Measuring public value: The economic theory

Marc Cowling

Contents

Aims of The Work Foundation project

Building on existing academic and policy work around public value, The Work Foundation's project aims to help policymakers, public managers and institutions understand the concept of public value and see how it can be applied in practice.

Public value addresses many of the contemporary concerns facing public managers. These include problems of securing legitimacy for decision making, resource allocation and measuring service outcomes. This research project draws together different strands of the current debate around public value, clarifies its elements and seeks to further understanding of this topical and important conceptual innovation in public service delivery.

The project's objectives are to:

- provide a clear definition of public value
- provide public managers with a set of guiding principles that orient institutions to the creation of public value
- use sector and case studies to illustrate how organisations might understand where gaps occur in achieving public value
- clarify the components and processes of public value in order to facilitate its future capture and measurement.

Sponsors

The project is sponsored by the following organisations:

- BBC
- The Capita Group plc
- Department for Culture, Media and Sport
- Home Office
- London Borough of Lewisham
- Metropolitan Police
- OfCOM
- Quality and Improvement Agency (formerly the Learning and Skills Development Agency)
- Royal Opera House.
- The NHS Institute for Innovation and Improvement (formerly the NHS Modernisation Agency)

About this paper

This paper is one of two on measurement, exploring how social scientists have operationalised the concept of public value and applied it in a variety of diverse settings. Together the two papers examine how public managers are currently measuring public value, the gaps in information, difficulties around decision making, and how a public value framework can resolve these issues.

This paper is one of several background reports being prepared for the public value sponsor group. The research outputs include:

- *Public Value, Politics and Public Management: A literature review*
- *Public Value, Citizen Expectations and User Commitment: A literature review*
- *Public Value and Local Communities: A literature review*
- Sector papers, seminars and presentations on how public value applies to different sectors like local government, policing, skills, broadcasting, arts and culture, and health
- Case studies examining how public value applies to different institutions, ranging from Lancashire Constabulary to the V&A Museum, and as a way of understanding particular local policy issues, such as recycling in Lewisham

Please note that the views expressed in this report represent those of the author, and may not necessarily represent those of the projects sponsors.

Executive summary

- This paper discusses many of the key theoretical concepts in the theory of social choice in order to provide a framework in which we can explore more practical aspects of the measurement of public value in a wide variety of contexts and settings.
- The summaries of the empirical research papers show that there is a variety of very detailed and rigorous models and methods that have been used. However, finding the 'best' means of capturing public value is critically dependent on what one is trying to measure, the relevant population, the presence of externalities and how one particular aspect of public provision is linked in to a wider system of social decision making. This is further clouded if there are both public and private providers in the supply chain.

Section 1: Introduction

- We begin with the proposition that in a modern developed democracy social choices are made through the voting system and economic choices through the market system. The key question was then defined as whether or not a framework could be developed to transfer a set of known individual preferences into a coherent system of social decision making. Behind this is the problem that if we base social choices on individual utilities, then we must make value judgements. Further, once a mechanism is in place, then individuals may have incentives to misrepresent their tastes; how, then, can we ensure that individuals represent their actual tastes?
- In reality things are found to be a little more complicated still. Each possible alternative social state has many components, some of which might be desirable under certain circumstances and not under others. A further complication is that some components are not divisible. If social states are the object of choice, then the ordering of social states is determined at the individual level by the direct consumption of the individual and her general standards, morals etc. Thus a true theory of social welfare should look at the entire system of values, including values about values. This is a particularly relevant point as people may value democracy and fairness, even if it means they lose out in a strictly economic sense.

Section 2: Measuring public value

- In terms of practical measurement, this paper explores examples across a range of public policy areas including the environment, tourism, transport, education and broadcasting. This was particularly interesting as these are all areas in which there have been significant shifts in the way that public services have been supplied over the last two decades in most developed countries.

- At the heart of these strategic reforms has been the concept of 'value for money', or the requirement that providers of services deliver to the market the 'best' levels of service for the level of subsidy received, subject to stakeholder needs and government objectives. Yet in most cases maximising the social benefit derived from public service provision is clouded by this mix of public and private actors who have quite different objectives in the supply chain. Thus, a key challenge for public policymakers is how to incentivise private agents to act in a way that is consistent with achieving the maximum social benefit.
- The key issues that public policymakers need to take account of when considering issues of measurement is first that consumption (the payment and use of goods and services) tells us nothing about quality of experience. Plus, when considering certain public goods, paradoxes exist; for example the very thing that attracts people to environmental assets is the thing that is most negatively affected by them. Also, people often do not have the option to purchase the exact amount of resource they would prefer. The quality of some goods is a collective choice, particularly in the case of environmental goods where resources cannot be explicitly purchased through the market per se.
- Key concepts that warrant serious consideration are use value and existence value (explicit current consumption and preservation for future consumption/ bequest value). Two of the most common methods, willingness to pay (WTP) and willingness to accept (WTA), tackle the same question from different ends. WTP captures people's willingness to pay to maintain a given level of provision and WTA captures what they would be willing to accept for a lower level of provision. Crucially, WTP is governed to a greater degree by income level than WTA, thus care must be taken when deciding on an approach to capturing value from users and potential users of a service.
- There are also some heavyweight statistical issues that cannot be ignored. For example, if we conduct a survey to capture WTP or WTA, as many public agencies do, then the survey must reliably measure these values. Yet even if we have the best method of capturing and measuring what we are trying to measure and can repeat our process with reliability, we cannot ignore the fact that other political and public choices can have a direct and potentially adverse effect on the provision of that good or service.
- The travel cost method is a commonly used method for capturing and measuring public value. This is often used for estimating the demand for, and economic value of, visits to tourist destinations and heritage sites. In this type of framework a key concept is consumer surplus, which can be calculated as the benefit the visitor derives from her visit over and above the cost paid for that visit. A corollary of this is that public sector managers have greater scope for increasing their revenues if the consumer surplus is large in terms of total WTP.

- Turning the focus of attention to the government's objective function, we must consider specific policy interventions, eg subsidising a bus service, as part of a much wider set of objectives. Thus the role of government is to take into account costs not typically considered by individuals or private providers when choosing their transport mode. Yet while the debate normally focuses on negative externalities, such as pollution, positive ones also need to be accounted for.
- The example of education also highlights how even non-users of this service can both support and capture some of the economic benefits of education provision. Some may even have altruistic motives. It also stresses how important and lengthy people's time horizons may be when making current decisions about public services.

Conclusion

- The report concludes by stating that economics, and in particular welfare economics, has a rigorous conceptual framework in which key aspects of value can be explored. Yet there are gaps in the ability to capture fully aspects such as the value people place on fairness, democracy and the process by which the public is engaged and consulted. However, it is beyond doubt that the strength of economics lies in its practical applications to the measurement of public value in any shape or form and, once measured, the ability to use an array of advanced techniques to design and analyse robustly surveys and captured data. The challenge for public policymakers is to define the relevant questions and issues in such a way that captures all the economic and non-economic aspects of an individual's decision-making process, and to best utilise these techniques in the decision-making process.

1. Introduction

In a modern developed democracy social choices are made through two basic mechanisms. First, political decisions are made through the voting system. Second, economic decisions are usually made through the market system. Clearly the relative importance of the two systems in terms of making social choices will vary according to the precise nature of the economic system. For example, in some countries or economic systems a much greater role is given to individuals, or groups of individuals, in terms of social decision making. In others, social decisions may be dictated or unduly influenced by a religious code or a small but powerful elite.

