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UNCOVERING THE
DIMENSIONS OF THE
COMMON GOOD –
PROBLEMS OF MEASUREMENT
OF THE SIZE OF THE
PUBLIC SECTOR*

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Abstract: There are problems in the measures of the size of the public sector both from the perspective of welfare state policies, monetary policy and the analysis of the economic role of public sector in general. In practice there are several different measures (e.g. total tax rate, total government expenditures /GDP, government value added/GDP, public consumption plus investments/ GDP). These give quite different values of the size of the government, and the ranking of countries in international comparisons changes depending on what measure is used.

In closer inspection it appears that very few indicators are internationally comparable. For example the meaning of the total tax rate differs depending on the tax system in a country. Some countries tax income transfers and some others do not. It is, therefore, not easy to get comparable information about the net financial burden of the welfare state.

In monetary policy the size of the public sector has become important because of the EMU criteria. The indebtedness of the government (debt/GDP) as an EMU criterion is defined on the basis of gross debt. Countries have, however, in different extent loan receivables. Therefore countries position with respect to EMU-criteria might change if net debt would be used as a measure of indebtedness.

The paper analyses the size of the public sector from several different perspectives. Since it is difficult to get a holistic idea about the size of the public sector, it is recommended that in the connection of national accounts a special satellite system should be developed in order to better serve different analytical purposes where the size of the public sector in the economy is needed.

Key words: the size of the public sector, the total tax rate, total public expenditures, value added of the government sector, public consumption, public investments, EMU-criteria, public assets and liabilities, public regulation, public-private partnership projects

Tiivistelmä: Julkisen sektorin koon mittaamisessa on puutteita sekä hyvinvointipolitiikan, rahapolitiikan että ylipäättänsä julkisen sektorin kansantaloudellisen roolin analysoinnin kannalta. Käytössä on useita eri mittareita. Näitä ovat mm. kokonaisveroaste ja julkisten menojen suhde kansantuotteeseen. Mittareina on usein myös julkisen sektorin arvonlisäys tai julkiset kulutus- ja investointimenot kansantuotteeseen suhteutettuna. Nämä mittarit antavat hyvin erilaisen kuvan julkisen sektorin suuruudesta. Myös maiden järjestys vaihtelee riippuen siitä mitä mittaria käytetään. Mittareiden lähempi tarkastelu osoittaa, että niiden välillä on tärkeitä käsitteellisiä eroja. Esimerkiksi kokonaisveroasteeseen vaikuttaa huomattavasti se verotetaanko tulonsiirtoja vai ei. Verojärjestelmien eroista johtuen tämäkään mittari ei ole erityisen luotettava kansainvälisissä vertailuissa.

Julkisen sektorin koko on tullut rahapolitiikassa tärkeäksi EMU kriteerien myötä. Julkinen velka ei saa olla yli 60 % suhteessa BKT:hen. Velka on määritelty kuitenkin bruttovelkana. Julkisen sektorin varallisuusasema riippuu viime kädessä kuitenkin mm. siitä, onko sillä myös lainasaatavia. Nettovelka olisikin eri maita oikeudenmukaisemmin kohteleva mittari. Kirjoituksessa tarkastellaan julkisen sektorin koon mittaamista useista eri näkökulmista. Johtopäätöksenä suositellaan erityistä satelliittitilien järjestelmän kehittämistä julkisen sektorin kansantaloudellisen rooli nykyistä selkeämmäksi määrittelyä.

Asiasanat: julkisen sektorin koko, veroaste, julkisen sektorin kokonaismenot, julkisen sektorin arvonlisäys, julkiset kulutus- ja investointimenot, julkinen sääntely, EMU-kriteerit, julkisen ja yksityisen sektorin yhteistyöhankkeet, ns. PPP-hankkeet

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1. Introduction

The core functions of the public sector are general organisation of society, legislation, defence and safety. The management of these duties has been organised through a political-administrative process into the public sector. The sector has also taken on many other duties outside these core functions diversely in different countries. The functions of the public sector change in the course of time even within the same country. Therefore, it is important to find out how large this sector is in our national economy.

In 2000, public expenditures in relation to GDP accounted, on average, for 46.4 per cent in the EU countries, the range being 32.6 to 57.7 per cent. The total tax rates varied between 31.1 and 54.2 per cent, the average being 41.6 per cent. Public consumption expenditures in relation to GDP fluctuated between 13.4 and 26.2 per cent, with 19.9 per cent being the average. Among all of these the figure was the lowest for Ireland and the highest for Sweden. Public investments in relation to GDP were the highest in Greece (4.1%) and the lowest in the United Kingdom (1.2%). On average, there were 74 public sector employees per 1,000 inhabitants in the EU countries in 2000, varying between 47 (Greece) and 152 (Denmark). (See Appended Table 1).

The indicators give a very divergent picture of the size of the public sector. This naturally leads to the question of how the size of the public sector should actually be measured. Is there some 'best' or 'right' indicator for the public sector size? What problems does this measurement involve? The purpose of this paper is to discuss this problem.

The following indicators are generally used for measuring the size of the public sector: total tax rate/GDP, total public expenditures/GDP, public sector value added/GDP, public consumption and investment expenditures/GDP, public sector employment as a proportion of total employment and transfers/GDP.

All these indicators describe the size of the public sector from the viewpoint of the current activity, that is, economic flows. In this case annual public expenditures, revenues and taxes are measured. It is also possible to view the public sector size from the point of wealth. Then the examination concerns economic stocks, public sector assets and liabilities and future obligations and problems related to their calculation. The wealth approach is useful particularly when assessing the sustainability of the public economy. For example, the EMU Stability and Growth Pact requires both approaches (the criteria set for public economy deficit and debt).

Technically, the indicators are expected to be reliable and comparable. Reliability means that what is meant to be measured is measured correctly. Comparability is

needed at least in three dimensions. Inside each national economy it is vital to obtain comparable information on different time periods because the functions and the role of the public sector change in society with time. We want to know what has happened to the size of the public sector with the passing of time.

