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Title of paper

**Measuring non-market activity in the national accounts –  
who is the customer?**

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The author has written this paper in his capacity as a private consultant on economic statistics. It does not represent the official views of the UK Office for National Statistics.

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## Abstract

There has been an increasing tendency in the national accounts to treat government as a producer with households as consumers of the output. This culminated in the Atkinson Report (2005), where non-market output is considered as a kind of marketed output, but where no price or value is revealed when the service is delivered. This is enshrined in principle A: “*the measurement of government non-market output should, as far as possible, follow a procedure parallel to that adopted in national accounts for market output.*” This paper demonstrates through an example that it is wrong to treat the recipient of public services as a consumer, as if they were on the receiving end of an economic exchange. The true consumer of public services is society at large, and it is government as the representative of society which acts as consumer of public services. A large area of research has been initiated on how to measure government activity as if it were a market service. The assumptions necessary are open to contest, and it is difficult to agree measures that are consistent over time or space. This has particular relevance for the European Union, where economic and fiscal policy requires reliable and harmonised statistics on growth.

## 1. Introduction

This paper is not a technical one: there is no role for algebra or equations. My aim is to awaken in the reader a concern that the current research to improve real measures of growth in government output can never meet the needs of the national accounts. And the reason is not because the research techniques are not yet far enough advanced to help solve the measurement issues. The reason is that the whole edifice is based on a false premise – that it is useful to consider recipients of public services as taking part in an economic exchange with government, just as a household buys goods and services from private industry. To pursue this line is to chase a will o' the wisp.

The great benefit that market exchanges bring to compiling national accounts is the associated recording of values and prices. Linking the price to the characteristics of the products (good and services) bought, enables quality changes to be transformed into quantity changes, and so adjustments for quality can be made to growth measures. If non-market deliveries are taken to be analogous to market exchanges, many of the powerful techniques to measure real change in the market exchange would be available to the non-market cases. This would be a very desirable state of affairs.

So the issue boils down to – can useful lessons be learned from considering non-market deliveries as if they were market exchanges? Is it useful to consider recipients as partners in an economic exchange? Are the underlying drivers sufficiently close to justify these assumptions?

Why is there such a divergence of opinion over this topic? Why is there such disagreement over issues which should be capable of rational argument and resolution? I believe it is because on the surface, two events, which economically could hardly be more different, look so alike. It is tempting, and easy, to assume that an activity such as teaching – which is much the same sort of process whether supplied through the market or through public institutions - should be subject to the same economic analysis whether public or private. But private education in economic terms is vastly different from public education. The main difference is of course that in private education, there is an economic exchange between supplier and recipient. A contract is drawn up between the parents of the pupil and the school, specifying what sort of education will be provided and at what cost. The education service can be split into different characteristics of delivery (teaching), environment (school architecture, seats, classroom size etc etc), extras such as sport, music, and snob appeal – Eton has an ability to open work and social opportunities in England which goes beyond the excellent education provided to pupils. Hedonic regression enables us to identify the price contribution of each characteristic, and so quality change can be accommodated by identifying changes in components and weighting them by consumer utility weights reflected in the price. As there is a price, a quantity of service can be identified. The economic exchange is between the school and the parents of the child pupil.

Now consider the public educational institute. There is no economic exchange – the education delivered, and the accessories, are determined not by the recipient, but by educational policy. The aim of the education is not to meet the wants of the individual household, but to meet the wants of society – the community in which the school is

situated. So there is no point in trying to determine a hedonic regression relationship between the characteristics of the public educational service and the wants of the recipients. For public education, the recipient has very little say in the manner and type of education delivered – this is determined by the government at national and local level. So hedonic regressions must be established where the price is paid – i.e. when the educational authority buys in the various components of the educational service – the wage rates of the teachers, the capital return from the buildings, the seats, books, sports, music, etc. It is often assumed that input costs are taken as an approximation to the measure of the output of the public education service – but in fact they are a measure of the consumption of the education service assembled by the local council, and consumed by it on behalf of society.

