

Benefits and costs of introducing tariff choice in uncontested markets –
A Report for Ofwat

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1. Theoretical models indicate that allowing a regulated company to introduce optional (or self selecting) tariffs can make individual consumers (and consumers on average) better off and be profitable for the company, as long as the original (regulated) tariff remains available to all consumers.
2. The models contain some restrictive assumptions and limitations and may be difficult to apply in practice.
3. One particular assumption crucial to the benefits is that consumers choose the best tariff for themselves. More recent research on consumer behaviour in general and in utilities in particular show that this may not be the case. Much of the market literature has been concerned with the telecoms and energy markets.
4. There may be distributional concerns if some consumer groups are less likely to choose well, particularly if there are likely to be long term effects on the 'base' tariff. Such concerns are reflected in the current British energy regulator's consultation on **reducing** tariff choice for both suppliers and consumers as a response to perceived failure of competition. This experience raises questions about the intrinsic value of choice for consumers.
5. Experience of optional metering in England and Wales provides some evidence of how residential water consumers have responded to that particular tariff choice. Other evidence on water consumer perceptions indicates that the assumptions made in theoretical models of tariff choice may not be applicable to this market. This may affect the applicability of welfare assessments made in the models.
6. We conclude by identifying some questions about the circumstances in which allowing optional tariffs (alongside a regulated base) is likely to be beneficial.

¹ The Centre for Competition Policy was set up in 2004, with a grant from the Economic and Social Research Council (ESRC) to fund a ten-year research programme and explores competition policy, including market regulation from the perspective of economics, law, business and political science.

1. Optional tariffs can make consumers and companies better off, if the original tariff remains available to all consumers.

The theory of allowing companies to offer tariffs in addition to a regulated price was developed in the 1980s and 1990s, before competition was widely introduced to the formerly regulated sectors and behavioural biases of consumers were considered in the general literature. The intuition is appealing, and presented in Willig's 1978 article. Several authors showed that allowing a firm to offer optional tariffs while still offering the original tariff could never be welfare decreasing if:

Consumers know which tariff is best for them, so will never be worse off from the new option; Firms offer new tariffs only if it increases their profits. If these two conditions are satisfied, there can be no loss from the introduction of optional tariffs as an addition to the original in such a static setting. Note that if there is a feedback from the revenue received by companies to the prices they charge to all consumers in subsequent periods, these results will not necessarily hold.

Optional tariffs are likely to be most beneficial for the firms if demand is very responsive to price changes. This can be illustrated by the example of introducing peak and off peak prices where there had been no previous differentiation between time of day/season. Peak prices are higher and off-peak prices lower than the uniform price, which continues to be available. Under the assumptions above, consumers will be by definition better off; but if consumers with high off-peak use move to the new tariff, while those with heavy peak consumption stay on the uniform tariff, the revenues for the company may fall. If it is up to the company whether or not to introduce such tariffs, then assuming it has reasonable knowledge of its own costs and its consumers' demands, it will do so only if it is profitable for itself. Faulhaber and Panzar (1977) show that under any optimal set of self-selecting two part tariffs, the lowest usage charge is greater than marginal cost. Adding another option will always bring the lowest usage charge closer to marginal cost and increase total surplus. Train (1991) confirms this result when the number of consumers is fixed (as is effectively the case in water) and consumers have some preferences for particular tariffs independently of the outlay they need to make (perhaps because of concerns about variation in bills).

Much of the theoretical debate in the US was motivated by offering measured tariffs rather than flat rate for telecoms, an interesting analogy to the current UK water situation where, as

discussed below, a choice of tariffs (measured or unmeasured) is already offered to most unmeasured customers.

Focusing on companies constrained by an average revenue constraint, Armstrong, Cowan and Vickers (1995) show that in a large number of cases, overall welfare will improve if a regulated firm is allowed to use non linear tariffs, and consumers have the option to continue consuming at the uniform price which maximised profit for given average revenue constraint.

