Consumer switching

Experimental economics research

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Acknowledgements

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Glossary

Terminology abbreviations

ETC   Early Termination Charge

LPLP   Losing Provider Led Process

GPLP   Gaining Provider Led Process

ECU   Experimental Currency Unit

Definition of selected terms

Consumer Welfare	A measure of the benefits derived by the consumer from the consumption of the communications service.
Slamming	Switching a consumer to another service provider without their knowledge or permission.
Period	A period in this experiment represents a calendar month (but lasts for merely minutes).
Cycle	A cycle in this experiment represents a 48 month period (4 years), January year 1 to December year 4. It lasts between 10 and 20 minutes.
Optimal behaviour	Using all relevant information available to make the best choice for oneself. This means that consumer welfare is maximised if consumers act optimally. This is the behaviour that is assumed/underpins all traditional models of economic behaviour. However, experiments and behavioural models help us to identify when and why behaviour may not be optimal.
Behavioural biases	Known areas where the assumptions of optimal behaviour may not hold.

Executive summary

This study completed for Ofcom reports the results of an economic experiment that investigates different features of switching processes for consumers in the market for communication services. The economic experiment tests the impact of two main forms of switching process, Gaining Provider Led Processes (GPLPs) and Losing Provider Led Processes (LPLPs) on a set of performance measures or market outcomes (specifically, consumer welfare and percentage of consumers that settle on a contract best suited to their needs).

Within each class of switching processes, GPLP and LPLP, the effect on the performance measures of specific switching features are tested. The precise treatments implemented are the following:

1. GPLP without verification such that there is the possibility of slamming[1] and there are no early termination charge (ETC) warnings;

2. GPLP with verification such that there is no slamming, but again no ETC warnings;

3. GPLP with verification (and therefore no slamming), and a simple ETC warning where the consumer is told by the gaining provider that she may incur an ETC if her contract is still within the minimum contract period;

4. GPLP with verification, and precise (or full) ETC warnings where the consumer is told the exact amount of the ETC she would incur;

5. LPLP where the losing provider will inform the consumer of the precise ETC and will make a retention offer that is similar to the new contract the consumer plans to sign-up to with a different provider; and,

6. LPLP as (5) but with several time delays that can frustrate the consumer (e.g. similar to when the consumer is kept on hold by the losing provider when trying to make the switch).

This design allows us to attribute any differences in consumer behaviour to the specific elements of the switching process.

In this experiment consumers may want to switch to competing providers with contracts that are more suitable to their own demand. Initially, in the experiment, consumers do not know their own demand (that is, they do not know how many phone calls they are likely to make each month) and they are signed on to an expensive contract that is not suited to their needs.[2] Over time, subjects observe realisations of their own demand, that is, in each "month"[3] of the experiment they

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[1] Slamming involves switching a consumer to another service provider without their knowledge or consent.

[2] Choosing to start the consumers with a contract that is not best suited to their needs is a design choice. This design is chosen because the purpose of the experiment is to investigate consumer switching under different switching process features, if we started consumers on the contract best suited to their needs then we would expect to observe no switching.

[3] A month is called a period in the experiment.

observe the number of calls they actually made in the month and these realisations are drawn from one of three different distributions (high demand, medium demand and low demand).[4]

The experiment proceeds through six cycles where a cycle is a 48 month period. In each cycle the demand type of a consumer is fixed, that is, it either stays high throughout the cycle, or medium, or low. Only when a new cycle begins, the demand type is randomly reset and the process starts again from the beginning with the consumer signed on to the expensive contract that is not tailored to her needs.

During a period (a month) in the experiment, consumers can take two actions (in addition to merely advancing to the next period). Firstly, they can search the tariffs of the other providers. Each search (that is, for each provider they check out) costs them 100 units in experimental currency units.[5] This represents the real life cost of searching for tariff information (either attending a shop, browsing the internet or absorbing direct marketing literature).

Consumers can switch at any point in time during the experiment. However, if they switch before the minimum duration of their current contract has expired they will have to pay an ETC. The parameters of the experiment are set in a way such that a perfectly rational consumer would never switch before the minimum contract duration has expired because the ETC is 'large' and it would cost the consumer less to continue with their current contract. Therefore, if consumers always acted optimally in this experiment they would never incur an ETC.

Main Observations from the switching experiment

The findings from this experiment suggest the following:

- GPLPs, except when slamming is possible, are better for consumers (i.e. generate higher welfare) as compared to the LPLPs, and this difference is large with consumer subjects losing on average 20% of welfare under the LPLPs as compared to the GPLPs.[6]

- Under GPLPs consumers make *better* switching choices, that is, conditional on switching they are more likely to switch to the provider that offers the contract most suitable for them. This result is surprising especially from the view point of standard economics. There are no relevant information differences between the GPLP and LPLP treatments, which would assist consumers to select the most suitable contract, that could explain this effect. Further, there are no differences in (voluntary) switching across these treatments.

- Similarly, we also find that the GPLP without verification leads to worse switching choices. Once slammed, subjects who switch are less likely to switch to the best provider, that is, they are more likely to make inferior decisions about which contract to pick. Again, this

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[4] High, medium and low demand attempts to mirror the differences in consumer demand in the field. The parameters for demand were selected for the experiment and are not taken from field data.

[5] The experiment currency units are converted in pound sterling at the end of the experiment and subjects are paid their earnings in pounds.

[6] When we compare GPLPs with precise ETC warnings (treatment 4) and LPLPs with precise ETC warnings and retention offers (treatment 5) which is the most natural comparison because only the process (GPLP or LPLP) changes all other features remain the same.

cannot be explained through standard economic arguments as subjects in the slamming treatment do have access to the same information about their own demand as subjects in all other treatments

- ETC warnings do not help consumers in the GPL processes nor the LPL processes.[7]

- Consumers with higher IQ perform much better than subjects with lower IQ and we also find that consumers perform better with more experience. While this might not be surprising from a common-sense point of view, it does violate the predictions of standard economics where cognitive limitations are assumed away.[8]

We believe these findings which cannot be explained by standard economic theory are driven by *limited attention*. Even in this simplified laboratory environment, consumers need to process substantial quantities of information in order to select the best contract for them. Consequently, the potentially beneficial effect of additional information from ETC warnings or additional tariff choice from save activity is wiped out through the additional complexity that these features induce. Similarly, slamming appears to cause, beyond its direct negative effect on consumers, substantial confusion which explains the lower quality of contract choices.

The explanation along the lines of limited attention is also in line with our findings on IQ and experience, and are further confirmed through a post-experimental questionnaire. For example, we find that substantially more subjects report they found the switching process confusing in the presence of ETC warnings. Other subjects reported being given a retention offer meant more calculations and therefore made it more difficult to select the best contract.

Conclusions and external validity of the experiment observations

We do believe our findings have a high degree of external validity.[9] If comparatively "smart" student subjects are unable to behave optimally in a stylised environment like this, it appears unlikely that the general population would do much better under the additional complexities of real life. Consequently, one would logically presume that simpler switching processes would indeed improve consumers' performance and consumer welfare in real life. It is, however, impossible to say to what extent without further calibration of parameters to field conditions and additional experiments.[10]

Nevertheless, we can conclude safely that it is very unlikely that there are any significant advantages of LPLPs vis-a-vis GPLPs that offer the same amount of protection against slamming.

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[7] While we do not specifically test GPLPs without ETC warnings, we do find that ETCs are higher in the LPLPs as compared to the GPLPs with ETC warnings (Table 4)..

[8] In traditional economic frameworks consumers are able to use all available useful information fully and rationally irrespective of experience.

[9] External validity is the extent to which learnings from experiment environments can be transferred to real world environments.

[10] We discuss these proposed extensions in the concluding chapters to this report.

1   Introduction

This study reports the results of a controlled laboratory experiment on the efficacy of different switching processes in the market for communication services. Specifically, we examine six different switching regimes, some of them resembling actual switching processes as currently employed in markets, some designed in a way to better understand the impact of their different characteristics such as how they protect consumers against slamming or how they provide information to consumers.

Four of the processes we implement are GPLPs, two are LPLPs. We implement more GPLPs than LPLPs because we study some "intermediate" processes that combine standard GPLPs with the informational characteristics of LPLPs.   The main difference between GPLPs and LPLPs are the number of different contact points that consumers wishing to switch must make. Under GPLPs consumers need contact only the new provider to which they want to switch. No contact is required to be made by the customer with the losing provider. GPLPs are therefore more straightforward for the consumer, and consumers do not need to contact the losing provider as such avoiding any pressure the losing provider may exert to keep the customer.

On the other hand, LPLP increase the number of contact points. Under LPLPs consumers may need to make up to three contacts (i) gaining provider to find out about their offers, (ii) losing provider to cancel services and to receive a code they need to pass on to the gaining provider to ensure uninterrupted services , and (iii) gaining provider again to give them the code and sign up. LPLPs provide the losing provider with the opportunity to make a counter offer and to exert sales pressure on the consumer in order to keep them.

Within these two broad categories six different incarnations of GPLPs and LPLPs in total are tested in this study.

Generally under a GPLP no verification or ETC warning is given to the consumer. The lack of verification can give rise to a situation of slamming where the consumer is switched to a different provider without their agreement. Likewise the consumer is not reminded by the gaining provider that they may incur an ETC if their existing contract is still within the minimum contract period.

Under the LPLPs consumers may have the opportunity to receive a counter offer from the losing provider and can be informed of any ETCs they may incur. Moreover, slamming is ruled out by design.

This controlled laboratory experiment implements four different GPLPs and two LPLPs. The design of these processes forms a chain, that is, from one switching process to the next we minimise the changes to the experiment environment. This sequential design helps us to pin down the causes of differences in the switching experience (if there are any). For example, if LPLPs were to outperform simple GPLPs we would be able to decompose this advantage and analyse whether it is due to retention offers or ETC warnings or both.

The six switching processes are the following:

1. GPLP without verification such that there is the possibility of consumers being slammed onto a new contract without their agreement. In this process there is no ETC warning given to the consumer.

2. GPLP with verification so that slamming does not occur. Again in this processes there is no ETC warning.

3. GPLP with verification (as in (2)), and with a simple ETC warning by which the gaining provider informs the consumer that she may incur an ETC if her existing contract has not reached the minimum time period.

4. GPLP with verification and full ETC warning. In this case the consumer is told the precise amount of ETC (if any) that she would incur if she switches at this time.

5. LPLP in which the losing provider informs the consumer of any ETC (full ETC) and makes a retention offer. The retention offer is designed to resemble closely the contract the consumer wants to switch to. It is, however, slightly more profitable for the provider (worse for the consumer).

6. LPLP as in (5) but this time with significant time delays to simulate frustration consumers may experience when the provider asks them to hold the line at various stages during the call and to serve as a proxy for prolonged save activity discussions.

We focus on two main performance measures: consumer welfare (i.e. subjects' pay) and consumers' ability to select the best, or optimal, contract for them given their demand within these six treatments/processes and when faced with four different providers each offering different contract tariffs.

Our main finding is that consumers in this environment have lower welfare and are less able to select the best contract for them in LPLPs as compared to GPLPs. The LPLP is a more complex situation for subjects to negotiate (even in this very simple laboratory environment) and this we believe leads to a situation of limited attention where the subjects become focused on the additional complexity, e.g. the number of contact points, ETC warnings, and the counter offers made in LPLPs. This makes it more difficult for them to make the best choices during the switching process.

Further, we observe that ETC warnings do not help consumers in either GPLPs or LPLPs. Welfare is higher in treatments without ETC warnings as compared to those with ETC warnings. Again this appears to be due to increased complexity leading to limited attention problems in consumers. The ETC is additional information added to already complicated processes, instead of helping consumers the ETC warnings make it more difficult for them to make the best choices for themselves. We do observe that ETCs warnings which are precise help consumers to make better choices as compared to simple ETC warnings, and this is because the warning is tailored to the individual consumer and can therefore be useful to them. However, even these full ETC warnings don't help consumers avoid ETC charges in this environment where it is never the best choice to incur an ETC through voluntary switching.

1.1   Limited attention

In this sub-section we briefly discuss the previous literature on limited attention.