Aside from these extreme cases, voting and the market mechanism represent the means by which the tastes and preferences of millions of individuals are aggregated to guide decision making over social choices. The important question is whether or not a framework can be developed to transfer effectively a set of known individual preferences into a coherent system of social decision making. An often-used example describing these issues is the 'paradox of voting'. To illustrate this we assume a society with three voters who must choose between three social choices (alternatives). Further assumptions are that the choices are made relatively frequently and sometimes all three alternatives are not available. In addition we also assume rational behaviour on the part of individuals and, in line with standard utility theory, variable price-income scenarios and constant wants.

With these assumptions in mind, society is required to order the three alternatives collectively and then, depending on whether all three are available, choose the one that is ranked the highest. In short, one alternative is preferred to another if a majority of society prefer it. To explore the full implications let A, B and C represent the three alternatives; and 1, 2 and 3 represent the three individuals who constitute society, who rank the three alternatives as follows:

1. prefers A over B and B over C (by implication A is preferred over C)
2. prefers B over C and C over A (by implication B is preferred over A)
3. prefers C over A and A over B (by implication C is preferred over B)

From this pattern of preferences we see that the majority prefer A over B and B over C, implying that society prefers A over C (assuming rationality). Yet a majority also prefer C over A. Thus, moving from individual to collective preferences violates the assumption of rationality.

The question is: are there more appropriate ways of aggregating individual preferences that do not violate the rationality condition on the part of society? This problem is central to the whole field of welfare economics – that of achieving a social maximum such that we can order social states according to the sum of individual utilities under each alternative state.

Yet if social choices are based on individual utilities, then this implies that we make value judgements. Thus economists should consider mechanisms by which social choices are made that satisfy value judgements, but do not violate other value judgements, ie value judgements must be consistent with each other. As we saw in our paradox of voting example this assumption was violated. If we consider voting as being a demand for collective consumption, then the market mechanism should roughly approximate the voting mechanism. Here the political system simply determines the initial endowment of resources (eg distribution of income), which is assumed to be fixed, as are prices. It is important to note that an interesting body of research on political choice questions whether political decisions are influenced by the size of the political majority (the elasticity of political choice with respect to voting majority).

Game theory also has some important insights. For example, once a mechanism is in place to make social choices from the preferences of individuals, people will have an incentive to misrepresent their tastes. We observe in multi-party political systems that many voters will vote for the least distasteful major party candidate rather than their own preferred minority party candidate. Clearly the most desirable outcome is to ensure that individuals express their actual tastes, thus enabling a consistent social preference pattern to be constructed. The issue here is how to construct a process by which individuals will reveal their true preferences.

1.1 Can we measure utility?

A means by which we can measure individual utility is absolutely necessary in order that we can make interpersonal comparisons of utilities. But even if we can measure individual utility, then there still remains the question of how we aggregate it. This is of great importance as the aggregate value is dependent on how each individual makes her choice. Thus we have a problem of compatibility, which requires a value judgement not linked inherently to individual decision-making processes and a system by which we can aggregate them (ie a mathematical formula). Therefore economists normally assume that the behaviour of an individual in terms of how she arrives at her choices can be described by a preference scale. And further, that this scale has no cardinal significance for individuals or across individuals.

1.2 Preferences and choice

We start with the assumption that there is a set of alternatives available to an individual. In the theory of consumer choice this is typically a bundle of goods and services. For firms this is typically a decision about inputs and outputs. In welfare economics these alternatives are typically described as a distribution of goods and services and jobs. In economics each alternative is represented by a vector.

In politics each candidate is an alternative. Alternatives are mutually exclusive. If we denote the alternatives x, y and z, then at any point in time the individual has available to her a subset 'S' of possible alternatives, out of which she must choose one alternative. We assume that an individual considers all pairs of possible alternatives before she knows the set S, and for each pair of alternatives makes one decision out of three:

1. x is preferred to y
2. x is indifferent to y
3. y is preferred to x

Assuming consistency across pairs of decisions the individual has now established a preference ordering. We now confront the individual with an opportunity set S. Faced with S, the individual looks for the one alternative that she prefers over all others. But what if she prefers the alternatives in S to all alternatives not in this particular subset, but is indifferent to those actually within S? Thus the choice is the whole opportunity set S.

Here relations between alternatives are expressed as preferences or as indifference, assuming they are comparable. The statement 'x is preferred or indifferent to y' can be written x R y. This type of relation is termed 'connected'. Consistency in preferences for all x, y, z, x R y and y R x require that the x R z relation is termed 'transitive' and allows an ordering. A weak ordering can be interpreted as 'greater than or equal to' and a strong ordering as 'greater than'.

From this we can now more clearly define choice from a given set of alternatives. If S is the set of available alternatives, then C(S) is the choice made from S (ie a subset of S). Each element of S chosen must be preferred to all elements of S not in C(S) and indifferent to all elements of C(S). Thus C(S) is the choice function as it assigns a choice to each possible environment. In essence this is the demand function in the theory of consumer choice with S representing the budget constraint. However, in the theory of social choice things are a little more complicated. Here each alternative has many components that may be desirable under certain circumstances, but not under others. There is also a further complication that some components are indivisible.

1.3 Ordering social states

In our discussion, social states are the objects of choice. In very precise terms this would require a complete description of the distribution of goods and services across individuals, the labour supply of individuals, the allocation of scarce resources and the scale of public services and type (eg health, police etc). We assume that each individual is capable of ordering these social states, and that this process of ordering is not solely determined by the personal share of goods

and services accruing to each individual. In fact, purely selfish assumptions are inappropriate in determining distributional issues. Thus the general ordering of social states is determined at the individual level by the direct consumption of that person and her general standards, morals etc; in short, the taste of an individual plus her values. A true theory of social welfare should look at the entire system of values, including values about values.

2. Measuring public value

Over the last 25 years there has been a significant shift in the way that 'public' services are supplied in many developed and developing countries. A pervasive theme throughout this period has been the delivery of cost-efficient services. This has manifested itself in many ways with privatisation, deregulation and competitive tendering among the most common methods adopted.[1] Alongside these policies aimed ostensibly at improving competition on the supply side, we have also observed policies aimed at stimulating demand.

At the heart of these strategic shifts (reforms) has been the concept of value for money (VFM). Conceptually, this encapsulates the need for providers of services to deliver to the market the 'best' levels of service contingent on stakeholder needs and government objectives. Behind the VFM concept is a requirement to identify, or quantify, the benefit to society associated with each pound of taxpayers' money spent. In practice, particularly in cases where service delivery occurs through a supply chain, multiple objectives such as social and commercial obligations cloud the issue of social surplus maximisation. For example, focusing purely on cost efficiency may not yield the maximum social surplus. This is the fundamental challenge facing policymakers in the provision of 'public' services today.

According to a recent report: '[There] are generally held to be two possible approaches to measuring value. The first is to calculate revealed preference, or what people actually consume…The second approach is to look at stated preference, or what people say they value.'[2]

Yet as the report itself states, consumption tells us nothing about quality of experience. Further, perception of quality fails to give any meaningful indication of how much something is actually worth. For example, Hilber and Mayer pose the question: 'Why do households without children support local public schools?'[3] In a transport context, Mokhtarian et al argue that demand for travel is not purely derived, ie it is not simply derived from a desire to reach a destination.[4]

The remainder of this paper will review how researchers have operationalised, measured and tested the concept of value in various contexts, notably tourism/ ecology, transport, broadcasting and education. This review separates out each area as many of the methods and data issues are context-specific. A more generalised approach would lose many of the important nuances of some of the more complex empirical research.

