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Article

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CESifo DICE Report

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Suggested Citation: Afonso, António (2004) : A Note on Public Spending Efficiency, CESifo DICE Report, ISSN 1613-6373, ifo Institut für Wirtschaftsforschung an der Universität München, München, Vol. 02, Iss. 1, pp. 35-39

This Version is available at:

<https://hdl.handle.net/10419/166798>

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A NOTE ON PUBLIC SPENDING EFFICIENCY

ANTÓNIO AFONSO *

Introduction

The adequate measurement of public sector efficiency, particularly when it concerns services provision, is a delicate empirical issue and the literature on it, particularly when it comes to aggregate and international data, is rather scarce. Even when public organisations are studied, this is seldom done in an international and more aggregate framework, and international comparisons of public spending performance and efficiency do not abound.¹

In his analysis of public investment and growth Barro (1990) discusses the relevance of government expenditure in public infrastructure for economic growth, while Romer (1990) makes a point for the importance of research and development expenditure for growth. As mentioned by Feldstein (2002), a major change in the public finance literature in the last three decades is the inclusion of government spending as well as taxation as privileged topics of research. Furthermore, most authors tend to use the share of total expenditures of general government in GDP as a measure of the size of the public sector. These simple ratios by themselves give little information about the quality of the outcomes generated by public spending, and of the relative and absolute performance of the government as a provider of public goods.

Additionally, the literature has also been assessing the role of rules and institutions, and the scope for privatising public sector activities.² The majority of the studies conclude that public spending could be much smaller and more efficient than today. However, for this to happen, governments should

try to implement better institutions and should reassign many non-core public sector activities to the private sector.

Public sector performance

In the context of the current fiscal framework of the European Union (EU), several challenges are presented to EU member countries, namely the need to ensure sustainable public finances in order to avoid undermining the role of the euro. Indeed, it is usually mentioned in several European forums that fiscal consolidation with emphasis on structural expenditure reform can strengthen confidence and support growth.

It is also worth recalling that under the Maastricht Treaty and the Stability and Growth Pact framework – primarily designed for maintaining fiscal discipline within adequate bounds of flexibility – public spending levels are paramount. Therefore, increased attention both to public expenditure performance and efficiency is welcomed and needed from policymakers and practitioners. This includes not only the level of government spending but also the composition of such expenditures.

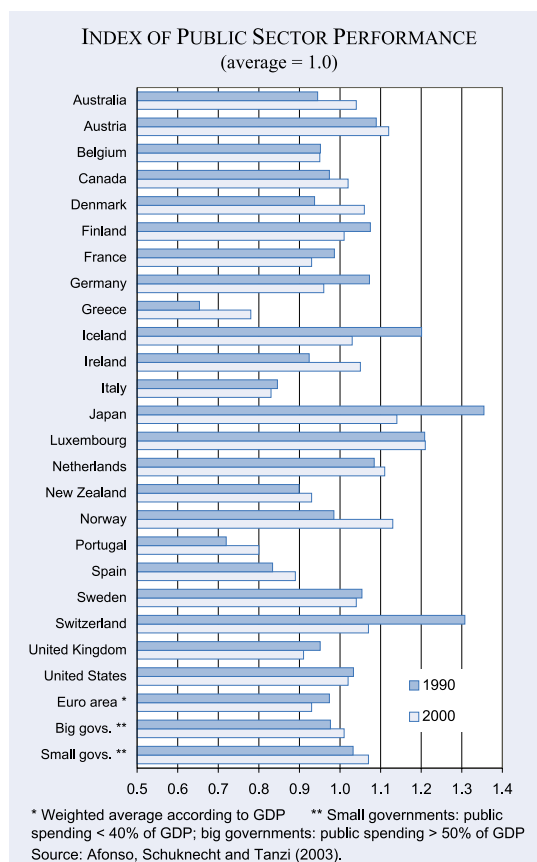
The upward trend on public spending in most developed countries in the last decades, namely since the 1970s, recurrently poses the question of assessing the performance of such spending. Even allowing for the possibility that in some cases the costs of providing goods and services in the public sector rose more than in the private sector, the rise in public spending may become a worrisome issue for some countries. In this context, the availability of an indicator of public sector performance, which allows for international comparisons, would be rather useful. This might then be used to tentatively rank countries among themselves and also as a possible cross-country output measure of public spending.

In order to compute a composite indicator of public sector performance Afonso, Schuknecht and Tanzi (2003) use several sub-indicators of public performance that take into account, for instance, administrative, education, health and public infrastructure outcomes. They also look at several other indicators in order to incorporate information on the usually defined “Musgravian” functions of the government: macroeconomic stabilisation, income redistribution and efficient resource allocation.

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¹ Some examples are provided by Clements (2002) for education spending in Europe, by Gupta and Verhoeven (2001) for education and health in Africa, by Afonso, Schuknecht and Tanzi (2003) for public expenditure performance and efficiency in OECD countries, and by Afonso and St. Aubyn (2004) for health and education efficiency in OECD countries.

