Lunn, Pete

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Telecommunications Consumers: A Behavioural Economic Analysis

Pete Lunn

Abstract: This paper argues that telecommunications markets present the consumer with a decision-making environment that is particularly likely to be prone to established biases in consumer decision-making. The analysis identifies four properties of telecommunications markets, which in combination are probably unique and which may make the sector prey to biases identified by behavioural economics. The analysis offers a range of known behavioural phenomena that, first, may help to explain the generally low levels of switching between telecommunications providers and, second, could result in failure to select optimum contracts, because of inaccurate expectations of usage or time inconsistent preferences. While more research is required to assess the merit of these hypotheses, they raise the possibility that telecommunications markets may be inefficient and prone to less effective competition than many other consumer markets. Potential policy responses are also discussed.

Keywords: Telecommunications; Decision-making biases; Behavioural economics; Regulation

Corresponding Author: Pete.Lunn@esri.ie

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1. Introduction

It is no exaggeration to state that the consumer response to the liberalisation of a range of formerly state-run markets, including networked utilities and telecommunications, has generally surprised economists. In theory, the opening up of these markets to competition should have allowed consumers to be active in choosing the best and lowest cost suppliers, producing upward pressure on quality, downward pressure on prices, and an overall increase in consumer surplus and economic efficiency. To some extent, this may have happened, but what has surprised is the degree to which consumer behaviour has apparently departed from this ideal competitive scenario. For instance, research in energy markets has revealed large numbers of consumers failing to switch to lower cost suppliers (Giulietti, Waddams-Price and Waterson, 2005). The majority who do switch suppliers fail to choose the best available deal and a sizeable proportion of consumers who switch in order to make savings actually manage to increase their bills (Wilson and Waddams-Price, 2010).

Coincidentally with the liberalisation of many consumer markets, behavioural economics has begun to shed light on previously unforeseen factors that underpin economic decision-making. Using methods developed in experimental psychology, researchers have uncovered a range of "behavioural biases" in economic decision-making, whereby agents systematically depart from the behaviours implied by the assumptions of neoclassical microeconomics (for review see Rabin, 1998; DellaVigna, 2009). While the precise implications of these findings for competition and consumer policy are as yet far from clear, there is more widespread agreement that such implications are important (Garcés, 2010, Rosch, 2010) and, moreover, that policymakers and regulators need to consider at least the possibility that behavioural biases cause considerable consumer detriment (Bennett et al., 2010; Lunn and Lyons, 2010). If so, then there may be scope for devising new interventions designed to limit such detriment and to allow consumers to gain the sorts of benefits from competition that have, arguably, proved somewhat elusive thus far.

The present contribution focuses specifically on the consumer telecommunications market, concentrating on domestic fixed-line telephony, mobile telephony and internet provision, with some references made also to television services. Following the widespread liberalisation of telecommunications markets, across a range of countries, many consumers have proved reluctant to switch provider, with perhaps half not even considering a switch (Xavier and Ypsilanti, 2008). Furthermore, in some countries telecommunications companies have been subject to increasing levels of customer complaints (Xavier, 2011) about services quality and bills not matching expectations. Service and tariff structures have become extremely complex and difficult to compare. Some researchers have shown that where the

total price in a consumer markets is not immediately apparent upfront, it may be in firms' interests to confuse consumers or obfuscate prices (e.g., Gabaix and Laibson, 2006).

What follows employs established findings in behavioural economics and consumer behaviour to locate possible barriers to effective competition and thus to identify potential sources of consumer detriment. It focuses on four aspects of telecommunications markets, which in combination are probably unique and which may make the market particularly prone to established consumer biases, and therefore a potential concern for policymakers. These four properties and the potential biases they engender are then related to two facets of consumer behaviour: switching provider and sub-optimal service usage.

Since the objective is to draw attention to issues of potential concern, the analysis is necessarily somewhat exploratory, perhaps in places even speculative, but it is nevertheless grounded in established empirical findings and current empirical debates within behavioural economics. The central question is what these scientific advances in our understanding of economic decision-making might imply in practice.

Section 2 identifies the idiosyncratic combination of features of telecommunications markets that raise specific concerns from a behavioural economic point of view. Section 3 considers potential explanations for the unwillingness of consumers to switch providers. Section 4 raises the possibility that many consumers are likely to make suboptimal decisions with respect to the use of telecommunications services. Section 5 concludes and considers implications for policy and future research.