Research on attention can be dated back to at least the late 19th century (W. James, 1890), with seminal work in the 1970s undertaken by Daniel Kahneman who pointed to the endogeneity of attention capacity. Over the last two decades the most vigorous research on attention has probably been conducted in the field of cognitive neuroscience where researchers have begun to analyse the mechanics of attention and their neural foundations (see, for example, the influential work of Posner & Petersen 1990 or, more recently Cobetta & Shulman, 2002).

In economics, the concept of attention had been largely ignored until the turn of the century. Homo economicus always paid perfect attention to everything of concern to him. But since then experimental evidence has been accumulating showing how economic decision-making is affected by limited attention. Typically, the experimental protocol varies "cognitive load" by forcing subjects to do multiple tasks. For example, Benjamin, Brown and Shapiro (2006) ask subjects to remember a string of seven numbers while performing some choice tasks. Strikingly, they report that small-scale risk aversion increases under cognitive load (which is at odds with standard economic theory). Employing similar techniques, Rydval (2007) studies how cognitive load interacts with financial incentives in a forecasting task.

If attention capacities are indeed limited then additional information can cause deterioration in the quality of decision making, a phenomenon typically referred to as "information overload". Information overload has been experimentally investigated in psychology, consumer research (Grether & Wilde 1983, Heroux, Laroch and McGowen 1987), and management studies (with strong effects reported in Chervany and Dickson 1974). Again, the economics literature is only now catching up. A particular striking experiment is reported by Agnew and Szykman (2005) who show how information overload can affect financial decision making. They show that with increasing information overload experimental subjects who face an investment task are more likely to stick to defaults, a phenomenon not unrelated to the effects on switching behaviour that we report here.

1.2   Experiments in economics

Economic experiments are a quantitative research method that allows policy makers to test different processes in the economy and to compare within the experiment environment both firm and consumer behaviour under the different processes, requirements, rules and policies. Experiments use subjects which can be either students or members of the public that may or may not have experience within the market of interest.

The hallmarks of experiments in economics are control, treatment and replication.

■   Control means individual decisions made in the experiment are induced by the environment (information, incentives, etc) that has been created by the experimenter and by no other factors. Moreover, choices and their determinants are perfectly observable.

■ Treatment is the ability to change specific incentives or features of a process or policy exogenously (that is, holding everything else constant) and to identify how and why individual decisions change as a result.

■ Replication is the ability for the experiment to be conducted multiple times by the same researcher, by different researchers and across different populations of people, in order to verify the results.

Experiments induce behaviour by creating real monetary incentives (and disincentives) that are directly linked to the decisions subjects make in the experiment. Experiments therefore observe actual human behaviour when subjects are faced with real economic decisions that entail gains and losses.

The experiment presented here for Ofcom is a conventional or controlled economic experiment with some framing as subjects know they are making telephone calls and can search and make the decision to switch contracts with alternative suppliers. Experiments can take different forms each having their own strengths and weaknesses. The main categories of experiment are the following:

■ Conventional laboratory experiments

■ Artefactual field experiments

■ Framed field experiments

■ Natural field experiments

Conventional laboratory experiments have the highest level of control, and are therefore (often) used to test specific design features of processes and policies, and as a proof of principle that the fundamental incentives upon which a process is built hold in practice in a simple and highly controlled setting. Subjects or participants in the experiment are often university students, and the type of goods and services they exchange in the experiment are often simply labelled good 1,2,…n or goods 'red', 'white' and 'blue'. Conventional lab experiments are the quickest and easiest to implement. The strength of conventional experiments is that all other influences on individual behaviour are removed from the experiment such that the underlying behavioural mechanisms can be scrutinised without any uncontrollable factors or noise. They are easy to implement and comparatively cheap.

Artefactual experiments are conducted in the laboratory (or laboratory-like environments) and use subjects that may, for example, be experienced in undertaking the experimental tasks in a real world setting (for example bond traders in a financial market). Or, they may use different types of subjects i.e. men and woman, undergraduate and graduate students, or young and older individuals to test if the fundamental incentives hold across different groups in our economy. Artefactual experiments are therefore useful if the type of individual is considered important or past knowledge and experience is important.

Framed field experiments are conducted outside the traditional laboratory, but still recognisable as an experiment. Framed field experiments use subjects that are familiar with the setting in which the intervention may be implemented (as can also be the case in artefactual experiments). Further, subjects in the experiments will often know the nature of the good or service that they

are exchanging. Some control can be lost in framed field experiments, this is because subjects can bring behavioural biases learnt in the 'real-world' field to the experimental setting and then make their decisions according to their real world experiences as opposed to responding to the incentives in the experiment.

Natural field experiments have the fundamental feature that the subjects do not know they are participating in an experiment. Subjects naturally undertake the tasks which the experiment is attempting to observe. Natural field experiments have the lowest level of control and treatment.

The type of experiment used depends on the policy question posed. Often practitioners will conduct controlled laboratory experiments with some framing. This means that the tight control between incentives and behaviours in the laboratory are maintained but some selected features are added to the laboratory. This is the case with the Ofcom experiment presented here. The experiment maintains all the tight control of laboratory experiments while introducing the context specific terminology of phone calls, phone bills and providers.

The fundamental features of the switching processes are set-up in the experiment environment, but the environment is stylised (or simplified) in order to maintain tight control. For example, subjects do not actually make phone calls but instead interact with their computers. Consumers cannot change their demand for phone calls in response to changes in price. Further, the providers are simulated in this experiment. While counter or retention offers are made by losing providers in some of the treatments they cannot engage in active selling or retention activity and as such the full physiological impact of retention offers is simplified. The external validity of this stylised environment, namely what we learn from the stylised environment about the more complicated real world is discussed in Chapter 4.

2   The experimental environment

The task is to implement the environment and each of the switching processes and their features in a way that allows Ofcom to directly compare the switching processes against each other. This created several constraints when designing the experimental environment.

We opted to include all the important facets in the simplest manner possible. The philosophy behind this is that we want to minimise the noise in decision making that originates from the sheer complexity of the basic environment. The less noise that originates from the experimental complexity, the clearer will be the results that we obtain for the comparison of the switching processes.

In particular, this leads us to keep many of the parameters (such as the distribution of calls and demand types, the available tariffs, switching and search costs) constant from subject to subject and within repetitions. An alternative approach would be to allow these to vary somewhat, but holding the sample size constant this will induce additional variance and make results less sharp.

When choosing parameters for an experiment like this (where there is no theoretical model that offers guidance on how different parameters should be related to each other) one has to rely on a manifold of judgements. In each case we have carefully considered how the choice of one parameter impacts on the overall environment and the choice problems the consumer subjects face. In that, we always tried to capture key aspects of real markets while maintaining simplicity and coherency of the environment.

We have opted for a simple basic environment informed by existing practices in communications environments. When we use a simple environment we are able to better identify which features of the switching processes are influencing behaviour and why. However, simple environments mean we must be careful extrapolating our observations to the more complicated field environment. This extrapolation from laboratory to field is called external validity. The implications of a simple environment for external validity will be highly asymmetric. This asymmetry in external validity means that if we find that subjects in a very simple environment do very well, i.e. in this case they have high consumer welfare across all switching processes and they always select the best contract for them, then we would be limited in our ability to say that they will also do well in a more complicated environment. However, if we observe that even in simple environments subjects struggle (as is the case in this experiment for Ofcom), then we can be confident that they would do even worse in a more complicated environment.[11]

In the experiment, consumers make phone calls over the course of several periods (although they cannot choose the number of calls that they make). They can learn their demand for phone calls and switch between the various contracts on offer. The principle features of the experimental environment, which we discuss below, are the following: the demand that consumers have for calls; the tariffs that are available to consumers; the switching process and the mechanism for searching for different tariffs; and, ETCs in fixed term contracts.

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[11] This asymmetry in simple environments and extrapolation to more complicated environments is discussed by Plott (1994).

The instructions given and read to subjects in the experiment are reproduced in Annex 1.

The environment is implemented as follows. A consumer is (unbeknown to her) assigned to be one of three different demand types: a high, medium or low demand user. This determines the distribution of calls they make in a given period:

(1)   Low demand: 0 to 100 calls per period

(2)   Medium demand type: 50 to 150 calls per period

(3)   High demand type: 100 to 200 calls per period

In each period, the number of calls made is drawn at random from the interval given with each number being equally likely. Consumers cannot influence the number of calls that they make. Moreover, they are not informed of their demand type, and they do not know that there are three demand types or the ranges.

The consumer has a utility (payoff) function that is a function of the number of calls that they make as follows:[12]

Payoff = 500 + 8 * Number of calls made

These payoffs (and similarly the costs we detail below) are reported in experimental currency units (ECU) and are exchanged into pound sterling at a rate of £1 for every 4000 when we pay subjects at the end of the experiment.

The payoff function simply reflects the idea that consumers get some satisfaction out of making telephone calls (ordering a pizza, chatting with family, paying a utility bill, etc.).

There are four providers of phone services, each of whom offers one tariff. One tariff is best for the high demand type, one is best for the medium demand type and one is best for the low demand type consumer. Again, this structure is not known to subjects. Rather they have to figure out how their own demand is best matched by the different contracts. The fourth tariff is 'dominated' – not best for any consumer type. In order to construct tariffs that satisfy these requirements, it is necessary that they are non-linear. This means that a tariff is composed of a fixed fee per period together with a 'per call' charge (as is not uncommon in many actual phone contracts). The tariffs are shown in Table 1.

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[12] Utility is a measure of satisfaction which underlies all consumer behaviour theory in economics.

Table 1: Contract tariffs		
Tariff	**Fixed fee**	**Per call charge**
Low	100	10
Medium	500	5
High	1000	1
Dominated	700	7

At the start of each cycle, the consumer does not know their own demand type (nor does she know about how the types have been designed). This reflects a situation where consumers subscribe to a service they have not much experience of in the past and are, hence, unsure about how they will use it in practice (so it is a bit like buying a first mobile phone, for example). Each cycle consists of 48 periods (called 'months' in the experiment – so the cycle lasts for 4 'years'). After each period, the consumer sees their telephone bill, detailing the number of calls made and the resulting utility (payoff), their current tariff and the resulting cost of these calls.

As a cycle progresses, the consumer will get a better and better idea of their demand type by observing the number of calls made in each period. Consumers observe the number of calls they make in their monthly statement (the screen shot subjects see is reproduced in Figure 1, Annex 2). In order to make the experiment simpler, we don't implement different call lengths; consumers are charged per call.

For example, suppose a consumer is on the Low tariff and makes 47 calls in a period. Then their payoff from calls would be 500 + 8 * 47 = 876. Their call costs would be 100 + 47 * 10 = 570. So their net earnings would be 876 – 570 = 306 ECUs. For certain realisations of demand and choice of tariff, the amount earned in a period can be negative.[13]

Initially, consumers are signed up to the provider of the 'dominated' tariff.[14] This design choice is simply to make sure that each subject has a reason to switch. Subjects who never switch would obviously be irrelevant for our analysis as the objective of the analysis is to investigate how the switching processes and their features affect switching. On average, earnings for all types of consumers will be negative on this tariff. This should encourage consumers to switch quite early on, possibly without having a very precise estimate of their demand type. This may necessitate further switching later on in a round.

During a period (a month) in the experiment, consumers can take two actions (in addition to merely advancing to the next period). Firstly, they can search the tariffs of the other providers. Each search (that is, for each provider they check out) costs them 100 units in ECUs. This represents the real life cost of searching for tariff information (either attending a shop, browsing the internet or absorbing direct marketing literature).

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[13] For example, if a consumer had a low demand and they chose a contract that was suited for a high demand type.

[14] As previously stated the dominated tariff is one that is good for no one.

The other type of action that the consumer can take is to switch tariff, which in our experiment implies switching provider as we assume that each provider offers one tariff only (excluding retention offers). As explained previously, there are six different treatments corresponding to the six different methods of switching tariff. We explain the precise steps involved in each switching process in the section below.

The switching process is costly. Specifically, there is a cost of 200 units in ECU every time the switching process is initiated and a cost of 15 units in ECU per second for every second spent in the switching process. These costs are subtracted from subjects' payoffs (the payoff function is shown at the beginning of this chapter). This reflects the real life cost of engaging in switching – the cost of assimilating the information about current usage and potential alternative tariffs, and the time spent actually engaging the switching process.