With average revenue regulation there might be a problem of the firm trying to increase profits within a revenue cap by serving low cost consumers and pricing high cost consumers out of the market (Bradley & Price, 1988), but this would be less likely with a tariff basket constraint (as applied to water companies) and a myopic firm which maximised profits. In practice, there is little evidence that companies responded to these incentives in the first decades of regulated privatisation (Giulietti & Waddams Price, 2005).

Vogelsang (1990) adapts Sibley's Incremental Surplus Scheme (ISS) for a regulated firm, and confirms that allowing the firm to offer any optional two part tariff will increase the total surplus, as long as consumers can still choose the original (regulated) tariff. Consumers are assumed to maximise their utility, and so will never accept a tariff which leaves them worse off, and the firm will set marginal cost prices, with the original tariff acting as a kind of yardstick. Vogelsang points out that this is the most Pareto efficient outcome in a stationary environment, but raises some questions which are reproduced below. The firm's rents are equal to the initial profits plus net consumer surplus increases from optional tariffs; consumers as a whole neither gain nor lose; and the firm minimises costs and invests optimally.

2. The models contain restrictive assumptions and limitations and may be difficult to apply in practice

Train (1991) points out that some consumers may be hurt if the company in fact loses money – perhaps because it miscalculated costs or demand. In such a case the ‘standard’ tariff might have to rise in order to allow it sufficient revenue, and so it is no longer true that no consumer is worse off – those who don’t choose the option will be because their (default) tariff will change. A more positive outcome might be that the introduction of the tariffs themselves may provide the regulator with additional information about the firm’s costs, and so enable more efficient regulation.

Vogelsang (1990) raises a number of practical concerns about the introduction of optional tariffs which seem very relevant two decades later. First, he notes that consumer advocates generally do not support policy changes which make firms better off. Secondly, more tariffs increase the complexity of consumer choice, foreshadowing more widespread concerns about whether consumers always choose what is in their own best interests. And thirdly, there may be concern about degradation of quality, though it is unclear why this should be more of a problem with optional tariffs than with other forms of price cap regulation.

If demand or cost changes in a way that is not initially predicted, winners and losers reflect the situation for price caps more generally: that is, cost changes are borne entirely by the firm, and might raise issues of viability; while consumers suffer surplus reductions from unforeseen demand decreases but benefit from increases.

Li Ning and Willington (2009) analyse a regulated firm with a binding universal access constraint, which may be relevant to water. They examine two different tariff schemes which supplement the approved regulated price. In the first scheme, the alternative tariffs must be available to all consumers; in the second, the firm can restrict access to the ‘alternative’ tariff. The latter will maximise total surplus, but as the authors point out, it may be less desirable because of considerations of fairness; they confirm that allowing the firm to offer the choice of alternative tariffs to all consumers will improve the total welfare. Their paper underlines the importance of perceived equity between consumers.

Panzar and Sidak (2006) identify some cases where allowing a regulated company to offer an optional tariff does not lead to an overall (Pareto) improvement. The most relevant for the current situation is that there may not be an improvement if a firm is not a profit maximiser (for obvious reasons); and, as others have observed, optional tariffs may not work well if regulation provides a mechanism which means that allowed revenue decreases, so the

regulated price is raised for others. Equally if the firm's revenue rises there may be good effects for other consumers through eventual (downward) revision of the base tariff.

Miravete (2007) considers the cost to companies of introducing more complex/general tariffs, arising from underlying product development/marketing/commercialisation costs which may outweigh the small gains from introducing such tariffs. Basing his findings on the US cellular phone market he shows that adding tariff complexity does not dramatically increase profits beyond three tariff options, and that losses from using a two-part rather than a more multi-part/fully non-linear tariff are very small. His analysis suggests that a single option (in addition to the original regulated price) would capture any potential net gains.