Secondly, we want to compare the public sector sizes between different countries. The rank and order of countries in international comparisons changes when different indicators are taken in use. This reflects the fact that public sector structures differ substantially between different countries. The problem is to create comparability between differing systems.

An important point of comparison relates to comparing the mutual sizes of the public and private sectors. Certain services, such as health and education services, can be provided either through the public or private sector. We may be interested in knowing what share the public sector has in the total supply of these services in different countries and what effects these differences have.

The way the public sector is treated in national accounts (SNA, 1993, ESA, 1995) forms a conceptually coherent whole that lays a good foundation for measuring the size of the public sector. The accounting provides a consistent and in many cases evens a very detailed picture of the functioning of the public sector. However, from the viewpoint of measuring the public sector size, the present SNA (System of National Accounts) has shortcomings and problems.

In the literature, the shortcomings of the public sector size indicators have been examined separately from the perspectives of social expenditures, public sector financing and tax system (particularly of tax expenditures). The OECD has examined especially the comparability of social expenditures and tax expenditures. There are differences between public expenditures on cash basis and accrual basis. Particular interpretation difficulties arise from those public sector measures that do not generate public cash expenditures and are therefore not registered in budgets. These measures can, however, have significant economic effects. Examples of such off-budget measures are debt guarantees and economic regulatory measures.

Much literature can be found on the above-mentioned special questions, but there is less literature where different viewpoints are united from the point of size measurement. This paper aims to produce such an overall view.

This paper first examines the fundamental problems involved in size measurement. They relate to the definition of public sector institutions, the scope of public sector activities and the commodities produced by the sector.

The problems connected with the differences of tax systems and tax subsidies will be studied next. After this I will discuss the comparability of public expendi-

tures and measurement problems brought about by public regulation and other off-budget items. Towards the end of the paper the public sector size will be viewed from the point of wealth measurements.

This paper does not attempt to be comprehensive in handling this problem. My intention is not to present a manual on how the size of the public sector should be measured, but rather to raise points of discussion related to the issue. Some other writer might come to a very different conclusion on this theme.

2. What is the measurement of the size of the public sector needed for?

2.1. Needs of the economic policy and research

What is the size measurements of the public sector needed for? Measuring the size of the public sector is important with regard to the needs of both economic policy and research. In economic policy the key issues are those related to the dimensioning of the public sector, that is, questions connected with the tax rate and the level of public expenditures. The EMU sets framework conditions to the development of the public economy. On account of economic policy decisions, it is often necessary to compare the size and development of the public sector over time nationally as well as internationally.

The research relating to the public sector is interested in how the size of the public sector influences economic growth, income distribution and efficiency. This gives rise to at least the following needs.

- Measurement of the tax burden.
- What effects does the public sector size have on the growth of the economy?
- What effects does the size of the public sector have on economic fluctuations? Is a large public economy a stabilising factor for the national economy?
- In what way does the public sector size influence the productivity and efficiency of the national economy?
- How does the size of the public sector correlate with various social indicators describing the standard of living (e.g. life expectancy, health and literacy)?
- What is the connection between the public sector size and income distribution?

It would be easy to go on with this list of relevant questions. From the viewpoints of both research and decision-making we are interested in how the size of the public sector influences the development of the rest of the national economy and, on the other hand, how the development of the national economy influences the public sector size. The influence can thus go both ways. Interest may be directed to both the macroeconomic effects connected with economic growth and business fluctuations and to the microeconomic effects related to the efficiency of the national economy.

There is probably not much disagreement among economists as to whether the public sector has any significant effects on the national economy. Agreement diminishes, though, when it is looked more closely where the effects are the largest. In the golden age of Keynesianism weight was given to the macroeconomic effects of finance policy. Some recent studies have emphasised that the size of the public sector has really big efficiency effects but the macroeconomic effects and the benefits of the active fiscal policy are small. (See e.g. Lucas, 2003)¹. The high tax burden and the large public sector are often considered to slow down economic growth. The efficiency argument often voiced claims that when the tax rate raises, the volume of dead-weight losses of the national economy will grow faster than the tax rate. One study found that both small and large public sector sizes are connected to greater economic fluctuations than medium size (Koskela - Viren, 2003).

A wide array of research literature has searched for reasons for the growth of the public sector size. A popular hypothesis has been the behaviour of the so-called median voter. This is based on the idea that as a consequence of majority decisions, the size of the public sector corresponds to the preferences of the median voter in a democratic society. On the other hand, we have hypotheses on the supply of public commodities, such as the Baumol hypothesis. According to it, a slow growth of productivity is typical of public production. This is followed by a fast rise of relative prices in the public sector, which raises production costs and the size of the public sector. The traditional Wagner's law dating from the 19th century is a hypothesis based on the income elasticity of demand; the income elasticity of the commodities produced by the public sector is more than one, which leads to growth in its relative size. The most recent studies have focused on the level of decentralisation of public administration, budget discipline and budgetary procedures and several other political factors. Empirical research appears to support the Baumol thesis, while Wagner's law has gained only little endorsement (Holsey & Borcharding, 1997).

Several central economic theories are thus involved in the size of the public sector. For testing the research hypotheses it is, of course, important that the public sector size has been measured in a relevant and comparable manner with regard to the hypothesis. Comparison problems concern both comparison of data between various countries and comparison between different time periods. Standardisation and comparability of statistical measurements are thus vital. Science cannot advance if measuring is not made properly.

¹ According to Lucas, the steady public sector has stabilised the macroeconomic fluctuations since the Second World War. He considers, however, that an active balancing of additional fluctuation produces only very few welfare benefits. Instead, the dead-weight losses caused by taxation are great and thus the public sector has significant allocation effects.