As is common in mobile phone, fixed line and broadband contracts we implement tariffs with minimum durations. Specifically, each new contract has a minimum duration of 15 periods (which mirror months). If a consumer leaves before the 15 months has been completed, they pay an ETC. This is equivalent to the fixed fee times the number of periods remaining on the contract.

When a consumer starts in period 1 (month 1), they are already 6 months into their first contract (they have 9 months before they can switch without incurring an ETC). We chose to start subjects part way through their contract, as opposed to at the beginning, because this design feature makes it more difficult for them to keep track of exactly where they are in their 15 month contract. This means that it is not really easy for consumers to know when they will incur an ETC, and therefore the ETC warnings may be more useful to consumers than if we chose to start them at the beginning of the contracts.[15]

2.1 The implementation of the switching processes

The main purpose of the experiment is to compare switching processes. We have designed the switching processes in an incremental fashion. That is, there is a clear progression from one process to the next where typically only one aspect of the process changes. This enables us to clearly associate any changes in behaviour with the specific change in the switching process features. Each subject participates only in one treatment.

The design of the switching processes themselves is driven by how switching works in various markets and by the desire to understand the precise consequences of key aspects of different switching regimes. Consequently, we also design "counterfactual treatments" that resemble switching processes that do not currently exist in markets (for example, GPLPs with ETC warnings). Some elements of the real life switching process have been abstracted away or eliminated, but the key elements to investigate remain. Selected screen shots are reproduced in Annex 2. We refer to specific screen shots as we discuss the switching processes below.

These key elements are:

   1) whether the process is led by the gaining or losing provider;

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[15] In other words we have designed the experiment to make the ETC warnings useful to the consumers in the experiment.

2) different levels of information about ETCs in GPLP treatments;

3) the ability of the provider in the LPLP treatments to make a retention offer before the customer switches;

4) the ability of the provider in the LPLP treatments to introduce delays and frustration in the switching process; and,

5) the possibility of slamming (that is, unauthorised automatic switching by a provider).

These considerations informed the choice of the following six switching processes.

1) GPLP treatment with slamming and no ETC warning (treatment 1);

2) GPLP treatment without slamming and no ETC warning (treatment 2);

3) GPLP treatment with a simple ETC warning (treatment 3);

4) GPLP treatment with a precise ETC warning (treatment 4);

5) LPLP treatment with a precise ETC warning and a retention offer (treatment 5); and,

6) LPLP treatment with delay with a full ETC warning, a retention offer and delays (treatment 6).

This ordered sequence of six switching processes provides a chain, where from one process to the next typically only one element changes (there are two changes between treatments (4) and (5) which cannot be avoided as a LPLP necessitates making contact with the current provider). Below we describe each switching process in more detail.

In each switching process, the consumer must first click the "switch" button (Figure 1, Annex 2 reproduces a consumer's monthly bill and the switch button). They are then confronted with a list of the four providers and they can click "Contact" to contact whichever provider they wish to (Figure 4, Annex 2). The provider from which they switch is the "losing provider" and the provider to which they switch is the "gaining provider". Note that a consumer subject can abort the switching process at any stage until they have successfully switched.

2.1.1   Gaining provider led treatment with slamming and no ETC warning

In this switching process, if a subject contacts the losing provider (his existing provider), they are told to contact the gaining provider. If they click on any other provider, it is an indication that they wish to switch to that provider.

The gaining provider welcomes the consumer (one screen, Figure 5 Annex 2), displays the tariff that they are offering (one screen, and example is shown in Figure 3) and the consumer clicks to accept this new tariff (they can also abort the switching process if they wish). They are then shown a screen confirming the switch. In order to simulate the idea that these steps do not happen instantaneously, there are short delays in between each of these screens.

After subjects have switched once, they will get "slammed" at some point later on. That is, they get switched to another provider at random.

The precise point at which slamming will occur has a random component. It occurs at least four periods after the consumer's first switch and with a probability of ¼ in each successive period.

There are no switching costs associated with slamming, but if they are within the minimum contract period of their provider, they will incur an ETC.

Consumers can switch (either back to their original provider or to another provider) after being slammed. If they do so within the first 15 periods after being slammed, they will incur an early termination charge, as usual.

Consumers will be slammed at most once and will only be slammed after they have made a switch. They will be slammed randomly on to one of the other available contracts.

The implementation of slamming reflects slamming as experienced outside the laboratory: it occurs without consent, can involve ETCs and potentially can involve a switch to a better or worse tariff.

2.1.2 Gaining provider led treatment without slamming and no ETC warning

This process is identical to the previous process with the exception that there is no element of slamming involved.

In this switching process, if a subject contacts the losing provider (his existing provider), they are told to contact the gaining provider. If they click on any other provider, it is an indication that they wish to switch to that provider.

As in the previous switching treatment, the gaining provider welcomes the consumer (one screen), displays the tariff that they are offering (one screen) and the consumer clicks to accept this new tariff (they can also abort the switching process if they wish). They are then shown a screen confirming the switch. In order to simulate the idea that these steps do not happen instantaneously, there are short delays in between each of these screens.

2.1.3 Gaining provider led treatment with simple ETC warning

This treatment is very similar to the gaining provider led treatment without slamming and no ETC warning. The difference is that after the consumer has accepted the new tariff, there is a screen which says "An early termination charge may be imposed by your current provider if you are within the contracted period" (Figure 9, Annex 2).

2.1.4 Gaining provider led treatment with full ETC warning

This treatment is identical to the gaining provider led treatment with simple ETC warnings, with the exception that the ETC message is more precise. It tells the consumer how many months (if any) there are left on his existing contract and the resulting ETC that will apply if she switches at that point.

2.1.5   Losing provider led treatment with full ETC warning & retention offer

In this switching process, if a consumer contacts the gaining provider, they are told to contact the losing provider first. After they contact the losing provider, they are taken through the following steps, each of which happens on a different screen:

1) The losing provider explains that they are sorry that the consumer will be leaving and says that some procedures must be undergone before the consumer can switch.

2) The consumer is asked why she is leaving. The options are "Not making enough calls on my current tariff", "Making too many calls on my current tariff", "Found an all-round better tariff".

3) The consumer is shown the ETC, if any, that will apply if they switch at that point.

4) The consumer is asked whether they would consider letting the losing provider make them a counter offer. If so, the consumer enters the details of the tariff that they propose to move to and the losing provider makes a retention offer.[16] The retention offer that the losing provider makes to the consumer depends on which tariff the consumer was planning to move to (see Table 2). The consumer can accept this offer, in which case they switch to this new tariff (although they still incur ETCs if applicable). If the consumer rejects the retention offer or doesn't allow a retention offer to be made, the consumer proceeds with the switch.

5) To switch provider, the consumer then follows exactly the same steps as in the Gaining provider led treatments.

Table 2: Counter offer contract tariffs		
Proposed new tariff	**Fixed fee**	**Per call charge**
Low	200	9
Medium	650	4
High	1200	0
Dominated	700	7

The retention offer is constructed in such a way that it generates, on average, a slightly higher telephone bill and is, thus, slightly less attractive to the consumer but more profitable for the provider than the tariff to which the consumer proposes to switch (assuming that they are acting optimally).

This is a key design decision. If the retention offer tariff is too cheap, then we would never experience any switching and if it was too expensive, it would be pointless having it, other than as

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[16] The losing provider only provides a retention offer if the details of the tariff that the consumer proposes to move to are valid i.e. if the alternative offer is one of the contracts available in the experiment. The consumer is not able to lie to get an even better offer in this experiment.

an extra stage of delay. Having the retention slightly more expensive than the proposed tariff enables us to see whether subjects are willing to trade off some of the hassle in switching for financial gain. At the time of designing the experiment, we had no information from the field as how retention offers are actually formed by providers.

2.1.6 Losing provider led treatment with full ETC warning, counter offer & delays

This treatment is exactly the same as the Losing provider led treatment with full ETC warning and retention offers except that there are significant delays between steps 2 and 3, steps 3 and 4, and steps 4 and 5. If the consumer accepts the counter offer, the final delay does not occur. These delays simulate the frustrating (but typically not financially costly) experience of many consumers switching between providers in various markets where they often have to wait for a long time, 'hold the line' or be 'transferred to a different department'.

2.2 Consumer decision making process

Here we outline the decision process a consumer subject must go through in this environment. This description is not intended to mirror the actual reasoning process of the experimental subjects, let alone that of real consumers in the field, rather it summarises how a rational, smart, "ideal" subject would reason in order to better illustrate the choice problem at hand for the reader of this report.

Initially, I don't know what my demand is for making phone calls. But having seen my first telephone bill, where I made 74 calls, resulting in a utility of 1092 and costs of 1218, I do at least know what tariff I'm on.

It seems that if I don't change tariff at some point or unless the number of calls I make increases a lot, I will end up with a negative payoff at the end. So probably, I should change tariff at some point. If I switch before 9 periods have elapsed, I will pay 700 for each period remaining. This seems quite high, especially compared to the 126 unit loss I made in the period. Even if the new tariff were free, it would not be worthwhile switching yet.

I don't know what the switching process will involve, but I know it will cost 200 plus 15 for every second I spend within it.

Suppose I decide to wait until 9 periods have been completed, learn more about my demand for making calls and then decide whether to switch. I see that I made the following number of calls: 74, 54, 3, 29, 47, 47, 90, 87, 37 – or about 52 on average, losing 148 per period.

Now that I can switch without penalty, I will see whether there are any other tariffs worth switching to. I'm currently with provider X. I'll look up the tariffs of the other providers. I know it costs 100 per look-up, but that seems a relatively small cost.

I learn from searching that the other tariffs are (100, 10) from provider 1, (500, 5) from provider 2, and (1000, 1) from provider 3, where (x, y) means the fixed period fee is x and the per call charge is y.

If I make 52 calls, I'll pay 620 with provider 1, 760 with provider 2 and 1052 with provider 3. The best for me would be provider 1 and I'll save about 444 per month or about 444 * 39 = 17316 in total. The cost of switching will be less than this if the switching process lasts less than 19 minutes.

Ok, I will switch.

Annex 2 reproduces a selection of the screen shots from the experiment. Below we describe the optimal strategy for a consumer in this environment. The optimal strategy is what the fully rational consumer would adopt.

The main features of the optimal strategy are listed in Box 1 for brevity. Detailed description of this strategy then follows.

Box 1: Consumer's optimal strategy
It is never the best choice for a consumer to switch contracts before the minimum contract period ends. The consumer should always stay on their starting contract until this contract period expires.
Once the minimum contract period has ended, consumers should always switch to another contract that best matches their demand for phone calls.
Consumers should only switch once (except if they are slammed).
A consumer should never accept a retention offer from a losing provider, it is always better to switch than accept a retention offer.
If a consumer is slammed then it is best for them to switch (back) to the better contract for their demand type.*

* Unless the slam happens near to the end of a cycle. If the slam happens close to the end of a cycle then it may be better to incur the losses per period from a worse contract than to incur switching costs and to return to the better contract.

The optimal strategy is quite straight forward, and is the same for all switching processes. First, recall that a consumer always starts on the "dominated" tariff (the dominated tariff is not best for any of the three consumer types included in this experiment). From there, it is never optimal to incur an ETC. To see this, note that even a high demand type user, who has the most to gain from switching, and makes on average 150 calls per month would only save (700 + 7 * 150) − (1000 + 150 *1) = 600 on average. This would not cover the extra ETC of 700 per month.

Hence the optimal strategy is to wait until the minimum contract period has expired (9 periods) and then to switch. At this point, most consumers will have a precise estimate of their demand.[17]

After switching, a subject should then not switch again – they should remain on the optimal contract for the remaining 39 periods of the cycle.

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[17] For there to be any ambiguity between the choice of low and medium contract, all demand realisations must have been in the region 50 to 100 or for any ambiguity to exist between medium and high demand type, all demand realisations must have been in the region 100 to 150. The probability of either of these events is 1/512.

Even the slowest of switching processes lasts for no more than 2 minutes. The switching cost is therefore at most 200 + 120 * 15 = 2000. This cost would more than be covered by the gain from switching to a superior tariff. Hence it is correct to switch.

Is it ever optimal to accept the retention offer in the losing provider led treatment? Doing so would cost more on average (by 50 units per period), but would save some time in the switching process (especially in the treatment with delays). However, the maximum time saved is less than one minute, or 900 units. As switching should be done when there are 39 periods still remaining, the amount saved by a quicker switching process does not make up for the per period loss. Hence, it is always better to switch than accept the retention offer.

