

A new approach to education PPPs in the Eurostat/OECD exercise

OECD Meeting on PPPs for Non-European Countries,
27 – 29 April 2009
Eurostat



Background

- Theoretical preference for methods measuring output
- Output approach gradually implemented in NA
 - Education output defined as *“the quantity of teaching received by students, adjusted to allow for the quality of the services provided, for each type of education”*
- Dissatisfaction with the input cost approach
 - Theoretical weaknesses
 - Implausible results
- User demand for more reliable volume indicators below the level of the main aggregates

Background

- Eurostat-OECD Task Force on the treatment of non-market services in the ECP
 - Operative 2006-2007
 - Broad mandate
- Proposed improvements to the input cost approach for health and collective services
 - No major change in methodology
 - Some minor modifications implemented as of 2007
- Proposed an entirely new approach to education PPPs
 - Reviewed and welcomed by the countries during 2008
 - Applied for the first time in the calculation of Eurostat's annual aggregate results for the reference years 2005-2007 (December 2008)

Basic characteristics of the approach

“A quantity model with quality adjustment”

- Direct estimation of volumes
 - Volume initially defined as number of students (FTE) relative to total population
 - Quality adjustment added in a separate procedure
- PPPs derived indirectly
 - AIC expenditure on education divided into the volume indicator

How to measure education output?

- Number of “student hours”
 - One student hour assumed to represent a fixed amount of transferred knowledge
 - Number of full-time students used as an approximation
- Degree of success in the transfer of knowledge
 - Depends not only on the quality of teaching, but also on students’ abilities and motivation, as well as socio-economic factors
 - Some adjustment attempted (PISA)
- No distinction between market and non-market output
 - Differences in the organisation of educational services across countries should not impact on the results
 - Total number of students aligned to actual individual consumption expenditure

Data requirements

- Education data from the common database of UNESCO, OECD and Eurostat
 - Student numbers at the various levels of education (ISCED)
 - Education expenditure data per education level
- Quality adjustment factors
 - Calculated on the basis of PISA scores
- Expenditure data from national accounts
 - Actual individual consumption expenditure on education
 - Reported by countries as part of the regular PPP exercise
- Auxiliary data
 - Population figures, exchange rates
- All input data available from existing sources
 - No additional reporting requirements for countries

Education data

- Student numbers
 - full-time equivalents
 - Per ISCED level
- Expenditure data
 - Not entirely in line with NA expenditures
 - Applied as weights only
- Quality of the data
 - Generally complete and consistent
 - Four out of 37 “Eurostat countries” currently not included; data provided by the respective NSIs instead
 - Some gaps in the data; imputations needed

Quality adjustment

- More critical in spatial analysis than in temporal ones
- Several sources considered
 - PISA, PIRLS, TIMSS, class size
 - PISA chosen for its regularity, country coverage and multi-subject approach
- Calculation of the quality adjustment factor
 - Based on PISA scores adjusted for students' "economic, social and cultural status"
 - Arbitrary standardisation of PISA scores
 - Quality adjustment factor calculated as each country's PISA score relative to EU27 average
- Quality adjustment applied only for primary and secondary education
 - PISA not suitable in tertiary education
 - Alternatives considered but not applied at this stage

National accounts data

- Education expenditure data are taken from the detailed GDP breakdown provided by countries
- Since the student numbers from the education database include all students, independent of institutional sector, expenditure should refer to actual individual consumption (household, NPISH and government education expenditure)
- The accuracy of PPPs and PLIs is heavily dependent on reliable expenditure data, whereas volumes per capita are determined by student numbers

Calculation of PPPs and relative volumes

- For each ISCED level, actual individual consumption expenditure per student is calculated
- Quality adjustment is applied to these expenditures
- The resulting “prices” enter the regular PPP calculation tool
- These PPPs are applied as spatial deflators of AIC education expenditure