2.2. What units are used for measuring size?

Size is not an unambiguous quantity but it can comprise several different dimensions. People's size can be measured in terms of height and weight. Both are measures of size but together they give a fuller picture. Capacity, density and so on can also be included in the measurement.

The size of the public sector can also be measured in different dimensions. In principle, the measuring units can be money, employment or welfare.

Economic quantities are usually measured as monetary quantities. Size can then be the ratio of public expenditures to GDP, for example. But should the bases of size measurements be public revenues or expenditures? Which are the relevant expenditure and revenue concepts? To what degree are the public sector's internal business activities netted? Monetary indicators involve several comparability problems, which will be discussed later in this paper.

Besides monetary indicators, the public sector size can also be viewed from the point of labour input. In that case it is calculated how many people work in the public sector, which is then compared with the labour force in the whole national economy. But what is thought of the fact that public current transfers are used to finance those working in the private sector? For example, several private non-profit organisations employ part of their staff with the help of public subsidies. The condition for the subsidy can also be that these organisations perform functions assigned to them by the public sector. In this case, to take account only of the labour force working in the public sector can give a very biased picture of the scope of public sector activities.

We are naturally also interested in examining the public sector from the point of welfare. Welfare is often described by means of various social indicators. What is the connection between the public sector size and welfare? Besides objective indicators, use of qualitative indicators is also feasible. Such could be, for example, people's opinions about the size of the public sector. In the following, we will mainly focus on monetary indicators. Employment and social indicators can, however, be useful in supplementing monetary measurements.

Nevertheless, we will soon come to the conclusion that it is not easy to present a single indicator for the size of the public sector. The purpose of measuring comes to the picture almost at once: from what perspective do we want to measure the public sector size? Therefore, we must first decide on the most relevant measuring method for our current set of questions.

3. Public sector institutions, activities and commodities

3.1. Public sector as an institution

In measuring the size of the public sector, we have to start from the definition of the sector itself. This concerns the definition of the institutional sector in the present national accounts. Is there something to be desired in this respect?

The public sector covers organisations related to the administration and organisation of society. In a democratic society the functioning of the public sector is based on the authority obtained in elections to organise the matters of society by virtue of law.² The public sector is thus a fundamental organisation from the point of the functioning and organising of society. The public sector also has a unique feature: it has a statutory right to collect taxes for financing its activities.

In practice, the public sector is comprised of very different organisations of various levels. It covers central administration and lower level regional and local administrative structures. It also includes supranational functions, which are relevant in the EU, for instance. In the SNA compulsory social security funds are also included in general government. In practice, there can be funds in other sections of the public sector as well. Only some public administrative units have legislative power. A considerable part of public sector organisations exist for the execution of laws and government policy.

The SNA (1993) separates central government, state government, local government and social security funds these form the concept of general government. In these respects the definitions should be in order.

In contrast, supranational administration is not a sub-sector of general government. But should supranational functions be considered when defining the size of the public sector? To what extent do EU functions have supranational features and should this be taken into account and in what way? One example of these is payments and customs duties paid to the EU or other supranational bodies. The OECD presents these in separate tables in its tax statistics. Payments to the EU are not regarded as taxes but payments to an international organisation. On the other hand, the EU has limited budgetary and legislative powers. This goes beyond the conventional nation-state concept. Should this portion be omitted from the nation-state's public sector? As with the deepening integration, the role of

² The public sector can in principle be defined in non-democratic societies as well. The basic functions of the public sector are similar in all societies that are organised in some way. This matter needs not be discussed any further in this connection.

supranational or joint EU decision-making is gaining more emphasis, this matter should also be discussed clearly in the definitions of the public sector.

Besides social security funds, other public sector activities are often organised in the form of funds. Such can be funds established for public financing of investments into housing production and agriculture, for instance. For international comparability, it is relevant how the finances of these funds are calculated into total public expenditures. Comparability of public sector expenditures is not realised if in one country public housing loans are entered into expenditures gross and in another country, where funds are used, only the fund surplus or deficit (difference of loans granted and repaid) is recorded in total public expenditures.

The broad public sector also comprises public enterprises and public corporations. In the present SNA these activities are included in non-financial and financial corporations. It is relevant to include public enterprises when examining the public sector size. Otherwise the description of the national economic role of the public sector would be incomplete.

3.2 The scope of public sector activities

In addition to the definition of public sector organisations, another important basic definition is related to the definition of public sector economic activities. To form an optimally comprehensive picture of the size of the public sector, we need a concept covering the whole scope of the activities. There our starting point should be the question: for what matters is the public sector responsible in society?

Economics literature discusses in length the bases of public sector activities. Economic arguments for public activities concern the incompleteness or nonexistence of markets. These shortcomings are due to natural and other monopoly situations, imperfectness or asymmetry of information, or they are connected to the characteristics of the commodities produced by the public sector.³

In practice, various political and non-political factors have an effect on the public sector size and its scope of activities. Political factors reflect people's different preferences and selections. Non-political factors are rather of technical nature, related to the quality attributes of commodities or the functioning and nature of markets.

³ Stiglitz (2002,p. 350) points out '...it is now recognized that market failures are pervasive – markets do not result in (constrained) Pareto efficient outcomes whenever markets are incomplete or information is imperfect, that is, always...Such a wide compass for intervention provides insufficient guidance to what government should do.'

According to Pigou (1947), the size of the public sector can be viewed from two different angles. First, the use of resources in the public sector's own production can be examined. These are so-called exhaustive expenditures. They are expenditures that are absent from the other uses of the national economy. They concern the public sector's own production, whether collective or private services or investments.

In addition to exhaustive expenditures, Pigou claims that the public sector transfers resources from one national economy sector to another. These are transfers that have no effect on the size of the national income. They are redistributive expenditures of resources and, according to this view; they do not influence the size of the public sector.⁴

Public sector activities can thus be described from two viewpoints: 1) the public sector as a producer (direct use of resources in the public sector), and 2) public sector as a redistributor of income and wealth. From the producer viewpoint, the correct way to measure the public sector size would be to examine jointly the value added of the public sector, that is, public production, unemployment and public consumption and investment expenditures. From the viewpoint of redistribution, the relevant indicator is transfers.