---

[1] Hensher D and Houghton E, *Performance-Based Contracts for the Bus Sector: Delivering social and commercial value for money,* Institute of Transport Studies, University of Sydney, 2002

[2] BBC and Human Capital, *Measuring the Value of the BBC*, http://www.bbc.co.uk/thefuture/pdfs/value_bbc.pdf, October 2004

[3] Hilber C and Mayer C, 'Why Do Households Without Children Support Local Public Schools? Linking house price capitalization to school spending', NBER Working Paper, No 10804, September 2004

[4] Mokhtarian P, Salomon I and Redmond L, 'Understanding the Demand for Travel: It's not purely derived?', *Innovation*, Vol 14 No 4, pp355-380, 2001

2.1 Tourism and natural resources

2.1.1 Contingent valuation of Marine Protected Areas

There are around 1,300 Marine Protected Areas (MPAs) throughout the world. They exist to manage and protect coastal populations and the ecosystem, and to halt the degradation of coastal resources.[5] The big problems are essentially related to an expanding human population and increasing public access to beaches. The paradox is that the very thing that attracts humans to beaches – the abundance and diversity of marine life – is the thing that is most negatively affected by their presence. Implementing a policy of stricter protection by perhaps limiting access to reduce the extent of human disturbances has a financial cost. Thus the research question is: 'How much do people value the prevention of further deterioration of the coastal ecosystem'?

The method adopted by the researchers was to estimate the value of policies that 'avoid some causes of ecosystem decay'. Briefly, they used a contingent valuation (CV) method to capture stated preferences among the sub-population of the area that lived close enough to the shoreline to undertake daily visits. A key issue in this kind of valuation is that visitors do not have the option to purchase the exact amount of the resource they would prefer. Thus provision and upkeep in terms of the quality of such goods is a collective choice, and hence the most common method of dealing with it is through regulation and legislation. As environmental resources cannot be purchased through the market mechanism per se we cannot observe prices. This means that we cannot use price as a signal of how much visitors value the provision of different amounts or different qualities of such goods.

Before looking at the empirical research, there are three further issues that merit attention:

1. Use and existence value

Use value is classified into direct or indirect; and direct can be further sub-divided into resource use as an economic activity or disposal (recycling). Indirect use also has two components: aesthetic and ecosystem. Existence value is divided between explicit current consumption and preservation for future consumption (bequest value). Importantly, revealed preference methods can measure use value, but cannot deal with existence value. The researchers' choice of the CV method, which captures stated preferences, enabled them to capture both types of value.

[5] Hall D, Hall J and Murray S, 'Contingent Valuation of Marine Protected Areas: Southern California rocky intertidal ecosystems', *Natural Resource Modeling*, Vol 15 No 3, Fall, pp335-368, 2002

2. Willingness to pay (WTP) versus willingness to accept (WTA)
Following on from use and existence value, there is also an interesting tension between asking people what remuneration they are willing to accept (WTA) for a reduction in the quality of a public good and asking people what they are willing to pay (WTP) to avoid a quality reduction. In a general sense, WTA exceeds WTP, although this is in part related to the fact that an individual's income constraint affects ability to pay, but not willingness to accept. Earlier research suggests that the lack of close substitutes (as might be the case for Marine Protected Areas) causes even greater divergence between WTA and WTP.[6]

3. Property rights and contingent valuation (CV)
There is also an important point about non-transferability of the property rights for public goods. For MPAs it is not possible for the public to actually sell their 'rights', thus they cannot receive compensation per se.

Therefore for the researchers in this study two big questions remain. First, are they measuring what they need to measure (validity)? Second, is the survey procedure repeatable and likely to generate similar responses (reliability)?

The contingent valuation method estimates the direct and indirect use value as well as the non-use value. Importantly it also values the method of payment and how the good is provided. CV results are affected by property rights that are concomitant with the method of payment (the tax system) and provision of the good (through government). In extreme cases, for example if the respondent is unwilling to pay higher taxes, an individual's WTP might be zero.

Regarding conflicts around property rights, it is also the case that while an individual might believe that the public has a right to a good environment, the burden of responsibility should fall on those who damage it. Here again an individual's WTP might be zero. Yet we cannot view this issue in isolation. For example, other political and public choices can have a direct and adverse effect on the ecosystem. But we can only maintain the ecosystem through a collective willingness to pay the cost of collective/public action.

Here again there is a tension. If the public ranks the right to a healthy ecosystem as the dominant objective, then WTA is the most appropriate measure. If the reverse is true then WTP is the correct measure of CV. Remember that in general WTP is the lower estimate of the two.

[6] For example Hanneman W, 'Willingness to Pay and Willingness to Accept: How much can they differ?', *American Economic Review*, Vol 81, pp635-647, 1991

Concerning reliability, the big question is whether estimates of the benefits attributable to a policy change are reliable enough to make a sound policy decision. The normal way of testing for reliability is by measuring the mean squared error (MSE). In cases where this number is large it is unlikely that replicating a survey will generate the same results as the original. This is an important issue in the sense that there may be underlying scientific uncertainty that clouds the policy-making process.

It is also the case that MSE may not be appropriate. If preferences change fairly quickly, then a 'true' value might not exist no matter how good our estimation procedure is. If a true value does exist it may change over time. In particular, changes in population demographics and cultural values might affect the true value and the most appropriate method of capturing it eg WTA or WTP.

Survey design is critical to achieving a robust measure of CV. Hall et al designed their questionnaire in three parts:

1. a description of the hypothetical market
2. questions to elicit value
3. respondents' socio-economic characteristics.[7]

We will briefly discuss each in turn.

1. Hypothetical market

This section describes five areas:

1. the good to be valued
2. the baseline amount of the good
3. how an additional amount will be provided
4. the range of viable alternatives
5. how payment for additional amounts of the good can be made.

In this case, the coastal ecosystem was categorised into three types and the good to be valued was the prevention of further decay resulting from human activity. The baseline for the good was described using detailed local scientific data. Two means were proposed for the provision of additional amounts of the good: stricter enforcement of existing legislation, and the designation of certain areas as off-limits (a ban). Substitutes were identified as other recreational uses based on a respondent's available time and money (budget constraint). Data was collected on visits to the available alternatives. A similar procedure was adopted for use of taxes. Importantly, respondents were also questioned about their preference for complementary activities as well as substitutes.

[7] Hall D, Hall J and Murray S, 'Contingent Valuation of Marine Protected Areas: Southern California rocky intertidal ecosystems', *Natural Resource Modeling,* Vol 15 No 3, Fall, pp335-368, 2002

2. Questions to elicit value

There are two common methods to elicit value. The first involves moving incrementally from a low value to a high value until the respondent indicates they
are unwilling to pay more. The alternative is simply to ask the question 'how much are you willing to pay?' The latter places the onus on the respondent, who may or may not have an appropriate benchmark for comparison.

A more basic method is to elicit a yes/no response by asking respondents whether or not they are willing to pay a specific amount. The critical point is that different respondents are given different amounts. This method avoids certain biases inherent in the former method, providing the variation in amounts across respondents is large enough. The problem is that the actual information collected is very limited. In comparison, the close-ended method whereby incremental values are offered to an individual until they are unwilling to pay more requires a large number of observations to achieve statistical efficiency. Many researchers favour a double-bounded method where a referendum-style question follows that depends on the response to the first question.

3. Respondents' socio-economic characteristics

In terms of respondent characteristics, the survey collected personal demographics such as age, race, gender, household income, education etc, alongside information relating to engagement in recreational activities and importance ratings of environmental goods, ie clean beaches. Further questions also sought to capture aspects of cultural/political preference, eg do you consider yourself to be a concerned environmentalist?

