Public services performance: an extended framework and empirical assessment across the enlarged EU

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Abstract (Number of words: 134 – Maximum: 150).

Performance of the public sector is at the core of long-term wealth creation and welfare improvement. Yet, its measurement remains inadequate and flawed with data deficiency. The paper proposes an extended framework for the assessment of public services performance that accounts for long-term impacts on welfare and empirically evaluates it across 25 European countries on the basis of a wide set of proxy indicators. We relate the performance scores to input costs indices and propose a coherent typology of countries that corresponds to the patterns of economic effectiveness of public services. The empirical analysis reveals that due to differences in input costs across the enlarged EU the economic effectiveness of public services varies to a much larger extent than the performance, with some relatively large-sized governments (Sweden, Denmark, Austria) being the most effective ones.
Key words: Performance, effectiveness; European Union; public services

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1. Introduction

The current economic crisis and new socio-economic concerns are exerting pressure on the public sector budget and have placed the discussion on how to allocate scarce resources effectively on the top of the political agenda. The key policy documents in Europe - the *Europe 2020 Strategy*, the *Lisbon Reform Agenda* and the *Stability and Growth Pact* - also call for enhancing the quality and efficiency of the services provided to citizens and consumers. In particular, the provision of public services represents a crucial aspect as they account for a nearly a quarter of value added and a third of employment generation in the European Union[1]. Therefore, assessing the performance of these activities is a matter of interest in its own right and also due to the indirect influence they have upon the economy. Despite considerable progress, research on this topic at the conceptual, methodological and empirical level is still deficient and sometimes ambiguous due to the use of different concepts.

Performance is a broad concept that is related to, but is different from, other notions such as effectiveness or efficiency. Performance refers to the capacity of an organizational unit to attain multiple and complex objectives (economic, social and environmental) (Djellal and Gallouj, 2008). The degree of achievement of those goals is indicated by the term effectiveness; when account is made of the costs (of production factors) incurred to this end we refer to it as economic effectiveness. Finally, efficiency denotes the degree of achievement of those objectives while minimizing the use of resources. The term may be considered from a financial perspective (asignative efficiency) or a physical perspective (technical or productive efficiency). This research aims to contribute to the measurement of performance in public services from an extended perspective, which accounts for multidimensional long-term impacts on welfare. A

[1] Public or non-market services comprise public administration, defence and compulsory social security; education; health and social work; other community, social and personal services; and private households with employed persons.

holistic framework based on outcomes for final users, quality considerations and welfare effects of public services provision is proposed. By taking into account the input costs associated to their production, we also assess economic effectiveness of public services.

A technical approach has traditionally assessed performance in public services on the basis of the concept of efficiency (Clements, 2002; Afonso and St. Aubyn, 2005; Afonso et al, 2005 and 2006; Shuterland and Price, 2007; Angelopoulos et al, 2008; Adam et al, 2011). In fact, Pestieu (2007) advocates to measure public service performance only on the basis of productive efficiency, even if he admits that it is a partial indicator of overall or global performance. Due to the conceptual and methodological problems related to the measurement of productivity in services, Gadrey (2002) claimed for the reconsideration of this notion with the aim of introducing service complexity, intensity and outcomes. Some scholars have also started to advocate the adoption of a more holistic perspective of the concept of productivity in public services, where the well-being of the labour force/population, as well as the sustainability of the environment determine long-term economic growth (Andersen and Corley 2009). This is also the case for individual public services, such as planning and social services. Carmona and Sieh (2008) propose a holistic analytical framework for performance measurement in spatial planning that encompass multiple elements around three dimensions: service quality, product quality and organizational quality. Efforts for developing more comprehensive performance indicators are also being made in social services at local level (Ayala et al, 2008). At international level, several projects and programmes have been developed recently with the aim to assessing economic performance from an environmental and social perspective[2]. Furthermore, academic studies have identified a hidden (or missing) economic performance of public services related to sustainable development, socio-economic and ecological issues (Djellal and Gallouj, 2010).

[2] For example, 'Beyond GDP conference Istanbul Declaration', OECD Global Project on Measuring the Progress of Societies. See also Stiglitz et al, 2009; European Commission, 2009.

Within this framework, the paper pursues three major objectives: (i) to discuss and review the conceptual framework for measuring different aspects of public services performance; (ii) to build composite indicators, which are useful for understanding the extended performance and economic effectiveness of public services across 25 European Union (EU) member states; and (iii) to develop a consistent typology of EU25 countries according to the performance and costs patterns in public services.

The paper is organised as follows. First, we discuss the conceptual framework and broader features of public services that have an effect on the measurement of their performance. Moreover, a survey of previous studies on this subject is presented. Section 3 details the methodological approach and the dataset used for building the composite indicators. We compute indicators for extended public services performance (*SPI*) for EU25 on the basis of a wide-ranging set of 19 indices available for 2005. In addition, services economic effectiveness indicators (*SEEI*) are estimated considering the relationship between performance and labour and capital compensation costs. The fourth section discusses the empirical results. We find that the range of input costs, and thus, economic effectiveness of public services is much more diverse and heterogeneous across the enlarged EU than the performance. In particular, some large-sized governments are found to be more effective than smaller ones. On the basis of the identified patterns a typology of countries is proposed that reflects both the performance and input costs of individual countries in four categories of public services. Last section provides conclusions and policy implications of the analysis and points to further areas of research.

2. Discussion of literature: Public services, performance and effectiveness measurement

Performance assessment may serve to different purposes, such as management and policy evaluation (Carmona and Sieh, 2008). For management purposes, the performance of the

processes, the organisation and the accountability of public service-providing agencies may be evaluated so as to determine how they allocate resources to achieve the goals set by the policy makers (Boland and Fowler, 2000). Monitoring and evaluation is widely based on performance targets, indicators and benchmarking although there is a lack of evidence regarding their usefulness (Propper and Wilson, 2003). According to de Brujin (2002), the effects of performance measurement are ambiguous due to the strategic behaviour adopted by the different actors within organisations. Other authors argue that the management perspective of performance neglects the institutional perspective arising from social processes within organisations (Brignall and Modell, 2000). If the aim of performance assessment is overall policy evaluation rather than management appraisal, then the conceptual and methodological purity of the framework matters more than its functionality (Carmona and Sieh, 2008). However, in most public services, distinguishing between both purposes is particularly complex.

Public services perform different activities for citizens and businesses that are not easy to evaluate on the basis of traditional productivity and efficiency measures, which relate the output of the production process to the inputs. Unlike market services, public services are mostly not sold on the market and information on their prices is not available, hence the output is more difficult to measure and quantify. In addition, equating the output of public services with value added and its comparison with inputs (e.g. number of employees or hours worked) implicitly hinders the change in productivity of public services if account is not made of the quality change. Until recently, output volumes of public services were estimated by input volumes, due to the lack of data on prices in the national accounts implying that the larger the inputs (budget expenditure) the bigger the output or benefits for consumers. However, it was argued long ago that this is not the case (Tanzi, 1994). Most European countries have only recently begun to directly measure the volume of government outputs for health, education and other public services that will eventually provide information on more appropriate measurement of public services productivity.