2. Idiosyncratic Telecommunications Markets

Consider a regular transaction for a good or service. The consumer hands over an amount of money in return for the chosen product. The consumer has a degree of uncertainty regarding the respective private values of the available products at the moment of consumption. For instance, there is variability in the flavour of foods, the durability of durable goods, the fashionability of clothes, the punctuality and comfort of train journeys, the atmosphere in a favoured café, and so on. The extent to which the consumer gains surplus from the transaction selected depends upon the *ex post* value (or, if you prefer, utility) at consumption, which must be evaluated *ex ante* at the moment of choice and purchase.[1] All consumer transactions contain a degree of uncertainty over private value

[1] It is standard in economics to talk of ex post and ex ante, implying that available information can be different before and after a choice. From a psychological perspective, however, these concepts are more distinct. The consumer takes the purchase decision based on perception of the quality of the good or service under consideration and the expectation of the value they will ultimately get out of it. Even once they experience consumption, the value may be continue to be somewhat uncertain, as

and, hence, over consumer surplus at a given price. Private value is probably least uncertain when consumers make routine choices regarding which breakfast cereal to buy or where to buy petrol, but perhaps much higher when choosing among products the consumer has not previously consumed or experienced. Yet in most transactions, the consumer's decision is whether to spend a certain amount of money for a given quantity of the chosen product in order to consume that same quantity sometime thereafter.

This situation is different for the smaller number of products and services for which the consumer is billed following a variable flow of measured consumption, such as for gas or telecommunications services. Here, the choice is again made in advance of consumption, according to an agreed pricing structure. But, in addition to any uncertainty over the private value of the product, there is uncertainty too over the level of usage and hence the final price that will be paid over a given period. This uncertainty occurs in slightly different forms where consumers opt for pre-payment or a flat-rate pricing plan. For pre-payment the uncertainty surrounds the amount of time it will take to run out of credit and thus to require a top-up. With flat-rate payments, the uncertainty transfers to the likelihood of staying within usage ceilings, after which higher rates are usually applied. What is common to each case is that when signing up to the service consumers must estimate their likely usage level, which requires them to anticipate their own future behaviour.

In the case of domestic energy, usage is partly habitual and often partly regulated by a machine, such as an automatic heating system coupled to a thermostat. Notwithstanding uncertainty over the weather, past levels of consumption (and therefore past bills) are likely to be a good guide to future consumption (and future bills). Telecommunications markets, as we will see, are not so simple.

2.1 Four Key Characteristics of Telecommunications Markets

Telecommunications markets have at least four non-standard characteristics. While it is probably the case that none of these characteristics is unique to the telecommunications market, the combination of them almost certainly is.

First, the decision to purchase a particular service contract is often taken simultaneously with the decision to purchase a related device, such as a mobile handset, wireless modem, or perhaps a recording device for television programmes. The consumer may have to consider trade-offs between the offer of ongoing service and the immediate benefits of owning (or in some cases renting) the particular device associated with the offer. The

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the consumer must form an overall assessment of the hedonic value obtained, which may also be spread over time.

simultaneity of purchase extends even further where different services are “bundled”, e.g. fixed-line and broadband internet, broadband and television, etc.

Second, much of the value provided depends on factors unrelated to the product and provider. The private value of communication depends on who you communicate with and why: vital in emergencies; of higher value if you form a new relationship; of lower value if you become so busy you under-use it; immediately improved by the discovery of a great new website; and so on. Communications products are enabling devices and services the value of which depends on what they ultimately enable.

Third, communications equipment and services offer access to immediate and varied experience goods. In simple terms, they provide social contact and entertainment on tap. Subject to the precise flat versus variable rate nature of the contract, the consumer effectively buys the right to purchase on demand (mostly) pleasurable experiences at incremental cost, or such experiences up to a monthly limit beyond which they incur larger incremental costs. While other billable domestic services such as gas and electricity are somewhat similar, in that daily decisions affect usage and ultimate price paid, the volume and variability of decisions are very different. From a decision-making perspective, domestic energy usage is primarily a matter of habit and physical comfort. Communications equipment and services, meanwhile, are typically subject to multiple daily decisions with respect to a much broader range of experiences of variable quality and duration.

Lastly, and indeed most obviously, telecommunications is subject to an extreme pace of technological change. Consumers regularly take purchase decisions covering equipment and services they are yet to experience. This is less true of ordinary fixed line telephony, despite the increased availability of various dial-up services. But it is especially true in the areas of mobile and internet services, where the size, speed, functionality, reliability and design of equipment is under constant development, such that the repeat buying of products is rare or even impossible due to obsolescence.

