

# THE SIZE AND PERFORMANCE OF PUBLIC SECTOR ACTIVITIES IN EUROPE

HEINZ HANDLER, BERTRAND KOEBEL, PHILIPP REISS, MARGIT SCHRATZENSTALLER\*

## Abstract

The obvious difference in the economic performance of countries has led to the question why some countries are so much wealthier than others, and whether the size, the structure, and the organisation of the public sector contribute to cross-country income and growth gaps. Public sector activities may have an effect on overall productivity and growth via two channels: directly by the level and changes of productivity within the public sector, and indirectly by triggering off productivity changes in private production. This paper is concerned with the former aspect. It provides an overview of the size and the structure of the public sector in Europe and compares it with the US and Japan. This is related to the more recent empirical literature on public sector performance. After reviewing some of the measurement issues related to public services, the evidence on the size of government and its performance is analysed. The results on industrial countries are not fully conclusive, but seem to attribute more efficiency to smaller rather than to larger governments. Public sector reforms to consolidate the size of government are therefore likely to enhance the sector's own productivity and thereby positively contribute to overall economic performance.

## 1. Introduction

The promising signs since the mid-1990s that in the United States, fuelled by technological innovations combined with free market attitudes, a "New Economy" could evolve, have not fully materialised. What is remaining, however, is a significantly faster growth of output and productivity in the US than in Europe. This development is in stark contrast to Europe's

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catching up in the preceding years as well as the EU's ambition to become the world's most dynamic and competitive economy. Looking more closely at individual country developments, the picture becomes more diverse. In the last few years, there has been a group of "high-performing" countries and regions such as North America and Australia, but also Northern Europe, Ireland and Greece, that contrasts with "low-performers" such as Japan, Germany, Italy and Turkey (OECD 2003b).

The obvious difference in the economic performance of countries has led to the question of why some countries are wealthier than others, and whether the size, the structure, and the organisation of the public sector contribute to cross-country income and growth gaps.

The public sector influences overall economic performance via two channels: On the one hand, the public sector produces goods and services and will therefore directly impact on overall output and productivity by its size and efficiency. On the other hand, the public sector also affects the way private production takes place, so that a public policy exerting a net positive effect on the private sector will indirectly back up economic growth and productivity. This paper is concerned with the first channel.<sup>1</sup>

In democracies the size and the structure of the public sector are not exogenously given, but reflect the preferences of voters who decide on the scale and the scope of government duties. Citizens may regard the actual size and structure of the public sector optimal, in which case reforms that are not consensual would be welfare-reducing. However, the following observations justify evaluations of the consequences of public sector activities: First, voters' preferences are distorted by information deficits (Boeri, Börsch-Supan and Tabellini 2001) and citizens may neither be aware of the size of the public sector nor of the trade-off existing between public sector activity and economic performance. Second, it is often possible to improve the outcome of public sector activities without changing its size or structure; or to maintain a given outcome of public policies at a smaller size of the public sector by changing its structure. Third, a society's preferences for public activities are contingent on the economic and demographic context. In recessions, for example, people care much more about social security and unemployment than in periods of growth. Finally, in cases of government failure, the preferences of citizens may not fully be taken into account by politicians and administrations.

This paper provides an overview of the size and the structure of the public sector in Europe and compares it with the US and Japan. This is related to the more recent empirical literature that

deals with public sector performance. Particular attention is paid to specific areas of public activity where a reorganisation of governmental intervention could help advance overall economic performance.

Section 2 screens the available information on the size and the structure of the public sector in the US, Japan and Europe, including selected data from the new EU member states. Government size is measured by the share of public sector employment in the total labour force, the share of public expenditures in gross domestic product (GDP), and the share of total taxes in GDP. The structure of the public sector in the EU is scrutinised from the expenditure as well as from the tax side of public budgets. Section 3 is devoted to public sector performance. It first reviews some measurement issues, including the relation between performance, productivity and efficiency as well as the experience of countries with national output indicators. It then discusses the relations between the size and the performance of public sectors. This is complemented by a review of the ways and means to improve public sector performance. Section 4 presents some concluding remarks.

## **2. The size and the structure of public sector activities in Europe**

The concerns about the long-term sustainability of public finances have stirred demands to reduce the size of the public sector and to reconsider the structure of expenditures and taxes. In view of the mounting resistance to further increases in the tax burden, fiscal sustainability is often seen as attainable only by reducing the dynamics of public sector spending on goods and services as well as on transfers. In this section we assess the size and the structure of public sector activities in the European Union member states in comparison to the US and Japan.

Since public production and its influence on the private sector are difficult to measure with one single statistical indicator, the size and the composition of government activities are gauged using different indicators, which all cover the supply side of public activities. First, we use public employment as a proxy for the quantity of public services produced by the government. Since public employment is largely uncorrelated with the business cycle, this measure captures the structural size of the public sector quite well. When using it in international comparisons as a proxy for public production, it is implicitly assumed that public sector productivity is also

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<sup>1</sup> The second channel is explored in Handler, Knabe, Koebel, Schratzenstaller and Wehke (2005).

comparable across countries, i.e. this measure abstracts from cross-country variations in public sector productivity. Second, the volume of economic transactions that involve the public sector is measured by the share of total government expenditure in GDP. Third, from the financing side, and largely mirroring the expenditure side, government size is reflected by the ratio of total taxes to GDP.<sup>2</sup> The latter two measures, though being subject to cyclical variations to some extent, also measure public sector transactions as they impinge on the private sector.

Overall, there are considerable differences of the results derived with the different measures for each country and between country-specific results delivered by each measure. This is highlighted by the fact that the US government is about the average size of governments in EU countries when measured in terms of employment, but it is much slimmer in terms of public expenditures and taxes.

## **2.1 Measuring public sector size...**

### **2.1.1 ...using the share of government employment**

The evolution of the share of government employment (including military personnel) in the labour force in 17 EU countries (the EU15 countries, the Czech Republic and Poland, which will be labelled as “EU17”) is depicted in Figure 1.<sup>3</sup>

The left diagram presents the trajectories for those countries in which the public employment share increased between 1982 and 2002; vice versa in the right diagram. In the European Union, public employment remained roughly constant over the 23-year-period regarded and fluctuated around 17%. The slight downward trend observable since 1992 results from corresponding developments in a number of countries and is not just due to the inclusion of the Czech Republic and Poland. In contrast to the stationary trend for the EU as a whole, the experience of individual countries is very heterogeneous in level and long-term development. While the Scandinavian countries and France have the largest public sectors, with a share of public sector employment in the total labour force of more than 20% in 2002, public employment in Greece, Ireland, the Netherlands, and Germany was about half that share. The United Kingdom is the only country in this sample that significantly decreased its share of public employees, from a

