Measuring consumer inertia in energy

David Deller#, Monica Giulietti*, Joo Young Jeon#, Graham Loomes*, Ana Moniche^ and Catherine Waddams#[1]

ESRC Centre for Competition Policy, University of East Anglia

Moving to a low carbon economy requires consumer response to signals about energy consumption and cost. We identify consumer reaction in retail energy by analysing residential consumer decisions made in the same market, namely choice of energy suppliers in a collective switching exercise, and relate these to environmental preferences. We use the decisions made by nearly 110,000 consumers to identify switching barriers amongst a particularly active group of consumers. The decision whether or not to accept an offer can be viewed as a pure switching choice, since participants had already undertaken the equivalent of 'search' activity by providing their energy consumption details to the auction, in a process very similar to that used by switching websites. Very little further action was required to accept the offer made in the auction, and participants were sent many reminders to make such a decision.

The dataset used is particularly rich since it includes: the energy characteristics reported by each consumer; whether or not participants saw one or two offers; the offer(s) which they received; the savings that these offers represented; and whether or not each consumer switched supplier. We deduce the switching costs (including those of inertia) by observing whether or not participants decided to accept the offer of the auction. For around 10,000 consumers we have additional survey data regarding their motivation to switch and preferences. This enables us to identify how these extra factors affected participants' switching decisions.

We use probit analysis to identify the effects of many different factors on the switching decision. Our main result is that seeing two offers rather than one reduced the likelihood of switching by five percentage points, providing evidence of 'choice overload'. The winner of the auction was a co-operative company with well-known environmental and ethical values, and we have information to identify the effect of consumer preferences in this regard on consumers' choice of supplier.

1. Introduction

Consumers' apparent inertia in the energy market has come under increasing scrutiny with growing focus being given to the behavioural element of consumer decisions. The energy market presents an apparent contradiction: there are concerns about affordability for many households as energy prices rise, but at the same time consumers, including those who are struggling to pay their bills, appear to leave 'money on the table', by not engaging with the market and not switching to the cheapest available supply. In the collective switching scheme which is the subject of this paper, the total savings captured by those who changed supplier was only £4.9m, compared with a total of £15.3m of savings available.

In the Spring of 2012 the British Consumers Association, a subscription based consumer organisation trading under the name 'Which?', embarked on the largest collective energy switching exercise undertaken in the UK. The government has recommended this model as a way to generate additional consumer activity in the energy market and address one of the features of this market which the regulator (see for example Ofgem, 2014) has identified as problematic. 'The Big Switch' (TBS) provided a unique opportunity to observe participants' actions when they received their offer, in particular whether or not they decided to change energy suppliers.

Which? advertised an open invitation for consumers to join TBS. Participants provided all their energy related information to Which? in advance, mirroring the information required by a switching site to identify the best offer for any one individual. This information was then aggregated and provided to the energy companies bidding to supply consumers, under conditions determined by the auctioneer[2]. After the auction between energy companies took place, each participant was presented with an offer based on the winning bid and invited to accept it, but with no obligation to do so. Where the winning bid was not the best offer on the market for that conumer, they were shown two offers – the auction winner and the best offer on the market. Some consumers were offered no improvement on their current supply arrangements, and we have excluded these observations from the analysis reported here[3].

The analysis of data from around 110,000[4] participants enables us to identify how different factors affected whether or not participants accepted the offer made to them, including the energy supply characteristics consumers fed into the auction itself. We asked participants for information on their

---

[2] These included a national offer (despite regional cost differences) and conditions around available payment methods. Three separate auctions were run; each auction was for one of the following payment methods: Cash/Cheque, Online Direct Debit and Offline Direct Debit.

[3] Even when faced with an alternative deal which was more expensive than that from their existing supplier, a very small number of consumers still switched supplier.

[4] 267,282 consumers expressed initial interest in participating in TBS, of whom 165,180 provided sufficient information about consumption to be included in the auction. 35,357 of these switched. The cases analysed here are those who participated, were offered a non-negative saving and had only one existing energy supplier. Individuals with very extreme and nonsensical values were also excluded .

personal characteristics and their attitudes, and included these details in further analysis for a subset of 10,000 individuals who responded.

TBS data thus provides a unique opportunity to observe the large scale simultaneous decisions of consumers when confronted with an energy offer or offers. The data include information about the energy characteristics of households (previous supplier, actual or estimated annual consumption, payment method, whether one or two fuels are consumed), the offer(s) which participants face, and whether they accepted an offer (and which one if there were two). Real money was at stake in the switching decision and the decision was made privately according to consumers' own interests.

The second unusual opportunity which TBS presents is to investigate the switching decision separately from the rest of the search process involved in changing supplier. The importance of distinguishing between search costs and switching costs is emphasised by Wilson (2006, 2012). Search costs are incurred regardless of whether a consumer makes a purchase or not. In contrast, switching costs are those costs directly linked to changing from one supplier to another and are only incurred when an actual switch takes place. Switching costs can take many forms including the hassle of switching, uncertainty about the new product's suitability/quality and contractual terms such as exit fees.[5]

In distinguishing between searching and switching, which often occur simultaneously in other contexts, we believe that the process of TBS enables the isolation of a 'pure' switching decision. In particular, since very little extra effort is required to accept the offer, we interpret any barriers to doing so as pure switching costs, representing consumer inertia when offered the prospect of monetary savings, after controlling for a comprehensive range of observable variables.

Thirdly, we have the opportunity to observe the effect of increased choice on TBS participants. Since the auction did not yield the cheapest deal in the market for everyone taking part, some saw two offers: one from the auction process and the best offer from the Which? comparison website. After controlling for all the other observable factors determining the switching decision, we can identify whether increasing choice from one to two offers affects the likelihood of switching. Those participants shown two offers instead of one were found to have a lower probability of switching: increased choice reduced switching.

