

Output and Productivity Measurement in Education

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Background 1)

- In Norway, as in many other countries there has been (and still is) discussions related to productivity growth in non-market production
- 1996-2001: A large project for Municipality – State – Reporting (named KOSTRA) was launched and finalised
 - All types of economic indicators as well as indicators on the municipalities' priorities, productivity, and coverage of needs

Indicators for primary and upper secondary education (examples)

<i>Domain</i>	<i>Types of indicators/statistics</i>
Resources	Operating expenditures (gross, net and adjusted)
Activities and services	Number of pupils and full time equivalents
Unit costs and productivity	Operating expenditures per pupil or full time equivalent, wages and salaries per pupil or full time equivalent

Background 2)

- 2005/2006: Ministry of government administration and reform asked Statistics Norway to develop a system of indicators in order to analyze **results from and productivity of central government activity**, including higher education

Indicators for higher education

<i>Domain</i>	<i>Types of indicators/statistics</i>
Resources	Costs, investments and personnel statistics
Activities and services	Number of students
Results	Students with educational points, total number of points, average points per student, passed degrees, publication points
Unit costs and productivity	Costs and employees per educational point, unadjusted and adjusted for cost differentials
Related indicators	Applicants per number of admitted students, Level of education in the population

Background 3)

- In 2001, Eurostat issued the *Handbook in price and volume measures in national accounts*
- Direct output measures for educational (and health) services implemented in the Norwegian national accounts in 2005, starting from the reference year 2003
- 95 per cent of education services are supplied by non-market producers, **mainly by local government**
- Education expenditures account for about $\frac{1}{4}$ of total government final consumption expenditures
- Education amounts to 5 per cent of GDP

Challenges

- All services produced should be specified and measured
- The services should be measured in volume terms
- Weights for aggregation purposes
- Quality adjustments

Definition of output

- The *Handbook* defines education output as
“The quantity of teaching (that is, the transfer of knowledge, successfully or not) received by the students”.
- It suggests that this output can be measured by number of hours that pupils or students spend at being taught, so called pupil-hours.

Education industries, education services and corresponding volume index (government sector)

Industry	Product	Volume index
Local government education services	Primary education	Pupil hours in ordinary and special schools – weighted by gross operating expenditure from year t-1
	Upper secondary education	Full year equivalent number of pupils stratified by education programs (3 general studies, 9 vocational) – weighted by gross operating expenditure from year t-1
	Adult education	Number of students and participants in primary and upper secondary education – weighted by gross operating expenditure from year t-1
Central government education services	Primary education	Pupil hours in ordinary and special schools – assumed the same cost weight as for local government primary education
	Upper secondary education	Number of pupils (only two schools)
	Higher education	Number of students in colleges, university colleges, institutes of arts and universities – weighted by operating expenditure from year t-1. Universities are in addition stratified by groups of faculties having different unit costs.