So a service which on the face of it looks almost identical, turns out to be fundamentally different in economic terms – for the private education there are customers for an economic exchange with the school, and there is an output which can be reduced to real terms using the available price and values available through the market instruments. For the public education, the customer is the local authority acting on behalf of the community, not to supply educational services to individual recipients for their personal benefit, but to educate members of the community on behalf of the community. All the choices are made to benefit the community, not the individual pupil. Of course, individuals and communities share common aims – to have well educated pupils. But the differences in economic terms are greater than the similarities. The outcome for the private household is a household member able to get on in society, educated, good at sports, able to appreciate music, and well qualified to get a good job and earn a lot of money. The outcome for the public education service is a well educated community, well able to meet the needs of modern society by being educated to fill the jobs needed to keep society going. These outcomes are of course similar, as the aim of a community is surely to benefit its members in general terms, but the distinction between individual gain, and gain in an individual for the benefit of the community, is real and crucial.

## 2. An example – bands in the park

Consider a public park in London, in which two brass bands play for the entertainment of visitors to the park – local residents, summer tourists and visitors to London. The local council employs one band, and no charge is made for the visitors to pause and listen and enjoy the music. This band is known as the Council Band. On the other side of the park, there is another band. This is composed of self-employed musicians, which have created a company called the London Parks band. They pay a licence fee to the local council to be allowed to play in the public park.

What are the economic drivers of these two bands?

The Council band consists of local government employees who are paid money according to their terms of contract. This will be to play in the Council Band, under the supervision of the Council Band conductor, according to the purpose of the band. So in order that the conductor knows what to do, there will be a statement of purpose from the local council, and conditions of contract for each employee that support the statement of purpose. Let us suppose that the statement of purpose for the Council Band is

“The Band shall employ up to but not surpassing 20 musicians, with an annual current budget of £500,000. This sum shall cover all expenses including the wages of the musicians, and the cost of other materials such as uniforms, music, etc. There will be a capital budget of £50,000 which shall be used to maintain the bandstand and the instruments of the Band, which shall remain council property. The purpose of the band is to provide musical entertainment to all who visit the park. In the summer (from 1 May until 31 August), the band will carry out two performances each day, a lunchtime concert from 12:20 until 14:00, and an evening concert from 18:00 until 19:30. the music will pre-dominantly be “light classical” with composers such as Johan Strauss being favoured.”

The statement of purpose of the private band is much simpler – consistent with company and Council Park regulations, and general law of the land, including employee conditions, the London Parks band will maximise profits for the benefit of the owners.

How do the respective bands earn their money? The Council Band earns its money by fulfilling its statement of purpose – as long as this is met, then the council pays the musicians. Local taxpayers give money to the council funds, and this is then given to the employees in exchange for their labour. Notice that a genuine market exists in the employment of musicians. The council has a choice of suppliers, and rate of pay. The musicians are free to ask for a rate of pay, which the council may or may not provide.

The private band earns its money by charging tickets for visitors to enter the band auditorium and sit down on the benches to listen to the performance. The tickets have a price and a quantity, and the value of the sale of each band performance is equal to the number of tickets sold times the price of ticket.

Same or different?

So, the sun is shining, the bands are playing, and to an observer of the scene, there is no difference between the events – on each side of the park, a crowd have gathered to listen to the music. Each band is performing according to their talents, and given the market in employment, are likely to be performing to the same standard. They may even be playing the same tune. It is tempting to assume that the value of each performance is the same – especially if there is roughly the same number of listeners to each band. Why not take the price to listen to the private band and apply it to the public band, and so estimate a value for the public band in the absence of an economic exchange between the performers and the audience. And if a quantity measure is desired, then we can simply count the number of listeners to the public band as a direct measure of their output, in the same way as for the private band where the total sales of the tickets divided by ticket price will give a quantity measure of the private band performance.

Bingo!

And yet, two completely different economic events are taking place.

We can demonstrate the difference to the economy, by considering the economic behaviour of the two bands and audiences, in the light of a disturbance to the status quo.