Fourthly, we are able to identify the effects of consumers' environmental and ethical preferences between suppliers on their switching decisions. The winning energy company had a strong environmental and ethical reputation when it won the auction, and this is reflected in the data.

2. Literature Review

The literature on search and switching costs is large and diverse. The literature on switching costs and how they affect competition in markets is commonly associated with Klemperer (1987, 1995). To accompany the theoretical papers exploring the topic Farrell and Klemperer (2007) discuss the wide range of empirical studies that assess the size of switching costs, the determinants of switching

---

[5] See Klemperer (1987, 1995) for more detail about different types of switching cost.

and the impact of switching costs in different markets. Many studies consider telecoms markets or financial services. For example, Calem and Mester (1995) link the high margins on credit cards to search and switching costs; Kiser (2002) considers demographic determinants of switching in the bank deposit market; Stango (2002) links pricing in the credit card market to switching costs; Kim et al (2003) estimate the size of switching costs associated with bank loans; and Honka (2014) separates search and switching costs in the US car insurance market. Regarding telecoms, Knittel (1997) considers the impact of search and switching costs on price cost margins, while Shi et al (2006) and Park (2011) analyse the impact of reduced switching costs resulting from number portability in mobile phone markets. While acknowledging this wider literature, this review focuses on those studies that empirically assess consumers' switching decisions in energy markets[6] together with those studies investigating the impact of increased choice on consumers' purchasing decisions.

Understanding Consumer Switching Behaviour in Energy Markets
The importance of consumer switching behaviour to the healthy functioning of markets has long been recognised (for example, see Waterson (2003) and McFadden (2006)). Consumer switching behaviour in energy markets has been investigated in a range of ways. Some papers estimate search and switching costs using aggregate price and market share data, while a small number of papers follow an experimental approach. However, the papers that are most closely related to the current investigation of TBS are those based on consumer surveys. As explained in the introduction, TBS data offer several advantages over these earlier surveys. However, relative to earlier surveys, one limitation of the present study is that TBS data only includes those who have self-selected into TBS scheme, rather than being based on a nationally representative sample.

A range of survey based studies on changing energy suppliers have been conducted in the UK and Europe. European studie include: Pomp et al (2005), Pomp and Shestalova (2007), Ek and Soderholm (2008), Juliusson et al (2007), Gärling et al (2008), Gamble et al (2009) and Weber et al (2009). These studies have explored a fairly diverse range of topics. Some, such as Weber et al (2009), have placed an emphasis on decisions to select green energy, while Juliusson et al (2007), for example, investigate the choice between fixed and variable price electricity contracts.

In the UK, survey based papers include: Waddams Price and Bennett (1999), Waddams Price (2004), Giulietti et al (2005), Chang and Waddams Price (2008), Flores and Waddams Price (2013) and Waddams Price et al (2013). Many of these papers identify the importance of the anticipated gains from switching as a key driver of search and switching. This finding fits a rational model of consumer choice where individuals allocate their time to different tasks according to the expected gains available. This leads to the insight in Waddams Price (2013) that any regulatory intervention that reduces the potential gains to switching, such as Ofgem's introduction of non-discrimination clauses, is likely to reduce switching rates. Several studies also find that switching supplier in other markets positively influenced switching activity in the electricity market. Flores and Waddams Price (2013) and Waddams Price et al (2013) explore the differences in the factors affecting switching behaviour between groups and individuals. They identify that different groups, defined by their attitudes to

---

[6] A broader policy discussion on aggregate consumer switching rates in energy markets can be found in CMA, Ofgem and OFT (2014) and European Commission (2010). The presence of such papers and tracking surveys of consumer activity in energy markets (see Ipsos-MORI, 2012) highlights the increased emphasis given to consumer behaviour by regulators and politicians.

markets in general, behave in dissimilar ways in the energy market; that behaviour varies across markets; and that individuals, even after controlling for a range of observable factors, are diverse in their responses. While surveys such as these explore the motivations of consumers, they rely on respondents' ability to recall both their behaviour and its motivation.

In terms of combining billing information with socio-economic information, Kleit et al. (2012) and Hortaçsu et al (2012) are closest papers to the current paper. Kleit et al. investigate switching behaviour in Pennsylvania following the removal of residential rate caps in 2010. However, Kleit et al rely on area level socio-economic information, rather than combining billing information with individual level socio-economic information. The authors find that households are more likely to switch, and do so faster, in more educated areas with lower unemployment rates and higher median household incomes. A similar approach is employed by Hortaçsu et al (2012) for the Texan electricity market between 2002 and 2006. Hortaçsu et al find that the percentage of potential energy savings actually realised by consumers is positively related to an area's education level and negatively related to its level of poverty.

Rather than looking at the decisions of individual consumers, several papers estimate search and switching costs using aggregate price data, including Giulietti et al (2004), Salies (2005) and Giulietti et al (2014). Giulietti et al (2014) use a sequential search model to estimate the extent to which price dispersion in the marketplace can be explained by search costs. The authors suggest that a discrepancy between the number of switches predicted by their model for the UK electricity market in 2006, and the lower number of switches actually observed that year, can be explained by a dramatic increase in the range of tariffs offered during 2006. It is argued that the greater range of tariffs resulted in increased customer confusion, leading to fewer switches.

Wilson and Waddams Price (2010) provide further evidence that consumers may struggle to make 'good' decisions in the UK electricity market.[7] Under a range of assumptions (depending on when each consumer switched) only between eight and twenty percent of consumers switched to the firm offering the highest monetary surplus and at least one in six consumers actually paid more when they switched suppliers, even though their only stated reason to change supplier was to save money. Also, Annala et al (2013) question the rationality of consumers in the Finnish electricity market given the low switching rates observed compared to the size of monetary savings available. However Zhu (2013) cautions that non-switching in the presence of monetary savings can still be consistent with rational models of consumer behaviour if consumers have a preference for their existing suppliers.