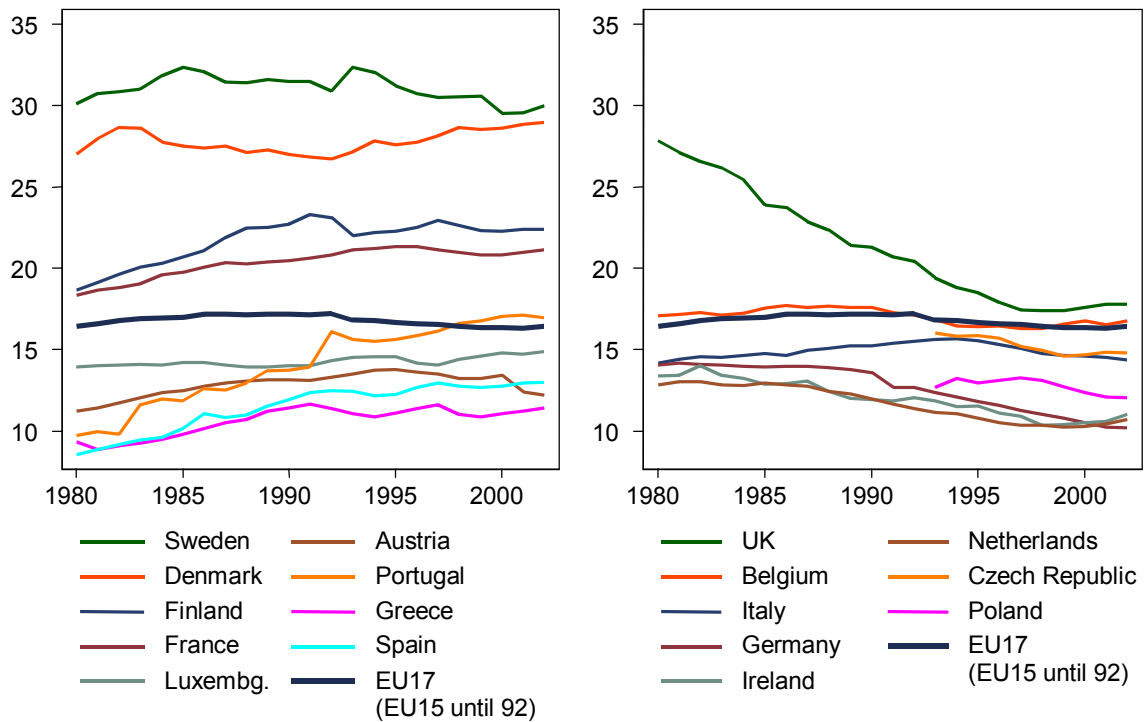
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<sup>2</sup> The data used for these indicators are taken from various sources, according to availability and coverage. Eurostat is generally preferred as a source, but for international comparisons which include the US and Japan, OECD data usually provide better coverage and more consistent definitions. This pertains, e.g., for the figures 1 and 2, for which data on the total population between 15 and 64 years and the corresponding and participation rates were required.

<sup>3</sup> No data are yet available for all EU25 countries.

rather high ratio of 27.9% in 1980 to 17.8% in 2002. The southern countries, except Italy, increased public employment from very low levels in the early 1980s, most pronouncedly in Portugal where the public employment share rose from 9.7% in 1980 to 17.0% in 2002.

Figure 1: Public employment as a % of the total labour force in the EU 17, 1980 to 2002

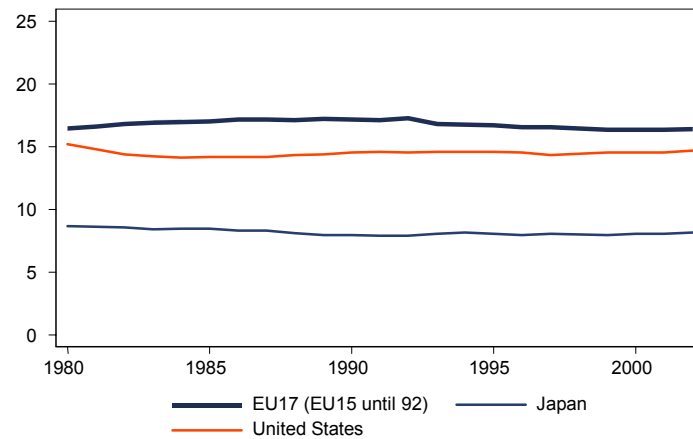


Source: OECD (2003a)

Figure 2 compares the EU average of public employment shares with those of the US and Japan. The public sector of the US is only somewhat smaller than that of the EU. However, public sector employment lies below 10% in Japan and is substantially lower than in Germany, the EU country with the lowest public employment share in 2002.

Table 1 provides a ranking of the EU17 countries, the US, and Japan by employment shares in 2002.

Figure 2: *Public employment as a % of the labour force in the EU, US, and Japan, 1980 to 2002*



Source: OECD (2003a)

Table 1: *Ranking public employment shares in the EU17, US and Japan*

	Country	Publ. Empl. Share in 2002	Position in 1992	Position in 1982	Trend over 1993-2002
1.	Sweden	30.0	1.	1.	decreasing
2.	Denmark	29.0	2.	2.	increasing
3.	Finland	22.4	3.	4.	constant
4.	France	21.2	4.	5.	constant
5.	United Kingdom	17.8	5.	3.	decreasing
6.	Portugal	17.0	7.	14.	increasing
7.	Belgium	16.8	6.	6.	constant
8.	Luxembourg	14.9	10.	10.	constant
9.	Czech Republic	14.8	n.a.	n.a.	decreasing
10.	United States	14.7	9.	8.	constant
11.	Italy	14.4	8.	7.	decreasing
12.	Spain	13.0	13.	15.	increasing
13.	Austria	12.2	11.	13.	decreasing
14.	Poland	12.1	n.a.	n.a.	decreasing
15.	Greece	11.4	16.	16.	constant
16.	Ireland	11.0	14.	11.	decreasing
17.	Netherlands	10.7	15.	12.	decreasing
18.	Germany	10.2	12.	9.	decreasing
19.	Japan	8.1	17.	17.	constant

Source: OECD (2003a)

Note: For the trend over the ten year period, the sign of the time trend of an OLS-regression indicates the direction if significant at the 5% level; insignificant time trends are indicated by 'constant'.

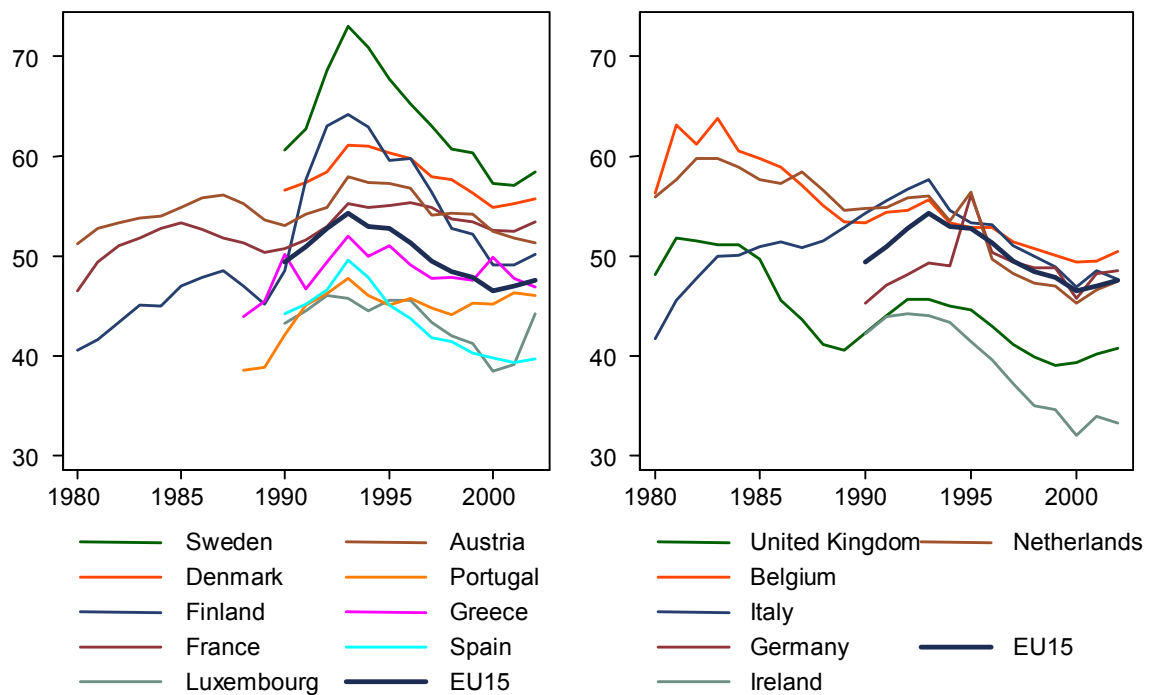
The ranking confirms that – based on government employment shares – the Scandinavian EU countries and France stand out with large public sectors. This is not a short-run phenomenon,

but a pattern which is rather stable in the long run. Furthermore, the US (exactly taking the middle position in 2002) has a public sector which is almost as large as the EU17 average and which exceeds those of a number of European countries in size.