2.2 Consumer Decisions in Telecommunications Markets

Despite this unique combination of characteristics, orthodox microeconomic models of consumer behaviour, those that we standardly employ as the framework for assessing competition in markets, treat telecommunications products as no different from any other products. The consumer chooses the combination of price and quality that maximises utility. To a behavioural economist, however, the distinct characteristics of telecommunications markets are immediately suggestive, because the market in fact confronts the consumer with very many decisions, on an ongoing basis, of a highly complex nature. This section therefore elaborates the description of the market from the decision-maker’s perspective.

Most obviously, the unique set of characteristics identified means that communications markets, especially the mobile telephony and internet markets, are fiendishly complicated territory for the consumer to navigate. The user-friendliness and capability of equipment is almost impossible to judge prior to purchase, unless the consumer is able to observe or try someone else's device first. Where the equipment and associated service offers the consumer access to new services (e.g. mobile internet), faster communication, new forms of communication (e.g. social networking, picture messaging), new products (e.g. games), or even a combination of each of these, the consumer has little in way of experience to fall back on regarding the value of the offering.

To the difficulty of judging the value of equipment and services, we must add the difficulty of judging the merits of the tariff structure. Before considering packages from alternative providers, it is far from straightforward to select the best package from among those offered by a single provider. The consumer must predict their own usage, yet (with respect to mobile and internet) is likely to be trying to predict how much they will use a new piece of equipment they are yet to get to grips with, and the extent to which they will actually use the array of communication and entertainment experiences to which it grants access. Furthermore, the calculation is not as simple as predicting a level of usage and minimising the cost, since the optimal level of usage is not independent of the tariff.

The complexity of these initial purchase decisions has at least three likely behavioural consequences. First, it is well established that consumers find complexity itself off-putting (Iyengar, Huberman and Jiang, 2004), leading them to avoid complex decisions and to fall back on rules of thumb or heuristics. Second, certain behavioural biases, including status quo bias and the endowment effect, are known to be stronger when private value is harder to assess (e.g. Horowitz and McConnell, 2002), and are likely therefore to play a greater role in communications markets than in most other consumer markets where private value is more easily judged. Third, both complexity and uncertainty over value mean that the market is likely to be prone to herding (Huang and Chen, 2006; Rafaat, Chater and Firth, 2009) and information cascades (Bikhchandani, Hirshleifer and Welch, 1998), whereby consumers copy the decisions of other consumers, a phenomenon more generally termed "behavioural convergence".

Thus far, however, we have only considered the initial purchase decision. Once equipment has been bought and the service contract entered into, the communications consumer is not finished with the business of taking decisions. Indeed, depending on the tariff structure, most communications consumers are effectively making further purchases on a daily basis, with the amount they consume depending on how much they use the device in question. Even where the tariff consists of a substantial flat-rate component, consumers need to ration their usage relative to ceilings of minutes, texts and megabytes, because using the device now may entail having to pay a much higher price towards the end of the billing

period. These decisions are again fairly complicated, but they also involve a key behavioural dimension: time.

Decision-making that requires immediate benefits and costs to be traded-off against future benefits and costs, typically reveals time-inconsistent preferences (Frederick, Loewenstein and O'Donoghue, 2002). The immediate is valued disproportionately highly relative to the future, such that most people discount time hyperbolically rather than exponentially, at least to a first approximation. This means that products offered on a "buy now pay later" system, such as billable telecommunications, may lead consumers to over-consume, depending on the extent of temptation. While it is true that the same decision-making structure affects energy markets to the extent that those who are too cold or too hot must weigh up immediate comfort against the size of a future energy bill, the frequency of such decisions in communications markets is likely to be very much greater. Gratification of one sort or another is constantly a click away – at a future cost. Consequently, the structure of ongoing decision-making in many communications markets may well mean that consumers will generally find it difficult not to over-consume.

In summary, idiosyncratic features of the telecommunications market are such that consumers face decisions of great complexity, requiring them to anticipate their future usage of devices that possess new capability and packages that offer new services. The price they ultimately pay depends not only on which offering among very many they sign up to, but also on their ability to monitor and control their own usage, for which they pay some weeks subsequently. This level of complexity and requirement for time consistent behaviour suggests that some known behavioural biases may be particularly prevalent in telecommunications markets.