Notwithstanding the importance of public services' productivity and efficiency, their fundamental purpose relates much more to the performance reflected in benefits for final users and for increasing public welfare. While the output of public services matters it is however the outcome that is of ultimate importance for final users, especially so in the longer term (Gadrey, 2002). This is often neglected in discussions on public services indicating that their performance is most often addressed from the supply side while the demand side and the broader perspective of service users/consumers are fairly overlooked (Stare and Rubalcaba, 2008). Furthermore, the performance of public services has to take into account multiple objectives, such as accessibility, quality, and equality in services provision that are even more difficult to measure. Finally, the outcome of public services depends not only on inputs and outputs, but also on a broader set of institutional, behavioural and regulatory issues. Arguing for the need to introduce performance measurement of public services Pestieau suggests that apart from input and output measures reflecting both the quantity and the quality, it is as important to introduce information on institutional environment. In his view, the factor that explains most of the performance of health care is not the quantity or quality of health care interventions, but a set of environmental factors and lifestyle aspects (Pestieau, 2007).

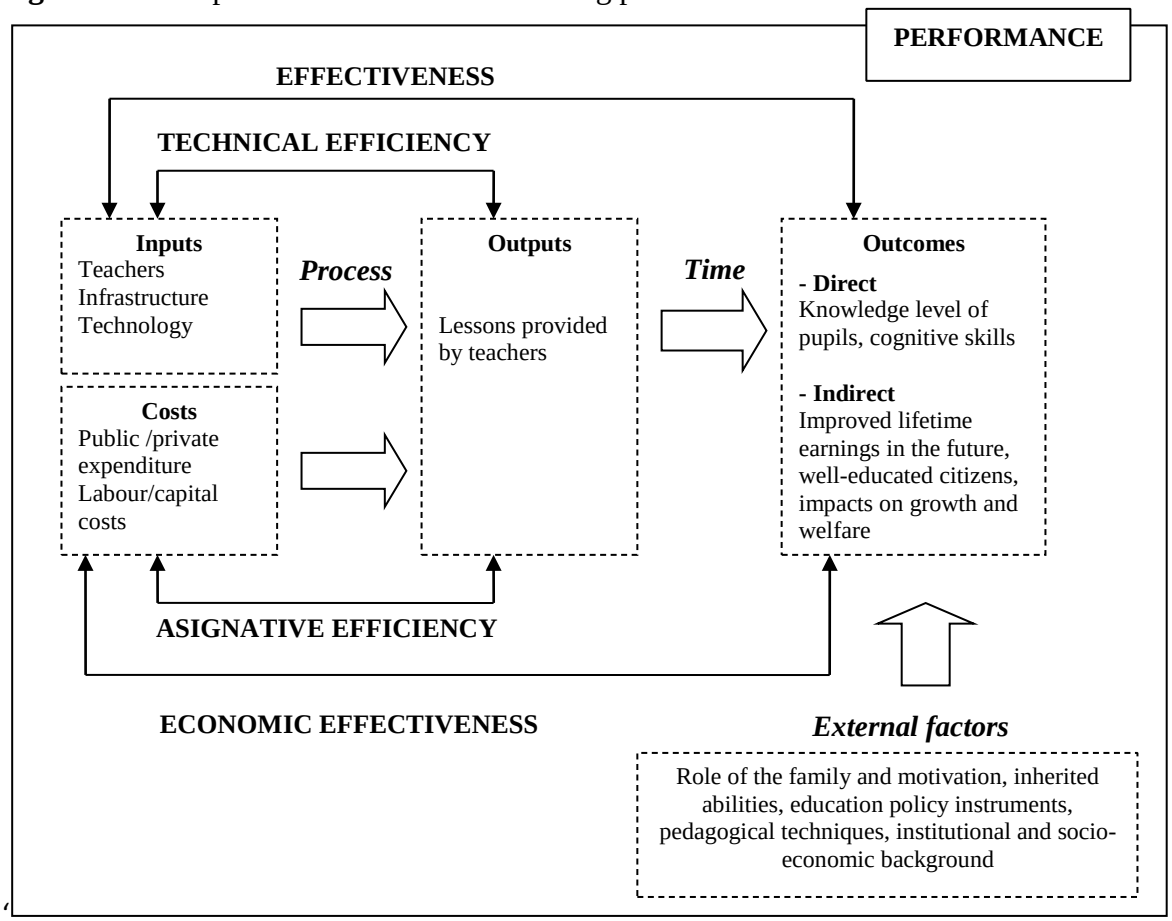
Gutierréz-Romero et al (2008) claim that, for subnational public bodies, the external factors (social, economic and political) are beyond the control of authorities that cannot easily influence performance . The external factors may even be a major determinant of the poor performance and public-service failure (Andrews and Boyne, 2008). In the same direction, OECD points to a very significant difference between the output and the outcome and relates it to the fact that it is usually reasonable to hold the government responsible for outputs but not entirely for the outcomes, as the latter are influenced by many other factors beyond government's control (OECD, 2009). It suggests that any assessment of public services performance needs to take into account

the perspective of different actors – from service providers and service users to society in general – with implications for the selection of measures that capture various aspects of performance. Understanding the complexity of public services performance and their impacts requires an appropriate conceptual framework, measurement methods and data availability. In the last two decades, attempts to cope with difficulties in measuring the performance of public services have intensified due to the increasing weight of public services in advanced economies related to the aging of population, the role of knowledge and education in increasing the competitiveness, environmental issues, etc. Additional impetus has come from the need to monitor the efficiency of public spending that requires new methods and approaches to assess the performance of public services as a necessary input to efficiency studies.

Despite the improvements made so far it seems that the measurement of productivity in public services is in a pre-paradigmatic phase in which various approaches are being tested, hence the comparisons in time and space are often risky. As a point of departure in discussing and evaluating public services performance it is of utmost importance to distinguish, on the one hand, between inputs, outputs and outcomes, and, on the other hand, between different aspects of performance of public services (e.g. productivity, efficiency and effectiveness). While inputs to public services supply could be measured in physical units of production factors (e.g. number of employees, hours worked) or in financial resources much bigger problems are encountered when defining the output, due to different perspectives that consumers may have (consumers as final users or as society in general). Further difficulties appear in defining and measuring the outcome of public services where external factors exert significant influence on the end result (e.g. individuals' behaviour, culture, social norms). For the European Commission (2001, pages 33-34) outcomes are 'for example, indicators of the level of education of the population, life expectancy, or level of crime'. In a similar way, Schreyer defines an outcome as 'a state that is valued by consumers' (2010, page 169) and denotes that although different it is not independent from the

outputs. He further distinguished between direct and indirect outcomes, the former being closer to the act of service provision and, to some extent, more plausible to measure. For example, the level of knowledge of pupils (that may be approximated by scores such as PISA) represents a direct outcome in the case of education while a critical mass of citizens with higher human capital is a related indirect outcome. Other indirect outcome may refer to the many ways education affects growth and welfare.

Figure 1. Conceptual framework for measuring performance: the case of education.



Source: based on Schreyer (2010) and Djellal and Gallouj (2008).

The conceptual framework for measuring performance and its various dimensions are shown in Figure 1. In view of the different relationships between the concepts previously studied, different forms of performance may be defined (Djellal and Gallouj, 2008): effectiveness (the ratio

outcomes/inputs); economic effectiveness (the ratio outcomes/costs); technical or productive efficiency (as the ratio outputs/inputs), and asignative efficiency (the ratio outputs/costs).