For the slamming treatment in the GPLP, there is the added complication of slamming. Subjects get "slammed" at some point after they switch. This happens at least 4 periods after they switch and with a probability ¼ in each successive period. Assuming there are enough periods remaining after they have been slammed to recoup all losses from early termination charges incurred during slamming, it makes sense to switch as before.

However, there is one additional factor to note. The ETC is now not always 700 per period if a consumer switches a second time. This is because a consumer is slammed onto another tariff at random. If a high demand type consumer is slammed onto a low demand type optimal contract (i.e 100 fixed fee with 10 per call charge), then they only pay an early termination charge of 100 per period. But the expected gain from switching is (100 +150 * 10) – (1000 + 150 * 1) = 450. The same argument does not apply to any other combination, as early termination charges would be too high to cover the gain and switching cost.

The final consideration is whether a consumer in the slamming treatment (who would know that she is in this treatment) would ever switch at all, given that they will only be slammed if they actually first switch. And when they are slammed, they could potentially end up with very high early termination charges. The answer to this question is that it is always correct to switch. If a consumer switches and gets slammed, they spend the first 9 periods plus (potentially) 15 periods after being slammed on a sub optimal contract, and incur potentially 11 periods of early termination charges plus the costs of switching twice. They will spend the remaining time (at least 48 – 9 – 15 = 24 periods) on an optimal contract. Overall, the costs of such a strategy, are lower than the costs of staying on the dominated contract for 48 periods, regardless of demand type and when slamming actually occurs.

2.3   Experimental procedures

A total of 119 subjects participated in this experiment. Each subject played six cycles, each consisting of 48 periods – they played low, medium and high demand types in two cycles each (one random sequence of low, medium, and high in the first three cycles and another random sequence in the second three cycles). Each subject only experienced one switching process. This design enables subjects to learn about the environment, the switching processes and adapt their behaviour. And it enables us to determine whether any potential effects of the switching processes can be overcome through experience.

Choosing to do a between-subjects design, where each subject encounters only one switching process, rather than a within-subjects design, where an individual subject may encounter more than one switching process, was a key design decision. It enables us to get (within the constraints

of sample size and time frame of the study) the cleanest data set possible, where we observe subjects as they learn about the experimental design and parameters and switching process they experience, free of the potentially confounding effects of learning about more than one process.

In addition to the 6 cycles of the experiment, each subject undertook an incentivised 12-question IQ test and a feedback questionnaire about the experiment.

The feedback questionnaire is reproduced in Annex 3.

Experimental sessions lasted on average 110 minutes.

3   Data analysis

Our data analysis will proceed in essentially three steps. First, we will examine some aggregate performance statistics in order to examine whether overall consumer performance, in terms of making good choices and in terms of consumer welfare, depends on the switching process and, if so, how. In a second step we will then examine switching in more detail and analyse the underlying behavioural forces that drive the results we have identified in the first step. Finally, we examine the role of cognitive ability and learning.

3.1   Aggregate performance and consumer welfare

Table 3 summarises the outcome for each of our six treatments measured in two simple but also fundamental performance variables - subjects' pay (in pounds) which equates to consumer welfare and the proportion of consumers who, at the end of a cycle have found the contract that is optimal (or nearly optimal) for them (that is, we also count accepted retention offers that are similar to the optimal contract as optimal for the purposes of this table). Next, Table 4 breaks down pay (welfare) into different components, total premia minus phone bills, total search and switching costs, and total ETC.

Table 3: Consumer welfare and contract selection			
Treatment	**Subjects**	**Pay/Consumer welfare (£)**	**% on right contract**
1) GPLP with slamming	19	2.05 (4.88)	60.5
2) GPLP no slamming and no ETC warning	18	15.21 (2.88)	68.5
3) GPLP no slamming and simple ETC warning	20	12.85 (4.61)	68.3
4) GPLP no slamming and full ETC warning	20	15.07 (3.05)	70.0
5) LPLP with full ETC warning and retention offer	19	12.11 (5.76)	64.9
6) LPLP with full ETC warning, retention offer and time delays	18	10.68 (4.95)	63.0

Note: Standard errors for consumer welfare are shown in brackets. The standard errors are a measure of variability around the average.

Table 3 also shows the number of subjects that we observe in each treatment. For a stylised controlled laboratory experiment like this, the sample sizes conform to what is in effect the experimental economists' industry standard for controlled laboratory experiments. Notice that we had to exclude 5 subjects from the analysis. These subjects appeared to be "cognitively challenged" on which we will elaborate further below in Section 3.3. This is simply removing the extreme outliers as one does in standard statistical practice. We remove the observations for these 5 subjects so that the results are not misleading due a small number of students who did not understand, or were simply of much lower computational standards than the majority.

The first thing to notice about the results shown in Table 3 is the poor welfare outcomes under slamming (1) and the slow LPLP (6). These are, of course, a direct consequence of our design and their size is a function of our parameter choice. These treatments are included in the experiment to allow us to identify the effect of removing slamming and then introducing ETC warnings. The time delays in treatment 6 are obviously going to perform worse because these delays increase the time it takes and therefore costs to search and switch just as it does in real life when the losing provider attempts to frustrate the process for example.

Examining the GPLPs next, we observe that there are, somewhat surprisingly, no advantages of ETC warnings. On the contrary, simple ETC warnings (treatment 3) lead to lower consumer welfare as compared to no ETC warnings in treatment 2. Consumer welfare in treatment 2 is £15.21 and in treatment 3 it is £12.85. This difference is (borderline) statistically significant – significant at the 10% level. This implies that we can be 90% confident that consumer welfare will be larger under GPLP with no ETC warning (treatment 2) as compared to GPLP with simple ETC warnings (treatment 3).[18] When we compare consumer welfare in treatment 4 with full ETC warnings and treatment 2, we find that this difference is not statistically significant (even at the 10% level).[19] Further, the proportion of consumers on the right contract in treatment 2 (68.5%) as compared to treatment 4 (70%) is also not statistically significant (even at the 10% level).[20] This means that it is very unlikely (there is less than a 1% chance) that full ETC warnings assist consumers as compared to no ETC warnings under GPLPs.[21] This implies, and we address this again later, that simple ETC warnings are not helping consumers but the full ETC warnings have little difference to no ETC warnings. Taking these observations together, strongly suggests that ETC warnings do not help the consumer.

It is important to think about the external validity of this observation. One immediate objection to our finding could be that, as the experiment design simplified the real problem, subjects were able to keep track of their minimum contract lengths easily with no ETC warnings. So giving warnings simply could not improve performance further. While attractive at first sight, this view is flawed. This is because under optimal behaviour even a consumer who knew her demand perfectly would

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[18] In other words, if the experiment were repeated a larger number of times, fewer than 10% of these experiments would show consumer welfare being higher with simple ETC warnings (treatment 3) than with no ETC warning (treatment 2). Overall, this suggests a reasonable level of support for not providing consumers with a simple ETC warning.

[19] The statistical significance is the probability that the difference between the observed average outcomes (as presented in Table 1) is a not a true difference but simply due to chance. Common levels of significance employed in tests are 10%, 5%, and 1% - the latter being the strongest indicator of an effect.

[20] We test at the 1%, 5% and 10% level.

[21] Another way to look at this, is that there is a 99% chance that the full ETC warnings make no difference to consumer subjects in this environment.

never incur ETCs: As described in the consumer decision making process (section 2.2) it is never the best choice for a consumer to switch contracts before the end of the minimum contract period. In other words, the argument against the external validity of our finding would be convincing if subjects did not (or very rarely) incurred ETCs in the GPLPs. However, subjects lose over 10% of their earnings through incurring ETCs (Table 4 overleaf shows the total ETCs incurred in each treatment). Consequently, the true reason for the ineffectiveness of ETC warnings must be more complex. We shall revisit this issue later. For now, we simply conclude that ETC warnings do not help consumers and that this is *not* an artifact of the experiment being too simplistic and easy.

Turning to Table 4, overleaf, and regarding overall welfare one treatment remains which requires consideration. It is the LPLP that requires subjects to contact two providers for making a switch, includes ETC warnings (from the current provider) and gives consumers access to retention offers that can be nearly optimal. From the outset, from a purely theoretical perspective, it is unclear whether this LPLP should be better or worse than the GPLPs. The data, however, provides a sharp result. Consumers achieve significantly less welfare under LPLP and this loss is substantial (Table 4 column 1). .The drop in welfare compared to the GPLP with full ETC warnings (which is the most natural comparison) is 20%. It may be tempting to attribute this difference to our experimental design and in particular our choice of the relative length of the LPL process. However, only one third of this loss is due to the lengthier switching process inherent in this treatment, as can be seen from Table 4 (search and switch cost is £3.79 as compared to £1.69). Consumers also incur higher ETC (£2.14 as compared to £1.52).

Table 4:	Consumer welfare, bill premiums, search and switch costs, and ETCs				
Treatment	**Pay/Welfare**	**Total Premia – Bill**	**Search cost**	**Switch Cost**	**Total ETC**
1) GPLP with slamming	2.02	13.69	0.36	1.57	9.71
2) GPLP no slamming and no ETC warning	15.21	18.55	0.40	1.07	1.87
3) GPLP no slamming and simple ETC warning	12.85	18.21	0.50	1.27	3.58
4) GPLP no slamming and full ETC warning	15.07	18.27	0.44	1.24	1.52
5) LPLP with full ETC warning and retention offer	12.11	17.25	0.56	2.08	2.50
6) LPLP with full ETC warning, retention offer and time delays	10.68	16.61	0.48	3.31	2.14

Note: Column 1 in this table is reproduction of column 1 in Table 3.

This suggests that the quality of decisions under the LPLPs is worse than the quality of decisions under the GPLPs. This notion is confirmed when we go back and examine the final column of Table 3. Fewer subjects are able to find a (near) optimal contract under the LPLPs. This is surprising, as from the outset one might think that the design of the switching processes might affect subjects' appetite for switching (as the costs for switching vary) but from the perspective of standard economics there is not much reason for why, conditional on switching, consumers would find it harder to pick the optimal contract under one or the other process. Of course, earlier switching will, on average, lead to worse contract choices, simply because consumers will have less reliable estimates of their own demand and the higher ETCs under LPLPs shown in Table 4 (except in the case of treatment 2 where the simple ETC warning is causing some problems for consumers) indicate that consumers do switch earlier under these treatments. However, again, there is no reason for why they should do so from the standard economics perspective. Moreover, the comparison with the GPLP with simple ETC also suggests that this is not the only channel driving the poorer choices under LPLPs. After all, ETCs are even higher under GPLP with simple ETC, yet consumers do better in finding the right contract for them.

3.2   Switching

Table 5 examines switching in more detail. The first column of the table repeats total ETC; the second column shows the average number of switches per cycle (distinguishing for the slamming treatment between forced and voluntary switches); the third column shows the percentage of optimal switches (for slamming once with and once without the forced switches and for the LPLPs once including and once excluding the acceptance of near-optimal retention offers); the fourth column shows the average time switches have taken; and the last column shows the number of aborted switches observed.

Table 5:	Switching				
Treatment	Total ETC	Number of switches (average per cycle)	% of optimal switches	Average time per switch	Aborted switches
1) GPLP with slamming	9.71	2.72 [1.72]	43.4% [57.9%]	24.6	7
2) GPLP no slamming and no ETC warning	1.87	1.22	61.4%	23.2	8
3) GPLP no slamming and simple ETC warning	3.58	1.15	62.3%	30.7	9
4) GPLP no slamming and full ETC warning	1.52	1.13	65.2%	30.7	13
5) LPLP full ETC warning and retention offer	2.50	1.31	57.0% [47.7%]	42.9	39
6) LPLP full ETC warning, retention offer and time delays	2.14	1.11	58.3% [53.3%]	107.1	26

First, we observe that the switching frequency is fairly similar across the different treatments. Under slamming, voluntary switching appears to be higher than under the others but those subjects who are slammed onto a non-optimal contract have to do one more switch. Although voluntary, this extra switch is 'necessary' for the consumer to repair the damage caused by slamming. Therefore, one needs to subtract roughly 0.87 (the fraction of those who are slammed on a non-optimal contract, computed here using the average switching accuracy from this

treatment) from the number 1.72 to get a measure of the switching activity that is un-related to slamming. Making this correction leads to an average number of switches of 0.85, i.e. slightly lower than those of the other treatments. Hence, if anything, slamming appears slightly to discourage further switching.