3. Consumers don't always choose well for themselves.

The work described above, and indeed most 'standard' economic analysis until recently, assumed consumers knew how to choose best for themselves. Given the importance of this assumption in the conclusion that optional tariffs are an improvement (because no consumer would choose it unless it was in their own best interests), some review of this assumption is appropriate in the light of recent developments in behavioural economics. A recent report for the Office of Fair Trading by Huck et al (2011) reviews findings from the general literature on consumer bias, including whether biased consumers may make 'rational' consumers better or worse off, in a general competitive rather than regulated context.

These more recent challenges from the development of 'behavioural' literature and understanding about consumer choice raises questions about the basis of the original models; unfortunately, as in much behavioural work, the result is rather negative, with rarely clear guidance on the consequences of the biases and appropriate policy response.

Like the theory, most of the relevant empirical evidence in regulated markets is based on the electricity and telecommunications sectors. The main precedents are in the introduction of optional time of day/seasonal tariffs in energy, and of usage rather than flat rate tariffs in telecommunications, a close parallel to the choice between measured and unmeasured supply in water.

Miravete (2003) demonstrates that consumers can make ex post (as well as presumably ex ante) errors in tariff choice because they are unable to commit to usage. Miravete distinguishes between errors of choice of tariff where consumption is correctly anticipated, and errors in forecasting usage (which may affect the optimal tariff choices). Water consumption is likely to be more predictable in some dimensions than telephone usage, though some uses (such as garden watering) depend on weather. However learning can occur on both the company and consumer sides, so that consumers become more aware of their own usage over time, and so make better choices.

At the same time, companies get a better idea of each consumer's type and therefore can price discriminate better (i.e. offer more tailored tariff choices from which the customer can self-select) and extract more of the consumers' surplus. Both benefits and downsides (from the consumer surplus/regulator's perspective) may increase over time, rather than necessarily be immediately realised.

Miravete's telecoms tariff experiment shows no evidence of a flat rate bias, found commonly in the behavioural literature, and suggests that in general consumers do make the correct choices for themselves based on realized usage. There are two parts to this choice: consumers' ability to predict their usage; and, secondly, their ability to make the correct choice based on their predicted usage. The benefit of field experiments, such as Miravete reports, is the abstraction from tariff complexity: there are only two tariffs to choose from – one fixed, one which has a fixed element up to a certain degree of usage. Risk aversion is also minimized as potential losses are small.

Miravete and Palacios-Huerta (2009) explore the evidence from one tariff field experiment on the attentiveness of consumers, something which is very difficult to test realistically in laboratory experiments. The situation mirrors some water metering choices, as consumers are given the option of a multi-part tariff (fixed fee, inclusive allowance plus per usage charge once the allowance threshold reached) or a flat rate tariff as previously. They find that the level of consumer attentiveness is high and that participants respond to small potential savings (\$5-6 per month); although consumers do make mistakes, these are not systematic. However, those who face more complex decisions learn more slowly and make more mistakes. No evidence of time-inconsistent choices or impulsiveness is found.

Tariff-choice biases are explored directly by Lambrecht and Skiera (2006), in particular any preference for flat rate fees or pay-per-use tariffs bias. The bases of each kind of tariff are explored. A flat rate bias can arise from an insurance effect where the consumer's risk aversion generates a preference for a predictable bill. A related aversion to loss may lead them to prefer a flat rate bill even if the average payment is higher. Other factors contributing to a flat rate bias may include a 'taxi-meter' effect where consumers enjoy non-metered usage more than metered usage. The flat fee "decouples consumption from payment", in effect giving consumers positive pleasure from the zero marginal price of additional units. Consumers may also experience a convenience effect from the predictability of the bill.

Lambrecht and Skiera also found an over-estimation effect, in which consumers consistently predict higher usage than they actually undertake, and so make ex post errors. The research finds evidence that consumers pay a flat-rate specific premium, which they explain by the factors outlined above.