Pigou's approach did not, however, consider the fact that the public sector also issues several decrees concerning the private sector in the form of laws and norms, which influence the allocation of economic resources in society. This activity can be called public regulation and it can take on a wide variety of forms. Various regulatory measures have significant economic effects. In measuring the size of the public sector it can thus also be considered whether public sector regulatory measures should be included in the examination. I will return to this question in Section 6.

⁴ We may comment here that this view is not exactly accurate. Public transfers have a two-way effect on the real economy. First, according to the theory, public taxes and transfers cause dead-weight losses in the national economy. As a result of transfers, the real level of national product thus changes. The magnitude of the change is in turn dependent on how large these dead-weight losses are. On the other hand, it is known on the basis of the theory that the dead-weight losses of, say, taxation do not grow linearly. If the dead-weight losses grow by the square of tax base, for example, they grow quite strongly with the growth of tax basis. Transfers also have an effect on the supply of labour and capital (saving) and these effects also change the size of the national income.

As is well known, there is no simple way of measuring dead-weight losses and the supply effects of labour. Thus at the operational level it is apparently not possible to include these measures in the calculation of the size of the public sector.

In addition to production, current transfers and regulation, in recent year's public and private sector co-operation has become more common. In this co-operation the public sector acts as an organiser or a commissioner (public provision), but not necessarily as a producer. These are called public-private partnership projects (ppp projects). The government wants to carry out some project or programme but does not necessarily produce it, or finance it. The conventional concept of the public sector is thus extended from production and current transfers to organising of and taking responsibility for matters (public provision). Because of this, should the concept of the public sector activity be renewed in statistics? Public provision covers all conventional public expenditures but in addition, the examination also includes the projects commissioned by the public sector but implemented and financed by the private sector. Public provision offers a broad view on the role of the public sector in society. But what could this mean in practice/operationally in the definition of public activity?

Analogous cases with ppp projects relate to social insurance. These appear when the compulsory pension insurance required by legislation is organised in the form of private social insurance. According to the current practice, compulsory social insurance belongs to the broad concept of the public sector and they are also included when defining the EMU criteria. With regard to the tax rate, it can be relevant whether the difference between payments and benefits is to be considered as taxes.

3.3. About the special characteristics of commodities produced by the public sector

The public sector produces commodities that have specific characteristics which often correct the incompleteness of markets. Such are: public goods⁵, club goods, externalities and merit goods.

Public or collective goods are such in nature that their production inevitably benefits all citizens and from the use of which no citizens can be excluded. A typical example usually given in this connection is national defence. Due to the free rider characteristics related to collective commodities, it is often considered that the public sector must itself produce these services. This is not, however, always the case. A country may have a hired army but the public sector is in charge of setting up such an army. The SNA identifies collective commodities (the concept 'public goods' in economic theory, SNA, 1993, paras 9.43, 9.92 by the concept 'collective consumption services'). According to the SNA, non-profit

⁵ It may be noted that a term public good is well established in economic literature. In statistical terminology however, we differentiate between goods and services, which taken together are commodities. In fact most of the public goods are services and therefore collective services are in this terminology collective commodities, not goods.

private institutions can also produce collective services but for the sake of simplicity, the entire production of the sector is treated as individual consumption.

Club commodities (Cornes and Sandler, 1996) are commodities that share the above characteristics of collective commodities but serve only a limited group of people. These may be connected to local government activities, for example. In fact, many non-profit sector commodities may be such club commodities by nature. At present, these commodities are difficult to identify from national accounts.

Externalities (Cornes and Sandler, 1996) are economic effects – advantages or disadvantages – that producers or consumers directly generate to other economic actors by their activity outside the market mechanism. A typical example can be environmental pollution caused by an enterprise. In such cases one reason for the effects may be deficient ownership rights in the commodity markets. An example involving a private person could be smoking by some person that causes lung cancer to his or her room-mate as well. According to Pigou (1960), the public sector size becomes too small because the positive externalities produced by it cannot be taken into account in budgets. Externalities are interesting but their measurement has usually proved quite difficult.

Merit commodities are such where it is considered that the person concerned cannot self reliably assess the need for a commodity, or his or her preferences are in some way inadequate, and therefore society must be in charge of producing these commodities (Musgrave, 1959). These commodities may be such as free school meals, free education and many health care-related commodities. Markets produce such commodities but insufficiently, in the decision makers' estimation. It can be thought that citizens do not know what is best for them and therefore the government must intervene in these markets. This can also be justified from the viewpoint of asymmetrical information. For example, in case of an illness the patient and the physician have a very divergent knowledge basis for treating the illness and thus it must be ensured that the required treatment is given.

Inadequacy of preferences is not, however, unquestionably the basis for producing merit commodities. This same phenomenon can be explained by the view of the public-choice school through various interests in the society. This school of thought claims that teachers, for example, want to have more education services as they will thus get employed better and the growing demand for teachers will also increase their pay. There is no indisputable way to separate all the factors influencing the size of the public sector.

In practice, the public sector thus produces many private commodities in addition to collective services. Similarly, the private sector can produce collective commodities besides private commodities. Discovering these 'product mixes' and their economic role is relevant for the development of public sector structures but

it can also help to understand the development of the public sector size in different countries.⁶

⁶ As is well known, in Sweden the role of public health care and education services is much larger than in the U.S. But when public and private health care and education services are added together, their ratio to GDP is almost equal to that in Sweden.

4. Problems connected with the total tax rate indicator

The gross tax rate is a very commonly used indicator of the public sector size. It shows how large the total tax returns are in relation to GDP. This indicator is often referred to in economic policy debate.