In Table 5 we can also observe that the total number of aborted switches is lower in treatment 5 as compared to treatment 4. It is important to note that this difference is not statistically significant. If we did find a statistical difference, then this may be due to the sunk cost fallacy due to the time delay in this treatment. In other words, the subjects' feel they have invested time and effort in the switching process and as such do not abort (even if it is better for them to do so). However, as this difference is not statistically significant, it is very unlikely that this is true.

Again it is necessary to question the external validity of these findings. Subjects in an experiment are to some extent prepared for "having bad luck" while consumers who find out that they have been signed on to a new provider in real life might perceive this as much more of a shock. Also, we believe that lengthy conversations, that perhaps exert sales pitches on the customer, would be experienced as directly undesirable beyond any impact they might have on the consumer's actual choice. Further, in an experiment like this there are always so-called "demand effects", that is, subjects are known to have a tendency to interact with their environment quite fully. In other words, since the only thing that subjects can do in this experiment is switching, they will be inclined to switch as there is not much else to do. Insofar, we will overestimate switching activity but we will do so across all treatments. That is, for the purposes of treatment comparison the demand effects cancel out. However, our design is such that both problematic treatments (slamming and the slow LPLP) do not fully resemble the psychological burdens that are imposed through such practices on consumers in real life. In other words, we would expect that we overestimate switching frequencies in these treatments and, consequently, might overestimate the number of consumers who are able to find the optimal contract for themselves.

Turning to the third column of Table 5 we get back to the issue of the quality of switches that had somewhat surprised us above. Instead of examining how many subjects were able to settle on the optimal contract in the end, we are now investigating each individual switch and count how many of them were at the optimal or near-optimal option. The quality of consumer choice is much better under the GPLPs (with verification, without slamming) than under the LPLPs and the slamming treatment, confirming what we have already discussed above. Even if we count the near-optimal switches in the latter treatment, the rate of optimal switches under the former treatment is on average 10% higher. This effect is significant if we pool all GPLPs and all LPLPs. Of course, rational consumers should normally not accept the retention offers that their current provider offers them (because we have designed them to be just below optimal for the subjects). Strictly taking into account only truly optimal switches the size of the effect gets substantially larger. The rate of optimal switching increases by roughly one quarter and this effect is now also significant for individual treatment comparisons.

The analysis of these data also re-confirms that the relatively poorer performance of the GPLP with simple ETC warning does not stem from poorer choices of available contracts. It is merely due to earlier switching which is reflected in the high ETC. Insofar, the quality of the choices as such is remarkable. Consumers who face the GPLP with simple ETC warnings make much better choices than consumers who face the LPLP.

3.3 Learning and cognitive ability

In the final part of our data analysis we study whether cognitive ability affects consumer behaviour and whether there are improvements over time through learning. For these purposes we run a regression that examines how pay (welfare) achieved in the cycles depends on a number of variables. We run this regression across all treatments, with the exception of the slamming treatment, and include a simple binary control (Yes or No) for whether switching took place under a GPLP or a LPLP.[22]

The main observations from these regressions are summarised in Box 2. A detailed discussion then follows.

Box 2:   The effects of learning and cognitive ability
• Intelligence does matter.
• Over the entire experiment, those subjects with higher IQs earn on average 25% more than those subjects with lower IQs.
• Smarter subjects are better at finding the best contract for their demand type, and incur fewer ETCs by switching too early.
• All subjects do better overtime, but the smarter subjects do the best.

Table 6 shows the regression results. Notice that we also control for the demand type in each cycle as profits are growing in the volume of calls made.[23]

Table 6: The effects of cognitive ability and learning on consumer welfare		
	Coefficient *(standard error)*	t-statistic
Demand type	131.483 *(7.630)*	17.23
Cycle	16.444 *(3.035)*	5.42
IQ	18.659 *(3.934)*	4.74
If GPLP	35.742 *(15.100)*	2.37
Constant	-307.279 *(46.630)*	-6.56

Note: Number of observations is 570. R^2 = .4181

In order to measure the effect of cognitive ability we use the results from the simple IQ test that subjects had to complete after the main experiment. There are 12 questions and for each correctly answered question subjects score 1 point. The population average is around 10 with the vast majority of subjects scoring 8 or above. A close inspection of IQ scores revealed a few outliers with

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[22] In order to correct for the repeated measurement problem (the fact that we observe each subject in multiple cycles, which implies that not all observations fulfill the independence requirements of simple OLS regressions) we cluster standard errors on the subject level.

[23] The demand variable is coded 1 for low, 2 for medium, and 3 for high, reflecting the linear nature of the average demand of the three different types.

5 or less correct answers. Interestingly, these subjects also performed very poorly in the main experiment and we decided to exclude them from the analysis as they were unevenly distributed across the different treatments. As previously mentioned this is a general econometrics technique to ensure that results are not misrepresentative due to a small number of large outliers.

We also control for learning and for the GPLP or LPLP nature of the process (respectively by including a counter for the six cycles and by including a dummy variable that is equal to one for the GPLPs and equal to zero for the LPLPs).

Remarkably, all coefficients are estimated with great precision. The dummy for the GPLP summarises what we already know from above. Subjects earn on average 36p per cycle less if they are under a LPLP. One IQ point is worth, on average, 19p per cycle. This implies that over the entire experiment those at the upper end of the IQ distribution (who score 12) earn £4.50 more than those who are at the lower end (who score 8) which equates to a relative welfare difference of about 25%.

Subjects also do get better over time and one period of experience is almost as good as one IQ point. In order to understand the ways in which subjects learn we need to decompose overall performance into two elements. There are essentially two main sources of error. One can switch too early and incur unnecessary ETC or one can switch to the wrong contract.[24]

Table 7 shows results from an estimation where we regress a binary variable that indicates whether or not a subject is on the optimal (excluding near-optimal) contract on the same regressors as before (and again clustering on the subject level).[25] Table 8 then regresses ETC per cycle in the same manner on the same variables. This simply means we test to see if IQ and experience makes a difference or not in the ability of subjects to select the best contract for them, and whether IQ and experience makes difference in the ETCs incurred.

Table 7: The effects of cognative ability and learning on optimal contract selection		
	Coefficient *(standard error)*	**t-statistic**
Demand type	-0.038 *(0.024)*	-1.57
Cycle	0.037 *(0.012)*	2.95
IQ	0.041 *(0.015)*	2.81
If GPLP	0.077 *(0.048)*	1.61
Constant	0.14 *(0.156)*	0.9

Note: Number of observations 570. R^2 = .0053

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[24] Given all subjects start on the "dominated" tariff, which is good for no one, subjects may consider switching before the minimum contract period is up in order to get off this "bad" tariff. However, given the parameters used in the experiment it is never optimal (best) to switch before a contract ends even when one is on the dominated tariff. Therefore, if subjects were behaving according to the fully rational model of behaviour they would never make the mistake of switching too early.

[25] Note there are no differences when we run probit estimations instead of the linear probability model.

Table 8: The effects of cognative ability and learning on ETCs		
	Coefficient *(standard error)*	**t-statistic**
Demand type	-2.639 *(2.218)*	-1.19
Cycle	-2.692 *(1.380)*	-1.95
IQ	-7.312 *(3.392)*	-2.16
If GPLP	5.446 *(9.858)*	0.55
Constant	122.750 *(35.650)*	3.44

Note: Number of observations 570. R^2 = .0322

The tables show that cognitive ability and learning matter for both aspects of consumer decision making. Smarter and more experienced subjects find the best contract more often and are able to avoid more ETCs (which, of course, implies that they switch later and have better data for making the right contract choice - the two learning processes thus support each other).

Notice that while the dummy for GPLPs borders on being significant in Table 7 it loses significance in Table 8. Thus, the poorer performance of LPLP is not due to different levels of incurred ETCs which we could already guess from Table 4. In other words, LPLPs do not perform worse because of ill-timed switches. Rather they do worse because of consumers being less able to switch to the contract that is best suited to them.

In terms of size, notice that the effects are not large enough to imply complete learning at the end of the experiment. After six cycles subjects are 20% more likely to find the optimal contract eventually and they will have reduced ETC by roughly 16p. The first effect is arguably larger than the second but both indicate that learning is far from complete.

3.4 The qualitative feedback questionnaire

In addition to the experiment we asked subjects at completion of a session to answer a feedback questionnaire on their experience in the experiment. The questions are reproduced in Annex 3.

It is important to note that this questionnaire is not incentivised and as such the answers vary from very detailed answers to simple comments, or no response at all.

A summary of the responses including some snapshots of actual responses are presented in this section.

First we present common impressions and experiences reported by subjects across the treatments. We then provide the treatment specific comments.

Subjects reported the following across all treatments:

■ They understood the process, namely the need to match their phone call demand to the different contracts on offer.

■ The switching processes in the experiment did mirror the real world, but that switching in the real world is more complicated.

■ Delays in the switching process annoyed subjects (we included small delays in all treatments to proxy for the delays experienced in real life, and treatment 6 had longer delays).

■ In real life subjects can manage their own demand in response to the price of calls, which they are unable to do in this experiment.

Gaining provider led treatment with no verification and therefore possibility of slamming and no ETC warnings.

In terms of the subjects' strategy, a sample of responses are reproduced:

■ "Choose the provider suitable with the pattern of phone call i.e. high level of phone calls then choose one which has high monthly fee but low cost per call and vice versa."

■ "Look at the range of number of calls, then decide which tariff is the most appropriate for the cycle. Accept losses and wait until the 15th month to switch as losses are usually much smaller than the switching fee + termination charge"

■ "My strategy was to find the cheapest monthly phone plan while considering my demand for phone calls in each cycle. However, as the phone plan might change automatically, it is very difficult to generate gain throughout the whole experiment. Even if it was possible to maintain a gain, it was small."

When asked if the switching process in this treatment was easy or not 70% reported it was easy, 10% reported it was neither easy nor hard, and 20% reported it was difficult.

Subjects reported that the annoying aspect of this treatment was by far the slamming. This combined with the ETCs incurred to switch back to a preferred tariff before 15 months, and the costs of search caused annoyance for subjects.

Subjects found that the switching process did affect their behaviour because they could be slammed to another contract often incurring an ETC without their agreement. Upon being slammed they would then incur another set of search and switching costs (and possible ETC). Combined these features hindered them in making a profit from their choices.

Gaining provider led treatment without slamming and no ETC warning

■ "My strategy was to change to the best subscription plan only after the 15th month so that I don't have to incur the unnecessary early cancellation fee. With more phone calls per month, it is better to go for the plans with higher fixed cost but lower per call charge whereas when there are little calls, it is better to go for plans with lower fixed cost and higher per call charge. The idea is just to calculate if you can get substantial per month increases in premia if you change."

■ "I only change the tariff if the current one is unsuitable. There is no point in changing the tariff more than once in a cycle as the distribution of calls do not change. I choose a tariff

with low fixed cost and higher marginal costs per call should I make very few calls on average and vice versa. Changing the tariff prior to the end of the contract is only beneficial if the gains from it are large, i.e. monthly gains in total outweigh the termination costs."

■ "I never switched provider before the end of the contract, so as not to incur an early termination charge, at the end of the contract I then switched to the most appropriate provider, and then stuck with that provider for the rest of the round."

Fifty three percent of subjects in this treatment reported that the switching process was easy, 42% reported it was neither easy nor hard and 1% reported that it was difficult. Note, that in treatment 1 which is identical to treatment 2 but has slamming, 20% of subjects reported it was difficult. This is likely to be due to the possibility of being slammed in treatment 1.

Gaining provider led treatment with no slamming and simple ETC warnings

In treatment 3 we added the simple ETC warnings to treatment 2. The introduction of the simple ETC warnings is the only change.

■ "My strategy was to formulate an equation that would calculate the profit I would make. Then I tried to figure which one of the tariff plans were the most profitable, based on the average number of calls I seemed to make in a month. I relied largely on my intuition to guess the average number of calls as soon as possible, and I also assumed that the types of tariffs stayed the same during all cycles. I learned that it is good to have a strong mind that is capable of managing several equations and conditions at once, figuring out which is the most convenient choice."

