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Non-market services – the view from the national accounts

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Abstract

This paper gives a view of the measurement of non-market services from the perspective of the national accounts. This measurement issue is a difficult problem which national accountants have traditionally chosen not to tackle.

Attempts to improve measurement in the UK in the late 1990s resulted in controversy and led to the Atkinson review which laid out a development plan for the UK. The paper will explain how national accountants view the problem and then briefly describe the history of the measurement of non-market output in the UK. It will discuss some of the problems which occurred with the approaches developed and then explain how the ONS has implemented the results of the Atkinson review. This will focus on some of the issues which have arisen, which include:

- the quality of value data on government expenditure,
- the different perspectives of service experts and national accounts,
- the availability of appropriate indicators which meet the requirements of the national accounts, and
- the adjustment of quantity estimates for changes in volume.

The paper concludes by describing some of the necessary, but not sufficient conditions for taking forward the measurement of non-market services including the need to develop relationships with those responsible for delivery of the services.

Introduction

Non market production is a significant part of production within most economies. Governments typically provide education, health, social care, defence, public order and many other services either free at the point of need or at economically insignificant prices. These activities need to be included in measures of economic activity to present a complete picture. However, measurement is not straightforward.

For market activities, output can easily be valued by the value of sales. However, there are no sales and no prices for non market output and a valuation needs to be defined by convention. The established convention is for non-market production to be valued by the costs of production (ESA, para 3.55, SNA 6.90 to 6.92). These include labour costs, intermediate consumption, an element for depreciation any taxes paid less subsidies received on production.

This approach provides basis for the valuation of output at current prices. However, the volume of output is also of considerable interest. Traditionally, national accountants have estimated the volume of non market services by deflating the inputs. So the volume of labour costs is estimated either by deflating the current price estimate using a wage index or by estimating the volume of labour using employee numbers and possibly other factors. Intermediate consumption would be deflated using price indices for goods and services consumed and so on.

However, deflating inputs has a major flaw. Any change in productivity will not be reflected in the estimate of the volume of inputs. Given that productivity in the market economy as a whole is estimated at rising by around two per cent per year (Page 37, PBR 2005) and that all governments are committed to increasing the productivity within the public sector, the implicit assumption, of zero productivity change, is almost certainly erroneous.

Traditionally, although not uniformly, national accountants have chosen to ignore the problems with this assumption and used deflated inputs as their measure of the volume of output. Atkinson (1995 paras 2.8 and 2.9) quotes some of the reasons given for this choice. These could perhaps be described as describing the problem as too difficult and therefore a reasonable second best approach was acceptable.

However, the publication in 1993 of the revised System of National Accounts (SNA 93) saw a change to the previous stance. The SNA (para 16.134) unambiguously stated that

In principle, volume indices may always be compiled directly by calculating a weighted average of the quantity relatives for the various goods and services produced as outputs using the values of these goods and services as weights. Exactly the same method may be applied even when the output values have been estimated on the basis of their costs of production.

In other words, national accountants should weight together output indices for non market production using weights derived from the valuation of their output.

The SNA went on to dismiss previous arguments (Para 16.138)

There is no mystique about non-market health or education which makes changes in their volume more difficult to measure than volume changes for other types of output such as financial or business services.

Many national accountants would disagree with this paragraph. Although they would recognise that measurement of many services is difficult, the absence of an observable price would seem to be a fundamental difference between market and non-market services. Further, in the case of market services, something is being bought and sold defining a unit of output. Such a unit of output may be much harder to identify in non market production. Nevertheless, direct measurement of output was now the recommended approach for the measure of non-market services.

The European System of Accounts (ESA, 1995) gives the conceptual basis for measuring economic activity within the European Union. It is almost completely consistent with the SNA. Additionally, it has legal status within the EU and so Member States are required to produce estimates in line with its conventions. After the publication of the ESA, Eurostat began work on producing a handbook on the measurement of prices and volumes which later formed the basis of a Commission Decision (OJEC, 2002). This bound most European Statistical Offices to use direct volume measures for many areas of non-market output from 2006.

Although the direct measurement of public sector output is now firmly established in the international national accounting manuals, this topic still attracts controversy. See for example, Lynch 2006.