Disturbance 1

It starts to rain. The council band immediately stops playing, because written into the conditions of employment with the council, as part of the “statement of purpose” is that they don’t play in the rain. So the council in effect decides that the performance is stopped. It doesn’t matter what the visitors (the apparent customers) say – the music stops.

The private band knows that if they stop playing, all the audience will want their money back – they know from bitter experience that if they put “no refunds if it rains” on the tickets, nobody will buy the tickets in the first place. So the band decides to put on their raincoats and continue playing, hoping that enough visitors will pay to hear despite a light shower, and after all, they’ve got raincoats and umbrellas too. So the private band continues, because the musicians want to earn money and it looks as if enough visitors will pay to hear them, even in the rain, to make it worthwhile. So the band plays on.

Notice how the two outcomes are determined by who is taken to be the customer for the band. In the case of the council band, the customer is in fact the council – they decide on the rates of pay (the price of performance) and they decide if the show goes on or not. For the private band, the visitors and audience are the customers – they pay money for a product which is well defined. If it were not well defined, potential customers would not be tempted to buy a ticket. The price is on the ticket. And the visitors determine whether a performance occurs or not – they are the true customers.

It would be a brave economist now that assumed that we could look at the behaviour of the private band to work out the value of the performance of the public band in these circumstances. The private band is still delivering, still producing and still earning money.

The public band is still meeting the terms of its contract with the local council, so in that sense it is still meeting the statement of purpose, and so still in these terms producing output. But of course the output in this case is sitting in the musician's hut, having a cup of tea. And now the analogy with the private band has completely broken down. It would be quite wrong to assume that as nobody is listening to the council band, it is producing nothing. It is still meeting the terms of contract with its customer – the local council.

## Disturbance 2

Let us consider another case, where no one turns up because of another attraction that day – perhaps it is the London marathon. The private band turn up, and attracts no audience. So of course they take no money, there is no production and no exchange. They stop playing. What's that I hear? – Music drifting over from the other side of the park! The council band is playing its usual Monday lunchtime medley of military marches. Because that is what they are contracted to do by the council. The fact that there happens to be no audience makes no difference to the behaviour of the public band. Their customer (the local council) has decided that there shall be music every lunchtime and evening in the summer, for the benefit of visitors to the Park. And no matter how few there might be on any occasion. Again there is a stark difference in behaviour according to who is recognised as the true customer of the band performance.

To apply the private sector “direct measure of output” to the public band would be wrong. The private sector measure would be no tickets = no performance = no output. But the public band is playing, according to its terms of employment, and the output is delivered via the council statement of purpose, to “society” in the form of any visitors who may pass by.

Notice the distinct role that the council plays here – it is not simply a producer of a service called “the band playing in the park” – it is also the economic consumer of the service. They decide the rates of pay, they decide the music, and they take every economic decision with regard to the performances of the public band. The visitors are society who the council presumes “benefit” from the music being played. But they may not. The council may decide to try and educate the public in the ways of modern music, and get the band to play Stockhausen pieces on a regular basis. This could generate very low or zero audiences in the park for the public band. But the band would be producing the output the council wanted, even if “society” in the form of the visitors to the park (and the local voters) would quickly get fed up with the arrangement.

Let us see if we can gain anything from the existence of two bands providing the same service – one as a public service and one as a private service. Let us suspend our prejudice that the recipients of the council band are not true customers in an economic

sense. Let us pretend that they are. Can we use the example of the private band to deduce how we should measure the output of the public band?

For the private band, we can perform a hedonic regression exercise so that the price of the ticket is expressed as a function of the characteristics that customers value in obtaining a favourable outcome – “a nice day in the park listening to the band”. It is likely that the characteristics identified to satisfy the average consumer would include the following

1. Popular choice of music
2. Good standard of playing
3. Comfortable seats
4. Performances at times when there is most demand

Would it be possible to use this evidence to determine an imputed price for the public band?

Say the council band pretty well matched the private band in all these characteristics. Then we could impute a price for the public band to be the same as the private band, and so assume that the quantity was the same. For the private band, a direct measure of output would be the number of performances times the attendance (as this gives the value earned by multiplying by the price of a ticket). So it seems reasonable to assume that the same measure of direct output could be used for the public band.