² See, for instance, Mueller (1997), Persson and Tabellini (2001), Strauch and Von Hagen (2000), and Tanzi and Schuknecht (2000).



The so-called performance indicators are compiled from various indices that each have an equal weight. For example, red tape, efficiency of the judiciary, corruption and size of the shadow economy each contribute 25 percent to the administrative performance sub-indicator, with the values for each country normalised in order to obtain an average of one. Figure 1 is based on the results presented by the authors for public sector performance in 1990 and 2000.

One can see some differences in public sector performance among countries and across time. For instance, countries such as Austria, Japan, Luxembourg, the Netherlands and Norway have the highest public sector performance indicator in 2000. Looking at country groups, small governments on balance report better economic performance than big governments (public spending above 50 percent of GDP) both in 1990 and in 2000. Japan and the US report above-average performance in this public sector performance index. By contrast, the euro area (weighted average) performs below average.

Additionally, some countries managed to deliver a relative improvement in public sector performance

between 1990 and 2000, and other countries showed a decrease in public sector performance. Examples of the first group of countries are Greece, Portugal, Spain and Ireland. This development is probably related to the catching up that, in different degrees, those countries pursued towards the EU average living standards. Nevertheless, only Ireland succeeded in placing itself above the average of the 23-country sample.

Some countries seem to have experienced reductions in public sector performance. For instance, Japan and Switzerland saw their performance fall in 2000 compared to 1990. This is also true for the euro area as a whole. However, and as pointed out in the aforementioned study, progress in public sector performance made by the different countries over time is measured relative to other countries and not relative to its own past performance. Therefore, and one has naturally to stress this point concerning the author's results, any assessment of absolute performance changes must be done with great care.

Efficiency in education and health

Education and health expenditures are the programmes that in principle contribute most to improve the allocation of resources and tackle the issue of the provision of goods and services, which aim at correcting some market failures. Furthermore, spending in education, whether public or partly privately funded, is usually considered as more growth enhancing than some other expenditure items. For instance, public investment in education should increase the level of human capital and this can be seen as one of the main sources of long-run economic growth.

Normally, efficiency studies consider financial measures as the most relevant variable. Indeed, public expenditure, expressed as a share of GDP, can be assumed to reflect the opportunity costs of achieving the corresponding public sector performance. Looking at some descriptive figures, one can notice that public spending-to-GDP ratio in the OECD area declined moderately since the 1993 peak to remain somehow above 40 percent in 2002. Nevertheless, public expenditures differ considerably across countries. Average total spending in the 1990s ranged from around 35 percent of GDP in the US to 64 percent of GDP in Sweden.

Table 1
Education efficiency analysis, 2000

Country	Input efficiency score	Rank	Dominating producer
Australia	0.850	13	Korea
Belgium	0.689	18	Sweden
Czech Republic	0.931	7	Sweden
Denmark	0.912	10	Sweden
Finland	1.000	1	
France	0.832	14	Korea
Germany	0.961	6	Korea
Greece	0.758	16	Sweden
Hungary	0.801	15	Sweden
Italy	0.730	17	Sweden
Japan	1.000	1	
Korea	1.000	1	
Mexico	1.000	1	
New Zealand	0.914	9	Korea
Portugal	0.879	11	Sweden
Spain	0.876	12	Sweden
Sweden	1.000	1	
United Kingdom	0.922	8	Korea
Average	0.892		
FDH analysis, 2 inputs (hours per year in school, teachers per 100 students), and 1 output (PISA 2000 survey indicator).			

Source: Afonso and St. Aubyn (2004).

These differences are mainly due to more or less extensive welfare programs. On the other hand, public spending on health and education differs much less strongly across countries.³

Most of the studies on (public) spending efficiency analysis use non-parametric approaches, such as the Free Disposable Hull (FDH) or Data Envelopment Analysis (DEA), and the inputs used are usually measured in monetary terms.⁴ Some studies however, try to use, besides monetary inputs, also quantitative input measures.

For instance, Afonso and St. Aubyn (2004) assessed the efficiency in education and health in OECD countries in 2000 by looking at quantity measures of inputs used to reach the recorded outcome of secondary education and health performance. The authors used the OECD computed PISA indicator as the output measure and two quantity measures as inputs: the number of hours per year spent in school and the number of teachers per student. The results of the efficiency analysis are partially reproduced in Table 1 and are based on an FDH efficiency analysis.⁵

In Table 1, countries with an input efficiency score of one (maximum value, by construction) are located on the theoretical production possibility frontier. This means that for the available country sample, no other country reports a higher output level using the same or less input than the countries on the production frontier. In other words, the input efficiency score of a given country indicates how much less input this country could use to achieve the same level of output. For instance, on average, this sample of 18 OECD countries was able to attain the same level of output in education with a reduction in resources of around 10.2 percent (1–0.892).