Results for 2005

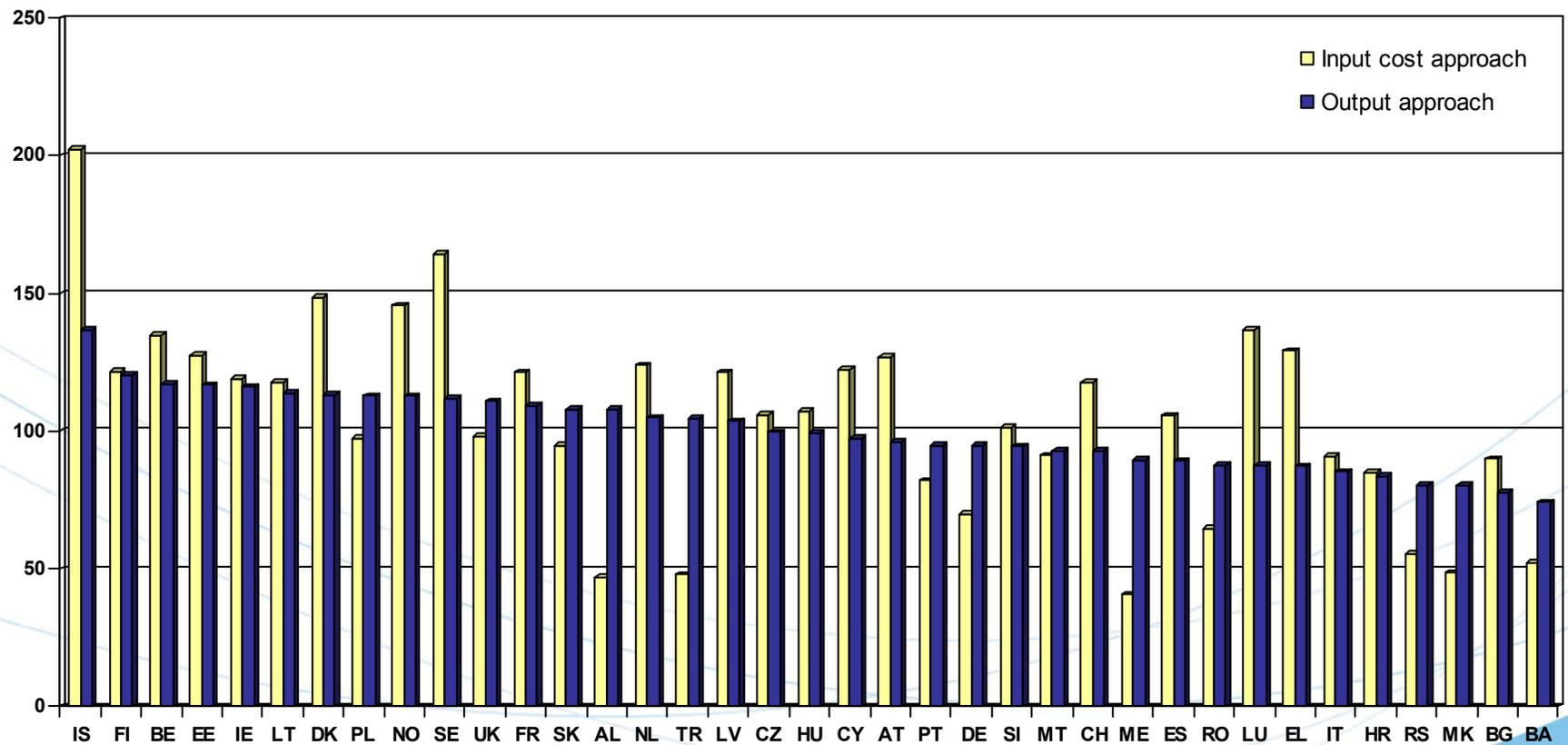
Eurostat countries only

Preliminary version (05 November 2008)

- Comparison with input cost approach
- Impact of the various steps taken
 - From input cost approach to “pure quantity approach”
 - From quantity approach to output approach (introducing quality adjustment)
- Impact on higher-level aggregates
 - GDP
 - Actual individual consumption