Before we present the key findings from this empirical study of MPAs, there are several more issues concerning sampling, and transferring preferences and WTP into action. First, there is an aggregation issue: is it appropriate to generalise the results to other parts of the coast? Second, can values be separated for the purpose of choosing between strategies aimed at different causes of damage to the ecosystem? Third, there are crossovers in terms of impact from other environmental policies. Fourth is the separation of use and existence values. Fifth, are there different values from local and non-local people, and is it appropriate to only survey local people? Sixth, is it only appropriate to ask visitors?

Finally, we report the results of willingness to pay (WTP) per visit to the ecosystem. The average WTP per visit is $6.11 and the median is $4.55. The

minimum is $3.11 and the maximum is $72.25. Interestingly WTP per visit did not increase relative to income, but did increase relative to distance away from the ecosystem. By estimating the number of annual visits and then applying it to the WTP, an estimate of an annual willingness to pay to avoid damage to the ecosystem can be calculated.

2.1.2 The demand for salmon fishing in Ireland

Here we summarise an empirical paper that used a count-data travel cost model for estimating the demand and economic value of salmon angling in County Donegal, Ireland.[8] Although the focus is explicitly on salmon angling, the paper has a wider context in the sense that the presence of salmon is an extremely good indicator of water quality. The findings are also of use to fishery managers because they can use this information to enhance the attractiveness of their individual fisheries to anglers, and from the inferred value to anglers attempt to extract this surplus for themselves.

The author uses a travel cost method to estimate a salmon angling demand function, where demand at a given location is a relationship between the number of days taken by an individual in a given period, the price of the trip (ie travel cost) and angler characteristics.

The data were collected from an on-site, in-person survey of anglers visiting Donegal in 1992. There is a series of assumptions implicit in travel cost models. These are:

- Travel cost and time are good proxies for the price of the visit.
- Travel time is neutral in the sense that it provides neither utility nor disutility. Ideally, information on the site choice decision is required to validate this assumption.
- The decision unit is trips of roughly equal length.
- Trips are for a single purpose only.
- The quantity consumed (number of fishing days) relates to the same site for all consumers (ie all fishing sites in Donegal are identical).

The angler's travel cost per day is calculated as the sum of travel costs (eg air fares, car hire, fishing expenses, accommodation) divided by the number of fishing days in the trip. The author uses actual costs, not cost per mile as is common in US studies. The demand function estimates the number of fishing days demanded per trip. The equation estimated is:

Days demanded per trip = f (travel cost, income, fishing quality, age, occupation and nationality)

[8] Curtis J, 'Estimating the Demand for Salmon Angling in Ireland', *Economic and Social Review*, Vol 33 No 3, Winter, pp319-332, 2002

The results show that: travel cost has the expected negative sign (ie reduces days demanded per trip), age has a positive effect, and occupation matters, as does nationality. Rather surprisingly, income was not found to be an important determinant, implying that days demanded per trip is unaffected by variation in income. Broadly, the analysis suggests that fisheries' marketing strategies might be most effectively targeted at older or retired anglers.

From this the author then calculates the consumer surplus (the benefit the angler derives from the trip over and above the cost paid). The average consumer surplus for an entire trip is IR£675.70.[9] The mean trip duration was 4.9 days, giving an average consumer surplus (CS) per day of IR£138.90. If average WTP is the sum of CS + travel cost, then the WTP for the average salmon angler visiting Donegal in 1992 was IR£206 per day as average travel costs were IR£68 per day. The net result is that salmon anglers visiting receive a considerable benefit from angling, over and above their angling costs. The implication is that fishery managers have considerable scope for increasing their revenues given that consumer surplus is such a large proportion of total WTP. This also varies across different types of angler. The only constraint for individual fisheries is that anglers may substitute one fishery for another if prices rise unilaterally. Alternatively, the state can capture some of this consumer surplus by raising licence fees across the board, thus removing any substitution effects.

2.2 Transport

2.2.1 Performance-based quality contracts for the bus sector

Reform of the bus sector has been occurring in many countries. A central feature of these reforms has been the establishment of a value for money (VFM) regime designed to ensure that bus operators deliver the best possible service levels consistent with stakeholder needs and government objectives. Underpinning this VFM regime is the need to identify the benefit to society associated with each dollar of subsidy from government.

Here we summarise an empirical research paper by Hensher and Houghton, which reviews key elements of a VFM regime, examines a Norwegian incentive-based contract system, and presents evidence from data for private bus operators in the Sydney Metropolitan Area.[10]

In terms of the supply of bus services in many countries, a primary focus has been on the delivery of cost-efficient services and an increase in passenger utilisation. This has occurred typically through a mixture of privatisation, economic deregulation and competitive tendering. What has often been lacking is a strategic overview that recognises that public transport is provided through a supply chain in which more than one objective applies, eg commercial and social obligations.

[9] The research was conducted prior to the introduction of the euro in Ireland

[10] Hensher D and Houghton E, *Performance-Based Contracts for the Bus Sector: Delivering social and commercial value for money*, Institute of Transport Studies, University of Sydney, 2002

This means that a more holistic approach is required that recognises that one institution cannot act without affecting other agents in the system.

Social surplus maximisation (SSM) principles applied to transport tend to suffer when the focus is narrowed to the detail of cost-efficient operations (the dominant focus with regard to competitive tendering). This loses the SSM associated with an overall mobility system. Thus the challenge is to integrate SSM and commercial objectives in a way that delivers improved service levels as a part of a VFM objective function. In short, social planning must be made with a commitment to commercial objectives and opportunities at the operational level under a cost and service efficiency regime in such a way that gives real meaning to optimum subsidy.

Governments typically argue that the role of a public transport subsidy is part of a wider objective aimed at shifting personal travel to public transport in order to reduce external costs such as traffic congestion, crash risk and negative environmental impact. A key part of reviewing the public service delivery regime is to establish an optimum system-wide subsidy system for the provision of bus services that will maximise profit and the level of passenger trip activity for the operator while also ensuring social surplus maximisation. Integrating these two maximisation objectives should allow that social surplus is the sum of producer surplus (PS) and consumer surplus (CS). Further, PS is equivalent (under a cost-efficiency regime) to profit maximisation for private operators.

An innovative payment system has been developed in Norway under which the local government makes payments to bus operators through an incentive scheme that pays for results rather than shares the costs of inputs. This approach identifies a set of external effects not typically taken into account by the individual traveller when choosing a mode of transport. For example, when a traveller chooses to go by car, she ignores the external costs imposed on others (eg congestion, pollution, accident risk etc) assuming that the institutional context does not allow for deployment of first-best car user charges to reflect these costs. Conversely, an extra traveller who goes by public transport helps to create a positive external effect. Importantly, as patronage increases on a particular route (or in an area) the socially optimum service frequency increases. This then benefits new travellers (whose patronage has led to service improvement) and also reduces trip time for those other travellers who continue to use the service.

In the absence of perfect price discrimination (where producers charge each individual what they are willing to pay), the operator is unable to extract the increase in consumer surplus that is enjoyed by the continuing users as a result of the increase in frequency. A fare increase for all passengers would preclude some

or all of the extra travel that justifies and requires the extra frequency. To achieve the optimum service level a government-funded incentive payment is needed. To the extent that the incentive payment results in lower fares and/or improved service levels there can be a social benefit from increased travel as well as from the reduction in car travel. This must be recognised in establishing the incentive payments.