### 2.1.2 ...using the share of public expenditures

The long-term development of the share of public expenditures (including social transfers) in GDP is depicted in Figure 3. Three characteristics (apart from the heterogeneity between countries) emerge: First, besides the Scandinavian countries included here, Austria, Belgium, and France tend to have the largest public expenditure shares, exceeding 50% of GDP in 2002. Second, Belgium, the Netherlands, the United Kingdom, and Ireland substantially decreased their public expenditure shares since the early 1980s. And third, public expenditure shares in the EU member states seem to be countercyclical and correlated with each other.

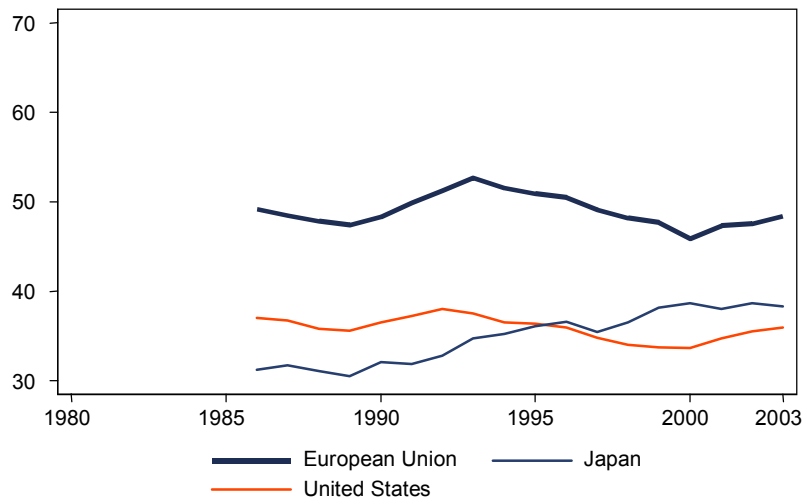
Figure 3: Total government expenditure as a % of the GDP in the EU15, 1980 to 2002



Sources: Eurostat NewCronos, OECD, Wirtschaftskammer Österreich.

A comparison of the EU with Japan and the US reveals that public sector size as measured by the share of government expenditures in GDP is much larger in the EU than in the US or Japan. The main reason is a larger extent of redistribution (as detailed further below).

Figure 4: Total government expenditure as a % of the GDP in the EU, US, and Japan, 1980 to 2003



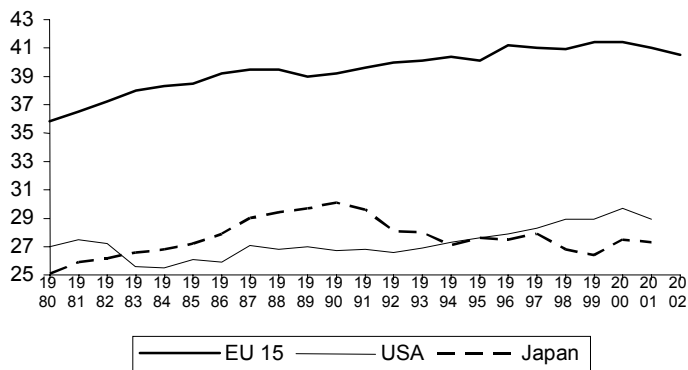
Source: OECD (2003a)

### 2.1.3 ...using the tax ratio

In addition to public employment and expenditures, another important indicator for public sector size (referring to the revenue side of the public sector) is the tax ratio, i.e. the share of total taxes (including social security contributions) in GDP. Figure 5 shows the average tax ratios for the EU15 from 1980 to 2002 and the tax ratios for Japan and the US from 1980 to 2001. They mirror the long-term trends in expenditure ratios outlined in the previous section.



Figure 5: Total taxes as a % of the GDP in the EU15, the US and Japan



Source: OECD (2003d).

The average tax ratio in the EU15 steadily increased between the beginning of the 1980s, when it was at about 36%, and the end of the 1990s; only for the last few years a slight downward trend can be observed. In 2002, the average tax ratio in the EU15 amounted to about 40%. Departing from a much lower level (27% in 1980), the tax ratio in the US remained broadly stable in the last two decades. The Japanese tax ratio was lowest among the countries regarded in 1980 (25%), but went up by about 5 percentage points during the 1980s. Until the end of the 1990s, the Japanese tax ratio decreased and stabilized by about 27% of GDP.

## 2.2 The structure of public sector activities

The structure of the public sector is reflected in the composition of public expenditures on the one hand and of total taxes on the other.

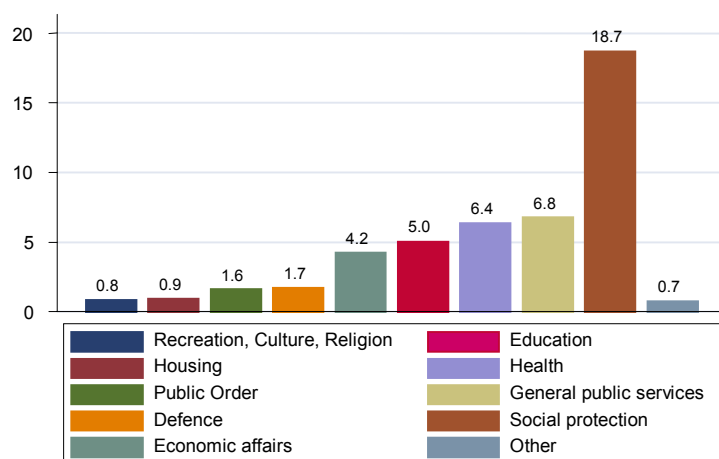
### 2.2.1 Expenditures

Figure 6 illustrates the structure of public sector expenditures in the European Union (EU15) in the year 2001.<sup>4</sup> By far the largest block of public expenditures are social transfers that (including their administration costs) accumulated to 18.7% of EU15 GDP. This is nearly three

<sup>4</sup> Although national and supranational statistical agencies put a lot of effort in making data from different countries comparable, the data used in section 2.2 should be treated with caution, as the categories that record public sector expenditures may differ from country to country. However, the overall impression remains unaffected by that fact.

times the amount that the “old” EU member countries spend on health or general public services<sup>5</sup>, the next two largest spending blocks. For defence, EU15 countries spend just 1.7% of GDP on average.

Figure 6: Public expenditures by category as % of GDP in the EU15 in 2001

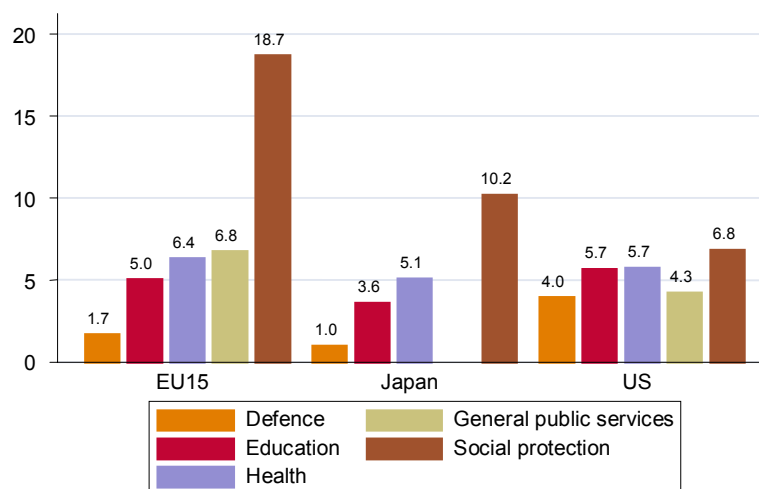


Source: Eurostat NewCronos

According to the latest data available (2001), there are significant differences in the structure of the public sector between the EU and that in Japan and in the US. These differences are highlighted by Figure 7. The largest difference, gauged from the social protection figures, is that the EU15 redistributed roughly 12% of GDP more than the US and 8.5% more than Japan. Moreover, the EU15 is leading with regard to health expenditures whereas it spends less than half the share of GDP on defence than the US does. Finally, the US devotes slightly more public expenditures to education than the EU15 and considerably more than Japan.