3. Switching Providers

The apparent reluctance of consumers to switch providers has been the subject of a number of previous investigations into telecommunications markets by both regulators and researchers (e.g. Ofcom, 2010, plus associated references to previous reports; Xavier, 2011). The primary focus of these investigations has been on the costs of switching and the need to boost consumers' willingness to switch providers by cutting switching costs. This section argues that evidence unearthed by behavioural economics suggests a number of alternative hypotheses to explain low levels of switching in telecommunications markets.

3.1 The Concept of Switching Costs

In Klemperer's (1987) original demonstration of the potential impacts of switching costs on the effectiveness of competition under oligopoly, switching costs were subject to a three-

way categorisation: (1) transaction costs, which covered the time and effort required to complete the administrative process of switching; (2) learning costs, which entailed the time and effort required to find out about other products and to learn to exploit brand-specific product attributes; and (3) "artificial" costs imposed by firms, such as discounts for loyal customers. Thus, costs were identified with time, effort or price. Subsequent and similarly influential work by Klemperer (1995) expanded the concept of switching costs to cover not only actual costs arising from expended time, effort and money, but also perceptions of such costs. More recent authors go so far as to define switching costs as "the perceived economic and psychological costs associated with changing from one alternative to another" (Jones, Mothersbaugh and Beatty, 2002, p.441, italics added), or "the real or perceived costs that are incurred when changing supplier but which are not incurred by remaining with the current supplier" (Xavier and Ypsilanti, 2008, p.14, italics added). This equivalence between actual and perceived costs is arguably immaterial for economists aiming to build models of how firms might respond to consumer loyalty and the equilibrium prices that might therefore ensue. But from the perspective of the policymaker, regulator, or researcher seeking to understand the root causes of consumer behaviour, whether switching costs are found to be genuinely high or misperceived to be high is likely to lead to different conclusions and policy implications.

There is a point of scientific inference at issue here too. The expansion of the concept of switching costs to include perceptions is a way of keeping faith with the theory that consumers are rational utility maximisers. Thus, if a consumer leaves money on the table by failing to switch providers when all objective evidence suggests that a switch would be beneficial, the implied explanation is that some subjective "psychological cost" to the consumer must have outweighed the potential gain from switching. This inference is flawed, since there are other possibilities. For instance, the consumer may have made the decision on grounds other than a cost-benefit analysis based on self-interest; may have undertaken no decision-making process at all; or may simply have made a mistake.

The inference that an observed failure to act in the face of a realisable gain must imply a countervailing psychological switching cost is to engage in a circular logic. Consequently, in addition to precluding other feasible explanations, this approach also takes explanatory power away from the concept of switching costs, because where switching costs are actually defined as perceived costs of switching, misperception of switching costs cannot occur by definition – what is perceived is the switching cost as defined. Yet misperception of switching costs may be a crucial part of the explanation for non-switching. Misperceptions, motivations other than self-interest, and deviations from standard rationality axioms, are not switching costs. In what follows, therefore, switching costs are considered only to be actual costs of changing supplier, in terms of the consumer's time, effort and money.

3.2 The Role of Switching Costs

Given this definition, there is evidence to suggest that while switching costs have a significant impact, they may not be the main reason for the overall disinclination to switch providers. Across the full range of telecommunications services, the large majority of consumers who do switch state that the process was relatively easy – it is only a small minority who experience difficulty (Xavier and Ypsilanti, 2008; Ofcom, 2010). These and other studies also find that the majority of consumers of fixed-line, mobile and internet services do not even consider switching provider over a twelve-month period. While some consumers (when prompted) cite hassle and not having the time as reasons for not switching, which are suggestive of high perceived switching costs, more common reasons cited surround loyalty to present suppliers and worries or uncertainty about alternative suppliers. These reasons do not concern switching costs, but instead suggest concerns about taking on a contract for an inferior product, or perhaps what Xavier (2011) calls an "endowment factor".

One interesting test of the importance of switching costs is the impact of mobile number portability (MNP). The cost of having to change mobile number when switching supplier would seem ex ante to be high. In an international analysis of cross-sectional time series, Lyons (2006) finds statistically significant increases in churn following the introduction of MNP, provided the process involved is sufficiently short. Yet the effect of MNP on switching has nevertheless turned out to be smaller than anticipated (Xavier and Ypsilanti, 2008). In the UK, the market that has perhaps been most regularly surveyed and studied, the extent of switching has in fact declined in recent years despite the introduction of MNP (Xavier, 2011, citing a range of reports published by Ofcom).