The UK history

The Atkinson Review (2005) gave an outline of the history of direct output measurement in the UK. The key change in recent years was the introduction of measures for health, education and social security in the summer of 1998 (Caplan, 1998). The ONS which is responsible for producing the UK accounts made the change partly to reflect the ESA but also to reflect an increased interest in outcomes and output of public services. Although this change was evident earlier, it was given impetus by the election of a Labour Government in 1997 with a commitment to increased public spending and revitalising UK public services.

However, things did not necessarily turn out as expected. Direct measures of output remained flat or falling at a time when nominal expenditure on services was rising rapidly. The result of this was that public sector productivity was apparently falling, a fact which was seized upon by opposition politicians who used estimates derived from ONS statistics to argue that increased public spending was being frittered away.

The ONS grew increasingly uncomfortable with the role of the output data in the Party Political debate and, in December 2003, announced the establishment of a review of the Measurement of Government Output and Productivity for the National Accounts to be led by Sir Tony Atkinson of Nuffield College. The review published its final report in January 2005 including a set of principles for measurement and some shorter term approaches to improve measurement within the UK accounts.

Problems with the use of direct output measures

The political controversy which revolved around the use of direct output measures demonstrates some problems for national accountants. National accountants are concerned with making estimates at a whole economy level. What is appropriate for national accounts may not be suitable for other purposes. The work done in the ONS in the late 1990s was never meant to be a definitive attempt at measuring the “worth” of public services. It was an attempt to produce a reasonable measure of the right thing

(output) rather than the wrong thing (the volume of inputs). Such a measure can never be an all embracing summary of the value of a complex public service. However, the ONS did not make a major effort to inform users and potential users of the limitations of the output measures which, perhaps, contributed to their mis-use.

Additionally, the measures used would not necessarily reflect the policy objectives of increasing resources. For example, the measure chosen for education was, in line with European guidance, the numbers of pupils split into various categories and with a quality adjustment based on outcomes at aged 16. However, in the late 1990s UK Government policy was to reduce class sizes and put teaching assistants into classrooms for the youngest schoolchildren. There was no change in measures of output as the number of children was broadly unchanged and any change in outcomes which would lead to an adjustment in the volume of output would not be seen, if at all, for some years. However the inputs rose reflecting the greater labour input and, hence, there was a decline in measured productivity within the education sector.

To the national accountant, this is reasonable. The output measure is acceptable although not without problems. However, to the observer of education policy, the national accountant's measure of output may be missing key features of education and is therefore fundamentally flawed.

In fact, there is almost no evidence that the increase in resources to education has improved outcomes at primary level. For example, the proportion of children leaving primary education with the desired level of knowledge (Level 4 or above in mathematics, English and Science) has risen only marginally over the period 2000 to 2006 (DFES trends table 5.3 <http://www.dfes.gov.uk/trends/index.cfm?fuseaction=home.showCategory&cid=5>). Testing at the end of Key Stage 1 (at age 7) actually suggests no change in attainment at all over the period 2000 to 2006. (Ibid section 5.2) Taken together, this evidence suggests that the existing quality adjustment is adequately picking up any quality change in primary education. However, for secondary education there have been very significant improvements over the same period which feed into the quality model, although the results do not show any significant change in the rate of improvement following the policy change.

In fact the whole issue of measuring quality change presents a major problem – both conceptual, but also politically. For example, when the Atkinson Review published its interim report, opposition politician Oliver Letwin was quoted as saying

the idea that quality improvements in the public services can be objectively measured and that such a fuzzy concept should be captured in the measurement of national output is absurd (Guardian, 20 July 2004)

By contrast, when, in October 2004, the ONS published a special report on health which showed a fall in health service productivity, the Secretary of State for Health, John Reid issued a statement saying

It's absurd that the current measure of productivity does not cover the range of massive improvements that are being seen across the NHS. (DH press notice, 18 October 2004).

Of course, to the national accountant, quality change is an intrinsic part of volume change and needs to be measured. Conceptual and measurement issues will be discussed later in this paper.

ONS National Accounts after the Atkinson Review

The Atkinson Review was broadly welcomed by the then National Statistician, Len Cook. In a Press release (<http://www.statistics.gov.uk/pdfdir/lcatkinrep0105.pdf>) he proposed a cautious approach to taking forward the Review. Incremental changes within existing conventions would be taken on. There would be a more rigorous approach for more radical changes involving significant external consultation.