<sup>5</sup> General public services are composed of expenditures for executive and legislative organs, financial and fiscal affairs, external affairs; foreign economic aid; general services; basic research; R&D, general public services; public debt transactions; and transfers of a general character between different levels of government. A detailed classification is provided at <http://unstats.un.org/unsd/cr/registry/regest.asp?Cl=4&Lg=1>.

Figure 7: Public expenditures as % of GDP in 2001: EU15, Japan, and US



Notes: The average of the EU15 figures is the sum of country expenditures divided by EU15-GDP. The social protection figure for the US does not include government employee retirement plans. The general public services figure for Japan is missing.

Sources: Eurostat, Japan Statistical Yearbook 2004, BEA

General government payments for social protection include cash and in kind benefits as well as administration costs for sickness and disability, old age, survivors, family and children, unemployment, and housing. The large difference in social protection spending between the EU on the one hand and the US and Japan on the other hand cannot be attributed to a single subcategory. It is rather caused by the fact that the EU spent more than twice the share in GDP for every subcategory that the US did. This is illustrated by Figure 8 that relies on the OECD Social Public Expenditure Database.<sup>6</sup> In addition, a comparison with Japan reveals that the US does not spend an exceptionally little amount of GDP on social protection. Rather the EU as a whole seems to be exceptionally generous with regard to social protection.

Table 2 documents that the structure of public expenditures has changed over time, with increasing expenditure shares for social protection, health and old age care. This shift is more pronounced in the EU15 than in Japan and the US.

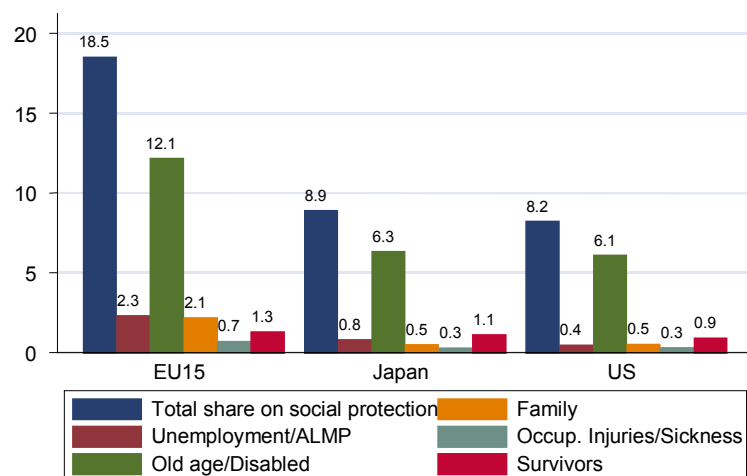
## 2.2.2 Tax revenues

Figure 9 depicts the structure of tax revenues (the tax mix) by source in 2001 in the EU15, Japan, and the US, breaking down total tax revenues into taxes on personal income,

<sup>6</sup> The OECD Social Expenditure Database covers only the time period 1980-1998. The update of the database will be released in the second quarter of 2004.

consumption, corporate income, property and other, and social security contributions. The tax mix differs remarkably between the EU15, Japan, and the US. Consumption taxes are the major

Figure 8: Public expenditure shares for subcategories of social protection as a % of GDP: EU15, Japan and US, in 1998



Sources: OECD SOCX, Eurostat

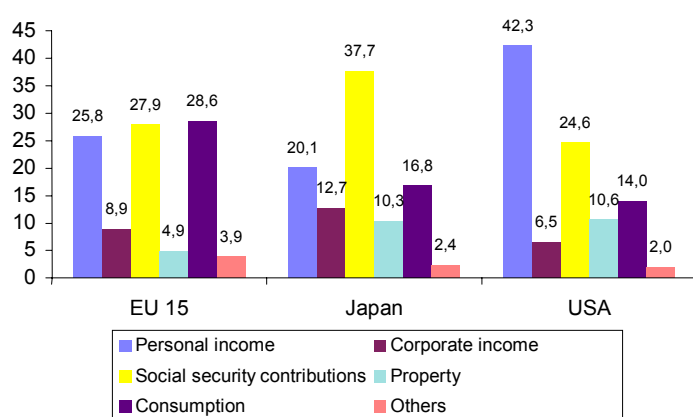
Table 2: Public social expenditure shares in GDP in the 1980s and 1990s

	Social Protection and Health		Social Protection		Health		Old age and Disabled		Unemployment and ALMP		Family and Children		Occup. Injuries and Sickness		Survivors	
	1980s	1990s	1980s	1990s	1980s	1990s	1980s	1990s	1980s	1990s	1980s	1990s	1980s	1990s	1980s	1990s
Austria	.	26.8	.	21.1	.	5.7	.	12.5	.	1.4	.	3.1	.	0.6	.	3.0
Belgium	26.1	25.2	20.0	18.6	6.0	6.6	8.8	8.5	4.5	4.0	2.7	2.3	1.3	0.9	3.1	2.6
Czech Rep.	.	18.8	.	12.6	.	6.2	.	7.9	.	0.3	.	.	.	.	.	0.9
Germany	20.8	25.8	14.7	18.3	6.1	7.5	9.9	11.3	1.7	2.8	1.7	2.2	0.7	0.8	0.7	0.5
Denmark	28.8	31.1	21.2	24.2	7.6	6.9	10.1	11.7	5.5	6.0	2.9	3.7	1.6	0.9	0.1	0.0
Spain	17.4	20.6	12.9	15.1	4.5	5.4	6.8	9.5	2.7	3.1	0.3	0.3	1.2	.	1.8	0.9
Finland	21.7	30.3	16.2	24.2	5.5	6.2	9.5	12.6	2.1	4.8	2.4	3.8	0.8	0.8	1.0	1.1
France	24.3	28.5	18.1	21.3	6.3	7.2	10.1	11.8	2.9	3.1	2.7	2.6	1.2	0.9	2.0	1.7
Greece	16.4	21.3	11.6	16.6	4.8	4.7	.	10.5	0.6	0.8	0.3	1.8	0.2	0.8	1.4	1.9
Ireland	19.1	18.9	13.3	13.8	5.8	5.2	5.4	4.6	4.6	3.9	1.4	1.8	1.8	1.0	1.4	1.1
Italy	20.8	24.8	15.3	18.9	5.6	5.9	10.2	13.9	.	.	1.0	0.9	0.8	.	2.1	2.6
Luxembourg	23.2	22.6	17.8	16.9	5.4	5.7	9.1	10.6	1.3	0.8	1.9	2.5	1.6	1.4	3.6	1.3
Netherlands	28.0	26.7	22.3	20.5	5.6	6.2	11.5	11.4	3.9	4.0	2.1	1.4	.	.	1.0	1.1
Poland	.	23.9	.	19.2	.	4.6	.	11.8	.	1.8	.	.	.	1.8	.	1.9
Portugal	12.6	16.6	9.2	12.0	3.4	4.7	6.5	7.6	0.7	1.5	0.8	1.0	.	.	0.9	1.2
Sweden	30.1	33.5	22.0	26.4	8.1	7.2	10.9	13.2	2.4	4.5	4.1	4.1	2.5	1.9	0.7	0.7
UK	20.2	25.0	15.2	19.4	5.0	5.6	7.2	12.7	2.1	1.3	2.3	2.3	0.4	0.3	1.6	1.0
EU15	21.8	25.9	16.1	19.3	5.7	6.6	9.2	11.8	1.9	2.5	1.9	2.0	1.0	0.8	1.5	1.3
US	13.2	14.8	9.1	9.1	4.1	5.7	6.0	6.1	0.7	0.6	0.6	0.6	0.3	0.3	1.0	0.9
Japan	11.0	12.7	6.3	7.5	4.7	5.2	3.9	5.2	0.5	0.5	0.4	0.4	0.3	0.3	1.0	1.0

Source: OECD SOCX.

revenue source in the EU15 (about 29% of total taxes), whereas they represent about 17% of total taxes in Japan and only 14% in the US. Nearly as important in the EU15 are social security contributions, amounting to almost 28% of total taxes. In Japan, social security contributions as well as taxes on corporate income have a significantly higher share in total taxes than in both the EU15 and the US. The US on the other hand relies heavily on taxes on personal income (42.3% of total taxes). Taxes on property are far more important in Japan and in the US than in the EU15.

