

MEASURING PUBLIC SECTOR PRODUCTIVITY IN FINLAND

PROGRESS REPORT

by

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1. INTRODUCTION - DEVELOPING PRODUCTIVITY STATISTICS FOR THE PUBLIC SECTOR

In 1993, the Economic Council in Finland launched the National Productivity Programme. The project on measuring public sector productivity undertaken by Statistics Finland is one of the ten productivity projects included in this Programme. The project started in 1995.

The aim of the project is to develop a measurement and follow-up system for the government sector productivity. The work comprises the collection of the basic data needed for productivity measurement as well as the development of measurement methods. In addition, the objective of the project is to develop alternative volume measures for public services to be incorporated into national accounts.

In 1996, the main task was to carry out a tentative measurement by which the applicability and adequacy of input and output data for productivity measurement purposes were assessed. So far productivity measures have only been compiled for the central government sector. The first productivity measures for local government will be compiled this year.

This paper outlines the progress of productivity measurement in public services in Finland. Section 2 deals with different productivity measures for the government sector. Section 3 deals with the first experimental productivity measures for central government and section 4 draws some conclusions and proposes further issues to be considered.

2. MEASURING PUBLIC SECTOR PRODUCTIVITY - SOME GENERAL IDEAS

In recent years several productivity studies of public services have been carried out in Finland. These studies focus attention on some special service functions. As yet, due to insufficient basic data, there exist no comprehensive and uniform statistics on public sector productivity in Finland.

Productivity can be measured in a number of ways. The interpretation of productivity growth is greatly dependent on the way productivity is measured. Public sector productivity is most often measured as labour productivity. In addition to labour productivity also multifactor productivity should be measured. The major problem in the interpretation of single factor productivity is that it attributes all increases in efficiency to one factor, even though the increased production may have been partly or even totally due to changes in other factors.

The key issue in productivity measurement of the public services is how to define and measure final output. Productivity is commonly measured as the ratio of the value of output to the value or quantity of inputs. In public services the output is usually measured as gross output and valued at the prices of a fixed base year. Inputs are commonly measured as their total costs in real terms or as the number of employee years.

As public services do not usually have market prices the value of output has been estimated by total costs incurred in the production. The measurement of output by input based measures leads to the case where productivity will approximately be one and productivity growth zero. This approach used in the national accounts does not really describe productivity. When measuring output by input based measures, productivity measures are inadequate and meaningless. However, like SNA93 says, changes in productivity may occur in all fields of production, including the production of non-market services.

In non-market services output has to be measured in physical terms so that changes in output can be separated from changes in inputs. This presumes that all services are measurable and all final products and

output indicators are clearly and consistently defined. It also presumes that all essential quality changes in final products can be tracked and taken into account.

In the project of Statistics Finland the central and local government services are treated separately. This is partly a consequence of their different nature. Improving output measures for central government is perhaps a longer-lasting process than improving output measures for local government. The central government services, most of which are collective services, are very diversified. Consequently, the output indicators of the central government have to be specified by each agency itself - they cannot be specified by the statistical agency. Nevertheless, the development process derives benefit from co-operation between the statistical agency and the respondents. This is the work we have paid special attention to. For example, we send each organisation an annual feedback report including the data they have provided and the productivity indices compiled on the basis of this data.

For productivity measures of the local government the data on municipalities' activities and economy are annually collected by Statistics Finland (Statistics on Municipalities' Economy and Activities). The first steps concerning the municipalities will concentrate on assessing the existing data - their applicability and adequacy for productivity measurement purposes.

3. THE FIRST PRODUCTIVITY MEASURES FOR CENTRAL GOVERNMENT IN 1996

Measurement issues

In the project the productivity measurement for central government services proceeds from the micro level to the macro level. At first, input and output indices are compiled for each unit. Because of the diversity of services each bureau, agency or other organisation is treated separately. Examples of the units included in productivity measurement are given in the appendix.

Although the input and output data are defined and measured by each unit, they are considered in the productivity statistics from a more comprehensive and uniform angle. The method used in the output aggregation at the micro level is the same for each unit: Törnqvist indices are used to aggregate the growth rates of final products in each unit.

Törnqvist output indices make comparisons between two time periods. They add up the growth rates of the final products between these periods. The weights used in the annually-chained Törnqvist indices are based on the cost or work time shares of the final products. In fact, the weights of the final products should be measured as their value shares. In public services this is not possible due to the lack of market prices. For this reason input based weights are utilised in weighting final products.

