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Measurement of non-market output in education

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SUMMARY

1. Background notes: National Accounts old and new methodologies
2. Atkinson Review recommendations
3. Launch of UK Centre for the Measurement of Government Activity
4. Measurement of Education Output
5. Education Productivity articles
6. New measures of Education Output: adjusting for quality and the changing real value of education
7. Supporting evidence: triangulation
8. Next steps

1. Background notes: National Accounts (NA) old and new methodology

The traditional approach in measuring government output in national accounts has been the “input = output” convention. That is the value of Education output has been considered as equal to the amount spent in providing education services. The problem with this approach is that it implies a constant unit productivity, not allowing any measurement of the performance of the public sector. Following international guidelines (ESA 1995) steps have been undertaken by UK national accountants towards a direct measure of Education output and specifically, in 1998, the introduction of a volume measure of output for schools (which represents the vast majority of government spending on Education). The full time equivalent (fte) pupil numbers in the four types of maintained school (nursery, primary, secondary and special schools) are added together using cost-weighting by type of school. International guidance suggests that pupil numbers should be used to measure education output (together with a quality adjustment). A quality adjustment factor of 0.25% is applied to total cost weighted pupil numbers, omitting nursery and special schools. The calculation of this adjustment is based on the trend in the average points score (APS) from General Certificate of Secondary Education (GCSE) results over a period of four years in the mid 1990s. An additional improvement made consists of the reclassification of government purchases of health professionals’ courses from Health to Education.

2. Atkinson Review recommendations

In 2004 UK National Statistician commissioned Sir Tony Atkinson to carry out a review of the current methodology to outline possible improvements in methodology. The Final Atkinson Report was published in January 2005. A series of problems were identified with the methodology used at the time to estimate government Education output and proposed improvements were presented in the form of recommendations (chapter 9):

- 9.1: Pupil attendance – annual update of schools cost weights

- 9.2 and 9.3 : revise Quality Adjustment for schools – consider wider sources of information.
- 9.4 - 9.6: new output measure for government purchases of teacher training and health professionals’ courses and places at private nursery schools
- 9.7: use suitable deflators and quality assurance of inputs
- 9.8: work on Education output and productivity change: ONS productivity articles

3. Launch of UKCeMGA

The UK Centre for the Measurement of Government Activity (UKCeMGA) was launched in July 2005 to carry forward and implement the Atkinson review recommendations.

The table below summarizes the improvements in the current methodology for measuring Education output (which have been implemented following the AR recommendations 9.1 and 9.4 - 9.6).

Table 1. direct measurement of government Education output

Government Expenditure on:	Volume Measure used:
Schools	Pupil Attendance Quality Adjustment
Nursery Schools and Classes	Pupil Numbers (fte)
Nursery free places	Number of places filled
Initial Teacher Training courses (ITT)	Number of students

Health Professional Courses	Number of students
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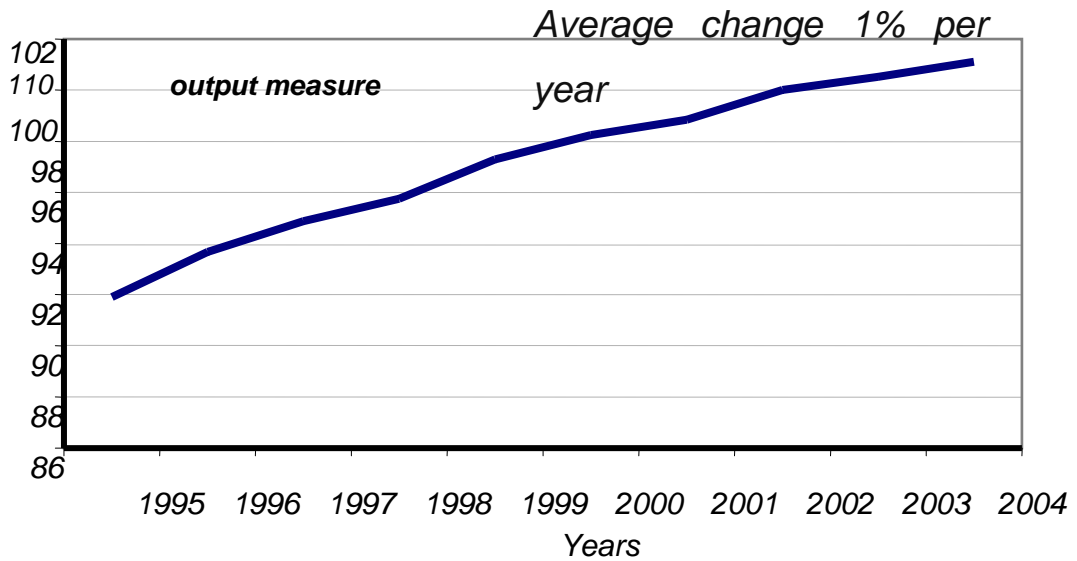
With regard to quality adjusting Education output (AR 9.2 and 9.3):