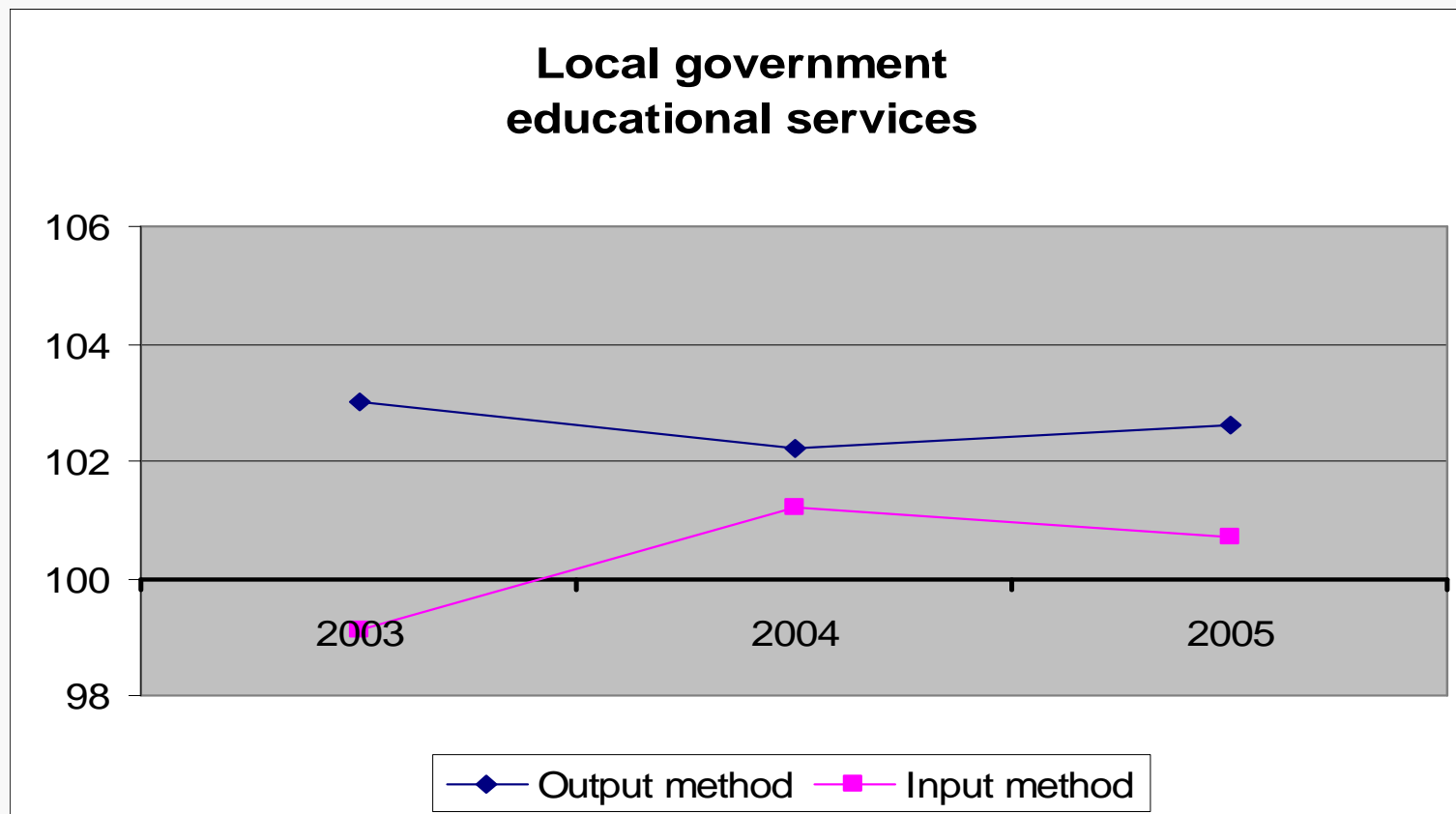
Quality adjustments

- No specific adjustments for quality changes but
- detailed stratification of the educational institutions, especially in medium and higher level of education
- The unit price differentials are believed to express that the activities are different in different strata,
 - it is not clear to what extent this difference is due to quality differences
- **In addition**, questionable whether output is well measured by the indicator ‘number of students’ for Universities etc
 - For example, we believe that the result of an R&D activity should be included in the activity list (plan to improve this in the future)

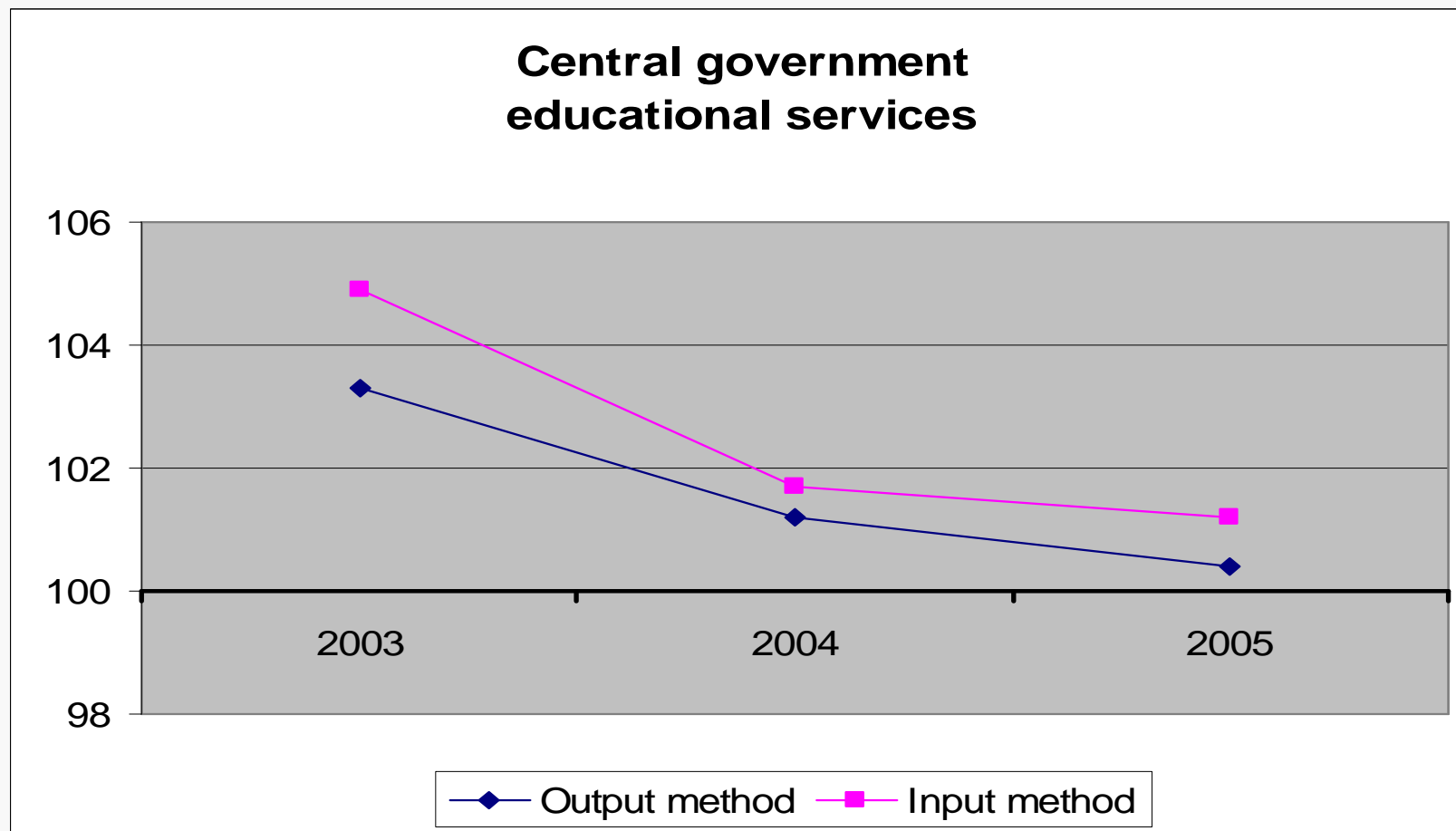


RESULTS

Volume growth rates; comparison of output method approach and input method for **local government educational services**. Previous year=100



Volume growth rates; comparison of output method approach and input method for **central government educational services**. Previous year=100



Productivity - definition

Productivity = Outputs / Inputs

Productivity (labour) = Outputs / Hours worked

Using this last definition, productivity growth in education

Productivity (labour) growth in education, local and civil government. Per cent change from the previous year.