The indicator, however, includes characteristics that render it not directly comparable between different countries. These are due to differences in the taxation structure. Therefore we need to examine the following topics: taxation of current transfers, public sector internal taxes, and current transfers, taxes between different administrative levels, current transfers and tax subsidies. A good source describing the differences in the tax systems of diverse countries is Messere (1993).

Taxation of current transfers

A significant item influencing the gross tax rate is the taxation of current transfers. In some countries the current transfers paid by the public sector are exempt from tax, in some countries taxes are paid on them. Tax exemption or taxability of current transfers has an effect on the comparability of the tax rate between different countries. For example, in some countries unemployment benefits are exempt from tax, while in some other countries direct taxes and social security contributions are paid on them. Then a comparison of the gross benefits gives a distorted picture of the real level of unemployment security.

In addition to taxes and social security contributions levied on current transfers, taxation also influences the amount of social expenditures according to whether indirect taxes are paid on social security services or to what degree the tax system includes social benefits (tax benefits or tax expenditures) granted through taxation. The indicators developed for measuring net social costs measure how much governments actually channel funds into net public social expenditures and what part of the national product the recipients of social benefits actually receive (net total social expenditure). To account for this difference, gross and net social expenditures over GDP have been calculated in the field of social security in OECD countries. About the methodology of calculation of net social expenditures and its development, see Adema, 1997 and Adema, 2001.

Indirect taxes also influence how social security expenditures benefit the recipients. Thus, the OECD framework also takes account of the portion of private consumption expenditures going to indirect taxation. The reason for this is as follows. If in country A the value added tax percentage on private consumption is 10, this country has to pay a gross benefit of around EUR 111 to the recipient to get a net benefit of EUR 100. Similarly, in country B with a value added tax per-

centage of 20 the gross benefit has to be EUR 125 to attain a net benefit of EUR 100.⁷

The influence of taxation on net social benefits is illustrated by the figures calculated by the OECD in 1997 (See Appended Table 1). The difference between gross and net benefits varies by country from 2 to 9 percentage points to GDP. The difference is particularly large in the Nordic countries of Denmark, Sweden and Finland.

Another advantage with net social benefit calculations is that this framework allows comparison with compulsory, statutory private social expenditures and voluntary private social expenditures. When private expenditures on social security are taken into consideration, the United States, for example, comes close to many European countries.

Calculation of net public social expenditures produces problems. The methods used for this vary. For example, in the United Kingdom social benefits and household-specific and individual-specific micro simulation models containing taxation have been used in calculations. Then again, calculations have also been made utilising the average tax rates.

Taxes of regional local government, public sector reforms and volume of services

International comparability of tax statistics is also considered to suffer from the differing ways of collecting local taxes: 1) tax revenues are collected entirely at the level of central government, 2) both by local and central governments, or 3) computationally by dividing the central government taxes to various tax recipients.

In many countries the taxation and state subsidy systems between local government and central government have been reformed strongly (Stoker, 1997). Then the service standard provided by local government may also have changed. This may arouse discussion on whether the service standard has fallen in the course of time.

It is conceivable that the reforms have increased the efficiency of local government and thus the service standard has not necessarily gone through similar changes as financing of local government has. In order to resolve this matter, measuring the volume of public services comes into question. Volume measurements could be used to account for the development of the volume and quality of the public services over time. As is well known, measuring the production of the

⁷ In comparison of net benefits, account should, of course, ultimately also be taken of the purchasing-power-parity of the benefit, which depends on the local price level.

public sector is a difficult task. This issue cannot, however, be pursued any further in this connection. The SNA (1993, paras 16.133-141), however, recommends volume measurements on the outputs of health care, social welfare and education services. This recommendation is highly desirable.

Public sector internal taxes

This issue has to do with how indirect taxes included in the public sector's internal business transactions, such as value added taxes, should be taken into consideration when defining the size of the public sector. In international comparisons differences may be caused by dissimilar tax practices of these transactions.

Taxes, payments and consumer fees and excesses are alternative ways of financing public expenditures. Their differing roles and use in different countries may also cause problems in international tax rate comparisons.

Cash and accrual based transactions

The magnitudes of both annual tax revenues and public expenditures are influenced by whether transactions are registered on cash basis, i.e. when they are actually paid, or on accrual basis, i.e. when the obligation for paying the tax or expense is produced. The OECD has decided to adopt accrual-based statistics in its statistics production, although empirical studies show the differences between cash and accrual-based taxes to be small.

Production of cash-based and accrual-based statistics is significant mainly for short-term examinations where the differences can be even substantial. Then again, it is apparent that the differences have not much of significance for the long-term development of the public sector size.

Cash vs. accrual basis is also relevant on the expenditure side. This is especially important in the calculation of public assets and liabilities, which will be considered in section 7.

Tax subsidies

Possibly the most important difference in international comparisons of the tax burden is due to the extent a country uses tax subsidies (or tax expenditures) as part of the tax structure. Tax subsidies are subsidies paid through the tax system. For the object of taxation tax subsidies are either tax exemptions, deductions from the tax basis or taxes, tax credits or tax rate concessions, such as lower tax scales for certain purposes or postponement/suspension of tax payment.

A country using numerous tax subsidies in comparison to a country using direct subsidies can in principle have a considerably lower tax rate than the comparison country, although in both countries the effects can be quite similar.

Tax subsidies were taken into account in the OECD's calculations of net social subsidies. It should be noted, however, that a large amount of tax subsidies is also used for the promotion of business. These will be discussed later in this paper in connection with public expenditures when referring to financial support to industries.