The apparent conflict between the operator's objective function and that of social surplus maximisation is related primarily to the absence of the use of benchmarked best practice costing, and the presence of externalities linked to environmental and social (eg equity) impacts that are not internalised in the operator's profit and loss account. If social surplus maximisation imposes a substantial financial loss on the operator, then it would be unacceptable to them. If, however, a positive change in consumer surplus (based on private user benefits) and non-internalised externality benefits (EB) would increase revenue, then the operator would have the necessary incentive to act as a social surplus maximiser. Thus the only question left is how in practice to provide the appropriate incentive.

The implementation solution lies in changes to the pricing and/or supply regulations in such a way that opens up opportunities for the operator and regulator to seek out incentive-based mechanisms that reflect the challenge to internalise CS and EB. This requires freedom for the operator to participate proactively in pricing policy and service design to increase cost and efficiency. There must also be a benchmarking or monitoring system in place. An important feature of the performance-based quality contract system is a passenger-based incentive payment scheme, incorporating a subsidy per additional passenger trip above the level delivered under minimum service and fare levels. In this case, rewards to operators are revealed through the fare box, through increased consumer surplus and through reductions in negative externalities associated with car use.

The Norwegian system has two basic steps. First, fare levels are determined alongside revenues per kilometre and bus capacity to maximise a social welfare function. Second, rates for fare subsidies and revenues per kilometre are calculated to induce the profit-maximising operator to choose the socially optimum levels for revenue per kilometre and bus capacity. The operator does not set fare levels, but complies with a ceiling level set by the authority. The remuneration received per passenger by the operator is the sum of the fare level (step 1) and the subsidy level (step 2). Thus the system allows that a per passenger subsidy 'pays for results' and the revenue per kilometre payment reimburses some of the costs. The operator also receives the fare revenue. Here the revenue per kilometre subsidy will deter the operator from running empty vehicles. Thus the

incentive-based performance contract allows the subsidy to match the sum of the avoided external costs of car use and the benefits of increased service frequency.

The Australian system is implemented system-wide over a pre-defined geographical area. Demand for bus travel is defined as one-way annual passenger trips per contract period, and is assumed to be influenced by fares and service levels. Travel is divided into peak and off-peak, and passengers into school children and the rest (ie adults, children and OAPs). The benchmark is pre-contract demand.

Externalities are calculated as the sum of road damage, congestion, air pollution, climate change, noise and accidents, and estimated as marginal costs per vehicle kilometre for car travel. This is then added to the estimate of consumer surplus, which contains among other things willingness to pay for a one kilometre increase in service levels.

2.2.2 Is the demand for travel purely derived?

It is normally assumed that demand for travel is simply derived from a need to reach a destination. This assumption is particularly strong where travel is for mandatory purposes, such as work or school-related activities. Here we summarise a paper by Mokhtarian, Salomon and Redmond in which they question these assumptions by allowing for travel to have an intrinsic positive utility, ie travel is valued for its own sake.[11] They conclude that the demand for travel arises from a fundamental human need for mobility in addition to other subjective characteristics. The implications of their findings are that to forecast more accurately the demand for travel and the appropriate policy response, 'the role of those subjective characteristics needs to be understood much better than we do at present'.

Their paper begins by tackling the concept that travel is not pursued for its own sake, but only as a means of accessing desired activities in other locations, ie most travel is utilitarian or purposive in the sense that 'it is directed to the goal of relocating from one desired activity venue to another one'. Early researchers, for example Reichman[12] and Houseman[13], have argued that travel actually fulfils a basic human need, that of freedom or the right to move. This questions whether travel can in fact be considered as a disutility that should be minimised. Jones develops this line of enquiry by questioning whether it is correct to view destination choice as a trade-off between the (negative) costs of travel and the (positive) benefits enjoyed at the destination.[14] He contends that the process is

[11] Mokhtarian P, Salomon I and Redmond L, 'Understanding the Demand for Travel: It's not purely derived?', *Innovation*, Vol 14 No 4, pp355-380, 2001

[12] Reichman S, 'Travel Adjustments and Lifestyles – A Behavioural Approach' in Stopher P and Meyburg A (eds), *Behavioural Travel Demand Models*, Lexington, MA, Heath, 1976

[13] Houseman G, *The Right of Mobility*, Washington, NY, Kennikat Press, 1979

[14] Jones P, 'Destination Choice and Travel Attributes' in Hensher D and Dali Q (eds), *Determinants of Travel Choice*, New York, Praeger, 1978

better analysed as an interactive trade-off between the negative and positive aspects of both travel and destination options.

An important feature of Mokhtarian et al's research is that they allow for a third component of the utility of travel – that arising from the utility of activities that can be conducted while travelling, eg listening to music, thinking, relaxing, reading, talking to friends etc. Thus they derive the term 'excess travel' to capture travel beyond that necessary to reach a desired destination – effectively the sum of intrinsic utility linked to travel itself, plus the utility described above from activities.

With this framework in mind, the researchers then designed a lengthy survey questionnaire that was mailed to 8,000 San Francisco residents in 1998. Importantly, half were mailed to urban neighbourhoods and half to two suburbs. The response gave them 1,900 cases suitable for analysis.

The survey instrument contained eight core sets of questions relevant to this research paper. These were:

1. **Objective mobility:** Distance and frequency of travel by mode and trip purpose, as well as travel time for the trip.
2. **Travel liking:** 'How do you feel about travelling in each of the following categories?' ranked on a five-point scale from strongly dislike to strongly like.
3. **Attitudes:** Thirty-two attitudinal statements related to travel, land use and the environment with Likert-scale responses. Factor analysis was used to extract six underlying dimensions. These were travel dislike, pro-environmental solutions, commute benefit, travel freedom, travel stress and pro-high density.
4. **Personality:** Seventeen words and phrases were used to capture personality traits. These were then reduced to four personality factors: adventure seeker, organiser, loner and placid personality.
5. **Lifestyle:** Eighteen Likert scale-type statements relating to work, family, money status and value of time. These were reduced to four lifestyle factors: status seeker, workaholic, family/community-orientated and frustrated.
6. **Excess travel:** Thirteen statements relating to how often the respondent engaged in what would be considered unnecessary or excess travel (travel beyond the utilitarian).
7. **Mobility constraints:** Physical or psychological limits on travel that may affect both the amount of travel and enjoyment.
8. **Demographics:** Geography, car ownership, age, education, employment, household composition, income.

Using this rich data the researchers then sought to design a test to quantify what proportion of travel is 'excess' versus the proportion that is 'derived'. They developed (regression) models for 11 measures of distance travelled, including short distance plus several modes and purposes, and long distance plus two modes (personal vehicle and aeroplane) and purposes. All models were then tested against that subset of respondents who commuted at least once a month.

Their results show that:

- Demographic variables normally used to model travel demand play a major role. In particular, income plays a positive role (ie higher income = more travel). In contrast, age has a negative impact. Suburban residents tend to travel more in short-distance categories (and walk less).
- In terms of attitude, personality, lifestyle, excess travel and travel liking variables, the result shows that adventure-seeking people and people who travel just 'for the sake of it' travel more miles. In fact, people who liked long-distance travel covered 60 per cent more long-distance personal car miles than those who were neutral about it. Adventure-seeking people also travelled 21 per cent further on short-distance travel, 16 per cent further by car, 48 per cent further by air and 88 per cent further on long-distance work-related activities than their 'average' counterparts.
- People with high levels of travel stress travelled 19 per cent fewer long distance miles.

On the basis of their findings, they concluded that:

> 'The way people will react to policies intended to reduce vehicle travel will depend in part on the relative weights they assign to the three components of a utility for travel, and on whether they desire more or less mobility than they currently experience. Although non-travel alternatives are available that may partially satisfy the various utility components, those alternatives will often not be as desirable as travelling.'