Lastly, the concern that individuals may not be able to understand energy market offers has been explored in an experimental setting by Sitzia et al (2012), who find that tariff complexity and the number of tariffs may limit the effectiveness of consumers' choices, and that the effect can be exacerbated by consumers giving a lack of attention to the energy choice decision.

---

[7] The issue of whether or not consumers select 'suboptimal' taroffs, particularly when fixed fees are present, has been analysed for gym membership by Della Vigna and Malmendier (2006); for credit cards by Agarwal et al (2005); and for telecoms by Miravete (2003) and Lambrecht and Skiera (2006). These results then feed into the debate about whether spuriously increasing the range of tariffs offered, or 'foggy pricing', can prove advantageous for firms (for example, see Miravete (2004)).

Consumer Aggregation and Collective Switching

In addition to the advances over existing studies identified above, the current paper represents the first econometric investigation of consumer switching behaviour as part of a collective switching/consumer aggregation exercise. The only published paper on consumer aggregation exercises is Littlechild (2008), which reviews the performance of a municipal aggregation scheme in Ohio. The paper highlights how municipal aggregation initially led to an increase in switching rates, but not without generating various problems.[8]

For the UK context, DECC (2013) provides the most comprehensive data on the performance of collective switching schemes. It details the outcomes of the 31 projects which received funding from the Cheaper Energy Together fund at the end of 2012. The scheme seems to have delivered remarkably poor value for money: for the £5m of funding provided by DECC, the savings generated for consumers were only £2.7m. However, there was considerable variation in the switching rates achieved (5.5% to 23.1%) and the return on investment across the 31 projects (from savings of less than a tenth of the initial investment to savings of more than five times the initial investment).

Increased Choice and Decision Making

A key finding of the current paper is that increasing the range of offers seen by a consumer resulted in a decreased probability of the consumer switching. This result builds on an existing literature suggesting that an increased range of consumption options is associated with consumers choosing to avoid a consumption decision. The notion that consumers may face 'choice overload' is widely associated with Iyengar and Lepper (2000). These authors found consumers were more likely to purchase jam or chocolate when faced with 6 choices than when faced with 24 or 30 choices.

Earlier, Tversky and Shafir (1992) suggested that individuals are more likely to postpone difficult decisions than easy decisions and that increasing the range of options represents an increase in decision difficulty. In the case of electricity supply, consumers' decisions are also influenced by the fact that they have a well-defined default or status quo supplier. Samuelson and Zeckhauser (1988) explore the issue of status quo bias and find that the bias towards the status quo increases with the range of options shown to an individual. Dhar (1997) also notes that introducing additional options when an individual finds it difficult to form preferences over different options will make consumers more likely to stick with the 'no choice' option.

Turning to the Swiss healthcare market, Frank and Lamiraud (2009) find that individuals were less likely to switch healthcare provider in local markets where more products were on offer. Also, Bertrand et al (2010) find that when adverts for consumer loans showed fewer example loans individuals were more likely to take out a loan. Furthermore, Iyengar and Kamenica (2010) shows that when people face an increased range of options they show a preference for simply structured options. However, in a meta-analysis of earlier results Schiebehenne et al (2010) question the overall evidence supporting the 'choice overload' hypothesis and highlight that it is important to identify the conditions required for 'choice overload' to occur.[9]

---

[8] Other policy reports looking at US consumer aggregation schemes include: Hempling (2000), Colton (2006), Faulkner (2010) and Laufer et al (2013).

[9] The economics literature also contains a theoretical discussion concerning the relative merits of being faced with greater or fewer options. Kreps (1979) highlights the benefits of 'flexibility', however, Gul and

What is striking about our result, is that simply introducing one additional option into a market where opportunities for product differentiation appear limited and the context of the consumption decision appears fairly simple leads to reduced switching. The ability to associate this small increase in choice with reduced switching is one of the advantages offered by having a very large dataset containing considerable contextual information about individuals' decisions.

3. Data

Our data combine observations of a significant economic decision for a large group of consumers (TBS itself) with additional socio-economic detail obtained via a survey conducted about a year later.

Complete records of energy bill details and the offer each person received as part of TBS in May 2012 were obtained for 138,951 people. In Spring 2013 half this group, randomly selected, were sent a follow up survey to elicit information on factors which might affect the probability of each individual switching energy supplier, generating a response rate of 24%. We have restricted our analysis to those for whom the auction outcome offered a monetary saving over their existing supply deal, and to the 94% of participants with a single energy supplier at the time of the auction[10]. We have therefore excluded those participants who were still with both the gas and electricity incumbents in their region; this group, about 5% of the total, which may never previously have changed either energy supplier, are likely to differ in switching behaviour from other TBS members.

Overview of Respondents and their Energy Situation
We first provide some descriptive statistics on the nature of those involved in TBS and in the surveys.

A striking feature of Table 1 on the following page is that only 27% of those offered a non-negative saving switched[11], illustrating that even once people were offered a saving and had the additional support/reassurance provided by TBS, switching was not a foregone conclusion. While non-price factors, such as customer service, are likely to be important in purchasing any product, and a minority of respondents faced a monetary exit fee if they wished to switch supplier (reducing the real saving they could realise), a difference of 73 percentage points between the proportion offered a saving and the proportion actually switching suggests that the residential energy market suffers from high switching costs.

Pesendorfer (2001) and Dekel et al (2009) note that limited options can act as a commitment, while Sarver (2008) notes limited options can also reduce post-decision regret. Most recently, Ortoleva (2013) emphasises the trade-off between between a larger menu being more likely to contain a 'better' option and it introducing increased decision costs. Lastly, Kamenica (2008) argues uninformed consumers are most likely to suffer the negative effects of increased choice.

[10] Those respondents with two energy suppliers are currently excluded due to the additional decision complexity which may be introduced by having two existing energy suppliers instead of one. Excluding this group also simplifies comparisons of environmental and other preferences.