■ "First cycle was to search for alternative tariffs and switch as soon as possible. Once I realised how much the penalties for switching were, I decided to wait until the minimum contract period had ended in each cycle, then search and switch to a more profitable tariff."

■ "At the beginning of its cycle I was looking for the most suitable contract. No attention at the charge for breaking the contract early."

The first snap shot shows how complex the task is even in this simple experiment environment. The subjects again report that they understand the task is to find the best contract for them. We have one example of a subject ensuring no ETC was incurred and another showing that they did not worry about ETCs. Failure to take account of ETCs would lead to lower payoffs in this environment and as such this is an indication that the subject was overwhelmed with the information which is what we conjecture with the limited attention explanation.

With the introduction of simple ETC warnings, 50% of subjects reported the switching process was easy, 36% reported it was neither easy nor hard, and 14% reported it was hard. Note, that the introduction of simple ETC warnings in this experiment increases the number of subjects reporting it as difficult from 1% (no ETC warnings) to 14% (simple ETC warnings). This, again, is in the same direction as our conjecture that increased information makes it more difficult for subjects in this environment.

Issues that annoyed subjects were the minor pauses during the switching process, that switching costs were considered high. Two subjects reported that they found it hard to know when to switch even though we gave them the simple ETC warning. One found the ETC warning annoying, and one subject reported that the ETC warning took time to read and therefore cost them money.

When asked how the switching process in this treatment affected the subjects' behaviour, the issue of the costs of search and switch was mentioned as in the previous two treatments. One subject reported that the simple ETC warning did help as it reminded them that there was a minimum length to the contract. It was also reported that 15 month contract that started part way through made it difficult to keep track of where they were in the contract and a 12 or 18 month contract starting in month 1 would be easier.

Gaining provider led process with full ETC warnings

Treatment 4 is the same as treatment 3 but we add full ETC warnings. Again when we ask subjects about their strategy they report that they are matching their demand to the best tariff for them. Most subjects also report that they understand there are minimum contract periods and it will cost them if they switch before the end of this period. However, as can be seen from Table 4, they do still incur some ETCs in this treatment.

Interestingly the number of subjects that report that they find the switching process difficult is 5% in this treatment. In the treatment with simple ETC warnings it was 14% reporting that the switching process was hard. This provides some support, albeit tentative due to the nature of the questionnaire – non-incentivised – that the simple ETCs do cause attention problems for subjects but that the full ETCs which are tailored to the subject's situation mitigates some of this attention limit.

Subjects reported that they were annoyed by the time it took to switch due to the small time delays between screens and that this cost them money. They also reported that the costs for searching and switching did sometimes reduce their switching. ETCs were again raised as annoying for subjects.

Losing provider led process with full ETC warnings and retention offers

In this treatment the strategy reported by subjects was the same as in the other treatments discussed above. This is how it should be, as the problem subjects must solve does not change from treatment to treatment. All that changes are the features of the switching process within which they must solve the problem.

Forty percent of subjects in this treatment reported that they found it easy, 45% reported it was neither easy nor hard and 15% reported it difficult. This reported difficulty is similar to that reported in the GPLPs with simple ETC warnings (14%), but much higher than that reported under GPLPs with full ETC warnings (5%) and GPLPs with no ETC warnings and no slamming (1%).

The annoying feature reported by subjects in this treatment was the need to go to the losing provider as this cost time and therefore money. However some subjects did like the opportunity to be provided with a retention offer and reported that this does happen in real life. Some subjects did report that being given a retention offer meant more calculations and therefore made it more difficult to select the best contract. Interestingly, in this treatment subjects reported they felt time

pressured. Time pressure had not been reported previously (although annoyance with minor time delays between screens was reported), and suggests that the additional steps in LPLPs as compared to GPLPs is making subjects more aware of time costs.

Losing provider led process with full ETC warnings, retention offers and time delays

In this treatment with large time delays used to proxy the time delays consumers can experience in real life due to being kept on hold or waiting for the code required from the losing provider in order to switch your phone number, 30% of subjects reported the process was hard. Thirty five percent reported it was easy and likewise, 35% reported it was neither easy nor hard. This is the treatment with highest reported difficulty next to GPLPs with slamming and no ETC warnings. The overarching annoyance in this treatment was the waiting time to contact providers, which is expected.

Overall from this qualitative questionnaire we can observe that subjects' reported difficulty increases as the switching process becomes more complex i.e. when there is more information with the ETC warnings (particularly the simple warnings), and when there are more points of contact they must make (in LPLPs). This supports our observations from the data that subjects are experiencing limited attention problems in this switching experiment.

4   Interpretation and external validity

We observe three key results that demand an explanation and that, depending on that explanation, may be relevant for switching processes in real life.

1) The quality of consumer choice deteriorates once consumers have been slammed.

2) The quality of consumer choice is worse under LPLPs.

3) Subjects with higher IQ and more experience perform better than others.

The statistical significance and economic size of these effects require an explanation. This explanation cannot come purely from the traditional models of economic behaviour based on the fully rational consumer. With fully rational consumer models, performance (i.e. consumer welfare and the ability to find the best contract) would only be affected by constraints on choice ("is there a best contract?") and information sets ("do I know my demand for phone calls and can I get information on the tariffs?"). In this experiment there is a "best" contract for all demand types, all subjects have the same information to learn about their demand and all subjects have the same information on tariffs. Therefore, there is a behaviour(s) that is not explained by the rational model driving our observations.

The only theoretical approach we can see that would unify all three findings is a theory of limited attention. If consumers are unable to track and process all available information, any additional complication in the environment they face would impinge upon their performance. This is what slamming and LPLPs have in common: they increase the complexity of the environment that the consumer faces.[26]

Notice that limited attention would also explain the better performance that comes with higher IQ and more experience. While all subjects have limited attention problems which reduce their welfare, high-IQ consumers are better able to process more information and with more experience everybody becomes savvier in focusing on the relevant data (the limited attention problem declines as subjects gain more experience).

Of course, this explanation is borne out of the data that we observed. We did not set out to test it. But further tests could be easily conducted, for example, by varying the complexity of the underlying demand and supply systems (the number of different demand types, the number of available contracts, etc).

We, of course, should consider if there are other explanations for our findings. Clearly, any explanation of the fact that high-IQ subjects outperform low-IQ subjects would have to rely on

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[26] In fact, a theory of limited attention would even offer an explanation for the poor performance of basic ETC warnings. While these warnings provide another piece of information that needs to be processed and, hence, may reduce the available attention required for making good choices, the information is not precise enough to compensate for this.)

cognitive limitations of some sort. However, there could be other effects that drive the first two results. For example, in principle, it could be that switching processes affect consumers' preferences in some way, i.e., under some treatments they do care about other aspects of the experiment than just their monetary payoff. However, we find this unlikely. Subjects in this sort of experiment are well motivated through their monetary payoff and there is no interaction with other participants that could trigger credible deviations from income maximisation (such as concerns for relative standing etc.). Moreover, there are no differences in switching activity. That is, we find no evidence for loss aversion or endowment effects, namely that subjects form preferences for their existing contract (because it is the contract they already have/are endowed with) that could increase subjects' inertia and reduce their welfare through this channel.

Another class of explanations would be that the switching processes induce different biases in subjects' beliefs about their environment. But why would the experience of, say, being slammed distort subjects' beliefs about their own future demand? There is simply no good reason for this. We therefore also reject this class of explanations.

We are, thus, left with cognitive limitations as the main culprit of error in consumer decision making. Consumers appear to make use of their full cognitive resources and any increase in complexity has adverse effects on how they process the information given to them in the experiment and therefore their consumer welfare.

The key question is then, of course, whether this result is likely to carry over to switching in actual markets for telecom services. In order to answer this question, it is imperative to observe that the external validity of any such laboratory experiment is characterised by an inherent asymmetry. If selected "smart" student subjects do well in a simplified laboratory environment, one learns very little about the question how the general population would fare in a more complex, more difficult environment. However, if the selected "smart" sample struggles in the simplified environment, it appears exceedingly unlikely that the general population would do better in a more complex environment they face in real life.

We thus conclude that the difficulties our subjects encounter in switching are real. Real life consumers will suffer to no lesser extent from the same problems. But what does that imply for our specific findings on the relative efficacy of the six switching processes we implemented? Moreover, how do the various simplifications that we implemented impact on these findings?

Let us first revisit our main findings and discuss how we believe they would translate in real markets.

Simpler switching processes aid consumers. In the light of what we have said about the asymmetries in external validity, it is clear that we can be confident in concluding that *more complicated environments will not help consumers*. Notice the subtle difference in the two statements. While we can be confident that slamming or two-stage LPLPs (where consumers need to get in touch with their existing and new providers), will not help consumers, we cannot be absolutely certain as to how much better GPLPs may be compared to LPLPs in practice; they could be a lot better, a little better or in the extreme no better. The core problem here is that, in principle, real markets could be so complex and difficult to navigate that the advantage of GPLPs found in the simplified laboratory setting could narrow or even vanish. In other words, at this stage, we cannot rule out that the real world is so complex that consumers might do equally badly

under all switching regimes. Of course, this is a view of extreme caution. In light of our stark effects, it would be surprising if the entire advantage of GPLPs would be wiped out. Moreover, a simple follow-up study could have the potential to answer this question. Suppose we were to increase the complexity of the underlying market environment substantially,[27] for example, by having more demand types, more providers and more contracts. If the difference between GPLPs and LPLPs were to shrink then this would indeed warrant a cautious stance. However, if the difference was unaffected or even increased, it would be appear much more likely that our results would indeed carry over.

In the class of GPLPs tested in this experiment, we have observed *that ETC warnings do not improve performance*. The simple ETC warnings hinder performance and the precise ETC warnings do not improve performance in the environment tested here. This is surprising as *a priori* one would have thought that ETC warnings can only improve performance. We have conjectured that our findings may be due to a compound effect where the warning as such has a negative impact because there is additional information that needs to be processed and this takes attention away which is then compensated if the additional information is very precise. Admittedly, this is a conjecture. The main reservation regarding this finding would be that in real life it might be much harder to keep track of minimum contract durations and how much time has already passed. This might make ETC warnings much more valuable. As things stand, we cannot rule this out. However, again this conjecture could be easily tested - namely by designing an experiment where there is more variation in minimum contract durations and where it is generally harder to keep track of time and where you are within a minimum contract period. If the results were to hold in a more complicated setting, we would again be even more confident that it would also carry over to real life. Again, this is a very cautious stand point. When we designed the experiment we designed it in a way that would not make it trivial to keep track of minimum contract durations such that we expected ETC warnings to be valuable. Moreover, we find that subjects do incur ETCs even when ETC warnings are precise. This should not happen under optimal behaviour. Consequently, we are not in a situation where the experimental task was so simple that all subjects reached perfect understanding of the ETC problem and where ETC warnings were ineffective because everybody was keeping perfect track anyway. Rather, we find that subjects are not able to overcome the ETC problem even with precise warnings.

Finally, let us discuss some of the simplifications that we have implemented in the laboratory and how they are likely to have affected our findings.

Static demand: In reality, consumers may adjust their demand to the prices that their contracts offer, i.e., they might make more phone calls when they are on cheaper tariffs. We have abstracted away from this and have kept demand static (although it is stochastic). If consumers were to adjust their demand to prices (in the right direction), this would clearly magnify any difference that we observe between the different switching processes as there would be an additional dead weight loss if consumers are stuck on the wrong contract. From this perspective, we probably underestimate the advantage of GPLPs.

The only reason to switch is own demand: In reality, consumers might want to switch because they

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[27] While keeping the subject pool type the same, namely using university students such the distribution of IQ is generally the same.

have experienced poor quality or because competitors have come up with new contracts. Implementing these two aspects would mainly increase the complexity of the environment. This could reduce the relative advantage of GPLPs, for the same reason we discuss above that the real world may be so complex that under all processes consumers do equally badly. This It could easily be tested in a similar vein as described above.