There are very few international comparative analyses of performance of public services, mainly due to data limitations (Djellal and Gallouj, 2008). The Social and Cultural Planning Office of the Netherlands (2004) examined the overall performance of the public sector in 22 countries (19 from the EU plus other 3 Anglo-Saxon OECD economies) on the basis of indicators for four functions: stabilization, distribution, allocation and quality of public administration. They found several consistent clusters regardless of the policy area: Northern European countries, Western, Southern, Central and Anglo-Saxon countries. Afonso et al (2005) computed public sector performance and efficiency scores on the basis of composite indicators for public functions such as allocation, distribution and stabilization, as well as for public administration, education, health and public infrastructure for 23 OECD countries in 1990 and 2000. Using non-parametric frontier techniques they found that small governments, which spend less than 40% of GDP are on average more efficient than others. Afonso et al (2006) used similar methodology to compare new member states of the EU (NMS) with other emerging economies. One of the main results is that certain factors (such as education, the competence of civil servants, GDP per capita and the security of property rights) positively affect public sector expenditure efficiency. Angelopoulos et al (2008) followed Afonso (2005) methodology in order to construct measures of public sector efficiency in certain policy areas for a sample of 64 countries, including both developed and developing economies, in time periods between 1980 and 2000. They revised the relationship between fiscal size and economic growth, concluding that it significantly depends on the size-efficiency mix of the public sector. Additionally, Adam et al (2011) computed relative efficiency scores for 19 developed OECD countries over two decades (the 1980s and the 1990s) and concluded that they are influenced more by the quality of government managerial practices than by countryspecific socioeconomic environments or the effect of mere luck.

Nevertheless, most cross-country studies have focused on analysing a particular public service. Afonso and St. Aubyn (2005) investigated the efficiency in health and education in OECD economies by measuring expenditure and quantity inputs. For different reasons, three countries appear as the most efficient, no matter which measure or sector is considered: Korea, Japan and Sweden. In a similar line, Sutherland and Price (2007) analysed educational efficiency in different, policy and institutional settings in OECD economies. They identified several policy and institutional settings that appear to raise educational efficiency (e.g. greater decision-making autonomy at the school level) as well as practices that are detrimental to it (e.g. small school size and residence-based selection).

The contribution of our paper to the current state of knowledge is fourfold. First, we adopt a sectoral definition of the term public services, analysing the four major activities where public sector is the main or major service provider. Accordingly, we approximate public services with the data for non-market services even though the latter can be provided by private sector suppliers (Burger and Stare, 2010).This definition is not fully inclusive since some public services (e.g. railway transport) are not considered in the analysis, however it provides for a minimum level of comparability of public activities across countries. This is a way of evaluating the 'big picture' of public services' performance and economic effectiveness. Second, our study develops a comparison of extended performance and economic effectiveness across the enlarged EU. To our best knowledge, this kind of evaluation has not been conducted so far on a sample of the EU25 countries, which is important due to the economic and political relevance of those economies. Third, the number of outcome indicators used to assess the performance is larger than in previous analysis (e.g. Afonso et al, 2005; 2006). Fourth, instead of assessing public services' economic effectiveness on the basis of public expenditure as exemplified in other relevant studies, our investigation focuses on labour and capital compensation that are the main costs incurred to achieve a given performance level of public services. In this way, we do not relate the outcomes

of these activities to the use of public resources but rather to the expenditure for inputs involved in their provision. In doing so, we set the ground for conducting future comparative analysis of economic effectiveness between public and private services.

3. Dataset and methodological issues

The availability of 'real-world data' for the measurement of different aspects of performance in public services is frequently frail, crude or simply missing and this hinders the assessment of performance at the national level as well as international comparisons. To overcome these gaps measures are being developed for the assessment of the output volume of individual public services that would also allow for international comparisons (OECD, 2008a). Given the absence of data on output volume for public services accross countries complementary approaches to assessing the performance of public services have been introduced by constructing composite indicators (e.g. Afonso et al, 2005; 2006; Brand et al, 2007; Mandl et al, 2008; St. Aubyn et al, 2009; Di Meglio et al, 2009). In this paper, we use a similar approach and identify relevant indicators to approximate the outcome of individual public services and to capture the extended performance of public services in a comparative setting of EU25 countries. However, the outcome and the output of public services are sometimes not properly distinguished and the borderline between the two is hard to draw (Afonso et al, 2005).

Composite indicators are increasingly recognized as a useful tool in policy analysis and public communication (Bandura, 2006) and in benchmarking of country performance (Saisana et al, 2005a and 2005b; United Nations, 2005; Saltelli, 2007) as being easier for the general public to interpret them than to identify common trends across many separate indicators (Booysen, 2002; Sharpe, 2004). However, they might also convey misleading messages if they are poorly constructed or misinterpreted (Cherchye et al, 2007). This indicates that there is a lot of room for

improvement in developing internationally comparable sets of indicators to assess public services impacts (de Vries, 2001; Stiglitz et al, 2009).

As in other similar analyses, our selection of the socio-economic indices that compose the different performance indicators requires further debate (Cherchye et al, 2007). We acknowledge that the degree of suitability of the indicators for approximating the extended performance of public services is not homogeneous. The selection of indices reflects a best attempt conditioned by data availability. As a first step, a performance indicator for different public services is built. The sectors included in the analysis are: public administration and defense, compulsory social security; education; health and social work; and other community, social and personal services (NACE Rev. 1.1 codes L, M, N and O, respectively). It is acknowledged that due to data availability the latter category is approximated by sector 90:
'sewage and refuse disposal, sanitation and similar activities'. Data for EU25 countries have been compiled for 2005. Comparable data for later period are not available.

We assume that the *service performance indicator* (*SPI*) in each public service sector *i* and country *j* depends on the value of certain economic and social indicators (*I*), which measure the outcomes (*k)* of the activity considered, using a linear aggregation technique (Krantz et al, 1971) as follows:

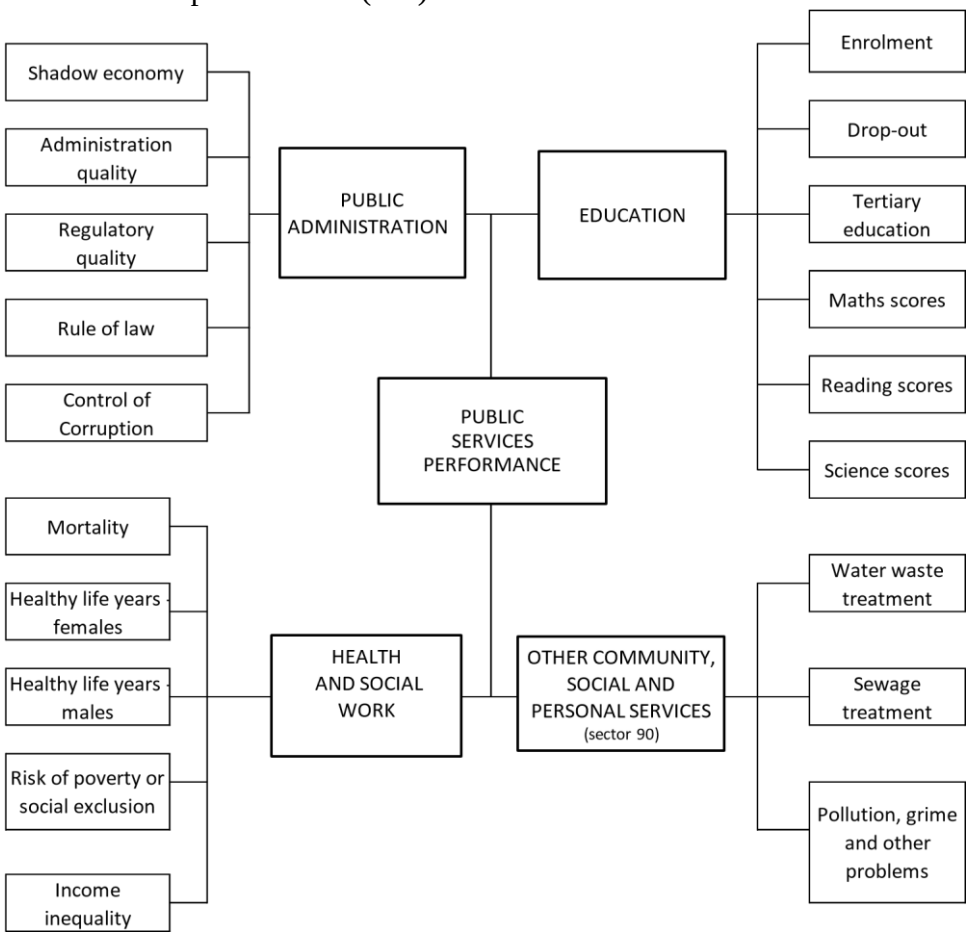
$$SPI_{ij} = \sum_{k=1}^{n} f(I)_{ijk} = \sum_{k=1}^{n} w_k I_{ijk} \qquad \text{(I)}$$

$$\text{with } \sum w_k = 1 \text{ and } 0 \le w_k \le 1, \forall k = 1, \ldots, n .$$

Following the Atkinson Review (2005), the outcome indicators change according to the type of service concerned. Therefore, they will be heterogeneous across industries, reflecting the multiple dimensions of social welfare related to their supply. Figure 2 illustrates the different indicators

used in our analysis and attempts to reflect public services outcomes as closely as possible[3]. The selection of outcome indicators has been made on the basis of the following criteria: (1) proxy variables that best fit the concept of performance presented in previous sections; (2) when appropriate, indicators already used in the literature in the relevant sectoral field (e.g. size of the shadow economy in public administration, as in Afonso et al, 2005; secondary education enrolment and PISA report in education achievement, as in Afonso et al, 2005; Afonso and St. Aubyn, 2005; Sutherland and Price, 2007); (3) data availability.

Figure 2 Public service performance (*SPI*) indicators



The *public administration and defense, compulsory social security SPI* comprises outcomes that reflect the extent of the underground economy (measured by the size of the shadow economy[4])

[3] See Appendix A for a list of indicators considered in each industry and data sources. Primary data is available upon request to the corresponding author.

[4] In terms of % of GDP (currency demand approach) according to Schneider (2009).

and governance aspects (such as administration quality, regulatory quality, rule of law and control of corruption[5]). The latter are computed on the basis of the indicators developed by the World Bank which, despite their limitations, are 'the most carefully constructed and widely used (governance) indicators' (Arndt and Oman, 2006, page49). For assessing *education*'s performance the data on the system attainment and quality are a particularly important outcome to consider. We use data on secondary school enrolment[6], and science, reading and math results[7] as proxies. However, the achievement results can be interpreted meaningfully only in the context of the system that produced them. Therefore, we also consider other outcomes such as drop-out rates (early school leavers) and enrolment in tertiary education[8]. In the case of *health and social work* the *SPI* comprises outcomes related to success in the provision which, in the case of health, is captured by infant mortality rates and by healthy life years (HLY) at birth[9]. Success in the provision of social work activities is assessed by the extent of vulnerable population to whom social assistance is mainly directed. Therefore, we consider data as regards the population at risk of poverty or social exclusion and the level of income inequality[10]. Finally, the *SPI* for *other community, social and personal services* (approximated by NACE sector 90) is based on indicators for water waste and sewage treatment as well as for the extent of pollution, grime and other environmental problems[11].

[5] Source: World Bank's Worldwide Governance Indicators for 1996-2008. They are measured in units ranging from -2.5 to 2.5, with higher values corresponding to better governance outcomes.

[6] Secondary education enrolment, % of population. Source: Education and training statistics, Eurostat.

[7] Source: OECD, PISA Database. Data of 2006 PISA wave have been used. Retrieved from: http://pisacountry.acer.edu.au/index.php. Average values for NMS have been used for Cyprus and Malta, since these countries are not included in the Database.

[8] Source: Education and training statistics, Eurostat.

[9] The indicator is measured in percentage of total life expectancy. The HLY at birth, also called disability-free life expectancy (DFLE), measures the number of remaining years that a person of a certain age is still supposed to live without disability. The emphasis is not exclusively on the length of life, as is the case for life expectancy, but also on the quality of life. Source: Public health statistics, Eurostat. [10] Source: Income and living conditions statistics, Eurostat.

The *SPI* for each service activity is compiled in such a way as to attribute equal weight to each outcome indicator, following the approach by Afonso and others[12] as there is insufficient knowledge of causal relationships or little consensus on other alternative weighting tools. It means that, for instance, the size of the shadow economy, administration quality, regulatory quality, rule of law and control of corruption, each contribute 20% to the *SPI* of public administration. Additionally, equal weighting is compatible with both linear and geometric aggregations used in the paper. For indicators where a higher number reflects a less favourable outcome (e.g. the size of the shadow economy, drop-out rates, infant mortality rate, etc.) we compute the reciprocal of the original values. Furthermore, to facilitate the compilation and comparability of the data, we standardize the values of all indicators converting them to a common scale (Ebert and Welsch 2004). In particular, we set the arithmetic mean for each of them so that the EU25 average equals to one. The crude data for each country and each indicator is then expressed relative to the EU25 mean so that values higher than one indicate better performance of a country relative to the EU25 average for a particular indicator and vice versa.

In the second stage, the economic effectiveness indicators are estimated. As mentioned earlier, our approach differs from previous analyses (e.g. by Afonso et al, 2005 and 2006) that considered public expenditures to reflect the opportunity costs of achieving the performance indicators. We have approximated the input costs in each economic activity by labour and capital compensation data relative to sectoral gross value added (GVA).. Based on the equation (II), we compute the *service economic effectiveness indicator* (*SEEI)* as the ratio between the *service performance indicator* (*SPI*) and the average amount of input costs (*SIC*)

[11] Source: Environment and energy statistics, Eurostat. No data available for Greece, Italy and the United Kingdom as regards water waste treatment and no data available for Denmark, Luxembourg and Portugal as regards sewage treatment.

[12] This introduces a strong assumption (Jacobs et al, 2004; Gall 2007; OECD 2008b). For this reason, results are also verified when changes in the weightings structure of the different subsectors are introduced (see Appendix B), suggesting that the findings are relatively robust.

used to achieve a given performance level. The overall *SEEI* for any sector *i* and country *j* is given by:

$$SEEI_{ij} = \frac{SPI_{ij}}{SIC_{ij}} = \frac{SPI_{ij}}{\alpha_{ij} LC_{ij} + \beta_{ij} KC_{ij}} \qquad \text{(II)}$$

where α and β are weights, and LC_{ij} and KC_{ij} are the labour and capital costs in sector *i* and country *j*. We use EUKLEMS Database, March 2008 Release, which computes labour compensation as the compensation of employees adjusted for the compensation of the selfemployed. Capital compensation is defined as a residual, namely, as the difference between value added and labour compensation. The average amount of input costs (*SIC*) is computed as an arithmetic mean between the standardized labour and capital compensation data. These values were standardized across countries by expressing raw data for each country relative to the EU25 average. Therefore, a *SIC* greater than one reflects that, in a particular sector, a country has larger input costs relative to the European average and vice versa.