Figure 9: Tax mix by source (as a % of total tax revenue) in the EU15, the US and Japan, 2001



Source: OECD (2003d)

Overall, there are considerable differences across countries concerning the size and composition of public sector activities. It is interesting to note that in the US the share of public employees in the labour force is about as high as in the EU15 as a whole and higher than in a number of individual EU member states. At the same time, the shares of US government expenditures and taxes in GDP are much lower than in the EU15. Within the EU, the range between countries with relatively large and relatively small governments is remarkable, caused primarily by the amount of social transfers distributed via the public sector.

### 3. Public sector performance

The data presented on the size and the structure of the supply of public goods and services in the preceding section do not contain any information on public sector performance or productivity. Thus, no conclusions can be drawn to what extent public sector activities directly contribute to an economy's overall productivity. After reviewing some of the measurement issues related to public services, the role of the size of government for public sector efficiency and for overall economic performance is analysed in this section.

#### 3.1 Measuring public sector performance

The conventional approach to measure productivity by relating outputs to inputs is often meaningless for the public sector, as data on output usually are not available and are therefore derived from input data.<sup>7</sup> The *value of non-market output* is traditionally approximated by adding up the production costs at current prices (minus revenues from market output, if there is any). To arrive at *non-market output in real terms*, the current year cost components (e.g. labour inputs) are deflated by the relevant inflation rate (e.g. wage inflation). Only for a few publicly provided goods and services, volume data in terms of the *number of units produced* are available.

A private service, being produced for the market, carries a price which reflects the buyers' valuation of the product.<sup>8</sup> Public services often are not produced for the market, but are offered for free at the point of use (e.g. certain health services) or provided at a subsidised price (e.g. many public transportation services). In this case market prices are not available as weights for aggregation, which makes it difficult to define an aggregate *output* in cases where a public entity offers a series of different services. It is much easier to value the *inputs*, because they are to a large extent valued by the market (e.g. intermediate inputs, wages of public employees).

The immanent problem of measuring public sector productivity is a lack of adequate information on the "market" value of government output, such as preparing laws, making policy decisions, or providing judiciary services. Measuring the value of *inputs* used in the production process of the public sector does not create problems over and above those to be met for the private sector. As for private sector activities, inputs can be approximated by the number of civil

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<sup>7</sup> One of the early researchers devoting extensive work on productivity measurement in the service sectors, was Griliches. See e.g. Griliches (1992).

servants involved or by hours worked for labour inputs, and by public sector investment outlays for capital inputs. Measuring public sector productivity then boils down to finding an appropriate measure of government *output*.

### **3.2 National output indicators**

It is not easy to determine what constitutes the output of government activities. The general notion could be that government consumption expenditures lead to activities changing inputs into outputs which are then consumed by users (Pritchard 2002). In practice, the construction of an output measure for a particular field of government activity would involve a number of steps (Baxter 2000): first, set up a list of all relevant activities in that field; second, find a volume measure to describe how the amount of work in that field is changing over time; and third, use weights that are proportional to nominal expenditure on the activities in a base year to produce an aggregate measure for the whole field.

By way of the ESA 95, the *European Commission* recommended the use of output indicator methods. Eurostat attempts to improve price and volume measures of non-market output, concentrating on the health, education and general administration branches of public services. At the *OECD*, the Statistics Directorate and the Public Management Directorate (PUMA) consider ways to advance on public sector output and productivity measurement (OECD, 1999). As a result of these attempts, it can be expected that the traditional input-based methods will eventually be abandoned.

National experience with the construction of productivity measures for the public sector is scarce and diverse. Some of the national activities are reported in OECD (1999) and in various national sources. Major examples are briefly presented below and are summarised in Table 3:

- *Australia*: Older output measures (based on the cost of inputs) are being replaced by genuine output indicators, e.g. for health, education, crime and justice, to be incorporated into national accounts.
- *Finland*: Starting in 1994, productivity of all general government agencies (except ministries) has been measured by output indicators which are to be incorporated into the national accounts (Lehtoranta and Niemi 1997).

Table 3: Examples of measuring government output

Government activity	Output Indicators	References
<b>Health services:</b>		
United Kingdom	Weighted indicator of 14 activities, based on number of times the service is provided (number of treatments). No quality adjustment yet. Weights: relative expenditure on each service.	Pritchard (2002)
<b>Education:</b>		
United Kingdom	Lessons given to a pupil: a class of 30 counts as twice as much output as a class of 15. Considers quality improvements of 0.25% p.a. (improved examination success)	Pritchard (2002)
Finland	Measuring cost efficiency in real terms at municipal level, including comprehensive schools, upper secondary schools, vocational institutes and community colleges, covering 99% of all educational services provided by municipalities.	Niemi (1998)
<b>Social security:</b>		
United Kingdom	Benefits payments: number of claims assessed and payments made to clients. Weights: relative cost of claim type in the base year.	Pritchard (2002)
<b>Personal social services:</b>		
United Kingdom	Elderly people in residential care, children in care: Number of activities performed for clients, weighted by net running costs in the base year.	Ashaye (2001), Pritchard (2002)
<b>Police:</b>		
United Kingdom	Main unit of output: clearing up a crime, shifting to violent crime.	Pritchard (2002)
<b>Prisons:</b>		
United Kingdom	Looking after a prisoner for a day. No adjustment for quality change.	Pritchard (2002)
<b>Justice - Other:</b>		
United Kingdom	<i>Legal aid</i> : classifies into 10 types, number of cases for each type. Weights are based on total expenditures (including outpayments) for each type (rather than administration costs which are not accessible). <i>Courts</i> : various types of cases, information available on number of cases, hours of administrative work, summons and warrants issued, and average cost of a case in base year.	Baxter (2000), Pritchard (2002)
<b>Fire:</b>		
United Kingdom	Fighting fires, fire prevention, special services: Number of attendances at fires and time spent on fire prevention duties. Weights: average staff hours spent on each type of incident.	Ashaye (2001), Pritchard (2002)

- *Sweden* applies an output indicator approach and the Data Envelopment Analysis.<sup>9</sup> Output indicators on health and education will be incorporated into Swedish national accounts.
- *United Kingdom*: Since 1986, the Office for National Statistics (ONS) has developed genuine output measures for education, health and social security. By 1998, they were incorporated into the national accounts for general government, accounting for 54% of total government consumption. In 2000 and 2001, the courts, prisons, agricultural intervention,

<sup>9</sup> Data Envelopment Analysis (DEA) and Free Disposable Hull (FDH) are widely-used non-parametric approaches to assess the extent of slack in government expenditure. Both methods are deterministic production frontier technique which allow the ranking of public sector entities by their apparent performances. In contrast to FDH, the underlying efficient production frontier under DEA is assumed to be convex, though it is not based on a particular functional form (the data determines the shape of the frontier). The "outer envelope" in the input-output plane is formed by those organisations that produce more than others with given inputs. Efficiency of a particular organisation is defined by its distance from the outer envelope of all organisations included in the sample. *Input efficiency scores* indicate how much less input a country could use to achieve the same level of output. *Output efficiency scores* show how much more output a country would be able to produce with the same inputs as currently employed.



fire, social services and the probation service were added, the total coverage reaching almost 70% of the potential (Pritchard 2002).

- *United States*: Performance indicators based on school tests are used by many State education authorities (e.g. California, Texas). Health and other public services are also evaluated with the help of performance indicators.
- *World Health Organisation*: A more recent application has been reported in WHO (2000) and critically evaluated by a scientific peer group on the methods employed. Another application has been the comparison of UK hospital trusts in Dawson et al.

### **3.3 Performance, productivity and efficiency**

There have been many attempts in the literature to come up with empirical estimates of public sector performance, productivity, and efficiency (see box 1). Given the diverging research intentions and the lack of harmonised data, the results of this research are to some extent anecdotal and hardly comparable. In particular, reliable and meaningful international comparisons are scarce. The relevant studies either deal with the relative performance of specific producing units (such as hospitals or local authorities), frequently using frontier analysis, or with broad sector aggregates (e.g. health, education, and administration), evaluating performance over time or across countries. Apart from that, governments often target their policies not at one single specific *output* (such as constructing a road) which can be measured directly, but more generally at multi-dimensional *outcomes* which cannot be determined for a specific point in time (such as improving transport services).