[11] The higher switching rate of those completing the survey may indicate a self-selection bias. Respondents who switched may have been particularly active in responding to the questionnaires, either because they are inherently more active individuals, or because they had had a positive experience of TBS.

Table 1: Summary statistics on energy bills and potential Big Switch savings

Statistic	TBS Participants with Complete Data	Survey Respondents[1]
% Switching supplier at TBS	26.83*	37.95*
Median bill size (actual and estimated) (£)	1,170	1,159
% Using estimated bill	35.21*	30.81*
% Facing an exit fee	11.09*	16.38*
Median saving offered by best supplier (£)[1]	112.57	105.94
Median saving as % of existing bill[1]	10.24	9.92
% Shown two offers	46.36*	49.29*
% Paying for their electricity by Direct Debit	90.82*	98.58*
Total Number of Observations	**109,924**	**9,747**

* indicates a difference statistically significant at the 5% level between TBS participants with complete data and survey respondents.

[1]This analysis is based only on those respondents who asked to be entered into the online Direct Debit auction (the vast majority of respondents). Note that a person who chose to enter the online Direct Debit auction did not need to be currently paying by Direct Debit.

The median saving available is reasonably substantial, at £106 for survey respondents, around a tenth of the median respondents' bill size. That these savings are insufficient to induce switching is particularly significant given that TBS participants appear to be relatively sophisticated consumers and have characteristics associated with high switching rates. For example, 91% of participants paid by Direct Debit, the survey respondents are well educated, and seem to enjoy a fairly high socio-economic status, as shown in Table 2. Three-fifths of respondents have a first or postgraduate degree and over 90% owned at least a partial stake in their home. The higher number in receipt of a disability benefit is likely to be related to the higher age of TBS participants

Information about the respondents' existing energy supplier and their electricity supply area are provided in the Data Appendix. The distribution of consumers across electricity supply areas is broadly in line with national figures, although respondents are slightly more likely to come from southern areas of the country outside London than is the population as a whole.

Table 2: The demographic and socioeconomic characteristics of the survey respondents

Statistic	Wave 1 Respondents	Equivalent Figure for Great Britain[1]
Age group containing median age[2]	55-64	35-39
% Male	71.63	49.16
% With first degree or higher	60.40	27.12
% Who fully or partly own their home	93.43	67.00
% Households receiving a disability benefit	7.58	1.56
Income category containing median household income	£35,000-39,999	£30,000-34,999
Total Number of Observations	**9,747**	**-**

1. These statistics are based on tables from available by searching the Office for National Statistics (ONS) website. Age and % with a degree come from '2011 Census: Key Statistics and Quick Statistics for local authorities in the United Kingdom', Table KS102UK (published 11/10/13) and Table QS501UK (published 4/12/13). % Male comes from '2012-based National Population Projections', published 6/12/13. % owning home is from the 'General Lifestyles Survey' and the median income is from ' Average incomes, taxes and benefits by quintile groups of ALL households, 1977-2012'.

2. The number of observations for this variable is 6,282.

Differences between Switchers and Non-Switchers

A summary of characteristics and attitudes, comparing switchers and non-switchers at TBS, is provided in Tables 3, 4 and 5; almost all the statistics show a difference between non-switchers and switchers at the 5% significance level (indicated by *). The exceptions, where the difference is not statistically significant, are in the percentage of males and the percentage of respondents receiving an energy related benefit when Winter Fuel Payments are excluded[12].

Taken together, the tables suggest that the biggest differences between switchers and non-switchers relate to the detailed circumstances of TBS and the offers made as part of it, rather than to respondents' demographic or socio-economic characteristics.[13] Nevertheless, Table 3 shows that a larger proportion of switchers have a degree, they are more likely to own their own home and that switchers' households are more likely to include someone who is employed.

---

[12] The Winter Fuel Allowance is an age related benefit (currently received by virtually all those aged over 62), while eligibility for other energy related benefits is income related.

[13] It should be noted that The Big Switch population is relatively homogeneous. As such, we cannot rule out the possibility that in a broader population the difference between switchers and non-switchers, in terms of their demographic and socio-economic characteristics, may be greater.

Table 3: Switchers' and Non-Switchers' demographic and socio-economic characteristics

Statistic	Non-switchers	Switchers
Age group containing median age[1]	55-64	55-64
% Male	71.59	71.70
% With first degree or higher	58.67*	63.23*
% Who fully or partly own their home	92.86*	94.38*
% Households containing at least one person who is employed (part-time or full-time)	51.69*	55.18*
% Receiving a disability benefit	7.94*	7.00*
% Receiving an energy related benefit (excluding Winter Fuel Payments)	8.73	7.87
Income category containing median income	£35,000-39,999	£35,000-39,999
Total Number of Observations	**6,048**	**3,699**

*indicates a difference statistically significant at the 5% level between non-switchers and switchers.
[1] Age data were available for only 6,282 individuals

Table 4 on the following page shows that motivations for taking part in TBS and respondents' concerns about TBS process seem to be associated with the probability of accepting an offer. For example, the percentage of switchers who reported saving money as a reason for taking part in TBS was 13 percentage points higher than for non-switchers; and, more surprisingly, 29% of switchers reported being worried about the switching process compared to only 24% of non-switchers. We comment on this observation further in Section 5.

Almost a quarter of non-switchers report asking their existing supplier for a better deal, compared to only 13% of switchers. By going back to their existing supplier, the respondents are allowing their existing supplier to make a counter-offer, and those who do so may be indicating a relative preference for their existing supplier. A possible alternative explanation is that some consumers may have deliberately taken part in TBS exercise to gain an offer that could be used as a bargaining chip in negotiations with their existing supplier.

The second half of Table 4 highlights how the circumstances surrounding a respondent's energy switching decision may be related to whether or not they switch. Firstly, those individuals who switched were less likely to be under particular time pressure at the time of TBS and were less likely to want additional support during TBS process. Secondly, the percentage of switchers who had an actual bill in front of them was over 11 percentage points higher than for non-switchers.