Herweg and Mierendorff (2011) provide a theoretical model which develops many of Lambrecht and Skiera's propositions, confirming the three reasons for a flat rate bias. They emphasise three factors: the taxi-meter effect, suggesting that if payment is more salient,

consumption is less enjoyable; the tendency for consumers to over-estimate their usage; and risk aversion. Since the risks are small, they focus on loss aversion and consumers' wish to avoid even small deviations from reference point.

The National Billmonitor mobile report 2011 provides support for Lambrecht and Skiera's findings that flat rate bias is more prevalent than pay per use bias. 52% of the customers in their sample were on a tariff that was optimal for larger usage than theirs, whilst only 29% were on a tariff that was optimal for smaller levels of consumption. Three reasons are proposed for such bias. First, risk aversion which leads to tariff complacency and "bill shock". Secondly, the complexity and limitations of contract choices for a given handset which drive consumers to simpler tariffs. And thirdly, failure of customers to take advantage of the ability to change tariff "mid-contract". Many do not appreciate the fact that it is easier to increase than decrease the size of a contract during the contract term, so that picking a smaller package to start with may offer more options for later adjustments.

Evidence from the energy market suggests that consumers' knowledge of their current consumption is skewed towards the average (Mathieu and Waddams Price, 2005). Those with low consumption show an upward bias in their estimates, while those with above average consumption tend to think that it is lower. This may result from publicity about energy bills which focuses on the average bill, which then becomes a familiar reference.

Whatever the consumer biases, about their own demand, companies will generally respond to them, so that inefficiencies will be generated when the true demand is realised. If consumers overestimate their demand, companies will wish to charge them for the higher estimate but deliver only the actual demand, suggesting a preference on companies' side for a high upfront (flat rate) fee with a lower marginal charge. Where consumers underestimate their own demand, companies can profit by charging more for the later higher demand. For such consumers a company would want to set a low initial flat rate fee with high marginal charges. Though most of the literature on consumer biases applies to markets where there is some competition, the basic intuition should transfer to the regulated setting.

Grubb (2009) shows how companies can use three part tariffs to extract rents from consumers who overestimate the precision of their demand forecasts. Such tariffs are based on three characteristics. First, the flat rate bias of consumers arising from demand overestimate, the taxi-meter effect and risk aversion. Second, demand underestimate which arises from quasi-hyperbolic discounting (a stronger preference for today over tomorrow

than for tomorrow over the day after). And thirdly, monopoly price discrimination. This latter, of course, could be controlled at least to some extent within a monopoly setting.

Empirical studies show some evidence of consumer errors in choosing the best tariffs. Conlin et al. (2007) report some projection bias in the field, using catalogue sales and returns data. Some consumers overestimate the extent to which their tastes will remain constant, and so do not allow for potential changes in their future demand.

Wilson and Waddams Price (2010) find persistent consumer errors in choosing between different energy suppliers; while this is in a competitive context, it has parallels with the water market in that different suppliers each offered a single two part tariff of different structure (as well as different level) for a homogeneous good. Even among consumers who were switching only to save money, around one fifth ended up on a more expensive tariff for their level of consumption. They found little evidence that any particular demographic or socio-economic group made worse decisions than others.

4. There may be distributional concerns if some consumer groups are less likely to choose well, reflected in the Energy regulator's restriction of tariff choices.