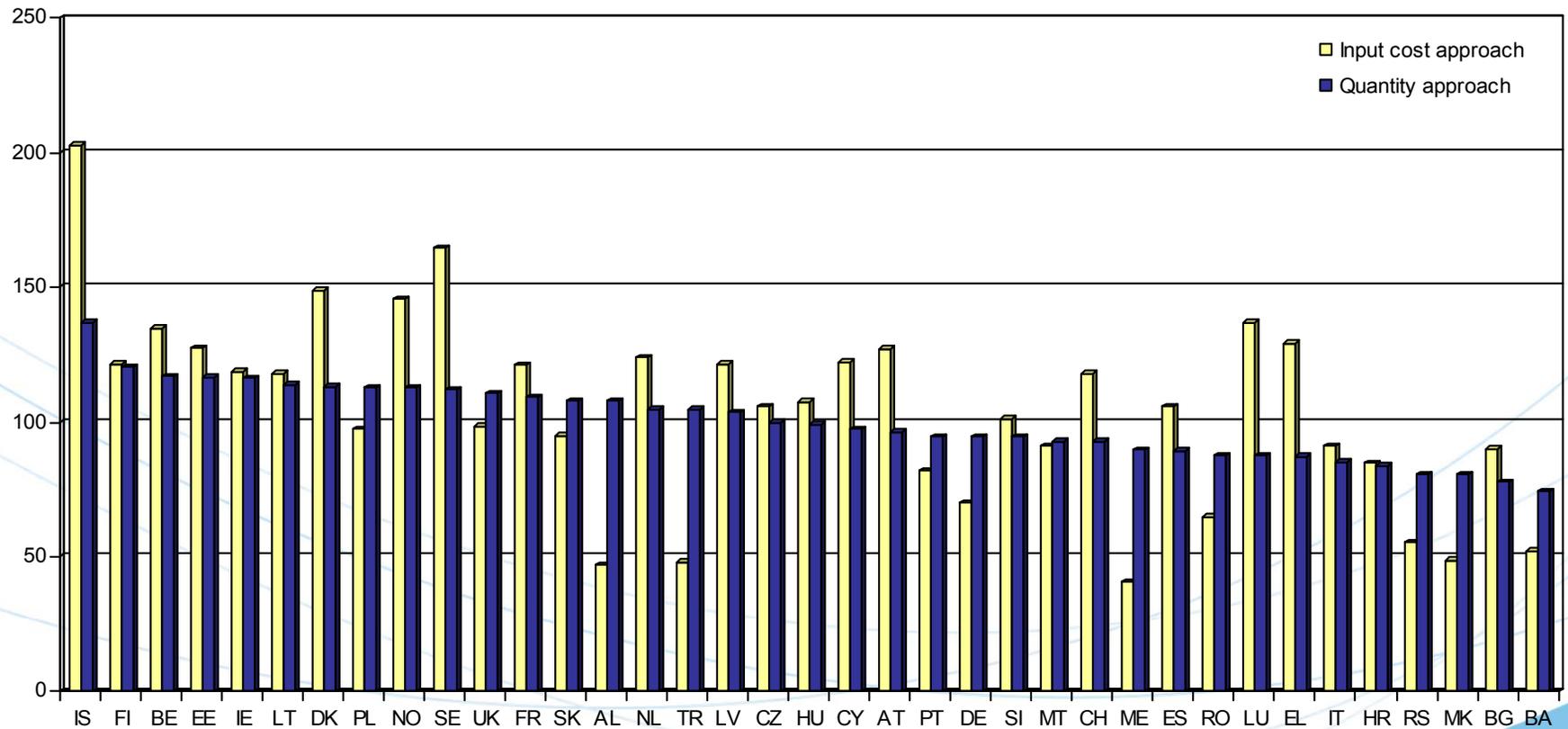
Comparison with input cost approach

Volume indices per capita, 2005, EU27=100



