perceptions of the likelihood of political instability and/or politically motivated violence, including terrorism”.	http://info.worldbank.org/governance/wgi/index.aspx#home
World Bank	3. Government Effectiveness	“Captures perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies”.	http://info.worldbank.org/governance/wgi/index.aspx#home
World Bank	4. Regulatory Quality	“Captures perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development”.	http://info.worldbank.org/governance/wgi/index.aspx#home
World Bank	5. Rule of Law	“Captures perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence”.	http://info.worldbank.org/governance/wgi/index.aspx#home
World Bank	6. Control of Corruption	“Captures perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests”.	http://info.worldbank.org/governance/wgi/index.aspx#home

Source: *The Worldwide Governance Indicators (WGI) project*
<http://info.worldbank.org/governance/wgi/index.aspx#home>

Lobont (2011) realised a critical analysis of different ways to perceive “quality of governance” or “good governance”. The author highlighted the most important elements of institutional architecture: i) Degree of Democracy, ii) Quality of Governance through its six dimensions presented by World Bank, iii) Corruption, iv) Level of Integrity, v) Fiscal Policy items, vi) Political Conditions for Economic Reform, and vii) Economic Freedom. A more detailed approach can be found in Lobont (2013).

From all these indicators, we found that Quality of Governance through its six dimensions presented by World Bank Table(1) reported aggregate and individual governance indicators (these indicators were calculated for 215 economies over the period 1996–2014), for six dimensions of governance. These aggregate indicators combined the views of a large number of enterprise, citizen and expert survey respondents in industrial and developing countries. They were based on over 30 individual data sources produced by a variety of survey institutes, think tanks, non-governmental organizations, international organizations, and private sector firms.

Lobont (2012), provided a synthetic evaluation of five fragility metrics (The Failed States Index, The Global Peace Index, The Human Development Index, The Index of State Weakness and The State Fragility Index and Matrix) in a study for Romanian societal-systems regarding its political, security, economic and social fragility.

State fragility index's ranks were based on twelve indicators of state vulnerability, namely four social indicators , two economic indicators and six political indicators. (Table2) The indicators were not designed to forecast when states might experience violence or collapse. Instead, they were meant to measure a state's vulnerability to collapse or conflict.

Table no. 2 Indicators of state vulnerability

Indicators	Sub-Indicators
Social Indicators	1. Demographic pressures; 2. Massive movement of refugees and internally displaced persons; 3. Legacy of vengeance-seeking group grievance; 4. Chronic and sustained human flight;
Economic Indicators	5. Uneven economic development along group lines; 6. Sharp and/or severe economic decline;
Political Indicators	7. Criminalization and/or delegitimation of the state; 8. Progressive deterioration of public services; 9. Widespread violation of human rights; 10. Security apparatus as "state within a state"; 11. Rise of factionalized elites; 12. 12. Intervention of other states or external factors;

Source: WorldBank, Database, (1996–2014), States Of Fragility

In general, the quality and accuracy of composite indicators should evolve in parallel with improvements in data collection and indicator development. From a statistical point of view, the construction of composite indicators can help identify priority indicators for development and weaknesses in existing data.

4. Results and Conclusions

Despite the apparent simplicity of composite measures, our paper reveals that their use and interpretation raises several challenges: i) different methods and methodologies of constructing composite indicators (Data Envelopment Analysis (DEA), Free Disposal Hull (FDH) methodology, Principal Component analysis (PCA)); ii) the uncertainty influence on

composite indicators; iii) the variation in performance due to factors beyond the control of managers or iv) the iterative consultative approach performance.

Composite indicators are synthetic indices of individual indicators and are increasingly being used to rank countries in various performance and policy areas. We need to use composite indices because the composite indicators are useful in their ability to integrate large amounts of information into easily understood formats based on the basis of socioeconomic variables and are valued as a communication and political tool. Composite indicators are increasingly being used to make cross-national comparisons of country performance in specified areas such as competitiveness, globalization, and innovation.

In general, the quality and accuracy of composite indicators should evolve in parallel with improvements in data collection and indicator development. From a statistical point of view, the construction of composite indicators can help identify priority indicators for development and weaknesses in existing data. The current trend towards constructing composite indicators of country performance in arrangement with policy fields may provide an impetus to improving data collection, identifying new data sources and enhancing the international comparability of statistics.

We noticed that the Public sector performance as defined by Afonso, Schuknecht, and Tanzi (2006) was assessed by constructing composite indicators based on observable socioeconomic variables.

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