Overall, it is likely that high switching costs significantly deter switching, but the continuing low level of switching despite falling switching costs suggests other factors are at work. Empirical findings in behavioural economics may well contain relevant insights.

3.3 The Endowment Effect and Loss Aversion

Xavier (2011) points to the influence on switching of the "endowment factor", which he defines as the tendency for consumers to "value what they have more than what they might have" (p. 21). The reference here is to the "endowment effect" (Knetsch, 1989; Kahneman, Knetsch and Thaler, 1990), whereby experimental subjects appear to value a good that is owned more than the same good when it is not owned. Typically, the endowment effect manifests itself either in owners of a good stating a much higher minimum price to sell a good than the maximum they will pay for the same good, or being disinclined to trade a good they own for one they do not, but which they would prefer if offered a simple binary choice between both goods where neither is owned. Thus, Xavier (2011) hypothesises that

whatever mechanism underlies the endowment effect may also feed into the unwillingness of consumers to switch providers. The decision structure is analogous, since it seems likely that a proportion of consumers stick with providers that they would not choose were they to enter the market again.

Perhaps the most widely accepted explanation for this well-replicated finding of behavioural economics is based on loss aversion. Kahneman and Tversky (1979) developed Prospect Theory as a descriptive theory of decision-making under risk, based on experiments in which subjects made choices between gambles. They recorded that subjects made choices that implied that they generally weighted monetary losses about twice as strongly as equivalent gains, i.e. people's choices suggest they are averse to losses. Tversky and Kahneman (1991) elaborated the theory into a model of consumer choice, whereby consumers similarly assign about twice as much weight to giving up an ordinary consumer good than to gaining the same item.

Applied to telecommunications, however, the implications of this theory are striking. As highlighted in Section 2, the complexity of the market is likely to lead to higher levels of uncertainty over value than is the case for most consumer goods. One established empirical regularity concerning the endowment effect is that it strengthens considerably with uncertainty over value (see meta-analyses of Horowitz and McConnell, 2002; Sayman and Oncular, 2005), such that the product (contract) presently owned can be valued at three, four, five, or even more times higher than the equivalent product not owned. Thus, if loss aversion underpins the endowment effect and the behaviour of non-switchers in telecommunications markets, consumers may be leaving quite substantial amounts of money on the table, with the contract from an alternative provider needing to provide several times the consumer surplus of the contract given up before consumers are likely to switch. This account would also leave policymakers in the awkward position of deciding whether policy should aim to alter consumer preferences (see Section 5).

Yet loss aversion is not an uncontested explanation for the observed unwillingness of people to trade to acquire alternative products they would seemingly choose in simple binary choice. Plott and Zeiler (2005; 2007) managed to overcome the endowment effect in experiments by training people to realise that it caused them to miss out on real ex post gains. Furthermore, List (2003; 2004) has shown that the endowment effect is attenuated for experienced dealers in real markets. These findings suggest that it is possible that the effect is less prevalent in real markets in which consumers have experience. Kling, List and Zhao (2010) and Lunn and Lunn (2011) have produced dynamic models of the endowment effect that suggest foregone gains would be likely to be temporary, in both cases with some empirical support. If true, any of these alternative accounts would lessen the concern that non-switching telecommunications consumers are routinely missing out on substantial

consumer surpluses. Nevertheless, the ultimate outcome of this debate and its application to consumer choice requires close attention from policymakers.

3.4 Status Quo Bias

The endowment effect is often related also to the broader concept in behavioural economics of "status quo bias". Samuelson and Zeckhauser (1988) first reported the tendency of individuals to stick with status quo choices after observing that new employees at Harvard University held retirement savings in substantially different portfolios to equivalent employees of longer duration. Their experiments then confirmed the generality of the effect.

The analogy to non-switchers in telecommunications markets and the possibility of a common cause are raised again. One possibility is that status quo bias is another manifestation of loss aversion, but this account requires a further stretching of the boundaries of loss aversion. Status quo bias occurs for decisions and responses to surveys that are unrelated to ownership. Simply informing a survey respondent, who may be faced with a survey inviting opinions as to which of two options is best, as to which option is the current one, is sufficient to bias responses in the direction of the status quo option (Kahneman, Knetsch and Thaler, 1991). This finding extends to surveys that ask about choice of contracts for electricity supply (Hartman, Doane and Woo, 1991). If this is caused by loss aversion, then individuals are averse to losses accruing to others and to society as well.