In general, public organisations produce plenty of different services and it is impossible to add them up in physical terms. By using Törnqvist indices the growth rates of different quantities can be combined. Another advantage of using chained Törnqvist indices is that changing weights allow the output mix (or "output quality") to change from period to period.

Labour productivity for each unit is measured as the ratio of output changes to the changes in the number of hours worked or the number of employee years depending on what measure the units use for their labour input. Total productivity has been approximated by cost efficiency in real terms and it is measured as the ratio of output changes to the changes in labour costs and other expenditures (excluding capital costs) in real prices. Labour costs have not been adjusted for the change in the labour composition ("labour quality").

Inquiry for input and output data

Statistics Finland collects input and output data from the government sector annually. Productivity measures for the public sector are also compiled annually. Data are collected in spring and results are given to units for their own use in autumn. In 1996, the inquiry was sent to 128 government units. The target set was composed of all central government agencies except ministries. The contents of the questionnaire are shown in the appendix.

The objective is to measure those services actually received by external customers, i.e. customers outside the organisation. The services taken into account should be final products in their nature and they should cover the final output of each organisation as widely as possible.

According to the inquiry the output measurement and the follow-up systems for the final products have advanced quite well up to the present. One reason for this advance is the fact that all agencies had to adopt a result-oriented administration in 1995 at the latest. The measurement of performance including the measurement of final products is an essential part of the result-oriented administration.

However, there are some deficiencies and weaknesses in final product specifications in some agencies. These agencies have not yet defined all their output indicators and at the moment they measure only a part of their total output. In these cases the change of the immeasurable part of the output was kept as zero when compiling the output index. In some cases several indicators can be used as a final product measure. In these cases the statistical agency has to decide, in co-operation with the respondents, which indicators would best describe their final products.

The main problem in compiling output indices is the lack of information on the weights of the final products. At the agency level output may be composed of one to ten or even more different final products. The cost or work time shares for these final products cannot at the moment be compiled by all agencies. However, administration's information systems have clearly improved and the data needed in productivity measurement will largely be available in the near future.

Results

The first tentative productivity measures were compiled for about half of the target units (n=128 units). The annual change in labour productivity was compiled for the year 1995. The summary of these measures includes results for 48 units. Only units having enough information on their products and output shares as well as inputs were included in the summary. These units covered about 38 per cent of the wage and social security expenditures in central government in 1995.

The results indicate that the growth rates of output and productivity vary a lot between different government agencies (see Figures 1 and 2). The range of variation in labour productivity is from 68 to 133 and in total productivity from 70 to 128. The variation of output indices is shown in Table 1 and the variation in the input usage in Table 2.

Table 1. **Statistical measures of output indices in 1995 (1994=100)**

	The value of output index
Minimum	64,9
Maximum	133
Median	102,0
Standard Deviation	14,4
N=number of units	48

The labour input indices between two periods are based on sums of hours worked or on the number of employee years in each unit. The total input usage (excluding capital) is measured by expenditures at fixed prices and the total input index is compiled as the ratio of real expenditures between years 1994 and 1995.

Table 2. **Statistical measures of input indices in 1995 (1994=100)**

	The value of labour input index	The value of total input index
Minimum	66,3	79
Maximum	127,2	136,2
Median	100,0	100,3
Standard Deviation	8,9	9,8
N=number of units	48	46

What do these results tell about productivity growth in the central government in general?

Aggregated productivity growth can be compiled by weighting the growth rates of each unit by their shares of wage and social security expenditures compiled in the national accounts. According to the first results, the weighted average of the growth in labour productivity in the 48 agencies under consideration was about 3 per cent in 1995. The weighted average of the total productivity growth was weakly negative.

At the unit level the factors affecting productivity can usually be found. However, the change in productivity and factors affecting it cannot be evaluated on the basis of these first results. A reliable evaluation will need a longer time period than two years.

Figure 1. The values of labour productivity indices in central government agencies in 1995
(1994=100)