The design of LPLPs: There are many assumptions that have flown into our design of LPLPs. First, notice that the losing provider always complies and that even the time delays in treatment (6) are not excessive. Also, the retention offer is designed to be almost optimal. Finally, there is no human interaction in our experiment and no psychological sales pressure applied. There are many scenarios that can be imagined under which LPLPs would perform worse. Potentially, retention offers could exploit behavioural biases such as loss aversion (where consumers have reference points and are overly cautious to avoid potential losses relative to the status quo/what they have now) and the losing provider has all the data that could allow them to tailor the retention offer accordingly. Also, we can assume that saying no to a retention offer can be more difficult when it is a person or indeed a trained sales person making the offer as opposed to a computer. Finally, time delays could be more substantial and there could be misinformation (like being told "it is not possible to issue you a code to switch", or the customer being passed between numerous staff members). On balance, it appears that we have chosen a rather benevolent version of LPLPs lending more credibility to the superiority of GPLPs that we find.[28]

Therefore, in summary, we do believe that our observations in this simple laboratory environment designed to capture the main features of the switching processes is robust and our observations that more complicated switching processes such as LPLPs will make it more difficult for consumers to switch as compared to more simple processes such as GPLPs.

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[28] Of course it could be possible to have LPLPs with out retention offers. In this experiment, however, we have not tested this variant.

5   Conclusions

The main objective of this laboratory experiment is to compare the quality of consumer choice – the ability for consumers to find and select the best contract for them given their demand for calls – and the consumer welfare achieved when faced with GPLPs and LPLPs.

Within these two broad categories we test in a sequential way different features of GPLPs and LPLPs. These features include GPLPS with slamming, GPLPs without slamming but no ETC warning, GPLPs with ETC warnings both simple and precise, LPLPs with ETCs and retention offers and LPLPs with time delays.

The objective is to inform Ofcom's consumer switching project and to complement other methods such as quantitative surveys and qualitative research that Ofcom is also using to understand consumer experiences under different GPLPs and LPLPs.

The main finding from this controlled experiment is that consumers do better under GPLPs than under LPLPs. While obvious difficulties such as an increase in the number of contact points consumers need to make partly explain this findings, we suggest that the main reason for this effect (and the other key effects that we observe in the data) is that consumers suffer from limited attention when making decisions about switching providers and contracts. Some features of the switching process that we would have expected to benefit consumers, or a subset of consumers introduce instead additional complications that actually impair their decision making. Consumers find it difficult to track and process all available information such as new information from retention offers or additional information on any ETCs they may incur, which increases the complexity of information available to consumers and does not help consumers.[29] Given that subjects have nothing else to do in this experiment than switching, the effect appears particularly stark. It is likely that when consumers have to solve multiple problems (as in real life) the limited attention problem becomes worse.

We implemented a controlled laboratory experiment and used university students drawn from the student population at University College London. The use of student samples is a common approach employed in controlled experiments. The use of students allows us to test quickly and relatively cheaply the fundamentals of the six switching processes and the resulting behaviour. The use of this relatively "smart" sample in a simple stylised environment does however have implications for external validity, namely how effectively the observations from the experiment can be transferred to a complicated field setting. If "smart" subjects do well in a simplified laboratory environment then we do not learn a lot about how the general population may fare in a more complex and difficult field environment. However, if "smart" subjects struggle in the simplified environment, it is very unlikely that the general population would do better in a more complex field environment.

This is the case in the experiment reported here. We find that even selected smart students have difficulties finding and switching to the best contract for them in what is a much simplified environment.

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[29] The simple ETCs reduce consumer welfare and the precise ETCs do not improve welfare relative to no ETC warnings.

We find that the simpler GPLPs with fewer contact points make it easier for consumers to find and switch to better contracts. However, exactly how much better (the magnitude) simpler processes are for consumers in the more complicated real world cannot be determined from a laboratory experiment. This is because real world market environments may be so complicated with some many competing demands for consumers' attention that the difference in performance (consumer welfare and ability to find the best contract) between GPLPs and LPLPs may be large, small or even negligible (however the latter is unlikely). What we can say with confidence however, is that simpler processes aid consumers and more complicated environments will not help consumers. One way to get at the issue of complex environments is to conduct a follow-up study in which we increase the complexity of the experiment environment and bring in additional field environment complexities such as more demand types across consumers, more providers and more contracts. If the difference between the simpler GPLPs and the more complicated LPLPs shrank then we would need to adopt a cautious approach, but if the difference was unaffected or even increased then we could be more confident that the observations in the simple environment carry over to the more complicated field environment.

Overall, however, it would be surprising if the entire advantage of GPLPs disappeared as the environment increased in complexity.

The policy observation from this finding is that switching processes should ideally be as simple as possible for the consumer particularly when making decisions in complicated environments as exist in communications markets with many suppliers and many different contracts.

Likewise, the additional information provided to consumers under the GPLPs with simple ETC warnings does not improve performance as compared to no ETC warnings. We conjecture that this is because the warning has a negative effect as there is additional information that needs to be processed and this increase in information takes consumers' attention away from the main task. In situations where the ETC warning is very precise such that additional processing is minimised then this (processing) problem is compensated. However, we would not over interpret the observed adverse effects of the simple ETC warning. In more complicated field environments it may be more difficult for consumers to keep track of where they are in their contracts and as such ETC warnings may be more helpful. Overall, this issue would warrant some further investigation.

The policy observation from this finding is that in the environment tested here, which has been specifically designed to make it not easy for subjects to keep track of where they are in their contract duration, simple ETC warnings hinder consumers and precise ETC warnings do not help consumers as compared to no ETC warnings. However, in more complicated field environments, where the difficulty of keeping track of contract duration may be more difficult than in this experiment, the ETC warnings, and in particular the precise ETC warnings, may indeed play a helpful role for consumers.

Overall from this laboratory experiment we would suggest that GPLPs and LPLPs were tested again in a controlled environment but with greater complexity. This approach would help determine the extent of the difference in consumer welfare between these two categories of switching process in an environment with some of the increased complexity prevalent in the field.

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Annex 1   Experiment instructions

Welcome to our experiment! In the course of this experiment, you will earn some money. The precise amount will depend on your choices and some luck. We kindly ask you to remain silent throughout the entire experiment. Do not attempt to communicate with your neighbours and do not try to look at their screens – and please do not attempt to use the computer for any purpose other than the experiment. If you have any questions, please, raise your hand and we will come and answer it in private. In contrast to some other experiments, we ask you not to take notes during this experiment.

This experiment is best explained in the context of telephone calls. Imagine you have your first mobile phone and you are signed up to some provider on a monthly plan. Each month you make all the calls you desire and at the end of the month, you receive your telephone bill. We will mirror this in the experiment.

This experiment is divided in different cycles, each of which has 48 "months". Throughout the experiment, we will use an experimental currency unit (ECU) to represent payments. At the end of the experiment, the ECUs you have earned will be exchanged into pound sterling at a fixed rate of £1 for 4000 ECU.

 In each "month", you are informed how many calls you made and how much you paid for them. You can also see details of the plan you are subscribed to, a monthly fee plus a per-call charge. (To make things easy in the experiment, we abstract away from different call durations. So you simply pay per call.)

Initially, you do not know how many calls you will make, on average, per month. The amount of calls will vary in some range, and over time you will get a clearer picture of your own demand for making calls.

Notice that you cannot influence the number of phone calls that you make. Instead, the number of calls you make is determined by the computer who draws the number in each period randomly from some distribution of numbers. This distribution stays the same until a new cycle begins (more on that below).

Making calls earns you money, called premia. This reflects the "payoff" from making calls, the satisfaction you get from talking to friends, the success of sorting out a utility bill, etc. Specifically, you will earn premia of 500 ECU plus 8 ECU per call you make, in each month. However, you also have to pay the charges for the calls you make according to your tariff.

In this experiment, there are four different telephone providers, the one you are signed up to initially and three more competitors. If you are interested you can, if you pay a small fee, look up the tariffs of the other providers. Simply click on the button marked "SEARCH" on your screen. This will show you a list with all providers in the market. You can then click on a provider and this will reveal this provider's tariff. For each tariff search, ie, for each provider you look up you will be charged a fee of 100 ECU.

If you find one of the alternative tariffs tempting, you can click on the button "SWITCH". You will then be guided through several steps to complete the switching process. You can abort this process at any point in time.

Switching does have some associated costs. Specifically, you pay 200 ECU every time you start the switching process and 15 ECU for each second that you spend in the switching process.

Once you have completed the switching, you will continue to make phone calls as before and receive your monthly bills. Notice that your demand for making phone calls will not be affected by your choice of providers. You can switch providers as often as you like during the experiment. Of course, you can also decide never to switch.

To advance from one month to the next, click on the "NEXT" button.

All tariffs are offered with contracts for a minimum duration of 15 months. Initially, at the start of a cycle ("January Year 1"), you are already six months into your contract. Whenever you terminate a contract before the minimum duration has expired, you have to pay early termination charges. These are simply computed as your monthly fixed fee times the number of months that the contract would still run for.

If you stay on the same tariff for the entire minimum duration, you are then put on a rolling one month contract which you can leave at any time without incurring any early termination charge.

[Slamming treatment only: In rare cases, it might happen that you are signed on to new providers without having given prior consent (you may incur early termination charges in such a case). If this happens and you are not happy with your new tariff, you can, of course, switch away again.]

This experiment consists of 6 cycles, each of which consists of 48 "months" of making telephone calls ("January Year 1" to "December Year 4").

Your earnings in each cycle will be the sum of all your premia minus (i) the sum of all your monthly telephone bills, (ii) the search fees you have incurred, (iii) the early termination charges you have incurred, and (iv) the total costs incurred in switching.

Once a cycle is completed, you will be shown your total earnings in the cycle and a new cycle will then start. The instructions for the new cycle are identical to the instructions for the first cycle but every time a new cycle starts, your demand for making phone calls may change. In other words, what used to be a good tariff for you in one cycle might no longer be a good tariff in the next.

At the end of the experiment, there will be an on-screen quiz consisting of 12 multiple choice questions. Instructions will appear on the screen. If you get more than 10 answers correct, we will pay you an extra £2 or if you get more than 8 correct we will pay an extra £1. You have a total of 8 minutes to complete the quiz. Following this, there will be a brief questionnaire where we ask for your feedback about the experiment.

Your total earnings will consist of your show-up fee (£5) plus the sum of your earnings from the 6 cycles plus any money earned in the quiz. Notice that through excessive search, excessive switching and very unfavourable tariffs, you can, in theory, make losses in a cycle. If this happens, these losses will be deducted from your earnings in other cycles.

Following this, we will call you up to be paid. You will need to sign a receipt, which will be supplied.

You can work through this experiment at your own speed. Please note that we cannot start the post-experiment quiz and questionnaire and payments until all subjects have finished the experiment. If you finish before other subjects, please sit patiently.