While the academic papers cited above found no evidence that particular household groups were more prone to bias than others, the energy regulator, Ofgem has found some consistent patterns of behaviour in the energy market, particularly in the choice between different suppliers. As noted above, this is similar to a tariff choice, since tariff differences are both the main distinction between different suppliers, and price² is the main motivation for switching, and features heavily in marketing campaigns. Ofgem (2008) found in its Energy Supply Probe that while all households groups switched supplier, the rate of switching was slightly lower amongst groups which might be considered vulnerable, including some for whom the regulator had statutory responsibility. Thus those over 65 and living in rural areas³ were less likely to switch supplier, and analysis of data shows that switching rates among these groups are statistically significantly lower (though by a small margin in most cases) than for consumers as a whole (Chang and Waddams Price, 2008). Switching rates are also lower amongst those with lower educational achievements and who are in rented accommodation, despite the persistence until 2008 of a 10% saving from switching. The energy regulator was keen to encourage all groups to benefit financially from superior offers, and introduced a number of ways to help consumers make choices which would be better for themselves. In particular, Ofgem segmented consumers into two groups: those who actively make a decision to switch and those who do not. Around a fifth search actively for the best deals, and generally achieve one. This is the same proportion which Wilson and Waddams Price (2010) found achieved the best deal in their earlier work. About half of the other four fifths would switch supplier if actively approached; however such changes were often not in the consumers' interests, since decisions are made with only partial information (usually information only about the offers available with the company who is canvassing) and under some sales persuasion. Following fines for mis-selling, three of the six major companies temporarily suspended doorstep selling in summer 2011. It will be interesting to see whether there is an impact on switching rates.

In a subsequent review of the market (Ofgem, 2011) the regulator still found cause for concern because of the persistent lower switching rates amongst some consumer groups, and higher prices and profits amongst suppliers. As a result they are consulting on further restricting the tariff options which companies can offer. In 2009 they imposed non

² Quality of supply is determined by the monopoly distributor in each region, rather than the retailer.

³ The lower availability of piped gas in rural areas probably explains this group's lower switching rates, as they are less likely to be able to achieve savings compared to those who can take advantage of dual fuel offers.

discrimination clauses on the companies which restricted their ability to offer lower tariffs out of their home region than within them. Unfortunately this is likely to have had an anti competitive effect (Hviid and Waddams Price, 2010), which seems to be confirmed by lower switching rates and higher profits. The regulator is now proposing not only that each supplier should offer a 'default' tariff which has a fixed element determined by the regulator, but that all other tariffs, which may be only temporary in nature, must also be expressed in terms of the same regulated fixed element and a single energy charge for some average consumer. Thus while the water regulator is considering allowing companies to offer consumers more choice, the energy regulator is consulting on restricting the tariff choices which companies may make to consumers. Of course some of the issues differ because of the choice of suppliers in energy, but the different approaches make an interesting contrast.

5. Response of consumers to optional metering in England and Wales

Characteristics of optants and non-optants

A water company database with over 8000 observations provides some initial evidence on whether households saved money when opting for a meter. In addition, it provides information on some key characteristics of these households. Three types of household are contained in the database:

1. optant metering
2. change of occupancy metering (company-initiated metering)
3. zonal metering (area-wide metering when water scarcity status is granted).

Bill changes associated with metering categories

When meters were installed, all categories of metered households saved money on their bill on average. However, numerical and statistically significant differences exist between the types of metered households. Specifically, optant households saved £115 per annum on average compared to just £37 for 'change of occupancy' households and £55 for 'zonal' households. A comparison between just 'optant' and 'compulsory' households (an amalgamation of categories 2 and 3 above) shows these groups saving £115 and £45 on average off their bills.⁴ The fact that optant households saved more money from their bill than both types of compulsory households suggests that on average, these household were able to make 'rational' choices about meter adoption. This evidence is encouraging in light of other evidence which suggests that water consumers have difficulty in engaging with particular aspects of their bill (see below). This compares to around £20 a year savings realised in 2000 and 2005 by energy switchers reported by Wilson and Waddams Price (2010, see above)

Comparing household characteristics of metering categories

Two key influences of whether households save money when adopting a meter are the levels of the unmetered and metered bills. These are determined by the rateable value of the property concerned and the household's water consumption respectively. As would be expected, the households in this sample differ according to both these 'characteristics'.

The average rateable value for optant households is £200 per year whereas for compulsory households it is £171.⁵ This underpins why optant households save more money when switching to metered charges – because the higher rateable value of their properties causes

⁴ The comparisons between all of these groups are statistically significantly different from one another at a 1% level or better.