Certain technical problems are involved in the measurement of tax subsidies. They require selection of the so-called normal tax system or the norm tax system. Deviations from this are either tax subsidies or sanctions (i.e. tax expenditures or tax sanctions). Problems may be caused by that first it is difficult to agree whether it is a question of a tax subsidy replacing some direct expenditure or of a characteristic closely related to the tax system. Second, measurement problems arise because tax expenditures cannot be directly observed. Therefore various methods have been developed for their measurement, which may produce divergent results.⁸

In 1995 the OECD examined the budgeting systems of tax subsidies in 14 countries. Opinions differ as to whether tax subsidies can be added together. As mere current transfers give an erroneous picture of the government support, taking account of tax subsidies may nevertheless provide a better, though not a wholly accurate image of the amount of the subsidy.

In Finland tax subsidies have been calculated regularly for many years. Their effects are considerable when converted into monetary measures. It is also typical that tax expenditures are allocated to specific sections of the public sector. These are particularly in use in the fields of housing, environmental policy and social security. In Finland more than one half of tax subsidies go to these areas. The situation may, of course, be different in other countries.⁹

⁸ There are three principal ways to measure tax expenditures: 1. Revenues foregone. This is the amount by which tax revenue is reduced by a particular provision. 2. Revenue gain. This is the amount of expected revenue in case the provision is abolished. 3. Outlay equivalence approach. This is the amount of direct expenditure that would be required to compensate the abolishment of a particular tax provision. Some of these methods require assumptions concerning the behaviour of the taxpayer in different situations, and therefore calculations may not be accurate. There are several methodological issues involved, which are not possible to pursue here.

⁹ The objective of Denmark's tax subsidy study for 1993 to 1998 was to examine tax subsidies together with direct subsidies and predict future tax subsidies. The norm tax system of tax subsidies was based on the concept of the comprehensive income tax base. Tax subsidies were calculated by the method of lost tax revenues and the income equivalence method. In Denmark tax subsidies caused by depreciation in business taxation were not included in the calculations. However, tax subsidies in business taxation (business development, etc.) were the highest ones, around 60 per cent, of all tax subsidies. Tax subsidies are presented as percentages of GDP, and they were calculated by a detailed macroeconomic model.

5. Questions related to measurement of total public expenditures

The comparability of public expenditures is good in many respects due to the recommendations of the SNA and ESA. There are, however, some entities that cause bias or distortions to measurements. Examples of these are the financial support granted by the public sector to enterprises and other sectors, treatment of business activities and funds, ppp projects and other possible off-budget projects.

Public financial support

The public sector often acts as a financier of business activities or housing production. Public financing often includes some support element. This may be comprised of long loan periods, years of grace, reduced interest rates and public warranties and guarantees. Some of these measures are not shown as cash expenditures and thus they are not included in budgets and in monetary indicators of the public sector size.

To attain comparability, financial support should be calculated by utilising a harmonising method. Several methods have been developed for calculating the support elements of financial support. Some of them examine the matter from the viewpoint of the public economy. Alternatively, the measurement can be made from the point of the recipient. These indicators do not necessarily yield the same end result. In this connection it is not necessary to go any further into the measurement techniques of the financial support element.

Public sector internal rents

Over the past few years, a government real estate company has been established in Finland, which has the right to collect rents on buildings owned by the state. If such a building previously housed a government agency, it did not pay any rent, but nowadays it has to budget and pay a rent. This raises the public sector expenditure level. These expenditures are, however, public sector internal transfers and as such they should not have any direct impact on the size of the public sector. Therefore they should not be visible as growth in the public sector size either. There may be long-term effects if the agencies try to save in rent expenditures because of having to pay a rent. This may take place by moving into smaller or less expensive premises. This efficiency effect is difficult to observe in practice, however. There may also be other types of “double accounting”. For example, in the Finnish central government budget various organisations record pension contributions as their expenditures, and the ministry of finance includes state pensions as its expenditures. There is double counting since most of the pensions are financed from these pension contributions on pay-as-you-go basis.

Public enterprises

The public sector also practises for-profit operations in various enterprise forms. The motives for public enterprises can, however, differ much from those of private business enterprises. These can be such as employment reasons, acquisition of revenue (fiscal monopolies), and imperfectness of markets or acquisition of investment revenue for the public sector.

Public sector enterprise forms can be government enterprises, public companies and public investments in private securities, which can cover both portfolio and direct investments.

Public companies are not included in general government and therefore it is not easy to examine them by means of national accounts. In principle, we may be interested in adding this portion to the scope of the public sector. It may be particularly interesting to find out the total amount of public investment activity, which covers both portfolio investments and direct, permanent investments. Separation of these is not in practice easy and it can often be unclear for which purpose the government has made the investment in the end.

The public sector also has fiscal monopolies, where the purpose is to produce revenue for financing public expenditures. These ought to be discussed in connection with taxation.

Public – private partnership projects

Although the public sector is in charge of a certain matter, it need not necessarily produce it. The government can, for example, commission some infrastructure project, such as a road, from the private sector. In partnership projects the implementation of the investment is given to the private sector. In them the public sector transforms investment expenses into current expenses. This takes place so that the public sector pays annual usage charges afterwards to the private sector. These payments are based e.g. on the usage volumes of the investment, in the case of road the annual charges can be based on traffic volumes. The important financial question is who carries the risk incurred by the investments, whether it will remain with the public sector or be transferred to the private sector.

If the project is also financed by the private sector, the measure is not visible in the public budget as expenditures and revenues even if the activity was directly caused by a public sector decision. Often these projects involve an agreement that the government will at least partly reimburse the private sector for the costs of the investment. The size of the public sector grows later through these payments. If the investment is partly financed by user charges, the investment as a whole will not even then be included in the public sector budget.

Through public compensations, the project will become part of the public sector in the course of time and at least in this way it will enlarge the public sector. In the flow examination the public sector size grows only later when the investment starts to produce services. According to the conventional implementation method, when the public sector itself makes an investment, the size of the public sector increases already at the implementation stage. I will return to this question again in connection with the wealth examination.