Annex 2   Selected screen shots

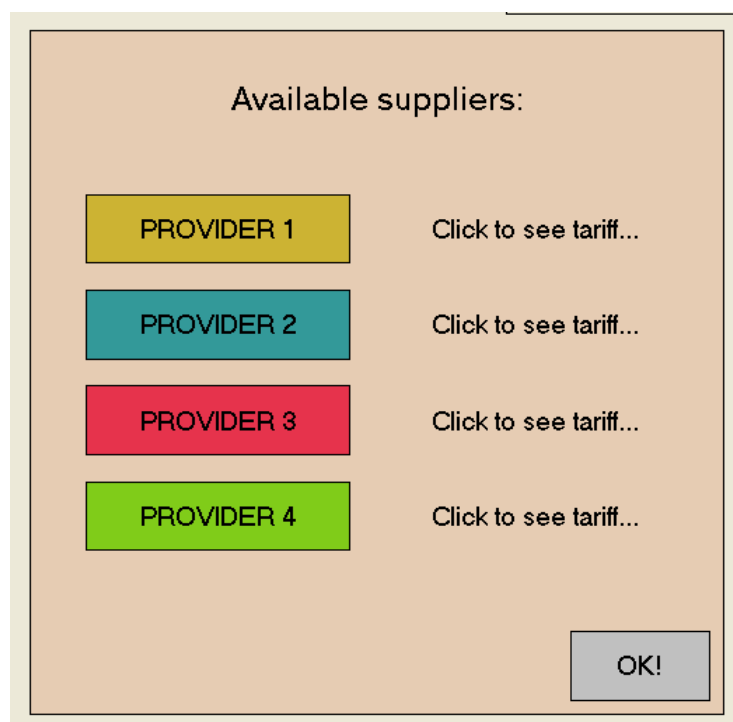**Figure 1: Telephone bill**

Figure 2: Search screen

Figure 3: Example provider offer

43
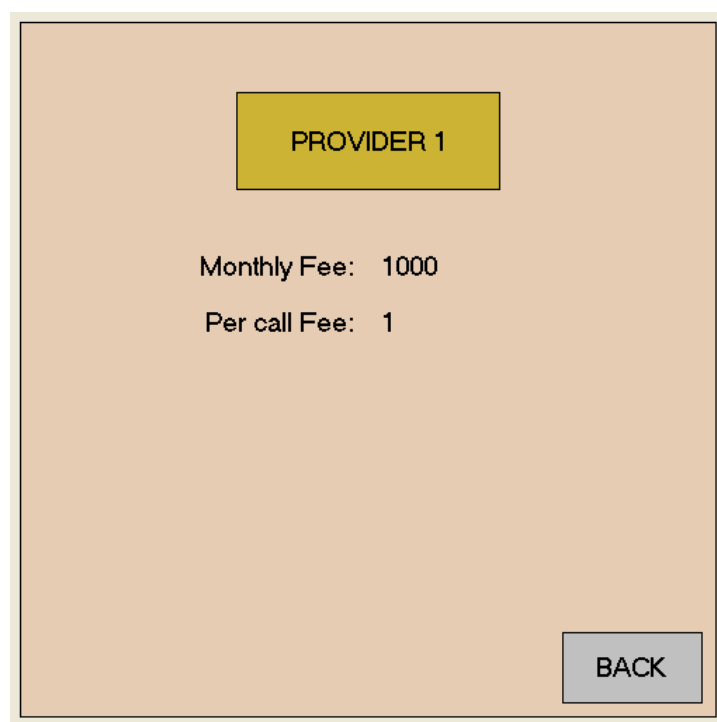
Figure 4: Switch screen
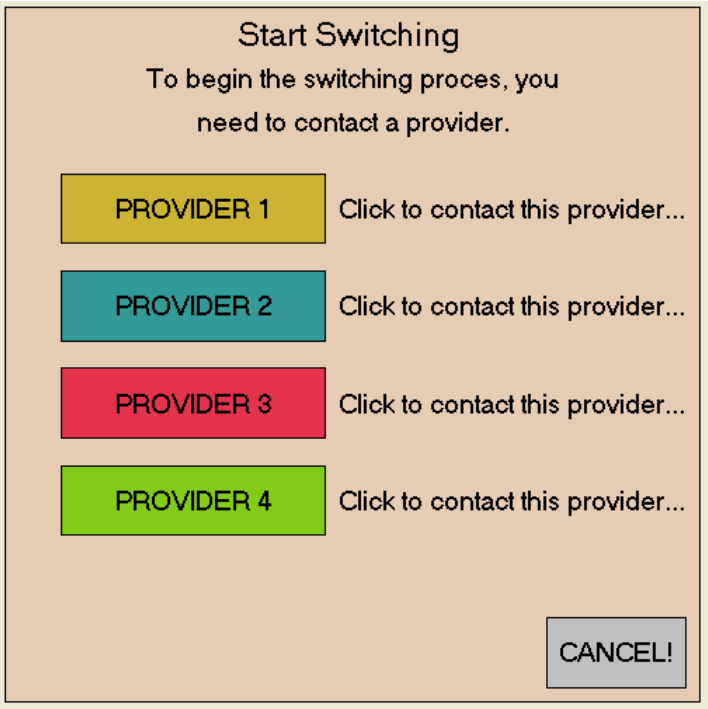
Figure 5: GPLP welcome screen

45
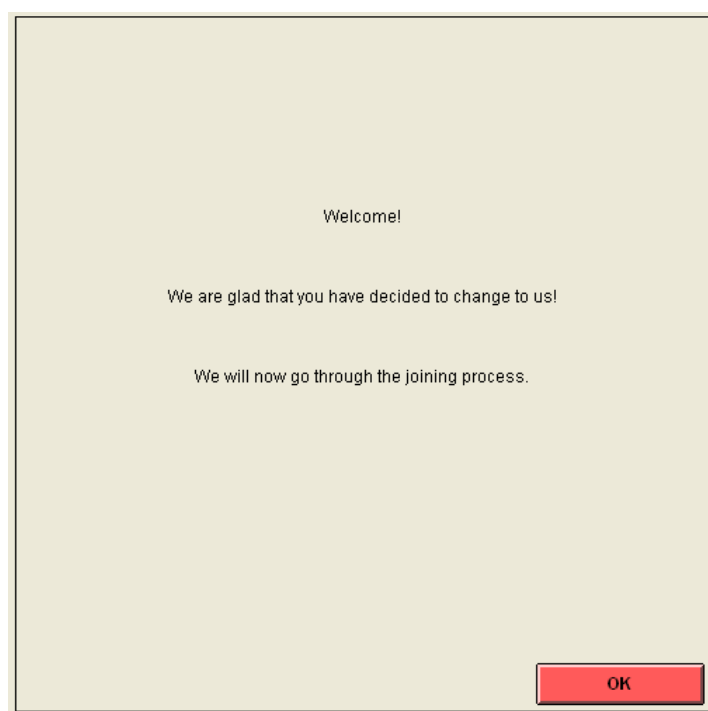
Figure 6: GPLP ETC warning precise

Warning!

An Early Termination Charge may be imposed by your current supplier if you are within the contracted period.

Months remaining on your contract   7

Monthly fee: 700

Early termination charge: 4900

Press OK to confirm your change of provider or Cancel to abort the process.

[OK]   [CANCEL]

Figure 7: LPLP "sorry" screen

We are sorry to hear that you may be thinking of moving to another provider.

Before you can contact them to move, you must first go through some procedures with us.
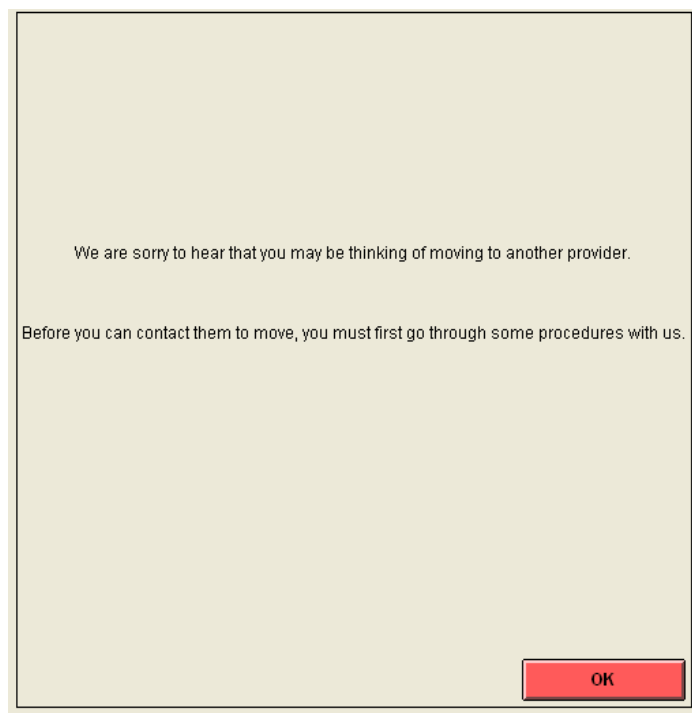
OK

Figure 8: LPLP "why" screen

We are sorry to hear that you are thinking of leaving us.

Why are you thinking of leaving?

Please select:

- ○ Not making enough calls on my current tariff
- ○ Making too many calls on my current tariff
- ○ Found an all-round better tariff

CANCEL   **OK**

Figure 9: LPLP ETC warning

Warning!

We impose an Early Termination Charge if you are within the contracted period.

This charge will be incurred once you have completed the move to the new provider. If you abort the process before completion, you will not be charged.

Months remaining on your contract	8
Monthly fee:	700
Early termination charge:	5600

Press OK to continue or Cancel to abort the process.

CANCEL   OK

Figure 10: LPLP counter offer request

We are sorry that you are considering leaving.

We may a special deal available that is better than the tariff you want to switch to.

Can we make an offer to you?

No Thanks!   OK
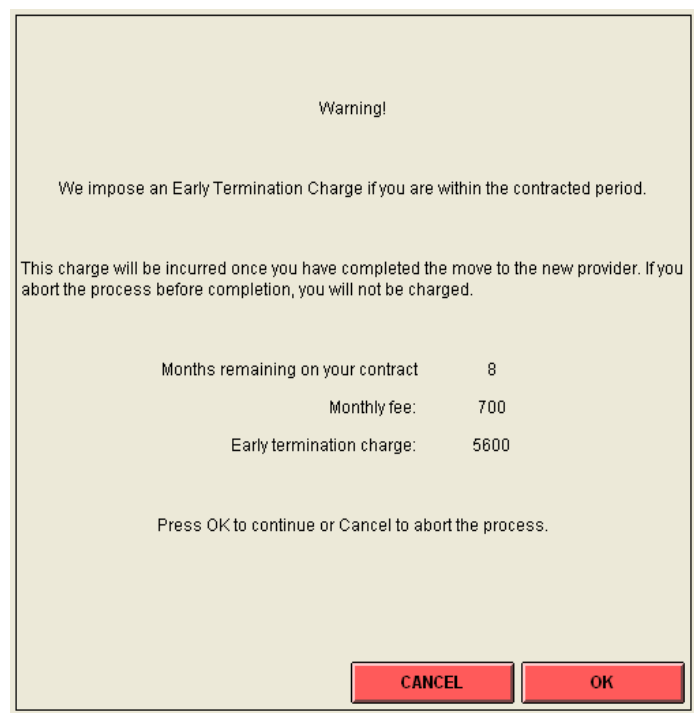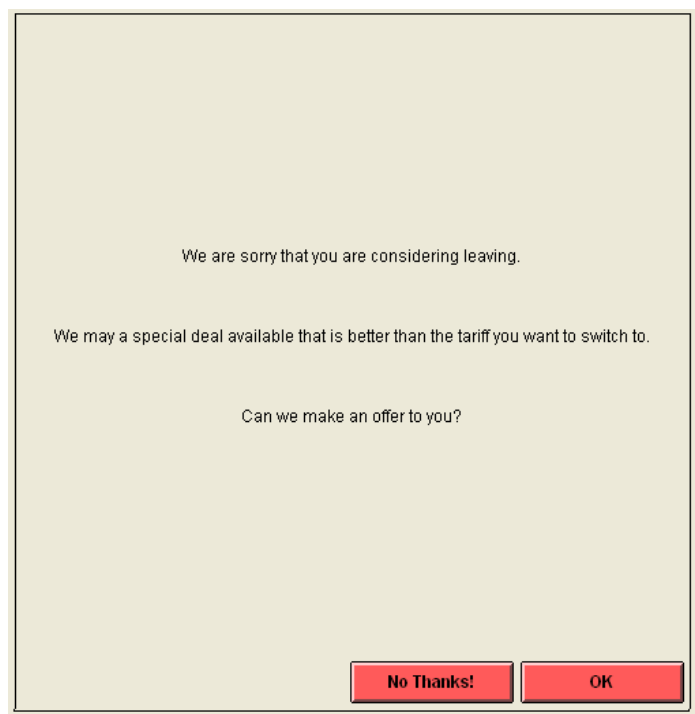
Figure 11: LPLP details of contract consumer proposes to switch to

Please enter the tariff you are proposing to move to:

Provider ○ Provider 1
          ○ Provider 2
          ○ Provider 3
          ○ Provider 4

Monthly Fee

Per Call Fee

OK

Figure 12: LPLP counter offer

We can offer a special tariff to you.

It is similar to the tariff you are proposing to switch to.

Monthly Fee: 1200
Per Call Fee: 0

Would you like to remain with us on this new tariff?

OK   No Thanks!

Annex 3   Feedback questionnaire

Did you feel the instructions were clear?

What was your strategy during the experiment? Did it change through the experiment? What did you learn?

How easy was the switching process?

Were there any aspects of the switching process or contracts that you enjoyed or that annoyed you?

Did the switching process affect your behaviour? Do you think it helped or hindered getting to the best contract for you?

How did the experiment, the switching practise you encountered and your behaviour mirror your experience of mobile phone, landline or broadband contracts and their switching processes in real life?

Any other comments?