Following a similar approach as Afonso et al (2005) we have assumed the average input compensation over a decade as a lagged effect from input expenditures on performance. As Atkinson (2005, page 13) argues 'there are lags between inputs and outputs' since an increase in public expenditure, for example, may improve output indicators at a later stage. This is particularly important in public sectors such as health or education. Considering ten-year averages also allows us to capture long-term trends and to avoid the potential effects of cycles.

4. Empirical findings

The results for the *SPI* indicators in the enlarged EU in 2005 are presented in Table 1. It shows performance scores for the individual public services sectors as well as for the total public services sector, and highlights their statistical significance. The first issue to underline is the notable but not extreme differences across countries. Austria is the best performing European

economy in public administration while Slovenia performs the best in education, and Sweden does so in health and social work and in other community, social and personal services. Two countries show the lowest performance scores: Latvia (in public administration and health and social work) and Malta (in education as well as in other community, social and personal services). Nordic countries like Sweden or Denmark and also Austria report high *SPI* indices for the total public services category whereas Malta and Latvia perform significantly below-average. This result is verified when changes in the weightings structure of the different subsectors are introduced, suggesting that our findings are relatively robust[10].

Countries with the highest value for public administration *SPI* include Austria and the Netherlands, both with a very small size of undergrounded economy. In contrast, Latvia, Greece and Italy post a below-average performance in the public administration while having very high shares of shadow economy. In education, Slovenia, Poland and Finland report the highest performance. Despite not being statistically significant, many other Central and East European countries (Czech Republic, Slovakia, Lithuania and Estonia) also show education scores above the average. Some previous studies have already shown the relatively strong performance of the new member states (NMS) in education (Afonso et al, 2006; van der Ploeg and Vengelers 2007; van Ark et al, 2008). We suggest that high scores of NMS in education are mainly explained by the comparatively lower rate of early school leavers. On the other hand, Malta, Luxembourg and Portugal are the worst performing countries in education. As regards the Mediterranean economies, low *SPI* is driven by relatively high drop-out rates, which more than doubled the EU average. In the case of Luxembourg the participation of population in tertiary education is well behind the EU average. In the category health and social work Sweden is the best performer (due to lower infant mortality rates and higher social work indicators) together with Luxembourg,

[10] In the Appendix B we present the total *SPI* with alternative weighting schemes. We have considered the share of the different subsectors in total public services employment, value added and also other possible weights to some extent ad hoc. Correlations with the tested changes in weights are in the (0.93-0.99) range.

whereas Latvia, Lithuania and Poland are performing the worst among EU25. In other community, social and personal services (approximated by sector 90) Sweden, Denmark and Austria are the leading countries while Malta shows the poorest performance.

Table 1. Services performance indicator (*SPI*) in the EU25, 2005

	Public administration	Education	Health and social work	Other community, social and personal services	Total public services
Austria	**1,29**	1,02	1,09 1,05	1,54	1,23
Belgium	1,02	1,00		0,75	0,96
Cyprus	0,89	0,91	0,95	0,59	0,83
Czech Republic	0,97	1,14	1,12	0,91	1,03
Denmark	1,17	1,03	1,16 0,84	1,69	1,26
Estonia	0,86	1,05	1,13 1,09	1,01	0,94
Finland	1,18			1,23	1,19
France	1,08	1,21		0,99	1,03
		0,96			
Germany	1,16	0,92	1,05 0,96	1,17	1,07
Greece	0,80	1,00	0,87	0,70	0,86
Hungary	0,84	1,01		0,88	0,90
Ireland	1,12	1,04	0,98	1,31	1,11
Italy	0,80	0,87	0,98	0,84	0,87
Latvia	**0,77**	1,00		0,73	
Lithuania		1,10	**0,72**	1,03	0,80
Luxembourg	0,83		0,75	1,02	0,93
Malta	1,17				1,04
Netherlands	0,92	0,77	1,21		
Poland		**0,75**	1,04 1,08	**0,20**	**0,73**
Portugal	1,20	0,98		1,21	1,12
Slovakia	0,90	1,23	0,80	0,88	0,95
Slovenia	0,94	0,78	0,92	0,81	0,86
Spain	0,94	1,13	0,87 1,10	0,72	0,91
Sweden	0,88	**1,25**	0,98	0,54	0,94
United Kingdom	0,97	0,85		1,23	1,01
	1,12	1,05			
	1,19	0,98	**1,34**	**1,81**	**1,33**
			0,92	1,35	1,11
EU25	1,00	1,00	1,00	1,01	1,00
Std. Dvt.	0,154	0,134	0,146	0,367	0,150
Large expenditure	1,16	1,01	1,17	1,51	1,21
Medium expenditure	0,98	1,01	0,99	0,85	0,96
Small expenditure	0,95	0,97	0,91	1,05	0,97

Statistically significantly **above** the EU average
Not statistically significantly different from the EU average
Statistically significantly **below** the EU average

Notes: [a] Each sector contributes 25% to the total indicator. Large expenditure comprises the SPI of those economies where public expenditure represents more than 50% of GDP during the 2000s (Sweden, Denmark, France and Austria). Medium

expenditure comprises the SPI of those economies where public expenditure represents between 40% and 50% of GDP during the 2000s (Hungary, Belgium, Finland, Italy, Germany, Slovenia, Netherlands, Portugal, Greece, Czech Republic, Malta, Poland, UK, Cyprus, Slovakia). Low expenditure comprises the SPI of those economies where public expenditure represents less than 40% of GDP during the 2000s (Luxembourg, Spain, Latvia, Estonia, Lithuania and Ireland). Source: Own calculations based on the sources in the Appendix A.

When considering data on public expenditure, we find that the larger the size of the government, the higher the returns as regards improved performance (Afonso and St. Aubyn 2010). As Table 1 shows, Sweden, Denmark and Austria, whose total spending surpassed 50% of GDP, posted a higher *SPI* than the average. This opposes the results obtained in earlier works by Afonso et al (2005 and 2006), where small governments report better performance scores.[11] This dissimilarity could be explained mainly by two reasons. First, the number of outcome indicators considered in our work is larger (19 vs. 15). Second, our country sample is different from that used by Afonso et al. Both differences affect the values of the performance scores since they are measured relative to the other economies included in the analysis.

Based on the previous analysis we computed the service economic effectiveness indicator (*SEEI*) that relates the performance (*SPI*) of each public service sector to the corresponding service input costs (*SIC*) for the EU25 (Table 2). The SEEI indicator for total public services is calculated as an average, by attributing equal weight to the economic effectiveness of each activity. The results indicate that differences across countries are much larger when we relate performance to input costs than when only performance is measured. Sweden, United Kingdom, Finland, Austria, Denmark and Ireland reveal the highest economic effectiveness in public services among EU25. On the other hand, Malta displays the lowest economic effectiveness score. Again, results are robust to changes in the weighting schemes.[12] When comparing country groups, we also find that large-sized governments in the EU25 post the highest economic effectiveness scores in total

[11] They consider small governments as those with public spending below 40% of GDP. Afonso et al (2005) studied EU15 plus OECD economies; Japan, Australia, Switzerland, Luxembourg and the US were included in the small government category. Afonso et al (2006) focused on EU10 and other developing economies; Latvia, Lithuania and Estonia were included in the small government group.