From input cost to quantity approach

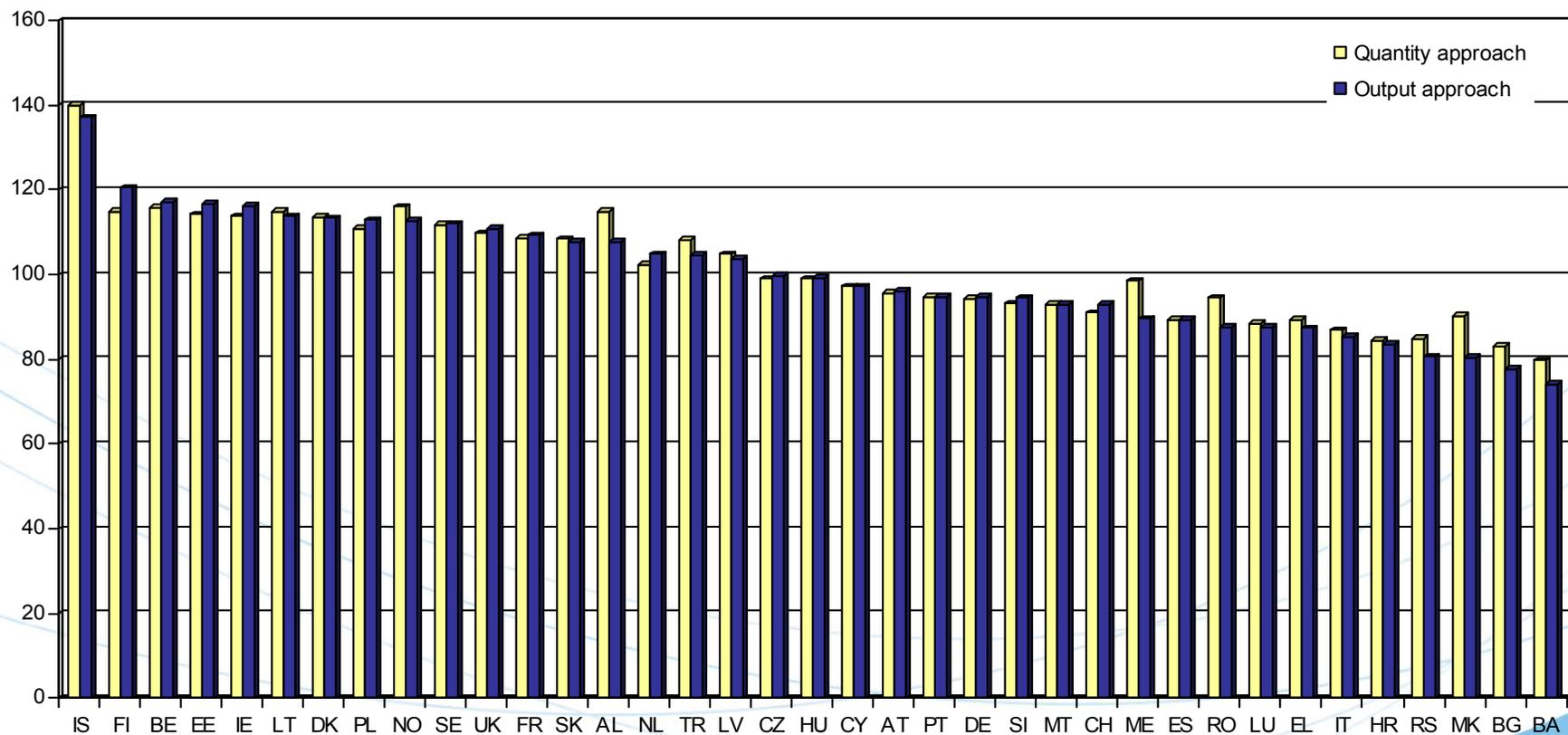
Volume indices per capita, 2005, EU27=100