A higher percentage of non-switchers compared to switchers, 54% versus 42%, received two offers of savings instead of one. This raises the question of whether receiving two offers may deter people from switching, which is explored further in the discussion of section 5.

Table 4: A comparison of Switchers' and Non-Switchers' motivations for taking part in TBS and the circumstances of TBS itself

Statistic	Non-switchers %	Switchers %
Motivation		
'To save money' as a reason for taking part in TBS	71.28*	84.70*
Worried 'something might go wrong with the switching process'	24.06*	29.20*
Worried 'the best deal is not available'	28.54*	20.90*
Asked existing supplier for a better deal	23.61*	13.38*
Circumstances of TBS		
Strongly Agree/Agree with 'The timing of TBS was an especially busy period'	25.34*	8.51*
No additional support wanted as part of TBS[1]	62.76*	83.06*
Basing decision on actual energy bill	64.78*	76.40*
Presented with two offers instead of one	53.74*	42.01*
Total Number of Observations	**6,048**	**3,699**

* indicates a difference statistically significant at the 5% level between non-switchers and switchers.
[1] The categories of additional help that were available to respondents were: a reminder phone call, phone support, a simpler switching process or something else.

Given the importance of the relationship between increased choice and switching, descriptive statistics equivalent to those in Tables 3, 4 and 5 are provided in the Data Appendix, but this time comparing those who received one offer with those who received two offers. Tables A1, A2 and A3 show that, apart from the median bill size and the preference for the offered supplier on ethical/environmental grounds, the differences between the one and two offer groups are generally small in magnitude. Those receiving two offers have a larger median bill size (partly a result of the auction design), are more likely to ask their existing supplier for a better deal and are more likely to be told that they could not save money through TBS auction. Most of these factors are controlled for in the econometric analysis described in sections 4 and 5.

The statistics described in Table 5 regarding the price and non-price characteristics of the offers received by switchers and non-switchers are not surprising. On average, switchers were offered a greater saving and were also more likely to prefer the new supplier they were offered to their existing supplier for a range of non-price characteristics.

Table 5 shows that, on average, both the absolute and proportional median monetary saving was around one third higher for switchers than for non-switchers. Moreover, the percentage of switchers who preferred the offered supplier over their existing supplier on ethical or environmental grounds was more than twice the percentage amongst non-switchers. It is unclear whether the importance of an energy supplier's ethical and environmental stance would be replicated in a sample that was more representative of the British population as a whole. It may reflect the fact that, at the time of TBS auction process, the winning bidder, Co-Operative Energy, had a particularly strong reputation in these areas.

Table 5: Financial and non-price factors determining the attractiveness of TBS offer to Switchers and Non-Switchers

Statistic	Non-switchers	Switchers
Financial Factors		
Median bill size (£)	1159.5	1158
Median saving size (£)	91.60	123.75
Median saving as percentage of existing bill	8.83	11.26
% Paying by Direct Debit	99.05*	97.77*
% Existing energy deal includes an exit fee	22.75*	5.97*
Non-Price Factors	%	%
Not happy with customer service of existing supplier	17.14*	26.80*
Stating an ethical supplier/a supplier's environmental friendliness as a key motivation for switching[1]	10.20*	20.38*
Preferring offered supplier over existing supplier re: ethics or the environment	23.76*	57.12*
Preferring offered supplier over existing supplier re: payment method	2.61*	11.19*
Total Number of Observations	**6,048**	**3,699**

* indicates a difference statistically significant at the 5% level between non-switchers and switchers.
[1] Respondents were asked to select up to three factors (from a range of eleven factors) which they thought would be most important in persuading them to switch energy supplier.

3. Econometric Method

Analysis of the basic TBS data

Identifying the factors associated with switching energy supplier started with analysis of the information that all participants provided to Which? as part of TBS. Information available directly from TBS included: original supplier, supply area (electricity region); the participant's existing gas and electricity supplier(s)[14]; whether the participant used actual bills or estimations in calculating their demand and/or expenditure; whether their tariff involved an exit fee; whether they had a dual fuel tariff; whether they saw one or two offers; the amount of money they could save if they switched; and the potential savings expressed as a percentage of their annual bill. [15] This investigation was carried out separately for each of the three auctions: payment by cash or cheque (paid quarterly), online direct debit (paid monthly) and offline direct debit (paid monthly). The vast majority of respondents analysed, 88,012, chose to enter the online direct debit auction.

---

[14] From this information, we could identify whether participants were with the gas incumbent and/or their regional electricity incumbent.
[15] This information was supplemented with data about median and modal income in each participant's postcode area, which was obtained from the CACI dataset. Preliminary analysis showed that this income information was not a statistically significant predictor of the probability of switching and so this variable was dropped from the model.

The econometric model used in the analysis is a Probit binary choice model. The dependent variable, Y_i, takes a value of 1 when an individual switches energy supplier and a value of 0 when an individual does not do so. For each individual it is possible to model the probability, p_i, of a switch occurring as:

$$Y_i = \begin{cases} 1 & with\ probability & p_i \\ 0 & with\ probability & 1 - p_i \end{cases}$$

Formally, the probability of an individual switching, p_i, can be modelled as:

$$p_i = Prob(Y_i = 1 | x_i) = F(x_i'\beta)$$

where p_i is the probability that switching is observed given the values of the vector of explanatory values for individual i, x_i. This probability, in turn, can be expressed as a function of x_i multiplied by the coefficients for each variable found through the regression process, β. As we are using the Probit model a central assumption is that the underlying error process for the latent variable lying behind the model is Normally distributed. The function $F(.)$ ensures that the probability, p_i, lies between 0 and 1. For the Probit model, $F(.)$ is the Normal cumulative distribution function.