[12] In the Appendix B we present the SEEI with alternative weighting schemes. Correlations with the tested changes in weights are in the (0.88-0.98) range.

public services. The latter differs from the effects found by Afonso et al (2005 and 2006) for the reasons already suggested above.[13]

Table 2 Services economic effectiveness indicator (SEEI) in the EU25, 2005

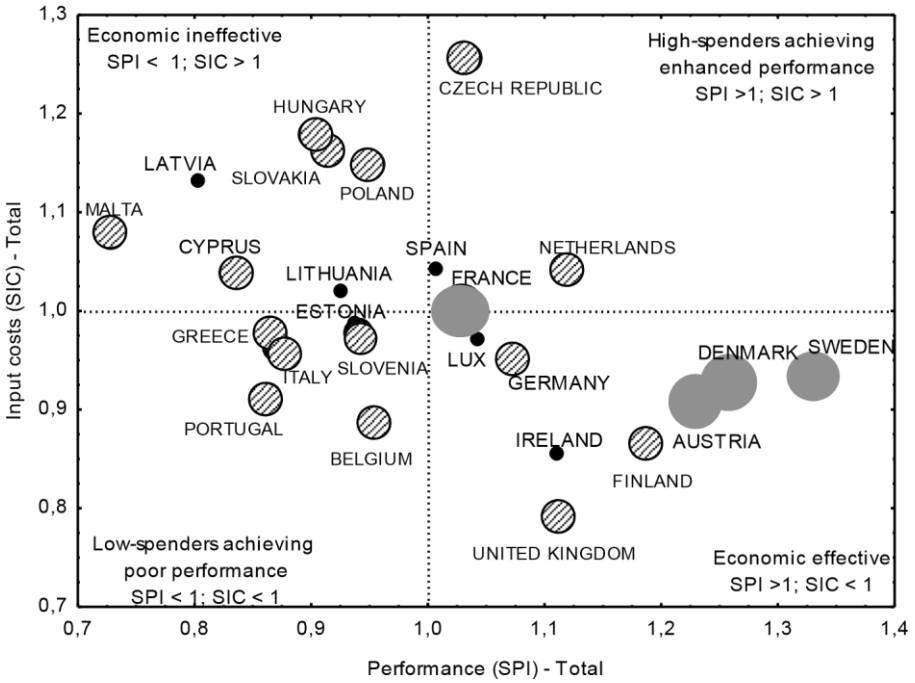
	Public administration	Education	Health and social work	Other community, social and personal services	Total public services [(a)]
Austria	1,37	1,00	1,47	1,74	1,36
Belgium	1,29	1,12	1,20	0,79	1,08
Cyprus	1,24	0,78	0,78	0,54	0,80
Czech Republic	0,90	0,66	0,99	0,76	0,82
Denmark	1,31	1,03	1,48	1,60	1,36
Estonia	0,90	0,93	0,93	1,07	0,95
Finland	1,37	1,17	**1,84**	1,34	1,37
France	1,08	1,04	0,96	1,08	1,03
Germany	1,25	1,33	0,92	1,05	1,13
Greece	1,29	1,82	**0,57**	0,61	0,88
Hungary	0,70	0,70	0,85	0,84	0,77
Ireland	1,10	**1,89**	1,20	1,22	1,30
Italy	0,71	1,22	0,95	0,86	0,91
Latvia	**0,58**	0,90	0,70	0,65	0,71
Lithuania	0,90	0,93	0,87	0,82	0,91
Luxembourg	1,14	0,90	1,13	1,19	1,07
Malta	1,01 1,05	0,62	1,00	**0,16**	**0,68**
Netherlands		0,86	1,04	1,68	1,07
Poland	0,75	1,18	0,61	0,82	0,83
Portugal	1,00	1,30	0,82	0,85	0,95
Slovakia	0,63	0,94	0,98	0,64	0,79
Slovenia	0,85	1,25	1,15	0,65	0,96
Spain	0,93	0,77	0,99	1,16	0,97
Sweden	1,12	0,96	1,65	**2,57**	**1,42**
United Kingdom	**1,45**	1,53	1,15	1,65	1,40
EU25	1,04	1,07	1,05	1,05	1,02
			0,305		Std. Dvt.
0,249	0,324 0,505	0,230	1,39		
Large expenditure	1,22		1,01 1,75		1,29
Medium expenditure	1,03	1,10	0,99	0,88	0,96
Small expenditure	0,92	1,05	0,97	1,02	0,99

Notes: [(a)] Each sector contributes 25% to the total indicator. See Table 1. Source: Own calculation based on the sources in the Appendix A.

[13] However, as in Afonso (2005), medium-sized governments post the highest scores in education.

Based on the relationship between performance (*SPI*) and the inputs costs incurred (*SIC*) we propose a typology of countries in regard of economic effectiveness of total public services and at the sectoral breakdown (Figure 3 and Table 3). Countries that reveal economic effectiveness attain performance scores above the European average while spending relatively less in terms of labour and capital compensation. We find most of EU15 countries and none of NMS in this category for total public services. On the opposite side, the countries that are economic ineffective achieve lower performance scores at relatively higher input costs. This category refers exclusively to most NMS. A third group comprises countries with aboveaverage performance scores and comparatively higher input costs, namely: *high-spenders achieving enhanced performance*. France, the Netherlands, Spain and the Czech Republic are found in this grouping. Finally, the category *low-spenders achieving poor performance* includes Belgium, some Mediterranean economies (Greece, Italy, and Portugal) as well as Slovenia and Estonia.

Figure 3. Performance and input costs of total public services, 2005: a typology of EU25



Notes: For each country the size of the bubble indicate the size of the public expenditure as a percentage of GDP. The colours differentiate between large (grey), medium (black striped) or small (black) sized government (see note of Table 1). Source: Own elaboration based on the sources in the Appendix A and Tables 1 and 2.

Table 3. Performance and input costs: a typology of EU25 by public services sectors

	Economic effective	**Economic ineffective**	**High-spenders achieving enhanced performance**	**Low-spenders achieving poor performance**
Public administration	Austria, Belgium, Denmark, Finland, France, Germany, Sweden, UK	Czech Rep., Hungary, Italy, Latvia, Poland, Slovakia, Slovenia, Spain	Netherlands, Ireland, Lux.	Cyprus, Estonia, Greece, Lithuania, Malta, Portugal
Education	Greece, Ireland, Slovenia	Cyprus, Malta, Netherlands, Spain	Austria, Czech Rep., Denmark, Estonia, Finland, Hungary, Latvia, Lithuania, Poland, Slovakia, Sweden	Belgium, France, Germany, Italy, Lux., Portugal, UK
Health and social work	Austria, Belgium, Denmark, Finland, Slovenia, Sweden	Cyprus, Greece, Hungary, Italy, Latvia, Poland, Portugal	Czech Rep., France, Germany, Lux., Malta, Netherlands	Estonia, Ireland, Lithuania, Slovakia, Spain, UK
Other community, social and personal services	Austria, Estonia, Finland, Lux., Netherlands, Sweden, UK	Cyprus, Czech Rep., Greece, Italy, Latvia, Malta, Poland, Slovakia	Denmark, Germany, Ireland, Lithuania, Spain	Belgium, France, Italy, Portugal, Slovenia

Source: Based on the sources in the Appendix A and Tables 1 and 2.