There are alternative explanations of status quo bias. One possibility is that it acts as a general defence against the law of unintended consequences. That is, once an individual becomes aware that one option is the status quo, it is arguably reasonable to infer that this option is less likely than as yet untried options to result in an unanticipated bad outcome. There are echoes of this logic in switching surveys, where sizeable proportions of non-switchers are concerned that some unanticipated mishap might occur during the switching process (Xavier and Ypsilanti, 2008).

Another possible explanation surrounds the possibility that the status quo acts as a signal of what other individuals prefer. Where an individual faces an uncertain choice, the behaviour of others can convey helpful information, especially where an individual has reason to believe that other people have a better understanding of the available options. Bikhchandani, Hirshleifer and Welch (1998) coined the term "information cascades" to describe the more widespread potential effects of such inferences based on the choices of others, and the existence of information cascades is now supported by considerable empirical foundations (see Hirschleifer and Teoh, 2003 for review). Again, the unique combination of features that characterise telecommunications markets, most notably the

complexity and speed of technological change, means that they are good candidates for information cascades and other forms of behavioural convergence. Such imitative behaviour can be a force of change or a force of stability, depending on the structure and age of the market. Where many consumers struggle to understand products and pricing structures, as in telecommunications markets, it may draw people towards providers who already have substantial market share, who may be perceived as safer bets.

3.5 Ambiguity Aversion

Given the nature of the telecommunications market, consumer decisions are taken in the face of considerable uncertainty. An individual consumer may suspect that they are able to get a better deal elsewhere, but be unsure of the size of the likely gain or of the probability that they are wrong and that the alternative they are considering is in fact a worse deal. It is well-known that individuals tend to be risk-averse, but what is less well-known is that they also tend to be averse to the nature of the uncertainty itself. Ellsberg (1961) showed that over and above risk-aversion, people prefer options where the risk they face can be quantified to options where it cannot, even the actual risks faced are the same.[2] This bias is usually termed "ambiguity aversion". It is likely that consumers are unable to quantify the risks they face when switching between complex competing offerings and will this be averse to the ambiguity.

Ellsberg's work was extended by Heath and Tversky (1991) and again by Fox and Tversky (1995), who developed and tested the "competence hypothesis". The idea is that the extent of ambiguity aversion is related to people's feelings of competence, defined by how much they feel they know of what could be known. This hypothesis is supported by experimental evidence. People prefer to take equivalent risks in relation to familiar events than unfamiliar events. That is, the more they feel they know of the domain in question, the more willing they are to choose riskier options.

This bias may be very important in communications markets and offers a potential rationalisation for the reluctance of consumers to switch. Because of technological change and ongoing innovation in already complex pricing plans and multiple offerings, only a few consumers are likely to feel high levels of competence when selecting telecommunications equipment and contracts. Consequently, the competence hypothesis predicts that consumers in these markets are likely to be particularly unwilling to take risks they might be

[2] Ellsberg showed this through examples of people's willingness to bet on the colour of balls drawn from an urn. We instinctively value a bet more highly when we know that an urn contains balls of two colours split 50-50 than when we know that the urn contains balls of two colours in an unknown proportion, although the expected value of such bets is identical.

more willing to take in relation to other types of products with which they feel more competent.

The competence hypothesis is, in effect, a heuristic: people assume that their familiarity with a domain of reasoning is a useful guide to how accurately they will be able to judge risks in that domain. How beneficial the heuristic is depends on how good this assumption is. The empirical work of Wilson and Waddams-Price (2010) may provide insight here. In a detailed study of consumer switching in the UK electricity market, in which the researchers had access both to switching decisions and actual usage patterns, these authors report that between 20 and 32% of consumers who switched supplier in order to obtain cheaper electricity actually ended up paying more. In the same study, less than 20% switched to the supplier offering the highest saving. This means that, even though the majority of switchers did save money, the chance that a consumer makes a costly mistake when switching suppliers is quite substantial.

For most consumers, the competence hypothesis suggests that they are likely to evaluate risks more accurately in the simpler electricity market, with a standardised product and a more straightforward tariff structure, than in the more complex telecommunications market. Thus, if the findings of Wilson and Waddams Price (2010) are taken as an estimate of the risk of making a loss when switching in the electricity market, consumers who feel less competent to assess telecommunications contracts may be taking a sensible decision in not switching: it is entirely possible that they will indeed misjudge the risk and end up paying more.