- Updating the 0.25% quality adjustment factor. An interim update is planned to be introduced in the National Accounts Blue Book 2007. This would refer to latest years of school test results.
- Alternative methods of quality measurement. An extensive discussion of the possible alternatives for measuring quality has been presented in ONS and education ministry articles (published in October 2005). It has been decided to consult widely with experts and practitioners in order to make an informed decision on the way forward, before undertaking further research and development.

4. Measurement of Education Output

Chart 1 below shows the current National Accounts measure of Education output using the direct volume indicator (as detailed in table1). This measure uses fte pupil attendance for compulsory schooling (adjusted for quality with a factor of 0.25%) and the total number of students for the professional courses purchased by Government (teacher training and Health).

Chart 1. Current NA measure of Education output 1995-2004 (index 2002 = 100)



5. Education Productivity articles

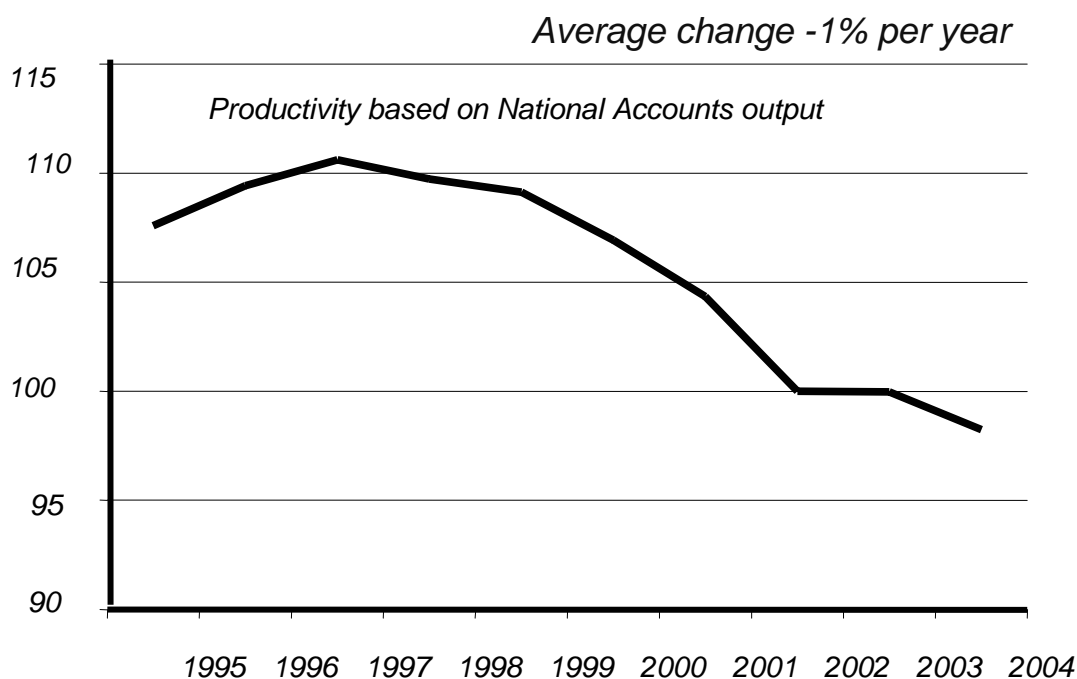
As recommended in the Atkinson final report (AR 9.8) UKCeMGA has worked in cooperation with the UK Education departments to investigate alternative methods for improving Education output and quality adjustment and presented the results in productivity articles. The first Education Productivity article was published by UKCeMGA in October 2005. The main content of the article is as follows:

- output and productivity trends 1995-2004 comparing previous and new methodology
- Presenting possible new methods for quality adjustments
- Triangulation: providing wider sources of information on the quality of Government Education services

Chart 2 presents the trend in Education productivity for 1995 – 2004. Productivity

estimates are obtained as output over inputs (index with reference year 2002).

Chart 2 . Education productivity 1995 – 2004 (Index 2002 = 100)



6. New measures of Education Output: adjusting for quality and the changing value of education

The productivity article presents the new estimates of Education output when adjusting for new quality indicators and the changing value of education (see Atkinson Review paras 4.34 and 4.35):

- Adjusting for Quality of output (Pupil attainment) – Chart 3.
 - * GCSE threshold 5+ A* to C. (proportion of pupils achieving the threshold in a given year). It does not take into account pupils passing GCSE tests but not crossing the threshold. Considers tests taken at the end of 11 years of education, by pupils aged 16.
 - * GCSE Average Point Score (attributing a score to all GCSE pass marks and taking the average. Considers tests taken at the end of 11 years of education,

by pupils aged 16.

* Progress between Key Stage Tests – at age 7,11,14,16. (Considers tests taken at all key stages, not just at age 16.) The remaining pupils not taking any exams in the given year are not represented.

* Adjusted Key Stage – apply results to all years age 5-16. Allows to estimate a quality adjustment for all the cohort of pupils. It needs assumptions for the latest years estimates, where data is not available.

- Adjusting for the changing value of education (1.5% factor) – Chart 4. The rationale for this adjustment is that education qualifications have higher returns for individuals today that they used to have in the past because of the increasing earnings of a growing economy. The Atkinson report suggested that a possible way to take into account of the value of education over time is to adjusted the output by the average earning growth in the UK economy (estimated to be around 1.5%).

Chart 3. Education Output: comparison of current method and new quality indicators