Several caveats apply to our analysis. Not only labor and capital compensation[14] but also public expenditure, policy in individual public services, innovation activity, tax and regulation policies, affect the effectiveness of public services. Factor compensation may be considered as a proxy of public spending, but ignores the composition and other characteristics of the expenditure scheme. Moreover, even though we try to approximate outcomes rather than outputs, this distinction is not always possible (as in Afonso et al, 2005). It is not easy to identify the impacts caused by other factors such as preferences, habits, climate or geographical conditions or even culture, tradition and personal behavioral patterns. These exogenous factors also play a role in extended performance and the economic effectiveness of services across countries; however they are much more difficult to capture and assess. Furthermore, the degree of suitability of the public services outcomes and

[14] EUKLEMS data represents the first attempt to get comparative and consistent data at sectoral level across EU countries. However, there is still room for improvements.

indicators that approximate them is not homogeneous. The selection has been conditioned mainly by data availability.[15]

5. Final remarks

The emerging trends that shape the socio-economic environment on a global scale, such as disruptive technologies, globalisation of markets, population aging and related increase in health expenditures, environmental problems and changing role of state require the provision of more effective, higher quality public services able to meet the demand of final users (individuals, enterprises or public institutions). A short survey of the literature confirms the multi-dimensional character of public sector services' impacts and the need to take into account the perspective of service providers, service users and society in general. Capturing various dimensions of public services' performance such as quality, outcome for services users and impact of public services on welfare, presents a big challenge to researchers and policy makers. The scholars need to apply a combination of different theoretical, conceptual and methodological approaches, along with a systematic collection of data to be able to provide evidence-based advice to policy makers.

With this in mind, the paper attempts to improve the assessment of the impacts of public services beyond the traditional indicators, by introducing a broader set of indicators and evaluating their impacts from an extended perspective. Accordingly, the focus is set on the outcomes rendered to end-users rather than on outputs. The use of composite indicators enables the adoption of a multi-criteria or multi-dimensional framework for measuring performance and economic effectiveness in public services. Overall, the empirical analysis at EU level shows that the performance of public services differs across countries, however the variation is much smaller than the

[15] This is particularly the case in the category 'Other community, social and personal services'.

differences related to the economic effectiveness scores of those economies. As far as comparisons with previous studies are concerned we found some differences. Main difference pertains to the result of our analysis indicating that some largesized governments in the enlarged EU (Sweden, Denmark, and Austria) are more effective in the provision of public services than countries with smaller governments.

We propose a typology of EU25 countries that reflects diverse relationships between performance and input costs for public services provision in total and at the sectoral level. In the case of total public services, most EU15 countries may be considered as *economic effective* with the exception of France and the Netherlands (which, together with the Czech Republic and Spain, are labelled as *high-spenders achieving enhanced performance*). Belgium, Greece, Portugal and Italy align to a group that we denote as *low-spenders economies achieving poor performance*, along with two NMS (Slovenia and Estonia). The rest of NMS economies are categorized as *economic ineffective* countries. Notwithstanding the fact that the distribution of countries to different types is not very surprising the results of our analysis suggest that other factors beyond our research focus may have important impact on the outcomes and the effectiveness of the public services provision. They may relate to smart management of public resources, quality of the institutional set-up, innovative approaches to public services delivery, introduction of new organisational practices, etc. Those missing explanatory factors could improve our understanding of the relationship between the performance and the economic effectiveness across countries and across sectors. In addition, they are of particular importance for public policy shaping that needs to take into account innovative approaches in the management and the provision of public services. A more challenging avenue for further study refers to the development of comparative analyses of economic effectiveness and differences between the public and private services.

From the paper some policy implications may follow. The first major implication is that policy leaders should not be obsessed with the size of the public sector, since performance and effectiveness can be much more important issues than size. The second relevant implication relates to the need of a comprehensive impact assessment that policy makers may promote for improving their own policies, by using a wide set of specific indicators and multidimensional approaches like the one proposed in this paper. Finally, performance gains may derive from innovative ways and models of public services provision: cooperation with other agents and networking between public-private-third sectors matters, so collaborative strategies may lead to improved performance. The results of analyses undertaken within SERVPPIN project demonstrate that innovation networks could facilitate better effectiveness in public services delivery (Rubalcaba et al, 2011). Thus, the complementarities between the public sector, the private sector and third sector deserve to be more fully exploited.

Despite presenting exploratory results, it is hoped that the paper will inspire the research and discussions on the possible improvements in measuring public services performance and more fully grasp their impacts as these activities play a dominant role in advanced economies. The contribution of this paper is very relevant and timely not only due to its focus on public services that are under pressure of severe budget constraints, but also in the context of recent initiatives for better measurement and understanding of progress, well-being and wealth of countries.

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APPENDIX A- Data description: definition and sources

Table A1 Public services indicators, series used and sources

Indicators/Variables	Series and explanations	Sources
	PUBLIC ADMINISTRATION	
Shadow economy	Size of the shadow economy, % of GDP, currency demand approach, reciprocal value (1/x)	Schneider (2009)
Administrative quality	Government effectiveness index [-2.5;2.5] rescaled [0;5]	World Bank, Aggregate Governance Indicators, 1996-2008
Regulatory quality	Regulatory quality index [-2.5;2.5] rescaled [0;5]	World Bank, Aggregate Governance Indicators, 1996-2008
Rule of law	Rule of law index [-2.5;2.5] rescaled [0;5]	World Bank, Aggregate Governance Indicators, 1996-2008
Control of corruption	Control of corruption index [-2.5;2.5] rescaled [0;5]	World Bank, Aggregate Governance Indicators, 1996-2008
	EDUCATION	
Enrolment	Secondary education enrolment, % of population	Education and training statistics, Eurostat
Drop-out	Percentage of people aged 18-24 with only lower secondary education not in further education or training, reciprocal value (1/x)	Education and training statistics, Eurostat
Tertiary education	Tertiary education students - levels 5-6 (ISCED 1997) as % of total population	Education and training statistics, Eurostat
Maths scores	Mean and distribution of student performance	OCDE, PISA DATABASE
Reading scores	Mean and distribution of student performance	OCDE, PISA DATABASE
Science scores	Mean and distribution of student performance	OCDE, PISA DATABASE
	HEALTH AND SOCIAL WORK	
Mortality	Infant mortality rate, %, reciprocal value (1/x)	Public health statistics, Eurostat
Healthy life years-females	Healthy life years at birth in percentage of the total life expectancy – females	Public health statistics, Eurostat
Healthy life years-males	Healthy life years at birth in percentage of the total life expectancy – males	Public health statistics, Eurostat
People at risk of poverty or exclusion	People at risk of poverty or social exclusion by age and sex, % of total population [ilc_peps01], reciprocal value (1/x)	Income and living conditions statistics, Eurostat
Inequality	S80/S20 income quintile share ratio, reciprocal value (1/x)	Income and living conditions statistics, Eurostat
	OTHER SOCIAL AND COMMUNITY SERVICES (SECTOR 90)	
Water waste treatment	Water waste treatment, % of total	Environment and energy statistics, Eurostat
Sewage treatment	Sewage sludge treatment, per capita	Environment and energy statistics, Eurostat
Pollution, grime or other problems	Pollution, grime or other environmental problems, % of total (Source: SILC) [ilc_mddw02], reciprocal value (1/x)	Income and living conditions population statistics, Eurostat
	INPUT COSTS	
Labour compensation	Compensation of employees adjusted for the compensation of the self-employed, as % of sectoral GVA	EUKLEMS Database, March 2008 Release
Capital compensation	Capital compensation, as % of sectoral GVA	EUKLEMS Database, March 2008 Release