3.6 Procrastination

A final behavioural finding that is of potential relevance for the willingness of consumers to switch is a consequence of the time inconsistent preferences outlined in Section 2. Because evidence shows that people value the immediate more highly than the future, they also tend to be more willing to give up time in the future to do effortful tasks than they are to give up time in the present. In other words, hyperbolic discounting is consistent with the intuitive notion of procrastination. Models of procrastination (e.g. O'Donoghue and Rabin, 2001) show how empirically supported functions of time discounting imply that people may decide to give up time tomorrow, or the next day, to complete a boring task such as wading through competing contracts for telecommunications services on the internet, but that when tomorrow or the next day comes around, they take the same decision and put it off for more days, and so on. In other words, these models suggest that even consumers who believe there are gains to be made by switching, may fail to get around actually to making a switch.

3.7 Summary of the Behavioural Economics of Switching

The analysis in this section has related the reluctance of consumers to switch telecommunications providers to four empirically established phenomena in behavioural economics. These phenomena are psychological regularities in human decision-making that mostly depart from the model of the consumer as a rational utility optimiser. They are not costs, psychological or otherwise, associated with switching. Because underlying theories of some of these phenomena remain the subject of scientific debate, they raise more than four potential forces that affect the likelihood of switching. As of now, there is little in the way of evidence that might allow researchers and policymakers to decide which of these forces has the greatest impact. It is also possible that a combination of them contributes to switching decisions. The challenge of devising policy given this current state of behavioural knowledge is left to Section 5.

4. The Potential for Suboptimal Consumption

This section considers relevant behavioural phenomena that are related to the timing of consumer decisions in the telecommunications market. As outlined in Section 2, when consumers choose between different service contracts, they must estimate their future usage patterns. Once they are signed up to a contract, however, those usage patterns are not determined by a single decision regarding how much to service to pay for, but by the cumulative effect of very many separate decisions about whether to make a call, send a text, watch a video stream, or play a game. This particular time structure of relevant decision-making brings another range of behavioural phenomena into play.

4.1 Overconfidence Bias and Miscalibration

This behavioural bias occurs when people must estimate their own abilities and outcomes. It exists in two related but distinct forms. First, people tend to be too optimistic in their assessments. For instance, Svenson (1981) conducted as simple survey that has become a classic psychological study, after recording that an impossible 93% of drivers thought their driving skills were above the median. Second, people are inclined to believe that their assessments of likely outcomes are more accurate than they in fact are, so that the probability of outcomes far removed from the assessment are underestimated. This latter aspect of overconfidence is termed “miscalibration”.

Overconfidence of both types has been recorded in real market settings for consumers (see DellaVigna, 2009, for review). People routinely overestimate their ability to stick to plans or to get things done on time. Thus, when choosing limits for call-time, monthly texts or data download, this behavioural bias implies that consumers are likely to overestimate their chances of staying within the limits and hence not incurring penalties or higher rates for

further consumption. Furthermore, they are likely to underestimate the probability of opening their bill and discovering that it is far from expectations. Combining these two forms of overconfidence bias, it is clear that the most likely direction of error will be considerable underestimation of the bill. So-called "bill shock" is one of the primary grounds for increasing numbers of complaints about telecommunications companies in some countries (Xavier, 2011).

The upshot of inaccurate estimates of future usage is that many consumers may select the wrong package from those available, because they are trying to chose the best package for a different usage pattern to the one that is ultimately likely to be realised.

4.2 Self-Control

A further consequence of the finding that people generally possess time inconsistent preferences, valuing benefits and costs in the immediate future much more than equivalent benefits and costs further into the future, is that people experience problems of self-control. This phenomenon has been observed in many markets (again see DellaVigna, 2009, for review), but especially where consumers are required to resist obvious immediate temptations for which they will pay a price at a later stage.

As described in Section 2, many telecommunications markets are structured on a "buy now pay later" basis. This is a property they share with other billable domestic services such as energy, but telecommunications products offer a broad range of instant social communication and entertainment possibilities. The combination of this feature of the market with the bill payment method presents consumers with decisions that are probably both unprecedented and unique. At any time they can incur future liabilities in return for instant rewards of great variety. It is therefore possible, perhaps even likely given what is known about the way consumers discount time, that a proportion of consumers will over-consume services, in the sense that their day by day usage will exceed the level that they would desire in general.