According to the results and the discussion provided by the authors, Hungary, for example, is dominated by Sweden, which has a lower number of hours per year spent in school and a higher students-to-teachers ratio. Furthermore, both Japan and Sweden had a better performance in terms of the outcome than Hungary in the PISA education index. Additionally, Sweden and Finland come up as efficient since they have a students-per-teacher ratio not very different from the average, they are below average in terms of hours per year spent in school, and are above average concerning the PISA index ranking.

However, the main aspect seems to be that the use of quantity measures as inputs instead of financial measures provides a better balance of the relative importance of the inputs used by each country. Indeed, it seems natural that in more developed countries like Sweden and Finland the cost of resources is higher than in less developed countries like Hungary and Mexico.

Still in the same study, Afonso and St. Aubyn (2004) also address health efficiency using quantitatively measured inputs: number of doctors, nurses and hospital beds. The outcomes are infant mortality and life expectancy. Those results, on the basis of a DEA efficiency analysis, are partially reproduced in Table 2.

Efficient countries are Canada, Japan, Korea, Mexico, Spain, Sweden, Turkey and the United Kingdom. The authors provide some explanations for the relative positioning of the countries in

³ See namely EC (2002) and OECD (2003).

⁴ For the interested reader, Simar and Wilson (2003) provide a nice overview of these non-parametric methods.

⁵ According to the authors, education expenditure is predominantly public, and particularly in European countries (92.4 percent of total educational expenditure is public in the European Union). Public expenditure in health is usually more than half of total expenditure, and it averaged 72.2 percent of total expenditure in the OECD.

Table 2
Health efficiency analysis, 2000

Country	Input efficiency score	Rank	Dominating producers
Australia	0.832	11	Canada, Japan, Spain, UK
Austria	0.703	21	Japan, Korea, Sweden
Canada	1.000	1	
Czech Republic	0.681	22	Japan, Korea, Sweden
Denmark	0.808	14	Korea, Mexico, Spain, Sweden
Finland	0.806	15	Japan, Korea, Sweden
France	0.835	10	Japan, Korea, Spain, Sweden, UK
Germany	0.604	24	Japan, Korea, Sweden
Greece	0.820	13	Korea, Mexico, Spain
Hungary	0.480	26	Korea, Mexico, Turkey, UK
Ireland	0.716	19	Japan, Korea, Sweden
Italy	0.798	16	Mexico, Spain, Sweden
Japan	1.000	1	
Korea	1.000	1	
Luxembourg	0.707	20	Japan, Korea, Spain, Sweden, UK
Mexico	1.000	1	
Netherlands	0.579	25	Canada, Japan, Korea, UK
New Zealand	0.830	12	Canada, Japan, Korea, UK
Norway	0.726	17	Japan, Korea, Sweden
Poland	0.679	23	Mexico, Turkey, UK
Portugal	0.844	9	Korea, Mexico, Spain, Sweden
Spain	1.000	1	
Sweden	1.000	1	
Turkey	1.000	1	
United Kingdom	1.000	1	
United States	0.725	18	Mexico, Sweden, UK
Average	0.814		

DEA analysis, 3 inputs (doctors, nurses and beds), and 2 outputs (infant mortality and life expectancy).

Source: Afonso and St. Aubyn (2004).

terms of rankings. For instance, some countries have few resources allocated to health with corresponding low results (Mexico, Turkey). Another group of countries attains better than average results with lower than average resources (e.g. the United Kingdom). Finally, there is a third group of countries that are very good performers (e.g. Canada, Japan and Sweden).

For this sample of 25 OECD countries, and according to the results reported by the aforementioned study, countries do not seem to perform that poorly, taking into account the available mix of quantitatively measured inputs. Nevertheless, some efficiency gains might be achieved since on average, countries could attain the same level of health related outcomes with 18.6 percent fewer resources (1–0.814).

Summary and conclusion

According to the two briefly surveyed studies in this note, there seems to be significant differences in public sector performance for industrialised

countries. When looking at particular public sector functions such as education and health, the results available in the literature also point to some relevant differences among developed countries.

Countries with small public sectors seem to be able to report “better” overall public sector performance in 2000. On the other hand, countries like the US, or Japan, seem to be in a better relative position than, for instance, the euro area. Nevertheless, an important caveat to bear in mind, when reading the aforementioned results, relates to the fact that public spending measurement issues are quite relevant in drawing cross-country comparisons.

Some countries come up as rather efficient in education and health related outcomes,

even if for different reasons: for instance, Japan, Korea, Sweden, Finland and Canada, in education and Japan, Korea, Spain, Sweden and UK in health. Again, another important word of warning is the fact that countries are different with respect to the mix of public and private funding of education and health, even if the majority is publicly funded. One possible source of inefficiency could derive from the interaction between these.

Therefore, one has to be careful when trying to derive policy conclusions from this sort of studies. Indeed, more important than to identify relative differences in the efficiency of public sectors among countries is the most difficult challenge, namely how to address the inefficiencies. This is particularly acute for countries that run high public deficits and where spending curtailng is necessarily in the pipeline, also as a need for ensuring long-run fiscal sustainability. Under such circumstances, an assessment of the quality of each euro or dollar spent by the government becomes more and more relevant.

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