In an attempt to distinguish between performance and efficiency, Afonso, Schuknecht and Tanzi (2003) compute *public sector performance (PSP) indicators* as the aggregate over specific performances in individual areas of public activity, with performance depending on relevant economic and social variables. They also calculate *public sector efficiency (PSE) indicators*, defined as the relation of the PSP indicators to the amount of public expenditure concerning a specific activity. Although measurement problems may arise in the international comparison of spendings, as the definition of spending differs across countries, these indicators are viewed by the authors as the best available approximation to the lacking cross-country data on public service costs.

*Box 1: Performance, productivity, and efficiency*

The terms "productivity", "efficiency", and "performance" differ somewhat in their meanings, but are often used interchangeably:

- *Performance* describes the results of an activity in a specific area (e.g. number of children educated) or aggregated over several or all activity areas of a public body. Performance is measured either in absolute terms or (as an index) in relation to equivalent results of previous periods, other sectors or other countries.
- *Productivity* measures output in terms of units of input (e.g. output per persons employed or per hours worked); productivity differences then capture output differences that are not due to input differences.
- *Efficiency* measures the (quantity) results of a production process in terms of (nominal) resources employed. An efficient production process is one for which the production costs are minimised. Thus, an efficient organisation is one that produces a given output with the minimum amount of inputs. "Balanced scoreboards" or "data envelopment" are examples of efficiency indicators.

Total PSP indicators for 2000 do not differ much across countries, with high values achieved by Luxembourg, Japan and Norway, Austria and the Netherlands, and low values attained by Greece, Portugal, Italy and Spain. The total indicator for each country is composed of 7 sub-indicators with equal weights.<sup>10</sup> Countries with high specific sub-indicators include Switzerland (administration and infrastructure), Japan (education), Iceland (health), Austria (distribution), Norway (economic stability), and Luxembourg (economic performance).

A remarkable result is that Japan and the US perform better than the euro area (GDP-weighted average). Looking at the *changes of relative PSP* (compared with other countries) over the period 1990 to 2000, the euro area, the US, and Japan have all lost ground, while individual EU member states such as Ireland, Portugal and Greece have improved their efficiency scores.

The cross-country differences in PSE indicators are more pronounced: Japan, Switzerland, and Australia exhibit by far the best values for overall efficiency, while Italy, Sweden, France, and Belgium are at the other end of the scale.

To measure the input and output efficiency of public spending, or the relative "wastefulness" of government expenditures across countries, Afonso, Schuknecht and Tanzi employ an FDH analysis (see footnote 12 above). Public sector output is approximated by their PSP indicators,

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<sup>10</sup> Sensitivity analyses with moderate changes in the weights showed that the findings are relatively robust.

while input is measured by public spending as a percentage of GDP in 2000. As a result, the US, Japan and Luxembourg turn out to be the most efficient countries in the sample, followed by Australia, Ireland and Switzerland. Most of the EU countries lie well inside the production possibility frontier, implying that the same results could be achieved with much less input. This kind of inefficiency is particularly visible in Sweden, France, Germany and Italy.<sup>11</sup>

To round off this section, let us briefly present some of the results from a sectoral analysis of education and health activities of the public sector in selected OECD countries: Afonso and St.Aubyn (2004) employ FDH and DEA to estimate efficiency frontiers and compare the outcomes. With regard to *education*, they use (i) financial inputs in terms of annual expenditure in PPP terms on secondary education per student in 1999, and (ii) physical input indicators such as instruction hours per year in school in 2000, and teachers per 100 students in 2000; PISA survey data on the performance of 15-year-olds are used as output indicators. For all countries considered, the estimates result in average input efficiencies in terms of output that vary (depending on the estimation methods) between 0.52 and 0.89, which means that on average the same output could be achieved by using 11% to 48% less inputs than actually employed. The results obtained for individual countries differ according to the input definition (in terms of financial resources allocation versus measurement in physical terms). Sweden and Finland for example are efficient countries if inputs are measured in physical terms, but not in expenditure terms. This may reflect the fact that resources are comparatively expensive in these two countries. In contrast, Hungary, though not efficient in physical terms, is efficient in financial terms, as resources are rather inexpensive.

Similar results are obtained for the provision of *health care services*. Using alternatively (i) per capita health expenditures in PPP terms and (ii) the number of doctors, nurses and beds as inputs, and the infant survival rate or life expectancy as output indicators, the estimated input efficiency in terms of output across countries ranges from 0.74 to 0.96. Again, Sweden is a country positioned on the efficiency frontier only when inputs are physically measured. Because of rather inexpensive inputs, the Czech Republic and Poland are efficient in financial, but not efficient in physical terms. The authors caution that the efficiency scores achieved for both sectors may partly be attributable to country differences in population density and composition as well as in the mix of public and private funding, and not just to the inefficient use of resources.

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<sup>11</sup> Afonso et al. (2003) point at the limitations of their analysis as regards data availability and the use of non-parametric estimation techniques. Given the latter, it is not possible to statistically evaluate the differences in

### 3.4 The size and performance of the public sector

Since a society's decisions on the tasks to be carried out by the state not only bears on economic rationale, but also on political and historical grounds, the optimal size of government is not easy to determine by exclusively relying on economic theory or empirical evidence. Economic reasoning may meaningfully be applied, however, when the size is related to performance criteria.

We continue with Afonso, Schuknecht and Tanzi (2003), who investigate the association between size and performance of public sectors in 23 OECD countries, employing their aforementioned PSP and PSE indicators. An interesting result is that countries with *small governments* (public spending in the year 2000 below 40% of GDP) on balance achieved a *better economic performance* than countries with medium-sized governments (public spending between 40 and 50% of GDP) or with large governments (more than 50% of GDP). Small governments perform better in administration, stability and economic performance, while incomes are on average more evenly distributed under large governments. Small governments are on average significantly more efficient than large governments, particularly pronounced for indicators assessing (not the quality, but) the outcomes of interactions between public policies and the market concerning the allocation, distribution and stability functions of government ("Musgravian" indicators).

A priori, high public expenditures could be associated with a well-functioning government and a high quality of public goods and services. Therefore, a larger size of government in itself is not necessarily an indicator of inefficient or bad government. Of additional relevance is the structure of outlays, with high transfers, subsidies, and salaries for civil servants being regarded to necessitate high (and perhaps distorting) taxation (Barro 1991). Similarly, it is not clear whether high taxation is bad in any case. A society's consent could be to delegate more tasks to the government or invest more in the quality of institutions compared to other societies, implying comparatively high public expenditures and high taxes.

This is confirmed by La Porta et al. (1999). From their correlation analysis for various performance indicators they report that countries with larger governments are less corrupt, have fewer bureaucratic delays, better provision of public goods, but also higher tax rates; high taxes

are not necessarily a sign of an inferior government<sup>12</sup>; freer governments are larger, more efficient, they intervene less and provide better public goods. The most interesting result of these correlations is that, on average, *larger governments perform better* with respect to other performance indicators in the sample (including the quality of business regulation, bureaucratic delays, and infrastructure quality).

Altogether, there are conflicting empirical results concerning the relationship between government size and its performance. The discrepancies may partly be explained by differences in the country samples, the time period covered, and in the relations investigated. Afonso, Schuknecht and Tanzi (2003) look at OECD countries, while La Porta et al. (1999) include many developing countries. The size of government is perhaps too broad a concept to capture a unidirectional causal relationship with government performance. This leads us to consider, in the following section, the literature on direct measures to improve the performance of government per se.

### **3.5 Ways to improve the performance of government**

The pressure for improvements in public sector performance has mounted over time in order to limit tax financing, to improve the public's trust in government, and to contribute to overall productivity. In many countries this has led to reform movements with the aim of (a) limiting government essentially to the provision of public goods and services and (b) introducing new management concepts in the remaining public sector entities in order to adopt more customer-oriented attitudes, decentralise administration, deregulate unnecessary government intervention, liberalise previous natural monopolies, and privatise state-owned enterprises.