The National Statistician also announced the establishment of the UK Centre for the Measurement of Government Activity (UKCeMGA). This would be a semi-autonomous unit within the ONS with responsibility for development of measures of output and to work with other government departments and the ONS National Accounts Group to embed improvements in the measurement of output. The resources available to this unit should mean that work will be sufficiently rigorous and fully informed by discussion with practitioners and experts in other government departments. These are features which were perceived to be missing from previous work.

One key change had started during the review process. The Review was given high level political support and prioritised by government departments with responsibility for delivery of public services. This gave ONS unprecedented access to experts on delivery of policies. This relationship was not without problems as will be argued later. Nevertheless this was a major and important development which allowed improved access to expertise and management data not previously accessed by ONS.

Changes in the published accounts

ONS has developed a framework for evaluation of new methods for national accounts (Robinson, 2006). This ensures that there is a full review of new methods before they are adopted in the published accounts. All proposals for changed methodology for measuring non-market output following the Atkinson Review were subject to this process. It can certainly be argued that some of the earlier output measures which had been introduced would not have stood up to this level of scrutiny.

Current price data

The Atkinson Review (chapter 5) highlighted problems with the supply of government expenditure for national accounts. These included misclassification of expenditure between different functions of government, problems caused by multiple data suppliers and poor timeliness of data. Many of the subsequent revisions to the national accounts came from addressing these issues rather than changes to output measurement.

One of the key operational successes of the Atkinson review is that senior staff in government departments now have specific responsibilities for ensuring that data supplied to HM Treasury on government expenditure is fit for purpose, in particular as regards functional classification. Additionally, UKCeMGA is responsible for improving the understanding of the use of these data among finance professionals within government.

Issues

Following the establishment of UKCeMGA and the delivery of its work programme, a number of key issues for national accounts have arisen. These included

- Conceptual problems – what is it that we are measuring?

- Data problems – data meeting the requirements of the national accounts may not be available
- Some difficulties in working with other government departments because of different perspectives
- Issues in the measurement of quality change.

To some extent, these issues inter-relate. However, they will be discussed in turn. It is important to note that solutions to these issues have not necessarily been found

Conceptual problems

The key issue in direct output measurement is identifying what is being produced. It is, for example, possible to look at fire services and say that the output is the number of fires fought. Alternatively, the provision of a fire service may be thought of as an insurance policy and so output should be measured in a way analogous to the measurement of insurance. These two different approaches lead to different ideas on output measurement.

Nowhere is this conceptual issue more clearly found than in collective services – such as policing, defence and public administration. It is hard to identify any real progress in this area. In other areas, the perspective of service providers and the conventions of national accountants may diverge.

Data problems

Issues with current price data have already been discussed. But there are major problems with output indicators even when they are available. Available information may simply not be of sufficient quality for use in constructing a time series. For example, one indicator presented by a government department was based on an irregular and infrequent survey of activity. This was the only information available on activity in the sector, but, from a national accounts perspective it was completely unusable. Its use would have resulted in indefensible, non-sustainable figures with discontinuities once a new survey was available. One area that was raised frequently during the peer review process for new methods of output was the future availability of any measure. National accountants want to be reasonably certain that an indicator is robust and will continue to

be compiled. This, of course, may not be the case if political or managerial priorities change.

Periodicity and timeliness are also major problems. In the UK, the first estimate of economic growth is published around 3½ weeks after the end of the quarter with more definitive estimates published later. This rapid publication requires the early availability of output indicators. In reality, such indicators are not often available. They may only be available annually or for a financial year (which in the UK runs from April to March) and there is generally a delay in availability of information. The delay leads to the possibility of an interim period where less complete indicators or projections have to be used with the possibility of a misrepresentation of the true position. This, in turn, may be manifested by significant revisions to published data.

There are two dimensions of coverage. First, does the indicator have sufficient coverage of the activity to which it relates? For example, in complex areas, such as children's social services, there may be a very large number of possible interventions and activities. Some activity or output measures may not fully reflect the full range of activity.

A further difficulty, which is perhaps more specific to the UK, is the issue of geographical coverage. The delivery of public services varies across the countries of the UK. This means that information which is available in England may not be available for Scotland or Wales. This is particularly important as different policies in different countries may lead to a very different evolution of output in the different countries. This geographical coverage issue was highlighted by the Atkinson review but the problems continue.