From quantity approach to output approach

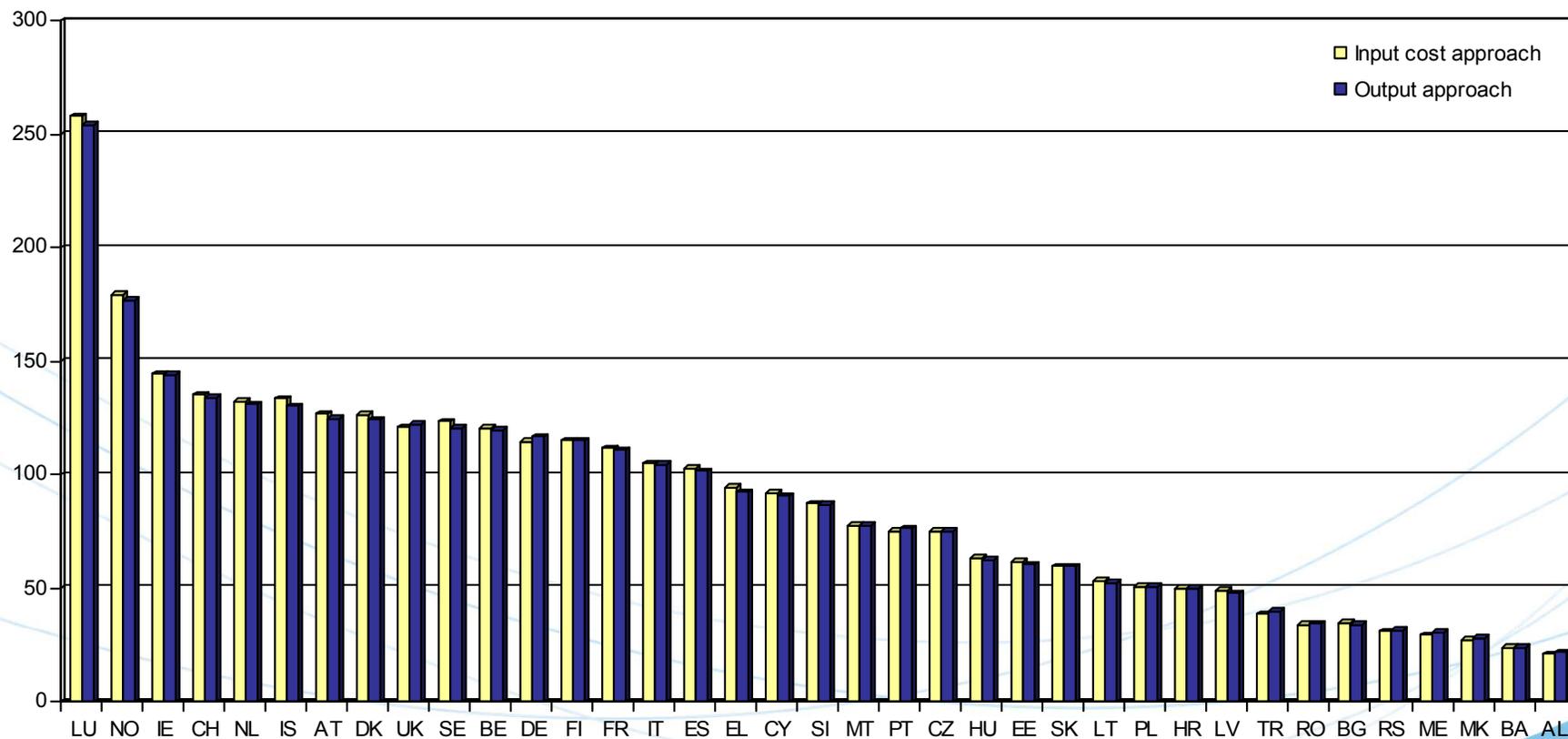
Introducing quality adjustment

Volume indices per capita, 2005, EU27=100



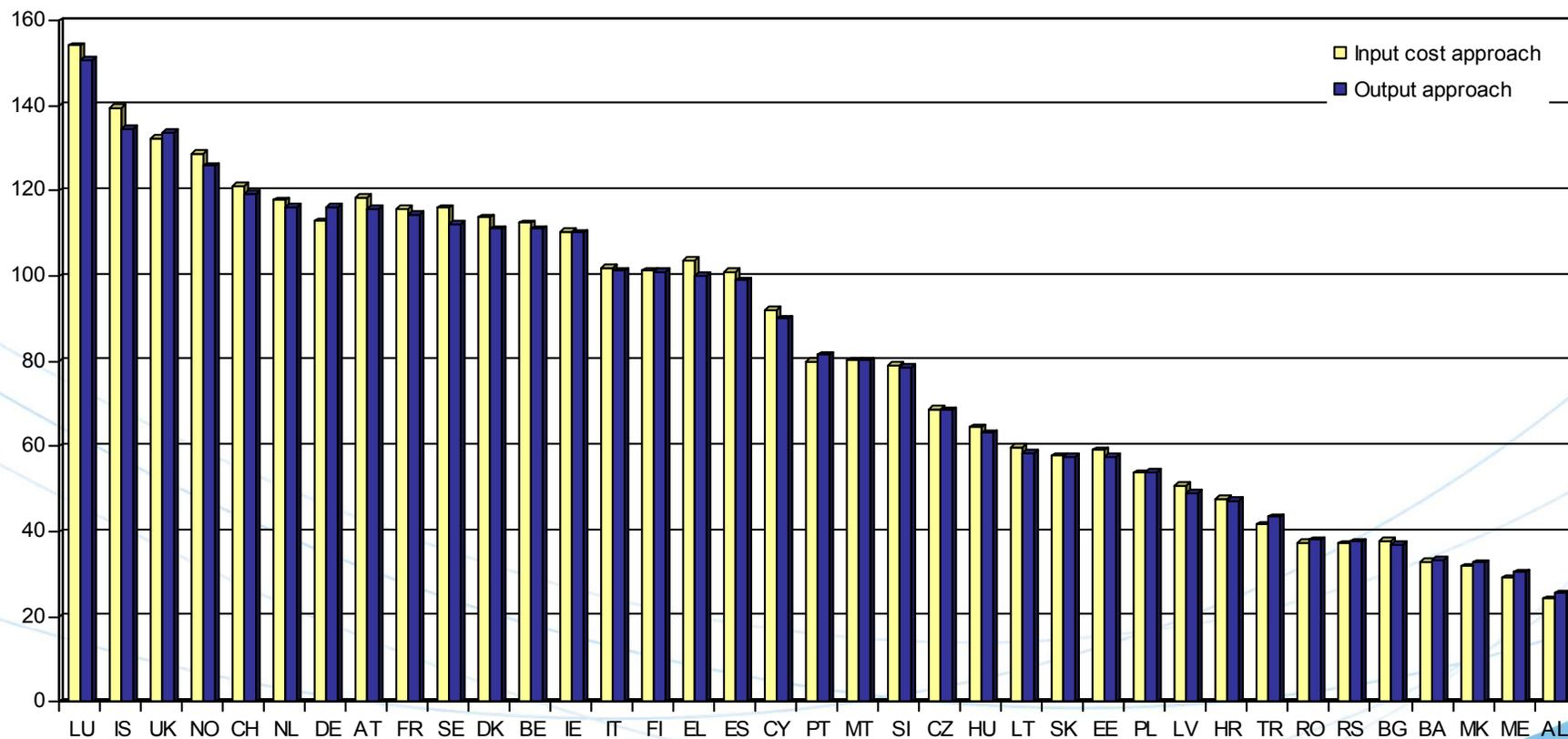
Impact at the level of GDP

Volume indices per capita, 2005, EU27=100



Impact at the level of AIC

Volume indices per capita, 2005, EU27=100



Conclusions

- Substantial improvement over input cost approach
 - Better theoretical justification
 - More plausible results
- Impact of the various steps taken
 - The introduction of the quantity approach (direct estimation of volumes) impacts the relative volumes of education very considerably
 - This impact is also quite pronounced for the higher-level aggregates, like actual individual consumption or even GDP
 - For most countries, the impact of quality adjustment is relatively marginal

Future challenges

- Time lag in the availability of education data
 - Extrapolations based on year t used for $(t+1)$ and $(t+2)$
 - No immediate improvement in the timeliness expected
- Limited quality adjustment
 - Only applied at ISCED levels 1 and 2
 - PISA chosen for its regularity, country coverage and multi-subject approach
- Interpretation of PLIs
 - Method gives priority to the estimation of relative volumes
 - PPPs and PLIs dependent on correct expenditure estimates
 - PPPs and PLIs also influenced by quality adjustment, making their interpretation ambiguous