⁵ These values are statistically significantly different from one another at a 1% level of significance.

them to have higher unmetered water bills which they switch away from. In addition, optant households have a notably lower level of consumption than compulsory households - 76 m³ per annum compared to 115 m³ per annum.⁶ These descriptive statistics support the expectation that the types of households choosing to be metered will have higher rateable values and/or lower consumption than unmetered households.

Warnings about selection bias with a choice of metering

The choice of optional metering for water consumers has the scope to introduce inefficient take-up of metering if unmetered charges do not proxy the household's consumption levels. Rajah and Smith (1993) explain that "systems of non-measured charges which do not approximate the payments which households would make if charged for their consumption, will tend to encourage some inefficient metering take-up by households whose non-metered charge is high relative to current consumption, and also an equally inefficient failure to adopt metering by households which would reduce their consumption if metered, but which pay very low non-metered charges" (p.92). Essentially, the current arrangements for meter choice may 'be encouraging exactly the wrong households to choose to be metered' (Cowan 2010, p.813). If such 'tariff' choice is to be retained in an uncontested market in the future, there is scope to improve the choice process so that more efficient adoption of metering is achieved. This would be consistent with Ofwat's sustainability objectives in terms of encouraging more efficient use of water resources.

UK and International Water Consumer Perceptions and Bill Engagement

Recent research presented in Gardner (2010) explores how accurate UK water consumer perceptions are for certain aspects of bills and charging. This is relevant to how consumers may behave given (uncontested or contested) choice in this market. Specifically, the evidence suggests that bill-related consumer perceptions are relatively inaccurate. This may have implications for the quality of tariff choices made by consumers and indeed how likely they are to engage in the 'market'.

Perception Accuracy

The research conducted explored the accuracy of consumers' bill, price and consumption perceptions. For a full discussion of the sample used and its representativeness the reader is referred to Gardner (2010).

⁶ These values are statistically significantly different from one another at a 1% level of significance.

Consumer's perceptions of the unit price of water were strikingly inaccurate – the price of a cubic meter of water was overestimated by 458% (the median price perception was overestimated by 567%). No directly comparable results are available in other international studies but Carter and Milon (2005) and Martins and Fortunato (2007) found a minority of respondents (6% and 20% respectively) claimed to know the unit price of water.

Interestingly, respondents had more accurate perceptions of their quarterly water bill than water prices: on average bills were overestimated by 65% (the median perception was -4% but only for a very small portion of the sample). These perceptions are significantly more accurate than price perceptions. This accords with the finding in Whitcomb (1999) that 63% of respondents stated they knew their total bill amount.

With respect to tariff perceptions, only 26% of respondents were able to correctly state which of two tariffs they were on (flat or increasing block). This is notably worse than if consumers had randomly chosen between the two alternatives, and raises the possibility of systematic tariff structure misunderstanding among consumers. These findings echo other studies which find that only between 18% and 50% of consumers are aware of the price structure they face (Young et al., 1983; Agthe et al., 1988; Energy Saving Trust, 2008).

With respect to consumption perceptions, the mean daily consumption in litres was underestimated by 29% (median perceptions were more inaccurate, underestimated by 70% -75%). The mean perception of quarterly cubic meter consumption was overestimated by 626% (however, the median perception was only underestimated by 0.65% which suggests that the nearly 5% of the sample that formed the median had very accurate perceptions or that they consulted their bill when answering the question).

In comparison to international evidence, consumption perceptions in this UK sample are very inaccurate. The most inaccurate were of quarterly cubic meter consumption, ranging from underestimates of 94% to overestimates of 9835%. Even the more accurate daily litre perceptions ranged from underestimates of 99% to overestimates of 813%. In contrast, Van Vuuren et al. (2004) find a range from underestimates of 44% to overestimates of 63% for South African water consumers. Previous studies which asked people whether they knew their consumption level found between less than half or a quarter did (Whitcomb 1999; Catenazzo et al., 2008). The new evidence for UK consumers is consistent with the lower end of this range.