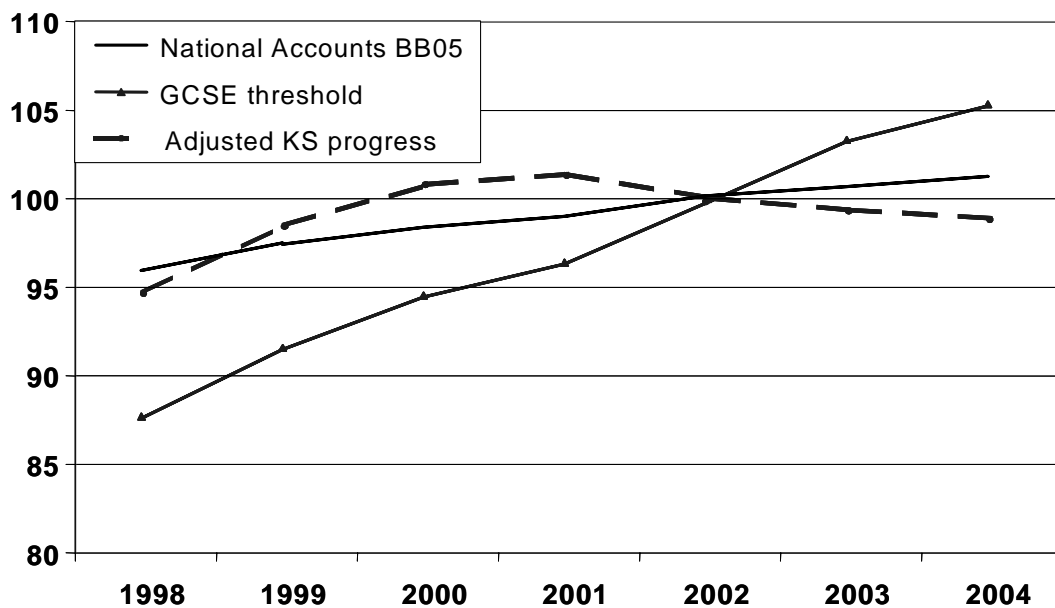
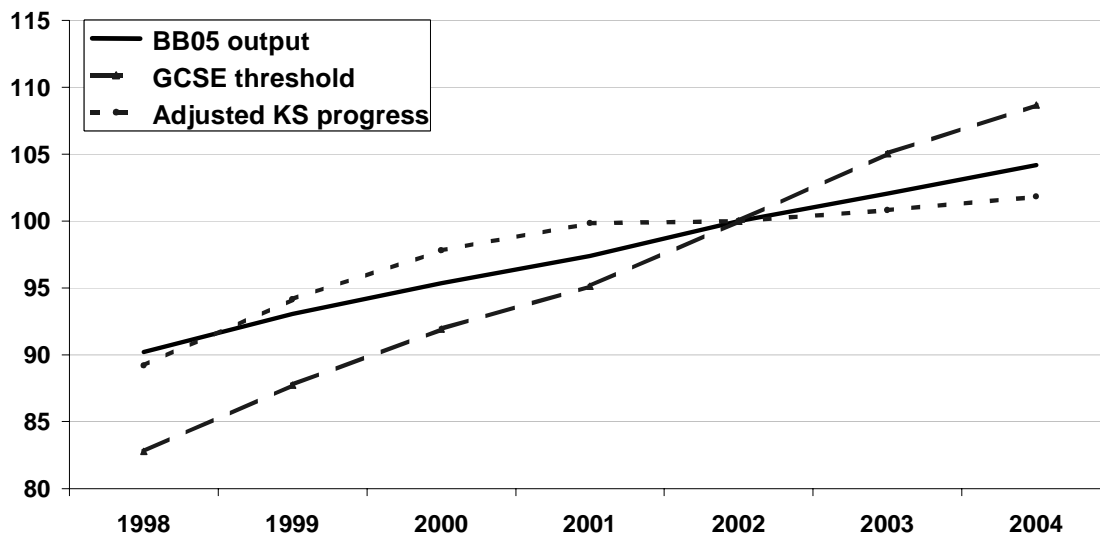


Chart 4. Education Output with new quality indicators and adjustment for changing value of education.

New earnings adjustment 1.5% per year

Index 2002 =100



The corresponding changes in productivity using the new quality indicators and the adjustment for the changing value of education are shown in charts 5 and 6.

Chart 5. New productivity measures without adjustment for changing value of education.