APPENDIX B- *SPI* and *SEEI*, alternative weighting scheme

Table B1 Public services performance (*SPI*), 2005, alternative weighting scheme

	Alternative weighting structure considering:						
	Equal weights (a) (d)	Employment (b) personal	Value added (c) services (g)	Public administration	Education (e)	Health (f)	Other community, social and
Austria	1,23	1,19	1,19	1,25	1,16	1,18	1,33
Belgium	0,96	0,98	0,98	0,98	0,97	0,99	0,89
Cyprus	0,83	0,86	0,87	0,85	0,86	0,87	0,75
Czech Republic	1,03	1,05	1,05	1,01	1,07	1,06	0,99
Denmark	1,26	1,22	1,20	1,23	1,18	1,23	1,40
Estonia	0,94	0,92	0,93	0,91	0,97	0,90	0,96
Finland	1,19	1,18	1,18	1,18	1,20	1,17	1,20
France	1,03	1,04	1,04	1,05	1,01	1,05	1,02
Germany	1,07	1,06	1,06	1,10	1,02	1,07	1,11
Greece	0,86	0,89	0,88	0,84	0,91	0,90	0,81
Hungary	0,90	0,90	0,90	0,88	0,94	0,89	0,90
Ireland	1,11	1,08	1,09	1,11	1,09	1,07	1,18
Italy	0,87	0,89	0,87	0,85	0,87	0,91	0,86
Latvia	0,80	0,80	0,81	0,79	0,87	0,77	0,78
Lithuania	0,93	0,90	0,91	0,89	0,98	0,87	0,96
Luxembourg	1,04	1,06	1,05	1,08	0,95	1,10	1,03
Malta	**0,73**	0,80	0,80	0,79	0,74	0,83	0,55
Netherlands	1,12	1,11	1,11	1,14	1,07	1,10	1,15
Poland	0,95	0,95	0,96	0,94	1,04	0,90	0,93
Portugal	0,86	0,87	0,87	0,89	0,83	0,88	0,85
Slovakia	0,91	0,93	0,94	0,92	0,98	0,90	0,85
Slovenia	0,94	0,99	0,99	0,92	1,04	0,99	0,81
Spain	1,01	0,99	0,98	0,99	0,95	1,00	1,08
Sweden	**1,33**	1,29	1,26	1,26	1,24	1,33	1,49
United Kingdom	1,11	1,07	1,08	1,14	1,07	1,05	1,19
EU25	1,00	1,00	1,00	1,00	1,00	1,00	1,00
Std. Dev.	0,150	0,131	0,127	0,145	0,121	0,136	0,218
Correlation with equal weights results		0,99	0,99	0,98	0,93	0,96	0,98

a) Equal weights assigned to each sub-sector (1/4)
b) Weights assigned according to each subsector share in total public services employment in EU25 (2005 data): 24% assigned to public administration, 25% to education, 34% to health and 17% to other social services.
c) Weights assigned according to each subsector share in total public services value added in EU25 (2005 data): 30% assigned to public administration, 28% to education, 27% to health and 15% to other social services.
d) 1/2 assigned to public administration and 1/6 to the other sectors
e) 1/2 assigned to education and 1/6 to the other sectors
f) 1/2 assigned to health and 1/6 to the other sectors

g) 1/2 assigned to other social services and 1/6 to the other sectors

Table B2 Public services economic effectiveness (*SEEI*), 2005, alternative weighting scheme

	Alternative weighting structure considering:						
	Equal weights (a)	Employment (b) (d)	Value added (c) personal	Public administration services (g)	Education (e)	Health (f)	Other community, social and
Austria	1,36	1,38	1,35	1,39	1,26	1,42	1,51
Belgium	1,08	1,13	1,14	1,16	1,10	1,13	0,99
Cyprus	0,80	0,85	0,88	0,97	0,82	0,82	0,74
Czech Republic	0,82	0,85	0,84	0,85	0,77	0,88	0,81
Denmark	1,36	1,35	1,32	1,34	1,25	1,40	1,44
Estonia	0,95	0,95	0,94	0,94	0,95	0,95	1,00
Finland	1,37	1,47	1,44	1,41	1,34	1,57	1,40
France	1,03	1,03	1,04	1,05	1,04	1,02	1,05
Germany	1,13	1,12	1,15	1,17	1,20	1,06	1,11
Greece	0,88	1,06	1,14	1,15	1,32	0,91	0,92
Hungary	0,77	0,77	0,76	0,75	0,75	0,80	0,79
Ireland	1,30	1,35	1,37	1,27	1,53	1,30	1,31
Italy	0,91	0,95	0,94	0,86	1,03	0,94	0,91
Latvia	0,71	0,71	0,71	**0,66**	0,77	0,70	0,69
Lithuania	0,91	0,88	0,89	0,89	0,90	0,88	0,86
Luxembourg	1,07	1,08	1,08	1,10	1,03	1,10	1,12
Malta	**0,68**	0,76	0,77	0,80	0,67	0,80	0,52
Netherlands	1,07	1,11	1,09	1,12	1,06	1,12	1,33
Poland	0,83	0,82	0,84	0,81	0,95	0,76	0,83
Portugal	0,95	0,99	1,01	0,99	1,09	0,93	0,94
Slovakia	0,79	0,83	0,81	0,74	0,84	0,86	0,74
Slovenia	0,96	1,02	1,01	0,93	1,07	1,03	0,87
Spain	0,97	0,95	0,94	0,95	0,90	0,97	1,03
Sweden	**1,42**	1,51	1,44	1,42	1,37	1,60	1,91
United Kingdom	1,40	1,40	1,42	1,45	1,48	1,35	1,51
EU25	1,021	1,053	1,053	1,048	1,060	1,052	1,053
Std. Dev.	0,230	0,236	0,228	0,235	0,237	0,253	0,323
Correlation with equal weights results		0,98	0,97	0,95	0,88	0,97	0,95

a) Equal weights assigned to each sub-sector (1/4)
b) Weights assigned according to each subsector share in total public services employment in EU25 (2005 data). 24% assigned to public administration, 25% to education, 34% to health and 17% to other social services.
c) Weights assigned according to each subsector share in total public services value added in EU25 (2005 data). 30% assigned to public administration, 28% to education, 27% to health and 15% to other social services.
d) 1/2 assigned to public administration and 1/6 to the other sectors
e) 1/2 assigned to education and 1/6 to the other sectors
f) 1/2 assigned to health and 1/6 to the other sectors
g) 1/2 assigned to other social services and 1/6 to the other sectors