In effect, parts of the communications market have effectively become offers of zero-interest credit for purchases of a range of social and entertainment experiences. In this sense the market bears a resemblance to the markets for credit cards and store cards. Some consumers in these markets find it difficult to select optimal contracts because of failure to control usage as they would wish (e.g. Ausubel, 1999). Indications that self-control issues are present include the fact that a proportion of consumers who continue with pre-pay contracts despite the generally lower usage costs of bill-pay. Pre-payment offers a mechanism of pre-commitment to aid self-control – one that is frequently imposed on children by parents. Self-control problems may be compounded by the fact that for at least

some consumers telecommunications devices offer on tap access to content that may be mildly addictive, such as gambling opportunities, gaming, shopping or pornography.

5. Policy Implications

The digital revolution and the enormous advances in information and communications technology that have occurred in recent years, and will probably continue to occur for some time to come, offer consumers opportunities to engage with social communication and entertainment of a frequency and sophistication that previous generations would doubtless have envied. Nothing contained in this article is intended to suggest that the overall benefits of these developments are not very large indeed. However, the unique combination of properties that characterises telecommunications markets raise issues regarding market efficiency and the effectiveness of competition, some of which may present policymakers with entirely new challenges. This section summarises those challenges and tentatively suggests possible ways that they might in principle be met, including via improvements in understanding through further research.

With respect to consumer's willingness to switch providers, two as yet unanswered questions are key from a policy perspective. First, is the low level of consumer switching a serious problem? Or, equivalently, how much surplus are consumers sacrificing by not choosing the lowest cost provider for their usage patterns? This question is in principle answerable through research that compares actual usage to available offerings.

The second question is much less easy to answer. What is the cause of low consumer activity? A number of hypotheses based on the findings of behavioural economics are advanced in Section 3, but to the extent that there is more truth in some hypotheses than others the policy implications are very different. For instance, if low switching is due a fundamental tendency to be loss averse, then the policy implications are profound. Loss aversion is intended to be a descriptive, not a normative, account of decision-making and the implication is that consumers effectively have irrational preferences. If consumers are leaving substantial amounts of money on the table in order to satisfy an apparently irrational attachment to their existing provider, then arguably regulators and consumer protection organisations might do everything possible to encourage them to overcome this attachment and to switch, be it through advertising, awareness campaigns or other ways to promote the benefits of switching. On the other hand, such interventions would be based on a strong determination that consumers making free choices in this market don't know what's good for them.

The possibility that lack of switching is due to procrastination suggests other potential policy interventions, such as changing the default to require consumers to take an active decision

to renew their contract, say on an annual basis (Xavier, 2011), as is the case with many forms of consumer insurance. There are dangers in such an approach, because withdrawal of service following failure to renew risks an adverse consumer response.

At present, it is in any case not possible to draw the firm conclusion that failure to switch for better deals represents irrational behaviour, be it due to loss aversion or procrastination. For it is also possible that the disinclination to switch is based on a rational view of the non-significant possibility of making an error, when choosing between such complex deals covering uncertain future behaviour. As discussed in Section 3, there may be good reasons for sticking with the status quo even where it is known that gains might be made, because of the potentially high probability of making a poor decision in an area where consumers correctly identify that they lack expertise. If so, it is possible that policy interventions designed to boost activity backfire, by causing many people to waste time and effort failing to save significant amounts, or worse still signing up to worse deals.

Lastly, there is reasons to believe that at least some consumers may make routinely detrimental decisions, because they are too confident in their estimates or because they systematically underestimate usage in the face of constant temptation to access the services on offer. This possibility again requires market specific research to assess the extent of lost consumer surplus, if any. But it again raises an interesting problem for policymakers wishing to increase consumer welfare: is the consumer benefitted more by an intervention that reduces the price given that they succumb to temptation, or by an intervention that makes it easier to exert self-control and reduce usage towards the originally envisaged level?

One potential avenue for policymakers here, if it can be determined that these behavioural phenomena are indeed influential, might be to exploit the available technology to assist consumers in their decision-making. For instance, is there any reason that providers who can now offer such a broad range of interactive services could not be mandated to offer consumers access easily interpretable information that can be used to monitor usage during the current time period? There is scope for experimentation here to determine the best form of disclosure, but a user-friendly system that allowed consumers to assess their remaining minutes, texts or megabytes, with a single click, just as they can observe the remaining power in a mobile battery, might do much to aid self-control and improve consumer's estimates of their own usage.

In general, if the technological advances in telecommunications can give us such unprecedented access to innovative services and media, then it would seem reasonable that it can also be used to make the use such services more "decision-friendly".

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