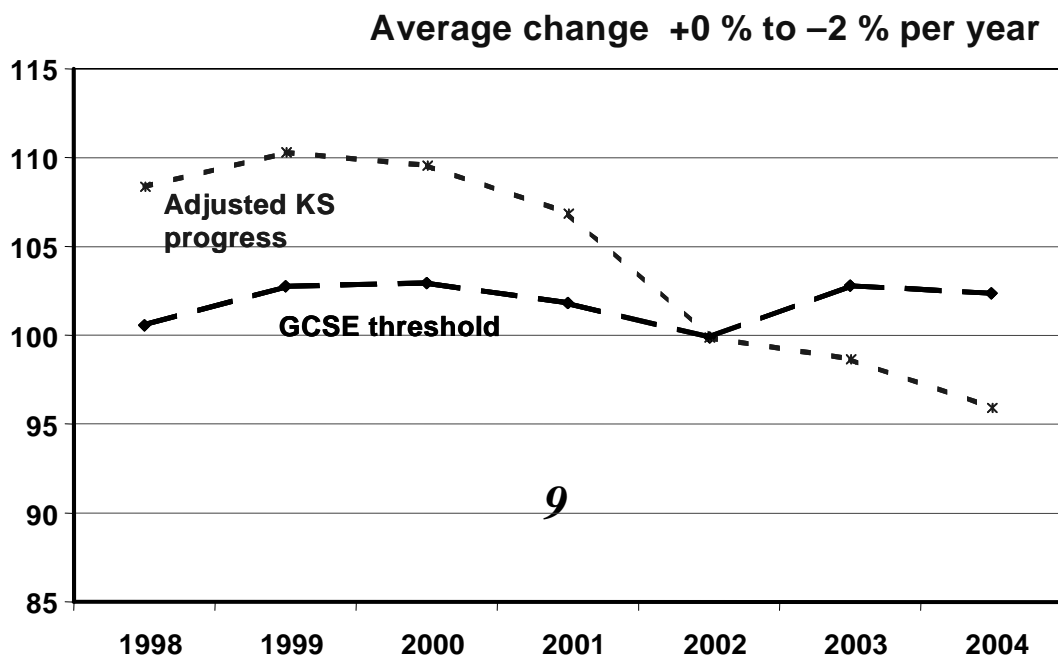
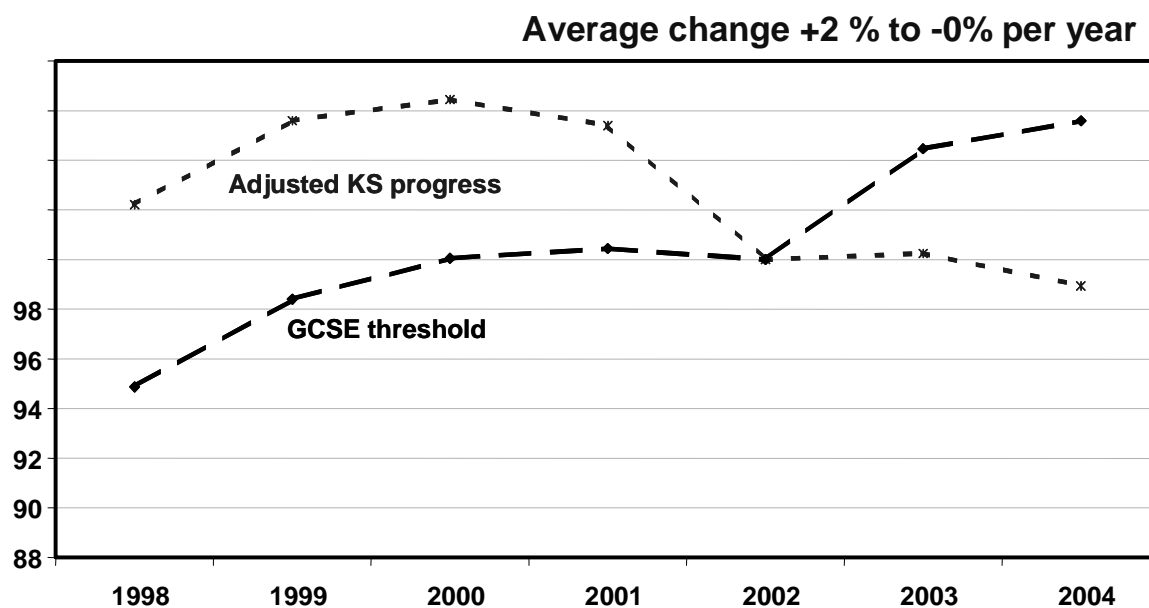


Chart 6. New productivity measures with adjustment for the changing value of education.



7. Supporting evidence: triangulation

After presenting the output and productivity figures using improved methods, the productivity article proceeds to examine wider information on Education services that can corroborate those figures and give evidence of an improvement or deterioration of public services.

To this purpose the following information has been provided:

- School inspection (Ofsted) results – improved teaching standards

- Class size
 - reduction
 - increased classroom support
- Public assessment – improved standards
- Government targets for education ministries – progress towards meeting targets

8. Next steps

- Undertake a wider consultation program to gain expert views on how to develop an appropriate method to adjust for Quality and for the changing value of education
- Improving output and inputs estimates
- Improving triangulation methods