We can link this model for estimating the probability of a specific decision, i.e. to switch or not to switch, to a situation where individual *i* compares the utility of switching (*S*) against the utility of not switching (*NS*).

$$Prob(Y_i = 1) = Prob(U_{iS} > U_{iNS})$$

where U represents utility and the probability of observing a switch by individual *i* is the probability that for individual *i* the utility from switching exceeds the utility from not switching. In our regressions the difference in utility derived from switching or not switching is modelled by a set of individual-specific characteristics (e.g age), choice-specific characteristics (e.g. the respondent's view of the new supplier's environmental credentials) and characteristics which vary across both individuals and choices (e.g. preferences for a particular payment type). The regressions also include an error term to account for the imperfect measurement of utility.[16]

In Table 6 in section 5, we report the average marginal effects for the main explanatory variables included in the model. If the explanatory variable is continuous, e.g. the saving amount offered, the marginal effect shows the change in the probability of switching associated with a small change in the value of the relevant explanatory variable. If the explanatory variable is binary, e.g. receiving an income related benefit or not, the marginal effect represents the discrete change in the probability of switching associated with the binary variable changing from one value to the other.

Analysis Including Additional Survey Data
The second piece of econometric analysis combines the basic TBS data with additional demographic, socio-economic and contextual data from the Wave 1 survey. From the survey we obtained 9,747 complete responses after cleaning the data. In broad terms, the econometric method used to produce the results in Table 7 of Section 5 is very similar to that described above. Again a Probit model is used to estimate the probability of switching and Table 7 reports the average marginal effects for the different explanatory variables.

---

[16] It is assumed that the unobservable utility levels can be represented solely by the observable variables we include in the model.

Focusing only on respondents with positive savings

Before running the main Probit regressions, we checked for selection bias resulting from our exclusion of those individuals who could not save money through the TBS auction or Which? switching site. In summary, we found that whether an individual received a non-negative saving and whether they switched supplier can be modelled as separate and independent processes.

The testing procedure involved estimating a Bivariate Probit model to evaluate the effect of different explanatory variables on the probability of switching energy supplier conditional on the respondent making a positive saving. The Bivariate Probit model requires the joint estimation of two equations: one predicting whether an individual was offered positive savings and one predicting whether an individual switched supplier. The explanatory variables used to estimate the probability of observing a positive saving amount were: payment method; current supplier; electricity supplier region; whether an actual bill or estimated expenditure was used to calculate the saving amount; whether the consumer had an exit fee; whether they were served by the incumbent and the median income for a respondent's postcode. The central assumption of the Bivariate Probit model is that the error terms in each equation are correlated.

A Lagrange Multiplier test was used to test whether the error terms of the two equations were actually correlated. The null hypothesis was that there was no correlation between the error terms. Our analysis indicated that the null hypothesis could not be rejected (p-value= 0.477).

Introducing an instrumental variable

The main alteration to the method used to analyse the basic TBS data is that instrumental variable techniques were used to deal with the inclusion of an explanatory variable representing the minimum monetary saving respondents required to switch[17]. While including information about the monetary savings required to induce switching helps to understand better the cost-benefit evaluation undertaken by potential switchers, the inclusion of the minimum required saving variable create an endogeneity problem. Including this variable can result in biased and inconsistent estimates due to common unobserved factors determining both the probability of switching and the minimum saving required to induce switching. A factor determining both these variables might be, for example, the respondent's general attitude towards dealing with risk. One might expect that individuals who are more 'cautious' will be both less likely to switch and also require more money to be persuaded to switch.

---

[17] Due to the hypothesised importance of this minimum required saving variable and its relationship to research questions beyond the scope of this paper the data for this variable was obtained from questions in six different forms or treatments. Respondents were allocated to each treatment randomly. Firstly, half the sample was reminded of the saving they were offered at TBS and half did not receive this reminder. Also, there were three variations in the way respondents were asked to record the saving they required: (i) on a grid with assigned values, (ii) using a slider with a maximum value of £500 and (iii) using a slider with a maximum value of £1,000. In the current paper, the data from all six treatments is aggregated and no controls are included in the regressions for the different treatments. The random assignment of respondents to each treatment means controls are not required. Additionally, tests were performed, and no systematic effects were found, between the estimated coefficients for the minimum required saving variable in the main regression and the treatment respondents had seen.

To deal with the potential endogeneity of the minimum required saving we used a two-stage estimation process. In the first stage, we carried out a least squares regression to estimate the minimum required saving using a range of explanatory variables. The instrumental variables which are correlated in a statistically significant way with the minimum saving required to switch, but are statistically independent of the decision to switch supplier are: education level, supplier area and the treatment received to state the minimum saving required to switch.

In the second stage, the predicted values of the minimum required saving, generated from the first stage regression, were included in the Probit model estimating the probability of switching as an instrument for the actual minimum required savings. Following this procedure to correct for potential endogeneity, the magnitude and sign of the main estimated effects were not substantially affected. However, after using the instrument, the minimum required saving is no longer a statistically significant predictor of the probability of switching. This lack of significance may be due to the inefficiency of the instrumental variable estimation leading to a so-called 'weak instruments' problem.

Those shown one versus two offers

Another specification issue is that those respondents who received two offers might behave differently from those who were offered only one set of potential savings. We wanted to ascertain whether the average marginal effects for all the explanatory variables were significantly different between respondents shown one offer and those shown two offers. A likelihood ratio test was performed which compared an unrestricted model, where the coefficients for the two groups of respondents could be different, to a restricted model, where the coefficients had to be the same for both groups. The likelihood ratio test rejected the null hypothesis that the coefficients were the same for both groups. Hence, in Table 7, separate regressions are reported for those shown one or two offers at TBS.

4. Results

Regressions using Basic TBS Data

Table 6, on the following page, shows the average marginal effects for the key explanatory variables when estimating the probability of switching energy supplier using only the data collected as part of TBS process. We focus on those factors which were statistically significant across the three auctions.