Reforms in public administration are the most obvious area to improve government performance. Main reform targets would be management practices, the budget process and the use of market mechanisms in the delivery of public services (Joumard et al., 2004). Comprehensive approaches pursued by the United Kingdom and some other countries in the 1970s and 1980s were followed by more limited, though targeted, reforms in continental Europe and the US. Most reforms were initiated in response to ever-increasing demands for public expenditures and to counter poor economic performance; they are clearly marked by country-specific forces (Knox 2002). Although individual reform packages may not solve all the problems in the public sector, governments should develop an understanding that permanent

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<sup>12</sup> The top tax rate is not significantly related to the variables on the security of property rights and the business regulation index.

reforms are necessary to keep up with the innovative developments in the private sector. Important directions of reform have been human resources management to improve incentives to civil servants, and outsourcing to service providers, although the latter has resulted in mixed experiences with radical outsourcing by developing countries. Securing fiscal stability over time and coping with implicit public debt calls for reforms to curb the built-in expenditure drivers while raising the cost effectiveness of public spending.

The most obvious area for an evaluation of public sector efficiency is *public management* which has traditionally been enshrined in a non-profit environment. It has long been argued that performance and customer orientation of public administration can be improved by introducing some commercial management practices. "New public management" (NPM)<sup>13</sup>, "total quality management" (TQM)<sup>14</sup>, and electronic government (e-Government) are popular concepts advancing in this direction. The goal of introducing market signals through techniques such as benchmarking and subcontracting with transparent tendering would usually be to improve the cost-efficiency of public services while responding to the citizens' needs in terms of better quality and a more diversified supply of public services.<sup>15</sup>

Up to the late 1980s, administrative reform policies were predominantly concerned with the relationship between citizens and government. Although this thrust has been retained in the NPM era, an equally important strand is now the efficiency and effectiveness of public management which has been pursued by the more common-law oriented countries as well as by international organisations. Some OECD countries have introduced explicitly defined objectives, incentive mechanisms to encourage results-oriented measures, and the evaluation of the outcomes.

Among the many important areas of potential reform is the *management of public personnel*: As already shown in section 2.1.1, the public sector is an important employer in EU countries, with ratios of government to total employment varying from some 10% to 30%. Human resources

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<sup>13</sup> NPM is devoted to the efficient production of quality service by the public sector. The term originated in New Zealand in the 1980s and addresses a management culture that focuses on citizens as well as on accountability for results. In its organisational choices it promotes well-defined targets, contract-like arrangements to provide performance incentives, and decentralised budgetary control through cost centres. NPM is not involved in the criticism of government duties per se.

<sup>14</sup> TQM was first developed for application in business enterprises, but was found a suitable tool also for improving the provision of public services. TQM is a "person-focused management system with the main target of continuously increasing customer satisfaction at the lowest possible cost" (Lindsay, Petrick, 1997: 20).

<sup>15</sup> In a case study concerning Britain's national mapping agency, Andreescu (2003) extends the analysis from NPM to a *post-NPM model*, which considers lateral rather than vertical modes of organisation (networking, partnership) and a public sector theory which lies in between the public and the private spheres.

management (wage differentiation, hiring and firing, promotion according to merits) in the public sector often differs substantially from that in the private sector. Improvements in the incentive structure are seen as a central device to enhance the performance of the public sector.

Another prominent area of reform is the introduction of *e-Government*, defined as "the use of information and communication technologies, and particularly the Internet, as a tool to achieve better government" (OECD, 2003c). Compared with traditional forms of communication between government and citizens, the main advantages of e-Government are improvements in information, the saving of time and the increase of the speed of response, the establishment of common standards across public agencies, and the elimination of redundant systems. Once the Internet-based system functions well, the quality of public services should improve significantly.

In the EU, e-Government is part of the eEurope 2005 Action Plan, which plays an important role in the context of the Lisbon strategy and aims at connecting the public administrations of member states to broadband by 2005. A Commission Communication identifies Sweden and Ireland as leading countries, and Germany and Belgium as serious laggards.<sup>16</sup> To improve the situation for the EU as a whole, the Commission proposes, inter alia, (a) to provide access to public services for all via multiple platforms (PC, TV, and mobile terminals), (b) to create new services via broadband development, (c) to establish electronic public procurement, (d) to develop pan-European services, and (e) to introduce one-stop-shop facilities for e-Government related activities of the EU.

The US government launched a massive programme in 2002, including facilities for disaster management, access to federal and state level benefit programmes, participation in the rule-making processes concerning small business, e-training courses, a job search engine, and electronic tax filing services.

In an international index comparison of e-Government readiness in 2004, the United Nations Online Network in Public Administration and Finance (UNPAN 2004) positioned the USA (with an index number of 0.913) well ahead of other countries, although within the EU Denmark (0.905), the UK (0.885) and Sweden (0.874) came close to the USA.<sup>17</sup> The world ranking in delivering public information and services through the Internet and the infrastructure

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<sup>16</sup> European Commission, "The role of eGovernment for Europe's future", COM(2003) 567, 29 September 2003.

<sup>17</sup> Another ranking, however, released online by the Economist Intelligence Unit (EIU) in April 2004, puts Denmark, the UK, Sweden, Norway and Finland in front of the USA.

needed to dispense them is led by North America (0.875), well ahead of Europe (0.587). The global world index stands at 0.413.

One of the directions taken by NPM reforms is outsourcing of the production of public services to private providers. Mukherjee and Wilkins (1999) report on the extensive creation of arms-length agencies and some of the problems to achieve the desired goals. In reviewing NPM-type reforms, Batley (1999) concludes that the effects of outsourcing have not exclusively been positive. Particularly in developing countries, radical outsourcing to service delivery agencies has resulted in transaction costs that outweigh the efficiency gains of unbundling. Extensive outsourcing of tasks to off-budget entities may also cause intransparencies of public budgets and the public sector as a whole; monitoring and controlling the development of overall employment, debt, and investment of the total public sector (i.e. governments and off-budget institutions taken together) may be made more difficult. Moreover, contingent liabilities may be produced if off-budget institutions are permitted to incur debt and governments are forced to act as "lenders of last resort".

Savoie (1995) goes a step further by claiming that NPM is a fundamentally flawed concept, as the complaints with bureaucracy have more to do with politicians than with civil servants and can therefore not be solved by introducing private sector management practices. As with many other controversies, the truth is likely to lie somewhere in between these positions. To keep up with the significant changes over the last decades in the environment for public service provision, public sector reform of some sort is unavoidable in any case.

In this context, the effectiveness of public spending deserves attention. To secure fiscal stability, governments need to keep their budgets roughly balanced over time. In many OECD countries, public debt is rather high and the potential for further tax increases rather low. At the same time, the pressure to increase public expenditures remains high, not only due to the demands made by interest groups, but also in the form of built-in expenditure drivers. The latter depend on exogenous influences and are often neglected in the budgetary process, such as ageing and its consequences for health and pension outlays. This calls for sustainable reforms to curb the growth in public spending while raising its cost-effectiveness.

Joumard et al. (2004) stress the importance of enhancing the efficiency of the *budget process* which involves the use of fiscal rules (tax, expenditure, budget balance or debt ceilings), extending the planning horizons, reducing budget fragmentation (into extra-budgetary funds and contingent liabilities) and focussing on public spending outcomes. Medium-term budget projections have already been introduced in many countries. In the EU, the "Stability



Programmes" for euro-zone countries and "Convergence Programmes" for other Member States serve that purpose.