But this would be put to a test to destruction if a new council was elected, and decided that the purpose of the public band was not to make park visitors have a nice day out in the park, but to help educate the community in the repertoire of brass bands from the North. So the band would still turn out at the usual times, play well, comfy seats, but play tunes that not as many people would want to hear and so the audiences would be much smaller.

If the model assuming the visitors are customers were used, then the attendance of very small approaching zero would suggest that the output of the band had fallen. But if it is accepted that the local council are the true customers acting on behalf of the community, then the output is unchanged as the band is still meeting the wants of its true customer and meeting the society needs as the council sees it.

Collective and individual

A collective service is one which meets the collective requirements of the community

A collective service is one which provides equal benefit to all recipients. An example would be the protection of sovereign territory and possessions by the Ministry of Defence and the relevant military services. The addition of a newborn baby to the population does not reduce the defence provided to the existing population, and each citizen continues to benefit equally from the service.

It therefore follows that there can be no exchange transaction between the public service and the recipient. Such an exchange would require a value and quantity, and the determination of these would generate the need for change on the arrival of a new consumer or the disappearance of an existing consumer.

The impossibility of an exchange for a collective service therefore precludes the identification of a unit of quantity, and the recognition of a measurable quantity of product revealed through an interaction with a consumer. It is therefore necessary to value collective services through their cost of provision.

What is an individual service? It is one that requires a single identifiable recipient. It is termed “rival” in that more recipients will reduce the service available for existing recipients. In principle, there is a unit of quantity underlying the measurement of the transaction, and if a price were available, a value can be calculated for the service provision.

For individual services, can we impute a price from the equivalent market transactions? At first glance, the answer seems yes. If there exists a market producer who delivers the same services as the non-market provider, then the price commanded in the market can be applied to the transfer of similar services from government to citizen to give a value of the services provided.

But the very existence of a market where profits can be made, demonstrates that the service delivered is economically different from the public service. If they were the same product, then there would be no incentive for consumers to choose a service they have to pay for, and so no private service. So the very existence of the private service precludes the use of the associated price to value the public service delivery. And if neither price nor value can be assigned to the public service provision from the recipient point of view, then there can be no measure of quantity delivered through the usual methods of deflation of value by price.

In the band example, the very fact that a private band can make a living in the same park as the public band, demonstrates that they are offering a different service that the public are prepared to pay money for, preferring a product which meets their wants more than the public band. These characteristics could well be a more responsive attitude to customer wants – playing a more popular programme, providing comfy chairs, etc.

The above arguments support the contention that the fact that some public services can be characterised as individual rather than collective, does not mean that they are therefore more suitable for measurement through indicators which a customer would recognise as delivered product. The apparent similarity of the transfer of individual social benefit to a market transaction is the fallacy that has led to so much confusion in this area. The nature of the product delivery may be the same, but the economic drivers are different, and no useful pass-over can be made from the market economics to the public service provision. This is what the band example demonstrates.

## The Atkinson Report.

As a member of society, and as a statistician, I am a strong supporter of measuring how well government delivers on its programme as set out in a manifesto on which it was elected to power. And measuring how good is an educational service, is not easy. As many international studies have shown. But it is very worthwhile, and given that the delivery of all public services can employ as much as 20% of the labour force, who are therefore not working on private sector value adding activities, it is important for every society that the effectiveness of public service delivery is measured. It should be measured over time, and to standards that allow comparison between different public services. Why is the organ transplant success rate double in some health areas than others? Why do some schools, apparently with the same social profile of pupils, the same qualifications in teachers, and the same infrastructure of buildings etc., achieve twice the pass marks in national exams as other schools?

The answers to these questions are critical in improving public service delivery. But I don't believe that productivity measures are an important part of the measurement answer. Productivity measures require inputs and outputs measured to well established international standards, and it is only natural that economists turn to the national accounts to provide such standards.

So in order for measures to quickly gain approval as well based, it seems best to develop better national accounts measures of outputs and inputs in order to derive useful measures of the effectiveness of public service delivery. But here we meet the first snag –measuring public services in the national accounts has traditionally assumed that the best approach to measuring output is to assume that it is equivalent to the sum of the inputs.