Across all the auctions, switching became more likely as the size of potential savings increased, both in absolute terms and as a proportion of a household's energy bill. Combining these effects, a £1 increase in the annual saving received was associated with increasing the probability of switching by around 0.2 percentage points in total, holding other factors constant.[18] An increase in potential

---

[18] A £1 increase in absolute savings was associated with an increased probability of switching of 0.1 percentage points. A one percentage point increase in the proportional saving is associated with an increased probability of switching of around one percentage point. Since the median energy bill was around £1200, an increase equivalent to 1% of the median annual bill would be around £12. Combining the two effects, a £12 increase in savings would be associated with an increase in the probability of switching of 2.2 percentage points.

savings from £100 to £110 (around the median potential saving) would thus raise the probability of switching by about two percentage points.

Table 6: Average marginal effects on the probability of switching energy supplier by payment method (TBS participants)

Variable	Cash Cheque	Online Direct Debit	Offline Direct Debit
1. Energy bill estimated by Which?	-0.098***	-0.117***	-0.157***
2. Actual energy bill used to make decision	0.059***	0.048***	0.034**
3. On a dual fuel tariff	0.022**	0.007**	0.017**
4. Faces an exit fee from existing deal	-0.145***	-0.160***	-0.151***
5. Saving amount of the best offer	0.001***	0.001***	0.001***
6. Saving as a percentage of existing bill	0.010***	0.008***	0.008***
7. Sees two offers	-0.113***	-0.074***	-0.042***
# of Obs.	**8,156**	**88,012**	**13,756**

Notes: * indicates significance at the 10% level, ** indicates significance at the 5% level and *** indicates significance at the 1% level.
The null categories for each dummy variable are: 1. and 2. Bill estimated by respondent; 3. Not on a dual fuel tariff; 4. No exit fee; 7. Sees one offer.
Dummy variables for supply areas and suppliers were also included as controls in the regressions but are not reported as they were generally insignificant.

A number of other factors were also related to the probability of switching. As might be expected, those with exit fees were less likely to switch, with the strongest effect (reducing the probability of switching by 16 percentage points) being in the online direct debit auction. The ways in which the bill (and therefore savings) were estimated were associated with the probability of switching. Those who had their bill in front of them were up to 6 percentage points more likely to switch than those who estimated their consumption/expenditure from memory; while those who relied on Which?'s estimation of their consumption[19] were at least ten percentage points less likely to switch. We interpret this difference as reflecting confidence levels: those individuals reliant on an estimate of their bill size, by either themselves or Which?, were likely to be less sure about the savings they would receive and, hence, less likely to switch. Those who saw two offers rather than one were less likely to switch. We explore the impact of being shown two offers instead of one further below. We interpret these results as showing that trust in the saving offered and reduced decision complexity are related to a higher probability of switching.

Several factors affected one of the auctions but not all. However, drawing comparisons across the three regressions is made more difficult by the large variations in sample size between the regressions.

---

[19] This estimation was based on information provided by participants about their house type and occupancy.

Regressions using Additional Survey Data

Table 7 on the following page shows the average marginal effects for the key explanatory variables when estimating the probability of switching energy supplier after combining the data collected as part of TBS itself with the information from the survey.

For reasons discussed in Section 3, the regressions have been split between those shown one or two offers as part of TBS. While in Table 6 the responses were analysed for different auctions separately, here the results are reported solely for the largest payment category, namely those in the online direct debit market.

Table 7 confirms that those offered a higher saving were more likely to switch, and if respondents relied on a Which? estimate of their existing energy bill they were less likely to change than if they estimated their own consumption/expenditure. Unsurprisingly, those who had an exit fee or would lose cashback or some other benefit by switching energy supplier were less likely to switch. Such losses would reduce the total benefit associated with switching supplier. Household income, estimated from post code data, did not have a consistently statistically significant impact on the probability of switching.

Those who saw two offers were more likely to switch if they were making the decision with an energy bill in front of them, which we interpret as an effect of the confidence which respondents had in the figures they were evaluating. We also asked directly about the confidence that respondents had in the figures given in TBS. For respondents shown only one offer, higher confidence was associated with a greater probability of switching. For respondents shown two offers, higher confidence was associated with a greater probability of switching when it was interacted with the saving amount.

Those who were worried about the switching process were more likely to switch than those who had no worries about the exercise, possibly indicating that such worries about the switching process were more salient amongst those with a serious intent of switching. However, as expected, those who were worried about the best deal not being available were less likely to switch. Respondents who had signed up because they wanted to save money (rather than simply being curious about TBS campaign) were more likely to accept the offer made.

Participants were asked about their preferences between their old and new suppliers for several characteristics. For both groups, those who favoured the environmental and ethical approach of the new supplier, or the new supplier's payment method were more likely to switch, while those who preferred the previous supplier's payment options were less likely to do so. Preferences for the previous supplier's environmental and ethical stance deterred those who saw one offer, but seemed to have little effect on those who saw two.

Table 7: Average marginal effects on the probability of switching energy supplier (reported separately for those shown one or two offers)