Of the perceptions discussed here the most accurate (or least inaccurate) perceptions were of the total bill amount. This was only overestimated by 65% while unit price perceptions were overestimated by 458% on average. The relative accuracy of these perceptions raises the possibility that consumers do not respond directly to unit prices, but rather respond indirectly to price changes as perceived via their total bill amount. This may have implications for tariff choice in an uncontested water market if consumers are unable and/or unwilling to engage with the constituent parts of their water bill. For example, they may not be able to calculate whether a switch to a different tariff structure will increase or decrease their bill. This, combined with loss aversion, may act as a disincentive for consumers to exercise choice in this market.

Engagement with Bills

As part of this investigation of consumer perceptions, how consumers engage with their bill was also explored, though no comparative international evidence is available in this area. Survey respondents were asked which aspects of their bill they look at. Very few consumers (only 15%) look at the price of water while less than half (44%) look at consumption. The vast majority (77%) look at total amount owed.⁷ These behaviours mirror the relative accuracy of perceptions discussed above- the total bill amount, consumption and price are both the most consulted and most accurately perceived aspects of the bill respectively.

Customers were also asked in how much detail they looked at their bill: 7.5% do not look at all, 46% skim it and 40% look in detail.⁸ When asked how easy it was to understand their water bill, 16% of consumers found it 'very easy' while a majority of 49% found it 'quite easy'. Only 7% of consumers found their bill 'very hard' to understand and 17% found it 'quite hard'. The remainder did not answer this question. While the majority of consumers found their bills quite or very easy to understand, consideration could be given to how to make bills more accessible to customers. This is particularly important if tariff choice is to be facilitated as consumers need to be able to engage with their bill (and information relating to new tariffs) to make appropriate decisions. In addition, which groups of customers find their bills very or quite hard to understand could also be explored, particularly to see whether these groups include a disproportionate number of vulnerable customers. If so, this raises the possibility that such groups might find it difficult to engage in tariff choices – see the discussion in the previous section.

⁷ These answer categories were not mutually exclusive.

⁸ These categories do not sum to 100% because of missing data.

6. When are optional tariffs likely to be beneficial? What are the challenges and potential solutions?

Introduction of optional metering will certainly benefit companies (if they behave rationally and introduce them only if they increase profits) and is likely to benefit some consumers. If these are the 20% who are found to benefit from better deals in energy because they have the ability and motivation to be active in the market, does it matter if the other 80% are no better off? Is the regulator comfortable with a change which makes companies and 'savvy' consumers better off, but does not have any effect on the majority of consumers?

Is choice always positive? Will presenting additional options reduce the welfare of consumers who feel they may be confused by the choice, and anxious about deciding well for themselves? How does this sit with Ofwat's statutory duties for the interests of some groups of consumers?

How are these decisions likely to be affected by the behaviour of the companies, and what would Ofwat's role be in regulating them? Evidence from several markets shows that companies are much more effective at communicating with consumers than are regulators (see for example Garrod et al., 2009), but their motives are different. Will there be a tendency for them to promote tariffs which are not necessarily the best for the consumers concerned? Do consumers have access to impartial advice that they can trust, and will they take it? Price comparison websites, which are an important aid to activity in contested markets, are unlikely to be available in an uncontested market. The framing of the options and the role of the default tariff will be crucial, as the current debate in energy shows.

What regulatory intervention would be necessary to ensure the best outcome for individual consumers, for the consumer group as a whole and for the industry? What role would consumer groups play, and would all potential outcomes be acceptable?

One consideration to take into account is that much of the economic analysis of when a change is beneficial is based on an expansion in demand, which is seen to be positive in most markets because more consumers are served. In water (and other markets where the price may not reflect the full resource cost) this particular argument may not be applicable.

Much of the literature which supports the proposal that tariff choice can increase welfare is based on the presumption that consumers make good choices (or engage with the market at all). We have provided evidence that this is often not the case.

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