Hicks gave the basis for the national accounts treatment in “The Valuation of Social Income”(Economica, May, 1940), when he said “ . . . , *we have to impute a value to the public services. Here I can see no alternative but to assume that the public services are worth, to society in general, at least what they cost; and that this principle holds at the margin. . . . If we accept the actual choices of the individual customer as reflecting his preference, then I do not see that we have any choice but to accept the actual choices of the government, even if they are expressed through a Nero or a Robespierre, as representing the actual wants of society. Thus unless we have any reason to suppose that the public services are produced under diminishing costs, we can take their average costs of production as a rough estimate (a lower limit) of their marginal utilities. The public services should thus be valued at cost.*”

The Atkinson Report does not argue against this – it accepts that in nominal terms, there is no alternative to measuring public services at cost, in line with the Hicks argument. But there is more to the Hick argument than simply observing there is no practical alternative. Hicks justifies the choice by observing that in the provision of public services, it is the government itself that makes the choices that in the market are the preserve of the consumer. So in national accounts, we do not show government spending as final consumption expenditure of government because we don't know how else to treat it, we do so as a positive result of the Hicks' line of argument that government is the true customer for public service “*I do not see that we*

*have any choice but to accept the actual choices of government as representing the actual wants of society”.*

Having accepted that government is the economic consumer of public services and so shown in the national accounts, we are faced with the challenge of producing estimates in real terms. Taking the relevant price indices for the input components and using these to reduce the nominal estimates to real terms, achieves this. For the goods and services bought in, these are the relevant price indices for these products, where they are available. For the labour input, a large part of the total, changes in wage rates can be used to produce estimates of real labour contribution. Weighting these various components together by the cost weights gives the estimates of volume production of public services.

But this has posed a problem for economists used to measuring development in private industry by looking at changes in productivity. Deriving outputs as the sum of inputs precludes the calculation of productivity from a comparison of inputs and outputs, as the estimation method ensures they are identical.

There are two possible reactions to this - either seek measures of the effectiveness of government outside the framework of national accounts, in satellite accounts. Or, remain in the national accounts framework, and develop new measures of output in real terms so that differences can be observed between inputs and outputs. This is the road that Atkinson has followed, by extending the measurement techniques for real output. This involves identifying outputs in the terms of specified delivered goods or services, which are accepted as the “raison d’etre” for the public service.

An example could be the passport agency, if it were accepted that their role was to produce passports for members of the general public with a minimum of delay, and were fit for purpose –facilitating international personal movements. So if with the same inputs, twice as many passports could be produced, most people would accept this as a doubling of productivity. But this productivity is largely function of the training of the personnel, and the effectiveness of the use of capital equipment. So if we were sufficiently diligent in measuring the increase in productivity of the factors of production, and used these to adjust the real measures of input, it is quite possible that we would not see a gain in productivity as measured in classical terms, even although the main product of the service has doubled. This suggests that productivity for public services is not the most appropriate measure of increase in effectiveness – by construction, the adoption of more efficient factors of production will decrease the measure of productivity. An alternative approach would be to drop the idea of productivity, and simply concentrate on simple effectiveness measures. In the passport agency, this could mean simply counting the number of passports delivered to members of the public. Then an increase due to changed holiday preferences, with little increase in costs for inputs (but a great deal of increase in the efficiency of capital used) would result in a useful measure of the effectiveness of public service delivery in the passport agency, which could not be shown through productivity measures. So the pursuit of useful measures of productivity of public services, because they have been so useful in the private sector, is one that will prove less useful than more simple measures of change in delivery, irrespective of input change.