And make two recommendations:

1. We should begin to view travel not just as a disutility, but as a literal 'good' having both positive and negative characteristics.
2. We must also recognise that different people will weight differently the three components of the utility for travel, and that their particular combination of weights could substantially affect their travel-related decisions.

2.3 Broadcasting

Programme selection in the context of television has been widely researched in response to the widely-cited allegation that programming lacks diversity,

and/or the profit motive encourages excessive production of programmes with mass appeal. Here we summarise a paper by Crampes and Hollander, which asks explicitly how a for-profit cable or satellite operator allocates a fixed-channel capacity to different programme types, and how different channels are bundled and priced.[15] Further, it also asks how these decisions differ between a profit-maximising firm and a welfare-maximising firm, and examines the effects on profits and welfare of two regulatory constraints that limit the operator's choices in regard to the number of distinct bundles that may be offered to subscribers.

Previous work in this area has found that:

- the total number of channels would be larger under competition than under monopoly, but that the latter would yield greater diversity
- results are very sensitive to assumptions regarding viewers' willingness to watch second-choice programmes, channel capacity and skew in the distribution of viewers' preferences
- competition duplicates programmes with wider appeal.

Typically, variety of content is captured by the number of programme categories, although more recent work investigates the interaction between programme diversity and the specification of individual programmes. An important issue that merits further clarity and understanding here is that of bundling. By this we mean a situation where a package is offered for sale, but individual products in the package are not (pure bundling). Mixed bundling describes a situation where consumers are given the option of buying the package as well as the option of buying the individual products that make up the package. Bundling is normally viewed as a technique used to extract consumer surplus that cannot be extracted when offering goods separately. It is also a strategy adopted as an entry deterrent or as a means of reducing competition among existing providers in the market. The interesting feature of the approach taken by Crampes and Hollander is that it focuses on the interaction between product bundling and product specification. Following this line of enquiry, decisions in regard to bundling derive solely from consumer preferences and further, that the audience consists of individuals who appreciate variety in programming for its own sake. However, the audience differs from each other as they derive differing levels of utility from particular combinations of programme types.

Their model assumes a monopolistic cable or satellite operator facing asymmetric information about viewers' preferences (ie viewers know more about their programme preferences than the operator). When two bundles are offered, prices and bundle compositions are chosen to extract the entire surplus from subscribers (ie no viewers – even those with very high willingness to pay – are left with any surplus). Thus, the optimal capacity allocation depends not only on the

[15] Crampes C and Hollander A, 'Product Specification, Multi-Product Screening and Bundling: The case of Pay TV', *Information Economics and Policy*, Vol 17 No 1, pp35-59

preferences of viewers with the highest willingness to pay, but also on the proportion of the audience made up of such viewers.

The basic model:

- a single cable or satellite operator
- all programming is of two types – sports or documentaries
- number of available channels (capacity) is governed by available technology
- each channel is dedicated to sports or documentaries
- the utility that the viewer derives is captured by her intensity of preferences for sports relative to documentaries
- all members of the audience belong to one of two classes, sports-loving or documentary-loving, based on their utilities
- the operator knows about the relative utility of sports and documentaries, but not about the preferences of individual subscribers. Thus it cannot discriminate on price across individual viewers (first-order price discrimination). However, it can offer programme combinations (bundles) that allow viewers to self-select (choose specific bundles based on their preferences for sport or documentaries)
- at any point in time, subscribers only watch one channel. The benefit of having access to more channels of a particular type is that a viewer has a better chance, at any time, of finding a programme they really like, and a better chance that, at any time, the viewer will find a programme of sufficient quality that they will find it worthwhile to spend the time to watch it.

The problem:

- the operator must decide the number of channels dedicated to sports and documentaries
- the operator's objective is to maximise profits subject to a number of constraints.

Constraints:

- Participation – consumers in each subscribing class must generate a surplus.
- Whenever distinct bundles are offered, consumers in each class must derive a higher surplus from the bundle targeted at them than from the bundle targeted at the other class.
- Technical constraints are such that the number of channels subscribed to cannot exceed the channel capacity, and the number of channels of a particular type contained in a bundle cannot exceed the total number of channels devoted to that type of programming.

Initial results:

- Whenever two bundles are offered, participation constraints are binding.
- A two-bundle offer always leads to distortions at the bottom and top (ie lowest and highest willingness to pay).
- Profit maximisation requires a distortion at the top in order to gain additional profits from the class at the bottom.
- The bundle targeted at the bottom class is distorted since it contains fewer channels than are available on the system (ie a low-quality variety facilitates price discrimination).
- Operators are more likely to offer two bundles when the size of the majority group increases and the gap in preferences is large.

2.3.1 How does bundling and capacity allocation differ for the welfare-maximising operator?

The welfare maximiser is under an obligation to generate a minimum amount of revenue to cover costs subject to the same constraints outlined previously. Thus welfare maximisation requires that all viewers be given access to all channels. This is in contrast to the private monopolist who allocates too many channels to sports, and from a welfare point of view, when the average viewer has a weaker preference for sports than for documentaries. For the profit maximiser, the one-bundle offer yields higher revenue for any capacity allocation than any two-bundle offer as the only adjustment that lets the operator meet its revenue constraint is one that increases the number of sports channels at the expense of documentary channels. Such an adjustment lowers welfare. Yet a strict revenue constraint can also prevent the welfare maximiser from offering two bundles.

2.3.2 What if conditions of access are regulated?

The authors then explore the effects on profits and welfare of the following regulatory constraints:

- the obligation to make all channels accessible to both groups
- prohibiting the selling of a bundle containing fewer channels than the total available on the system.

Regulation one, granting all subscribers access to all channels, is effectively setting a price ceiling. Profits are unaffected if the package offered to sports viewers is large, but lowered if the package is small. Welfare is increasing/decreasing depending on the proportion of viewers in each class. It is more likely to increase if the proportion of viewers who would subscribe to a smaller bundle is larger without the constraint.

For regulation two, the question is whether the operator is better off selling to both groups the bundle specified to maximise the utility of Class 1 viewers (sports), or whether the operator does better by selling to Class 2 viewers only (both at different prices). Briefly, the effect is to force the operator to set a price at which Class 1 purchases the larger bundle. This adjustment increases welfare. However, a lower price becomes more costly when the package is larger. For smaller packages, imposing the constraint affects welfare in two ways: it changes channel allocation, and it excludes Class 1 who in the absence of the constraint would purchase the smaller bundle.

To summarise, this paper has examined pricing, capacity allocation and bundle composition decisions by a monopolistic cable or satellite operator. Using a model that has two classes of viewers and two programming types, it has established that whenever two distinct bundles are offered to subscribers, one bundle will contain all the channels supplied by the operator. The implication is that a subset of channels will be made accessible to all subscribers. A second result is that a two-bundle offer is more likely to yield higher profits than a single bundle offer when the disparity of consumer preferences is large, and the size of the group having the strongest preference for the type of programming favoured by the average consumer is larger relative to the other group. A third finding is that when two bundles are offered, prices and bundle compositions are chosen so as to remove all consumer surplus.

It also found that whenever the average viewer has a stronger preference towards a particular type of programme, a profit maximiser allocates fewer channels than is optimal. Further, a welfare maximiser subject to a mild revenue constraint will offer a bundle containing all channels to all viewers. Yet as the minimum revenue required increases, the channel allocation chosen by the constrained welfare-maximising operator comes closer to the allocation that maximises the utility of the class with the lowest willingness to pay. As the constraint becomes even more restrictive, a threshold may be crossed where the welfare maximiser switches to a two-bundle regime. If the constraint is further tightened, this is met by the operator reducing the size of the smaller bundle. This increases revenue but reduces welfare.