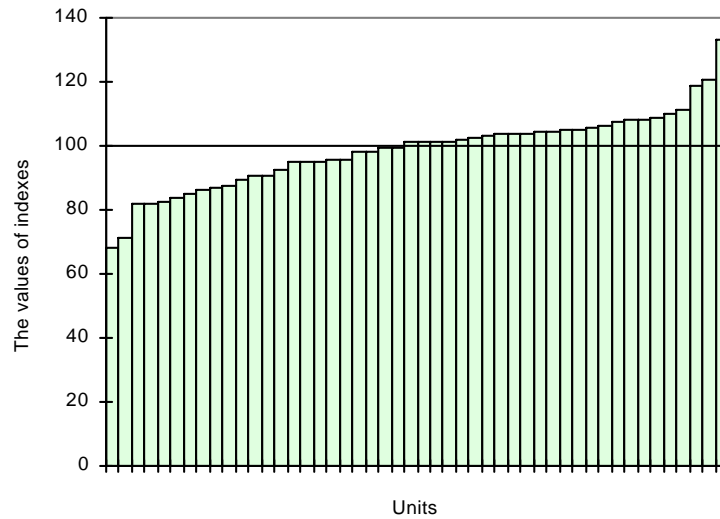
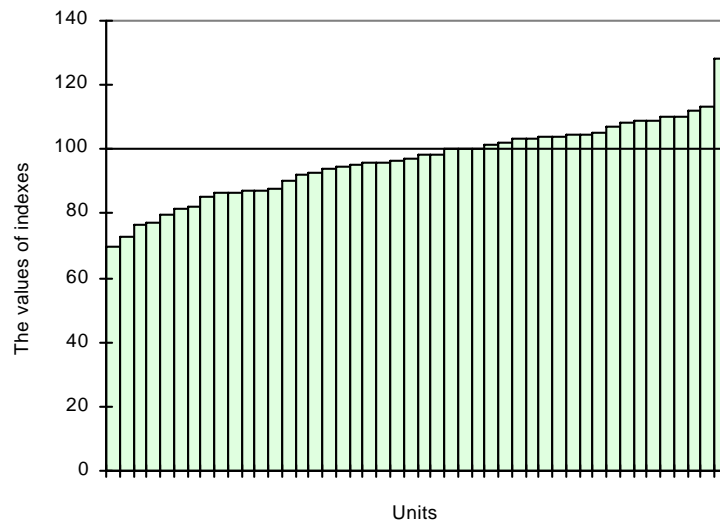


Figure 2. The values of total productivity indices in central government agencies in 1995
(1994=100)



4. CONCLUSIONS AND FURTHER ISSUES

The objective of the first tentative productivity measures on central government described in this progress report was to study the adequacy and applicability of input and output data obtainable for productivity measurement purposes.

Even though the first productivity measures indicated deficiencies in input and output data, the data supply is getting better at the same time as the information and bookkeeping systems in the government sector are developing. The coverage of productivity measurement is expanding together with the amount of data.

Of special importance is the finding that collective services can be measured - at least to some extent - by using suitable quantity indicators for these services and by continuously assessing the adequacy and applicability of these indicators, as in the case of individual services.

It is easy to realise that there are many issues to be worked on. First of all the input and output data produced by the agencies have to be improved further. Quality monitoring is also an issue worth considering. The following issues, among other things, should be considered in the project intending to measure public sector productivity:

- improving output measurement, clarifying the final products of services
- developing quantitative output indicators for services which are not easy to measure
- improving input measurement, widening the coverage of inputs to include capital inputs
- widening the coverage of measurement to include all public subsectors
- adjusting output by intra government flows
- assessing different approaches and index number methods
- analysing productivity growth; identifying factors affecting productivity and the public sector in general
- monitoring quality and structural changes
- adjusting output and input quantities with some quality indicators.

**EXAMPLES OF THE UNITS OF THE STATE ADMINISTRATION IN PUBLIC SECTOR
PRODUCTIVITY STATISTICS 1996**

Consumer Complaint Board,
Courts such as Supreme Court and Water Rights Appeal Court and Labour Court,
Data Protection Board,
Finnish National Road Administration,
Finnish Tourist Board,
Frontier Guard,
Forest Research Institute,
General Headquarters,
Government Institute for Economic Research,
Housing Fund of Finland,
Institute for Radiation Protection,
Marine Research Institute,
Meteorological Institute,
National Board of Navigation,
National Board of Patents and Registration,
National Consumer Administration,
National Consumer Research Centre,
National Food Administration,
National Research and Development Centre for Welfare and Health,
Office of Free Competition,
Population Register Centre,
Prison System,
Research Centre for the National Languages,
State Audit Office,
State Technical Research Centre,
State Treasury,
Statistics Finland,
Tax Administration,
Technology Development Centre,
Universities

THE CONTENTS OF THE QUESTIONNAIRE FOR DATA COLLECTION

OUTPUT

1. The way by which the shares of final products (the groups of final products) are defined
 - cost shares,
 - income shares,
 - working time shares or
 - some other ... which.

2. The final products (the groups of final products) and the units by which they are measured
The quantities of final products in 1994 and 1995.
The shares of final products in 1994 and 1995.

INPUTS

3. The quantity of labour input in 1994 and 1995.
4. Gross expenditures in 1994 and 1995 without investments, transfers and construction.