These partnership projects mainly change the time profile of the public sector size. Public investments first fall (because they are made by the private sector) but later public expenditures grow when the public sector starts paying compensations back to the private sector. It may well happen, though, that investment expenditures and compensations do not correspond to one another and the public sector size will also change as a result.

6. Public regulation

In the past few decades there has been a strong increase of regulations in the developed countries. These mainly concern the environment, health and safety. Regulations usually take the form of public sector norms. The norms oblige economists to take up certain measures. Execution of the norms has direct economic effects, but they are visible partly, only indirectly, or not at all in public budgets. Regulations can be used as alternative instruments for taxes, expenditures or subsidies (e.g. the environmental tax can be replaced by an order). Then again, the need for regulations has at times been seen to grow after privatisation measures as well. In the private sector the economic effects of regulatory norms are visible in prices and costs but they are not generally connected to the size of the public sector.

Positive regulatory measures aim to improve the welfare of consumers. Restrictions to competition are, in turn, estimated to cause welfare losses to consumers. Therefore e.g. the EU's internal market programme intends to remove competitive restrictions and thus improve consumers' welfare. A significant area of regulation is world trade restrictions, of which the most significant are restrictions to agricultural trade. These quantitative restrictions raise costs and prices, thus causing welfare losses to consumers. Producers can then receive regulatory rents.

The effects of regulations have been measured in examinations related to border protection of agriculture (OECD). The OECD has also studied the economic effects of harmful regulations and deregulation of markets. The studies show that if the regulation is left unquantified, a considerable part of public sector economic effects will be neglected.

Measuring the effects of regulations is a very complicated task and no uniformly accepted standard methodology has yet been created. This does not, however, eliminate the fact that it would be useful to develop a common measurement methodology for this field, in the same way as for tax expenditures. This would make it possible to include the effects of regulations in a logical manner in the measuring of the public sector size.

The focus areas of public activity may change with time between public sector expenditures and regulation. This occurs in connection with the deregulation of markets, for example. There is thus a distinct need to develop indicators describing policy changes in the course of time between direct budgetary activities and regulatory measures. If they were measured, our conception of the public sector development might change. Or alternatively: without these measurements our conception of the role of the public sector would become biased.

7. The size of the public sector from the viewpoint of national wealth

The public sector size can also be examined from the perspective of national wealth. This introduces important new viewpoints. First, economic studies have raised the question of how productive the capital of the public sector is. Public sector investments are mainly infrastructure investments whose allocation to certain consumers and entrepreneurs is difficult. For example, road investments benefit both travels to work, free-time consumption and the transport needs of businesses. Public investments indirectly improve the productivity of the private sector. This view should be taken into account when examining public investments. Therefore, measuring of public capital in an appropriate manner is important.

Second, public debt is a significant norm for the European Economic and Monetary Union. Therefore, it is vital that public debt is measured correctly for the EMU criteria and that it also offers a relevant indicator from the point of management of monetary policy.

The third important policy approach is related to the ageing of the population and the related preparedness for public pension and care service expenditures. These can be thought as future obligations that should be taken into consideration appropriately when estimating the sustainability of the public economy in the longer term.

In the field of environmental policy there are also long-term obligations that can be significant for the long-term sustainability of the public sector. A concrete example of this is the Kyoto Protocol. In all, considering the above-mentioned needs, it can be said that the wealth examination of the public sector has increased its economic policy relevance.

Loans receivable taken into account

Public debt and changes in it have assumed an important role in the EMU, which has restrictions both for public economy deficit and debt. Interestingly, the public EMU debt is defined as gross debt. In many countries the public sector can also have loans receivable, however. Net liabilities can thus differ significantly from gross liabilities. If public sectors in different countries differ much as to their wealth operations, this means that the present debt concept may handle different countries in a very different way.

Calculation of net liabilities is not without problems either. By its nature, public lending is often so-called soft credits. This means that they can include a subven-

tion element of some degree. This subvention element can comprise of favourable loan periods, years of grace, reduced interest rates, guarantees or possible remission of part of the debt when certain conditions are met.

The above-mentioned subvention element must be estimated to establish the public sector's net wealth position. For example, it was estimated in Finland about ten years ago that the public sector loans receivable included nearly one third of the soft subvention element. A separate survey would be needed to study the situation in the other EMU countries.

Commitments directed to the future

In addition to public debt, other public sector legal commitments are directed to the future. The most important of these are the pension commitments discussed above. In principle, all the public sector law-bound commitments are such. Their definition is not that easy, however. They can be quantified by means of generation accounts. Generation accounts provide a comprehensive dynamic viewpoint on the future of the public sector. This can be used as a kind of comparison basis when making forecasts for the future of the public sector. A good review of generation accounts in the EU countries is given in the publication *European Economy*.

Are partnership obligations public debt?

Partnership agreements between the public and private sector were discussed above. Do they generate public debt?

We noted above that projects have an effect on the size of the public sector only when the government starts paying for the projects carried out by the private sector. This can happen even much after the project has been started. In principle, the public sector commits itself in the project agreement to these compensations and cannot denounce them even later. Therefore such an agreement is analogous with debt. It can be with reason stated that partnerships are compulsory obligations directed to the future, which should in fact be treated as public debt.

8. Summary and conclusions

Three basic dimensions have to be taken into consideration in measuring the size of the public sector. The first is the institutional definition of the public sector. Second, the various public sector activities that have economic effects have to be taken into account. Third, the commodities produced by the public sector and their characteristics are to be examined.

The definition of the general government does not produce any major problems. If public enterprises are to be combined with general government, definitional problems may appear as to when an enterprise is considered public and how the functions made purely as financial investments are taken into consideration. In principle, it is also interesting how the supranational public sector (EU) is viewed when defining the size of the national public sector.