Some detailed comments on the Atkinson report

Paragraph 1.4

*In this review, we are concerned with the measurement of the volume of government output relative to the volume of government inputs, and with the implied measurement of government productivity. These measures are important because*

*[1] the functioning of public services is a matter of widespread public interest*

*[2] they throw light of the quality of the nation's public finances*

*[3] 1 per cent per year faster growth rate of government output raises the overall GDP rate by 0.2 per cent*

**Comment –None of these statements justify restricting the measure of effectiveness of public service delivery to productivity measures.**

Paragraph 1.19

*It would be a mistake to see the public sector just as a consumer of resources, rather than as a key producer in the economy. Some of the output, such as health care and education, may substitute for market sector production of the same services. In other cases, public sector output complements private sector production. Overall, it seems clear that the outcomes from government services are an important element determining the well functioning and growth prospects of the UK economy.*

**Comment. This is where Atkinson strikes off down the road of recognising the public as economic consumers of public services, rather than recipients of public services that the government commissions and generates on behalf of the public to meet the wants of society as a whole.**

Para 1.22

*A substantial part of public output takes the form of services provided to individuals: for example a GP consultation. There may be no market price, but the service adds to the individual welfare in the same way as a consultation with a vet, which is paid for as a market service, adds to the pet owners' satisfaction.*

**Comment. Here lies the assumption that undermines the market approach - as illustrated by the bands in the park. The delivery of non-market to members of society looks the same as the provision of a market service to customers, but is fundamentally different in terms of economic factors.**

**In the vet's office, right or wrong, the customer is supreme – if the owner has enough money, and wants the pet's life to be extended, then the vet will strive to extend the life (within ethical bounds). In the GP's surgery, society is supreme. If it would be more cost effective for society in terms of good value for money, a patient with the economic means to purchase an expensive treatment may be refused it from the public health. It is the decision of the Doctor following the**

**public service policy guidelines, that determines what is delivered to the patient, not necessarily meeting the needs of the individual patient considered as a customer. The Doctor's decision may well not add to the individual's welfare, but to the increase of welfare to society as a whole. Measuring the interaction of the Doctor with the recipient does not measure the output of the Health Service. The output of the Health Service is consumed by the State on behalf of society.**

## Chapter 4

### *Parallel with the Private Sector*

*4.6 The thrust of the SNA 1993 was, as emphasised by Neuburger and Caplan (1998), "to treat, as far as possible, public output in the same way as private output; the same general procedure can be used in both the public and private sector" (Economic Trends, 1998). This seems clearly right. The issue of measuring output and productivity apply across national accounts as a whole, and the principles applied to their measurement should, as far as feasible, be the same. This is particularly important in view of the transfers of activity that have taken place across the public/private boundary. It is evidently desirable that the relocation of an activity does not in itself lead to a change in the estimate of national output. Our terms of reference identify the need for comparability with measures of private sector services output and costs.*

### *4.7 Therefore we start from*

*Principle A: the measurement of government non-market output should, as far as possible, follow a procedure parallel to that adopted in national accounts for market output.*

**Comment. These two paragraphs put forward the proposition that measures of productivity for government services can be as useful for non-market services as for market services. It is assumed that public service and private output are sufficiently similar to apply market output measurement to the public services delivery. The only difference is that there is no market information on sales and prices for the government product.**

**But the absence of market sales is not simply a challenge to measurement. It reflects completely different economic behaviour. In the market sale, the consumer is in charge, and for one product they can choose between different producers according to price. As market conditions change, so they may alter their choice.**

**For a government delivery of a product to a household, there is no sale. There is no choice of supplier for the householder, no choice at which price to buy the product. The behaviour of the householder is different economically in the two situations, although in many cases the appearance is of the same phenomenon.**

## Conclusion

Attempts to improve the measurement of real government output, by identifying and measuring directly quantity indicators related to the delivery of the public service to the recipients, are misdirected. These quantity indicators are not necessarily representative of the true economic exchanges characterising the provision of public service. The exchange is between the government as producer, and government as consumer on behalf of society. The only measurables in this transaction are the inputs to the transaction, and the products are not consumed by members of society, but by government on behalf of society. Measures of effectiveness should therefore be concentrated on activity indicators representing government output with government as consumer. The outcome for the recipients is not relevant, and neither are recipient preferences. The distinction between individual and collective services is not important – all public services are collective in nature – they serve the collective needs of society as represented by the interpretation of this through government policy.