One strand of the literature has claimed that *decentralisation* of government could improve on the effectiveness of public spending. However, there are pros and cons to this argument, so that the outcome of fiscal decentralisation is not clear-cut theoretically and empirically (Oates, 1993). On the positive side, decentralisation allows for taking into account local preferences, increases transparency of spending decisions and provides for competition between regions. It thus checks "Leviathan" behaviour and the associated ever-increasing size of government (Brennan and Buchanan, 1977). On the negative side, a decentralised provision of public goods and services tends to neglect national and supranational policy goals, spill-over effects between regions as well as economies of scale and scope. In this model, fiscal discipline is a matter of co-ordination, and tax competition between regions may lead to under-financing of core public spending. At the bottom line, it depends on the type of service provided and on the stage of its production (approving a legal act, designing and implementing policy measures) at which level of government an activity is optimally placed.

#### **4. Concluding remarks**

The economic performance of nations is shaped by private sector activities as well as by public policies. In most countries, the public sector accounts for a non-negligable part of the total economy. Based on several measures capturing the supply of public goods and services, though, the size and the structure of public sectors differ markedly across countries. When measured in terms of public employment, the government size in the EU is not much different from that in the US (with Japan trailing far behind the other two regions). In terms of the share of public expenditures (or taxes) in GDP, however, the public sector is much larger in the EU than both in the US and in Japan. The EU15 stands out because of its significantly larger share of expenditures for social protection and general public services.

Due to the sheer size of public sectors and their contribution to overall economic performance and productivity in industrial countries, it seems worthwhile to devote more research efforts to the development of performance indicators which would allow meaningful comparisons over time and countries. Such comparisons could be usefully employed to develop benchmarks for public sector reforms, the necessity of which is acknowledged in most industrial countries. They could also help disentangle the contributions made by the public and the private sector to

growth and productivity differences between Europe and the US and thereby assist policy makers in their endeavour to pursue the goals of the EU's Lisbon strategy.

From the scarcely available empirical literature it seems that public sectors in the euro area perform rather poorly on average. Production frontier analyses of government outputs and inputs reveal that the US and Japan are among the most efficient countries, while euro area member states in general lie well inside the production possibility frontier, implying that much less input would be required to achieve the same output. However, there are remarkable differences across European countries, some of which clearly outperform the US. There is no straightforward relationship between the size and the structure of government and its economic performance, although it seems that small governments are on average more efficient than large governments. This evidence must be assessed cautiously, however, as the size of government is not just related to efficiency, but also to the scope and quantity of services provided.

Because of the lasting pressure on governments to slash taxes, to improve the quality of services and at the same time to keep the budget balanced, reforms in public administration have been an obvious area to improve government performance. Although the instruments introduced in practice (such as New Public Management) may not solve all the problems in the public sector, permanent reforms are necessary to keep up with the innovative developments in the private sector. Important directions of reform have been human resources management to improve incentives to civil servants, and outsourcing to private service providers. Securing fiscal stability over time and coping with implicit public debts calls for reforms to curb the built-in expenditure drivers while raising the cost effectiveness of public spending. To improve the effectiveness of public spending, the budget process per se has been a target of reform in many countries, considering the introduction of fiscal rules, extending the planning horizon, reducing budget fragmentation and focussing on spending outcomes. Unfortunately, without adequate measures of public sector output, only very few and vague statements can be made. Comparisons of public sector productivity over time and countries are nearly impossible and policy recommendations to improve productivity are either common sense or speculative.

## References:

- Afonso, A., Schuknecht, L., Tanzi, V. (2003), "Public sector efficiency: An international comparison", European Central Bank. Working Paper 242, July. Forthcoming in *Public Choice*.
- Afonso, A. and St.Aubyn, M. (2004), "Non-parametric approaches to education and health expenditure efficiency in OECD countries", Technical University of Lisbon, Economics Working Paper 1/2004, January.
- Andresescu, F. (2003), "Post-New Public Management models? New templates and possible lessons from a commercialising British public sector organisation", University of Southampton, School of Management, Discussion Paper in Management, No. M03-13, July.
- Ashaye, T. (2001), "Recent developments in the measurement of general government output", *Economic Trends* 576, November, pp. 41-44.
- Barro, R. (1991), "Economic growth in a cross-section of countries", *Quarterly Journal of Economics* 106(2), pp. 407-443.
- Batley, R. (1999), "The role of government in adjusting economies: An overview of findings", International Development Department, University of Birmingham, Birmingham, Alabama.
- Baxter, M. (2000), "Developments in the measurement of general government output", *Economic Trends* 562, September, pp. 3-5.
- Blanchard, O. (2004), "The economic future of Europe", NBER Working Paper No. 10310, February.
- Boeri, T., Börsch-Supan, A., and Tabellini, G. (2001), "Would you like to shrink the welfare state? A survey of European citizens", *Economic Policy*, 32, pp. 9-50.
- Brennan, G., Buchanan, J.M. (1997), "Towards a tax constitution for Leviathan", *Journal of Public Economics*, 8(3), pp. 255-273.
- Dawson, D., Jacobs, R. and Street, A., "Comparing the efficiency of NHS hospital trusts", ([www.niesr.ac.uk/event/jacobs.pdf](http://www.niesr.ac.uk/event/jacobs.pdf)).
- Griliches, Z., ed. (1992), "Output measurement in the service sectors", National Bureau of Economic Research, Studies in Income and Wealth, Vol. 56, University of Chicago Press, Fall.
- Hall, R., Jones, C. (1999), "Why do some countries produce so much more output per worker than others?", *Quarterly Journal of Economics*, pp. 83-116.
- Handler, H., Knabe, A., Koebel, B., Schratzenstaller, M., and Wehke, S. (2005), "The impact of public budgets on overall productivity growth", Austrian Institute of Economic Research (WIFO), Working Paper, forthcoming.
- Jourard, I., Kongsrud, P.M., Nam, Y.S., Price, R. (2004), "Enhancing the cost effectiveness of public spending: Experience in OECD countries", OECD, Economics Department Working Papers, No. 380, Paris, 12 February.
- Knox, C. (2002), "Public service reform, Northern Ireland Executive", Review of Public Administration, Briefing Paper, 26 September (<http://www.rpani.gov.uk/reform.pdf>)
- La Porta, R., López-de-Silanes, F., Shleifer, A., Vishny, R. (1999), "The quality of government", *Journal of Law, Economics, and Organization* 15(1), Spring.
- Lehtoranta, O., Niemi, M. (1997), "Measuring public sector productivity in Finland: Progress report", Statistics Finland, March.
- Lindsay, W.M. and Petrick, J.A. (1997), "Total quality and organization development", Delray Beach, FL (St. Lucie Press).
- Mukherjee, R. and Wilkins, J.K. (1999), "Unbundling Bureaucracy through Agency Creation", Adjudicated paper presented at the IPAC National Conference, August 30, New Brunswick, Canada.
- Niemi, M. (1998), "Measuring government sector output and productivity in Finland – application of the output indicator method", OECD Meeting of National Accounts Experts, STD/NA(98)4, Paris, 22-25 September.
- Oates, W.E. (1993), "Fiscal decentralization and economic development", *National Tax Journal*, 46(2), pp. 237-243.
- OECD (1999), "Productivity measurement in the general government sector", PUMA/HRM/M(99)1, Public Management Committee, Paris, April.
- OECD (2003a), "Economic Outlook", No. 73, June.

- OECD (2003b), "Structural policies and growth", in: Economic Outlook, No. 73, Chapter V, June.
- OECD (2003c), "The e-Government imperative", Paris.
- OECD (2003d), "Revenue Statistics", Paris.
- Pritchard, A. (2002), "Measuring productivity change in the provision of public service", paper for the NIESR Conference on Productivity and Performance in the Provision of Public Services, London, 19 November.
- Savoie, D. (1995), "What Is Wrong with the New Public Management?", Canadian Public Administration 38(1), Spring, pp. 112-121.
- UNPAN (2004), "UN global e-government readiness report 2004: Towards access for opportunity", United Nations Online Network in Public Administration and Finance (UNPAN), New York.  
[<http://unpan1.un.org/intradoc/groups/public/documents/un/unpan019207.pdf>]
- WHO (2000), "The World Health Report 2000 – Health systems: Improving performance", World Health Organisation, Geneva ([www.who.int/health-systems-performance/whr2000.htm](http://www.who.int/health-systems-performance/whr2000.htm)).