The functions of the public sector are diverse and their definition and measuring method influence the size measurements of the public sector size in an essential way. The scope of the public sector activity comprises the following elements:

- Direct public expenditures. These are consumption and investment expenditures, current transfers and subsidies and public debt management.
- Taxation. Tax practices can be different in different countries. One important question is the taxation of public current transfers. In some countries they are exempt from tax and in some subject to tax. The effect on the tax rate can be considerable. Tax subsidies are various public sector measures implemented in the tax system as tax concessions for specific purposes that decrease the revenue from taxes and the tax rate. These factors produce significant changes in the tax rates of different countries.
- In place of taxes the public sector can use the enterprises it owns to finance some measures. This is a fiscal monopoly that has a surplus in prices which can be entered as income in the public coffer.
- Public financial support. This is used to lower private sector financial costs from what they would become through competition on the loan markets.
- The public sector obligation to the private sector regarding some measure, such as collecting of social security contributions for the financing of certain social security benefits.
- In the so-called partnership projects of the private and public sectors the private sector carries out and finances some project for which the public sector later pays certain compensation. Thus the obligation directed to the future arises. The public sector will not at first experience any costs for the projects but the expenditures incur only later.

- Pensions and other public sector long-term future commitments can be regarded as similar future-oriented obligations. This essentially involves the question of whether the measurements are to be made on cash flow basis or commitment basis. In some cases the difference between these can be considerable.
- Treatment of future commitments also influences the total wealth and debt of the public sector.
- The public sector's regulatory measures do not necessarily cause any direct budgetary effects but their economic significance can be quite large. The purpose of regulatory norms is to attain some social policy objective of the public sector, but the costs accrued by their execution can be mainly directed to the private sector.

It would be desirable that these elements of the scope of public activity could be measured by uniform grounds. This would, however, require development and standardisation of the present measurement methodology.

The commodities produced by the public sector are collective ones that can be national or regional (club commodities) and private services (e.g. education and health care services). These can be specified operationally. In contrast, measurement of externalities is difficult. Classification of the commodities produced by the public sector as merit commodities would require information about the bases of decision-making.

The key problems for the measurement of the public sector size are due to the differing tax system structures. The main problems are whether the government uses direct expenditures or tax subsidies for attaining its objectives and for public current transfers subject to tax or exempt from tax. For these reasons the total tax rates are not directly comparable between different countries.

Expenditure structures can also differ considerably from one another. For example, the Nordic Countries have virtually free health care and education services, while the majority of these services are produced by the private sector in the United States, for example. In such cases it is often advisable to present both the private and public expenditure components at the same time.

When examining expenditures it should be noted that there are several off-budget expense items that produce monetary obligations to the private or public sector, but that do not cause public cash expenditures and are therefore left outside budgets. These are included in public financial support, for instance.

The pension system also involves future commitments that are not necessarily registered in the budget. Usually they are included only if pensions are consolidated and separate pension security payments are collected on them. These, too, can be below the profit margin, that is, the systems are only partly consolidating.

Considering the development of the age structure of the population, the registration method of pension expenditure now has a greater economic significance than before.

The accounting treatment of the commitments created in public and private sector partnership projects can have effects both on the time profile of the public sector and on the amount of public debt. The effects of public sector regulatory measures can primarily be directed to private sector costs and prices, whereby they are not seen as being occasioned by public sector measures.

Although the SNA provides a good foundation for measuring the size of the public sector, there are some purposes that the standardised national economic accounts do not quite satisfy. Our analysis shows that the 'best' indicator of the public sector size cannot be found easily. Different indicators describe different things. Thus it is vital that the user is informed what the differing indicators actually reveal. The public sector is a multi-dimensional and multi-activity entity, for which reason even for describing its size several dimensions and measurement methods are needed to obtain a correct and reliable view of the role of this important sector in the national economy. This also raises the question of whether the accounting system should be developed and combined to a satellite system concerning the size and scope of the public sector. The satellite systems are handled in the SNA and they are recommended for various purposes (SNA, 1993, paras 21.1. – 186).

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Table 1.

Indicators of the size of the public sector in the year 2000

	1 Total tax rate %/GDP	2 Public expendi- tures %/GDP	3 Public consump- tion ex- penditures %/GDP	4 Public invest- ment %/GDP	5 Value added of the general govern- ment %/GDP	6 Employ- ment in public sector per popula- tion of 1000	7 Gross social expendi- tures %/GDP	8 Net social expendi- tures %/GDP
Ireland	31,1	32,6	13,4	3,8	8,6	50	19,6	17,1
Portugal	34,5	44,3	20,3	3,8	16,8	84		
Spain	35,2	39,8	17,4	3,2	11,9	51		
Great Brit- ain	37,4	36,9	18,8	1,2	8,1	84	23,8	21,6
Greece	37,8	48,3	15,4	4,1	12,0	47		
Germany	37,9	48,4	19,0	1,9	9,6	54	29,2	27,0
The Nether- lands	41,4	45,4	22,7	3,2	11,9	47		
Luxembourg	41,7	40,3	16,2	4,0	10,8	63		
Italy	42,0	46,9	18,2	2,4	12,5	60	29,4	24,1
Austria	43,7	52,8	19,4	1,7	12,1	71	28,5	23,4
France	45,3	52,9	23,3	3,0	16,1	98		
Belgium	45,6	49,5	21,2	1,8	12,9	69	30,4	26,3
FINLAND	46,8	48,6	20,6	2,6	15,6	108	33,3	24,8
Denmark	48,8	54,1	25,1	1,7	19,0	152	35,9	26,7
Sweden	54,2	57,7	26,2	2,5	19,0	150	35,7	28,5
EU-15	41,6	46,4	19,9	2,3	13,1	74		

Sources: Col. 1: OECD Revenue Statistics, table A
Col. 2-4: European Commission / Statistical Annex of European Economy / Spring 2002
Col. 5: OECD National Accounts of OECD Countries Volume II (2002), tables 1 & 12
Col. 6: OECD, OLIS-database
Col. 7-8: DAFPE/CFA/WP2 (2001) 11, these are 1998 figures

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