Working with other government departments

The improved relationship with the departments responsible for service delivery is positive and essential. It has given the ONS access to expertise and data which it did not have previously. Nevertheless there can be a tension around this area. Possibly at its root is a perception that the national accounts measure of output will be used to value and judge the delivery of a public service. This provides an incentive for departments to seek to maximise the measure of output. National accountants are, however, interested in producing a measure of output that meets the requirements of international conventions. Once again, it is important for national accountants to be clear on the limitations of their product.

Those involved in service delivery are also frequently interested in outcomes and find difficulty in recognising the concept of output. For example, within education, the output is the delivery of education services. One outcome is children leaving school with educational qualifications. In some sense, the qualified child is an output of the educational system but they are not an output in the context of national accounts.

Quality change

Quality change is perhaps the hardest area for those measuring the output of non-market services. When the ONS introduced direct output measurement for education in 1998, a quality adjustment was used. The basis of this decision was that there was evidence of improvements in quality from two sides. First, English schools are subject to a rigorous inspection regime. Inspection evidence was that the quality of teaching was rising. Second, educational outcomes were improving. In particular, the results achieved in exams taken at age 16 were showing marked improvement. It was felt that this evidence could not be ignored and a quality adjustment based on outcome changes was introduced. This use of outcomes as a measure of quality was discussed in Neuburger and Caplan (1998).

However, the use of outcomes as a measure of quality can be seen to be problematic. Five main issues arise; reliability, timeliness, impact of outputs, comprehensiveness and quantifying the effects.

First, the outcome measure itself may not be reliable. For example, continuing with the education example, exams may get easier or different, making comparisons over time difficult. Outcomes for health outputs may simply not be available beyond mortality statistics which provide a very limited picture of quality of many treatments and interventions.

Second there may be a considerable time between the delivery of the output and the appearance of the outcome. For example, in education it may take many years for the full impact of improving teaching in the early years of education to be reflected in measures of attainment.

Third, changes in outcome may result from factors other than improvements of the quality of service delivery. Health outcomes may improve because of reductions in

poverty or improvements in other public services. Educational outcomes may change because of increased private provision or changes in the average ability of children entering the education system. It may be hard to extract the impact of quality change from these other factors.

Fourth, quality of public services is multi-faceted and comprehensive measures of outcome may not exist. For example, the inspection regime for English schools evaluates a schools performance on five major factors (overall effectiveness, achievement and standards, personal development and well being, the quality of provision and leadership and management) each with up to eight sub-factors (OFSTED 2006). Although improvements in many of these factors will lead to improved attainment, not all outcomes from education are reflected in the quality measure.

Finally, there are major difficulties in translating indicators of quality change into adjustments to quantity measures. National accountants are interested in measuring the volume of services delivered. It is far from obvious how to translate information on outcomes to adjust a quantity measure. For example, does an increase in grade average of one per cent represent a one per cent increase in quality – or is the quality change greater or less than the outcome change. One approach is to value the benefits of improved outcomes. This may provide a way forward but may suffer because of the need to isolate the effect of the quality change from other factors changing outcomes. Additionally, in areas such as education, the values are likely to be speculative and based on estimates derived from a radically different cohort than at present. For example, is the value of a degree the same if fewer than one in ten young adults go on to higher education as when the proportion increases to closer to forty per cent?

Conclusions from the UK experience

The direct measurement of non-market output, at least for individually consumed services, is now widely accepted by national accountants. However, the experience of the UK has demonstrated a number of key lessons. Many of these are reflected in the Atkinson Review but need to be fully reflected in day to day practice by producers of national accounts. From the current perspective of the UK national accounts, the following features and learning are perhaps the most important;

1. Build links with experts on the services to be measured. Without their knowledge, any measure will be sub-optimal. There may be better data available and their knowledge of delivery systems will help with measurement.
2. Value data from Ministerial financial systems is not necessarily infallible and needs to be scrutinised. Data suppliers need to be nurtured as much as, if not more than, respondents to business surveys.
3. Design and use a quality assurance framework which involves challenge to the approaches. This will help ensure that measures stand up to external scrutiny.
4. It is impossible to spend too much time explaining the limitations and appropriate uses of national accounts statistics. Users must understand these to avoid drawing false conclusions.
5. Be aware of the political climate into which estimates are released – and manage that.
6. Quality measurement is an intrinsic part of volume measurement. Far more work needs to be done to produce an internationally accepted approach to quality measurement. It is a difficult area but needs to be addressed.
7. Indicators of output decay over time. They need regular review and possible replacement.

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