2.4 Education

The choice of expenditure on school education is one of the most contentious debates in politics. It is particularly interesting as not all residents benefit equally from expenditure as only around a third of all households have children of school age. While altruism may encourage some voters to support local education even if

they do not benefit directly from such expenditure, we might predict that many communities may 'under-provide' education from the perspective of an individual who considers demand for education over their life cycle. A countervailing argument is that 'good' schools are an amenity that is capitalised in house prices. Thus, even if a property owner does not use schools, a future buyer of the property may care about the quality of local schools. Hence local residents will support education in order to benefit from an increase in house prices. This school/house-price effect has been identified in numerous studies.[16]

The research paper we summarise here by Hilber and Mayer argues that the level of local spending on education depends on the extent to which spending is capitalised into house prices.[17] A particular point of focus is on the relationship between house prices and areas in which land supply is restricted, such as suburbs of large cities where residents may be more willing to vote for education. Previous research has shown that in a world with imperfectly mobile voters and house value capitalisation, the voters' ideal spend for durable public goods reflects a blend of their own preferences and those of the eventual buyer of their house.[18] This is reflected in evidence that the median successful home-buyer outside core cities has school-age children, even if the median resident does not.

To test their basic hypothesis, the authors examine the extent to which house price capitalisation drives expenditure on schools, focusing particularly on differences caused by the relative availability of residential land. As long as land supply is not perfectly inelastic and communities are not perfect substitutes, both price and quantity will adjust in response to demand shocks. However, price adjustment should be greater (and quantity adjustment smaller) in places with less available land.

Normally, residents would sort perfectly into the community with their exact preferences. For example, elderly households would move into communities that focus exclusively on services for the elderly. However, with a relatively small number of communities, multi-dimensional preferences and moving costs, residents live in a second-best world. In heterogeneous communities, residents often have to vote on public services that do not match their preferences. Thus an elderly household may live in a community that just happens to have good schools simply because they have been there a long time, or because they enjoy other amenities in that community.

---

[16] See for example Black S, 'Do Better Schools Matter? Parental valuation of elementary education', *Quarterly Journal of Economics*, Vol 114, pp1243-1284, 1999; Weimar D and Wolkoff M, 'School Performance and Housing Values: Using non-contiguous district and incorporation boundaries to identify school effects', *National Tax Journal*, Vol 54, pp231-253, 2001

[17] Hilber C and Mayer C, 'Why Do Households Without Children Support Local Public Schools?: Linking house price capitalization to school spending', NBER Working Paper, No 10804, September 2004

[18] Brueckner J and Joo M, 'Voting with Capitalization', *Regional Science and Urban Economics*, Vol 21, pp453-467, 1991

Theoretical framework:

- Capitalisation of fiscal variables (public expenditure) and amenities should be high in places where residential land supply is relatively inelastic because all land is already in use for residential purposes – typically large urban and suburban communities.
- In rural areas where residential land supply is elastic, exogenous improvements in local attractiveness leads to relatively minor effects on local land values, assuming land can be easily changed for different uses.
- Some aspects of current public spending affect the utility of future residents (particularly durable goods), or if current spending decisions contain a commitment to future spending.
- The median voter's pay-off is composed of a direct effect (the benefit derived from higher public spending on schools) and an indirect effect (house capitalisation).
- Whether it is advantageous for the median voter to invest in public education spending (essentially through taxes) will depend on: their home-ownership status; the net benefit of the investment for them; the net benefit of the investment for the marginal homebuyer (or renter); the extent of capitalisation; and the probability of relocation for the median voter.

Empirical specification:

- Uses data from Massachusetts where Proposition $2^{1/2}$ placed caps on local property taxes and municipal spending.
- Sample One period 1990-94 and community characteristics from 1980 to allow things to feed through the system. Detailed data on land availability. Includes 208 cities and towns.
- Basic model is such:
  Change in house prices = F (local characteristics + change in public spending + change in housing stock)
- Sample two is a national sample and uses school district data for the whole US.
- Basic model is such:
  Spending per pupil = F (population density + local characteristics + school characteristics + state and federal revenue + state)

Results:

- Fiscal variables (public expenditure and taxes) and amenities are capitalised to a much greater extent in towns and cities with little available land.
- These communities also spend more on schools, and voters in these towns and cities are much more favourable to costly spending programmes.
- Per pupil spending is higher in communities with higher population densities. A community with a density of 1,500 people per square kilometre spends 3.3 per cent more per pupil than one with a density of 150 people per square kilometre.
- This disparity in per pupil spending becomes even higher in areas with high home-ownership rates.
- Elderly people are not particularly averse to spending on schools. Specifically, a high elderly population in dense population areas is associated with increased public spending on schools, although in rural areas there is either no effect or a small negative effect.
- Further, if the elderly in high population-density areas have a low expected duration in their current house (ie they will sell fairly soon), then they will be even more likely to support increased school spending.

This research raises some quite interesting questions about the future of educational spending, particularly in relation to the ageing population shift we are currently experiencing. For example, if the elderly increasingly move to areas where public expenditure is heavily focused on the provision of elderly services, then this may cause school spending reductions in municipal areas.

More generally, these results suggest that house prices can encourage the efficient provision of public services as voters care about the preferences of future generations, captured through the housing market, which provides a positive incentive for them to support a variety of services that may only be consumed by a minority of current residents. Further, there is little incentive for them to impose burdens on future generations of residents or home buyers.

3. Summary

In this paper we began by discussing many of the key theoretical concepts in the theory of social choice in order to provide a framework in which we could explore more practical aspects of the measurement of public value in a wide variety of contexts and settings. It is hoped that readers will benefit in two ways. First, by developing a better understanding of how difficult it is for public policymakers to capture the tastes and preferences of millions of individuals and even if they can, then translate this into social decision making in a meaningful and representative way. And second, by gaining greater insight into how the methods used to capture aspects of public value depend to a large degree on the context to which it is being applied. As we have seen from the summaries of the empirical research papers, there is a variety of very detailed and rigorous models and methods that have been used. But finding the 'best' means of capturing public value is critically dependent on what one is trying to measure, the relevant population, the presence of externalities and how one particular aspect of public provision is linked in to a wider system of social decision making. This is further clouded if there are both public and private providers in the supply chain.

To recap in slightly more detail the key elements of this paper, we began with the proposition that in a modern developed democracy social choices are made through the voting system and economic choices through the market system. Both represent mechanisms by which the tastes and preferences of millions of individuals are aggregated to guide decision making over social choices. The key question was then defined as whether or not a framework could be developed to transfer a set of known individual preferences into a coherent system of social decision making. Behind this was the problem that if we base social choices on individual utilities, then we must make value judgements. Further, once a mechanism is in place, then individuals may have incentives to misrepresent their tastes. Thus we are left with a specific problem. How can we ensure that individuals represent their actual tastes?

In reality things are a little more complicated still. Each possible alternative social state has many components, some of which might be desirable under certain circumstances and not under others. A further complication is that some components are not divisible. If social states are the object of choice, then the ordering of social states is determined at the individual level by the direct consumption of the individual and her general standards, morals etc. Thus a true theory of social welfare should look at the entire system of values, including values about values. This is a particularly relevant point in this project as people may value democracy and fairness, even if it means they lose out in a strictly economic sense.

In terms of practical measurement, we explored examples across a range of public policy areas including the environment, tourism, transport, education and broadcasting. This was particularly interesting as these are all areas in which there have been significant shifts in the way that public services have been supplied over the last two decades in most developed countries. Indeed, the most pervasive theme in many public services has been the delivery of cost-efficient services. This has manifested itself in many ways, although privatisation, deregulation and competitive tendering have been the most common methods adopted, although sometimes demand-side policies have also been included.

At the heart of these strategic reforms has been the concept of 'value for money', or the requirement that providers of services deliver to the market the 'best' levels of service for the level of subsidy received, subject to stakeholder needs and government objectives. Yet in most cases maximising the social benefit derived from public service provision is clouded by this mix of public and private actors who have quite different objectives in the supply chain. Thus, a key challenge for public policymakers is how to incentivise private agents to act in a way that is consistent with achieving the maximum social benefit.

So what are the key issues that public policymakers need to take account of when considering issues of measurement? The first is that consumption (the payment and use of goods and services) tells us nothing about quality of experience. We took a bus journey, but did we enjoy it? When considering certain public goods, paradoxes exist; for example the very thing that attracts people to environmental assets is the thing that is most negatively affected by them. It is also the case that people often do not have the option to purchase the exact amount of resource they would prefer. The quality of some goods is a collective choice, particularly in the case of environmental goods where resources cannot be explicitly purchased through the market per se.

Key concepts that warrant serious consideration are use value and existence value (explicit current consumption and preservation for future consumption/bequest value). In practical terms, different methods of eliciting value generally arrive at different answers. Two of the most common methods, willingness to pay (WTP) and willingness to accept (WTA), tackle the same question from different ends. WTP captures people's willingness to pay to maintain a given level of provision, and WTA captures what they would be willing to accept for a lower level of provision. For example, I might be willing to pay £200 in higher taxes to maintain a bus service to my village. Yet I might require a tax rebate of £500 for a complete withdrawal of the bus service. Crucially, WTP is governed to a greater degree by income level than WTA, thus care must be taken when deciding on an approach to capturing value from users and potential users of a service.

There are also some heavyweight statistical issues that cannot be ignored. For example, if we conduct a survey to capture WTP or WTA, as many public agencies do, then the survey must reliably measure these values. This is termed validity. And, if we ran the same survey again, would it generate similar responses? This is termed reliability. Yet even if we have the best method of capturing and measuring what we are trying to measure and can repeat our process with reliability, we cannot ignore the fact that other political and public choices can have a direct and potentially adverse effect on the provision of that good or service.

Another commonly used method for capturing and measuring public value is the travel cost model. This is often used for estimating the demand for, and economic value of, visits to tourist destinations and heritage sites. In this type of framework a key concept is consumer surplus, which can be calculated as the benefit the visitor derives from her visit over and above the cost paid for that visit. A corollary of this is that public sector managers have greater scope for increasing their revenues if the consumer surplus is large in terms of total WTP. However, some researchers have also argued that travel in itself is a literal 'good', having both positive and negative characteristics. If we believe this to be the case then these also need to be taken into account in any measurement.

Turning the focus of attention to the government's objective function, we must consider specific policy interventions, eg subsidising a bus service, as part of a much wider set of objectives. In this case providing a bus subsidy would be part of a wider aim of shifting personal travel to public travel. But why do this? Generally this is done because there are external costs that can be reduced, eg traffic congestion, crash risk, pollution etc. Thus the role of government here is to take into account costs not typically considered by individuals or private providers when choosing their transport mode. Yet while the debate normally focuses on negative externalities, positive ones also need to be accounted for. In our bus service example we saw that as patronage increased on a particular route, the socially optimum service frequency also increased. This benefits existing and new passengers alike. It is only government that can deal with externalities linked to social impacts (eg equity), since these are not in the objective function of the private sector unless they are incentivised by government to do so.

What about variety for its own sake? It is often argued in the context of retailing that people benefit from the existence of lots of smaller, heterogeneous shops offering bespoke products rather then huge, homogenous superstores. We saw in our broadcasting example how viewers can benefit from having access to more channels and a greater diversity and quality of programming. And we also saw

how private providers differ in terms of the types of programmes they offer as they are driven by profit maximisation.

Our education example also highlighted how even non-users of this service can both support and capture some of the economic benefits of education provision. Some may even have altruistic motives. It also stressed how important and lengthy people's time horizons may be when making current decisions about public services.

We conclude by stating that economics, and in particular welfare economics, has a rigorous conceptual framework in which key aspects of value can be explored. Yet there are gaps in the ability to capture fully aspects such as the value people place on fairness, democracy and the process by which the public is engaged and consulted. However it is beyond doubt that the strength of economics lies in its practical applications to the measurement of public value in any shape or form, and once measured the ability to use an array of advanced techniques to design and analyse robustly surveys and captured data. The challenge for public policymakers is to define the relevant questions and issues in such a way that captures all the economic and non-economic aspects of an individual's decision-making process, and to best utilise these techniques in the decision-making process.

Bibliography

Arrow K, *Fundamental Theorem of Social Choice*, 1951

BBC and Human Capital, *Measuring the Value of the BBC*, http://www.bbc.co.uk/thefuture/pdfs/value_bbc.pdf, October 2004

Black S, 'Do Better Schools Matter? Parental valuation of elementary education', *Quarterly Journal of Economics*, Vol 114, pp1243-1284, 1999

Brueckner J and Joo M, 'Voting with Capitalization', *Regional Science and Urban Economics*, Vol 21, pp453-467, 1991

Crampes C and Hollander A, 'Product Specification, Multi-Product Screening and Bundling: The case of Pay TV', *Information Economics and Policy*, Vol 17 No 1, pp35-59, 2005

Curtis J, 'Estimating the Demand for Salmon Angling in Ireland', *Economic and Social Review*, Vol 33 No 3, Winter, pp319-332, 2002

Hall D, Hall J and Murray S, 'Contingent Valuation of Marine Protected Areas: Southern California rocky intertidal ecosystems', *Natural Resource Modeling*, Vol 15 No 3, Fall, pp335-368, 2002

Hanneman W, 'Willingness to Pay and Willingness to Accept: How much can they differ?', *American Economic Review,* Vol 81, pp635-647, 1991

Hensher D and Houghton E, *Performance-Based Contracts for the Bus Sector: Delivering social and commercial value for money*, Institute of Transport Studies, University of Sydney, 2002

Hilber C and Mayer C, 'Why Do Households Without Children Support Local Public Schools?: Linking house price capitalization to school spending', NBER Working Paper, No 10804, September 2004

Houseman G, *The Right of Mobility*, Washington, NY, Kennikat Press, 1979

Jones P, 'Destination Choice and Travel Attributes' in Hensher D and Dali Q (eds), *Determinants of Travel Choice*, New York, Praeger, 1978

Lindbeck A, Nyberg S and Weibull J, 'Social Norms and Economic Incentives in the Welfare State', *Quarterly Journal of Economics*, Vol CXIV No1, February, pp1-35, 1999

Mokhtarian P, Salomon I and Redmond L, 'Understanding the Demand for Travel: It's not purely derived?', *Innovation*, Vol 14 No 4, pp355-380, 2001

Reichman S, 'Travel Adjustments and Lifestyles – A Behavioural Approach' in Stopher P and Meyburg A (eds), *Behavioural Travel Demand Models*, Lexington, MA, Heath, 1976

Weimar D and Wolkoff M, 'School Performance and Housing Values: Using non-contiguous district and incorporation boundaries to identify school effects', *National Tax Journal*, Vol 54, pp231-253, 2001

We provide:
Research
Consultancy
Leadership
Advocacy
Partnership

Registered as a charity no: 290003

First published: November 2006

The Work Foundation
3 Carlton House Terrace
London
SW1Y 5DG
Telephone: 020 7004 7100

Email: enquiries@theworkfoundation.com

Website: www.theworkfoundation.com