Variables	1 offer	2 offers
1. Energy bill estimated by Which?	-0.089***	-0.045**
2. Actual energy bill used to make decision	0.018	0.054***
3. Faces an exit fee from existing deal	-0.180***	-0.186***
4. Saving as a percentage of existing bill	0.009***	0.008***
5. Saving amount of the best offer	0.001**	0.000
6. Confidence in the accuracy of the saving offered in TBS (ranges from 0 and 1)	0.170***	0.053
7. Interaction of the saving amount from the best offer and confidence level	0.000	0.001*
8. Male	0.037***	0.011
9. Lives in a rented house	-0.079***	-0.054**
10. Household contains a part-time employee	-0.014	-0.031**
11. Household contains a homemaker	-0.040*	-0.000
12. Household contains someone who is unemployed	-0.025	-0.069**
13. Household contains someone with the employment status 'other'	-0.029	0.065***
14. Household member receives a disability benefit	-0.038*	0.007
15. Loses cashback by switching	-0.088***	-0.114***
16. Loses other benefits by switching	-0.038*	-0.035
17. Worried about the switching process	0.030**	0.052***
18. Worried that the best deal is not available	-0.016	-0.048***
19. Worried about the process being time consuming	-0.017	0.039***
20. Worried about problems with the new supplier	-0.004	0.023*
21. Reason for participating in the Big Switch: to save money	0.129***	0.082***
22. Reason for participating in the Big Switch: curious about the campaign	-0.101***	-0.110***
23. Reason for participating in the Big Switch: to encourage lower prices	-0.021*	-0.013
24. Prefers existing supplier for ethical/environmental reasons	-0.115***	-0.028
25. Prefers existing supplier re: payment method	-0.144***	-0.130***
26. Prefers existing supplier for other reasons	-0.057*	-0.056*
27. Prefers the offered supplier for ethical/environmental reasons	0.211***	0.155***
28. Prefers the offered supplier re: payment method	0.127***	0.153***
29. Asked for a better deal from existing supplier and was offered one	-0.116***	-0.128***
30. Did not ask for a better deal from existing supplier but was offered one	0.141***	0.128***
31. Agrees that it is hard to set aside the time needed to switch	0.034**	0.010
32. Agrees the timing of The Big Switch was an especially busy period	-0.209***	-0.201***
33. Reason that could persuade respondent to switch: Sufficiently large savings	-0.054***	-0.030**
34. Reason that could persuade respondent to switch:	0.045***	0.051***

Confident deal was best available		
35. Reason that could persuade respondent to switch: Unhappy with current supplier	0.079***	0.032**
36. Reason that could persuade respondent to switch: New supplier is ethical or environmentally friendly	0.050***	0.031
37. Reason that could persuade respondent to switch: the switching process is easy and quick	0.028*	0.006
38. Reason that could persuade respondent to switch: Other reasons	-0.059	-0.076**
# of Obs.	**4,943**	**4,804**

Notes: * indicates significance at the 10% level, ** indicates significance at the 5% level and *** indicates significance at the 1% level.

The Null categories for each variable are: 1. and 2. Bill estimated by respondent; 3. No Exit fee; 8. Female; 9. At least partially owns house; 10. No part-time employee in household; 11. No homemaker in household; 12. No unemployed person in household; 13. No household member has 'Other' as employment status; 14. No household member receives disability benefit; 15. No loss of cashback; 16. No loss of other benefits; 17. Not worried about the switching process; 18. Not worried that the best deal is not available; 19. Not worried about the process being time consuming; 20. Not worried about problems with the new supplier; 21. Saving money is not a reason for taking part in TBS; 22. Curiosity is not a reason for taking part in TBS; 23. Encouraging lower prices is not a reason for taking part in TBS; 24. and 27. Indifferent between suppliers for ethical/environmental reasons; 25. and 28. Indifferent between suppliers re: payment method; 26. No preference between suppliers for other reasons (1 or 2 suppliers); 29. and 30. Did not ask for a better deal from existing supplier and was not offered one; 31. It is not hard to set aside the time needed to switch; 32. The timing of TBS was not an especially busy period; 33. Sufficiently large savings is not an important reason to switch; 34. Confidence that the offer is the best available is not an important reason to switch; 35. Unhappiness with the current supplier is not an important reason to switch; 36. New supplier being ethical or environmentally friendly supplier is not an important reason to switch; 38. Other reasons are not important to the switching decision.

A range of other variables were included as controls in the regressions but are not reported as they were generally insignificant. These additional variables were the minimum required saving to switch and dummy variables for median income categories, energy suppliers, supply areas, some categories of housing tenure, some categories of employment status, a household receiving an energy related benefit, and some factors that would persuade people to switch. Details of the complete regression results are available on request.

We asked whether respondents had requested and/or had been offered a better deal by their existing supplier. Those who asked for a better deal and were offered one were less likely to switch; but unsolicited better offers from their existing supplier, perhaps surprisingly, increased the probability of switching to a new supplier. Those who felt the timing of TBS was poor were less likely to change supplier.

We asked respondents what would persuade them to switch supplier and found that this was related to the probability of switching, after controlling for other factors. Those who identified savings as an important motivator, were less likely to accept the offer, perhaps indicating that they needed a higher level of savings to switch. However, if a respondent reported confidence that the deal was a good one and unhappiness with a current supplier as important reasons that would persuade them to switch, the probability of switching was increased. Only among the single offer group, did viewing ethical and environmental considerations as an important reason to switch have a statistically significant relationship with the probability of switching.

While the overall patterns were similar, there are some differences in the factors associated with switching between those shown one offer and those shown two offers. As discussed in section 4, the

econometric analysis demonstrates that those shown two offers as part of TBS had a different decision making process from those shown only one offer. Some explanatory variables, e.g. gender, affected the probability of switching in only one of the two groups. Where the same variables provided significant explanatory power in both groups, there were also differences in the values of the coefficients between the two regressions. Comparing the two models using data from the total sample we identified different probabilities of switching: those shown two offers were on average 5.2 percentage points less likely to switch than those given only one offer (33.2% compared with 38.4%), a difference which is statistically significant at the 1% level.

This result is consistent with the behavioural economics literature which posits choice overload as increasing the chance of no decision and sticking to default or status quo options which, in this case, was sticking with the existing electricity supplier even when switching offered an opportunity to save money. This preference for the status quo in the presence of increased choice may be linked to the increased cognitive effort required to make a decision, and the increased potential for regret, or to reduced confidence that the offers represent the best available option.

5. Conclusion

TBS provided a unique opportunity to observe the detailed decisions and circumstances of a group of energy consumers faced with a real choice of providers in the residential energy market. While participants are not representative of the population as a whole, they are likely to be more active in this market than the average householder and have already taken active measures to register with TBS; so findings for this group could be viewed as an upper bound, in terms of engagement with the market.
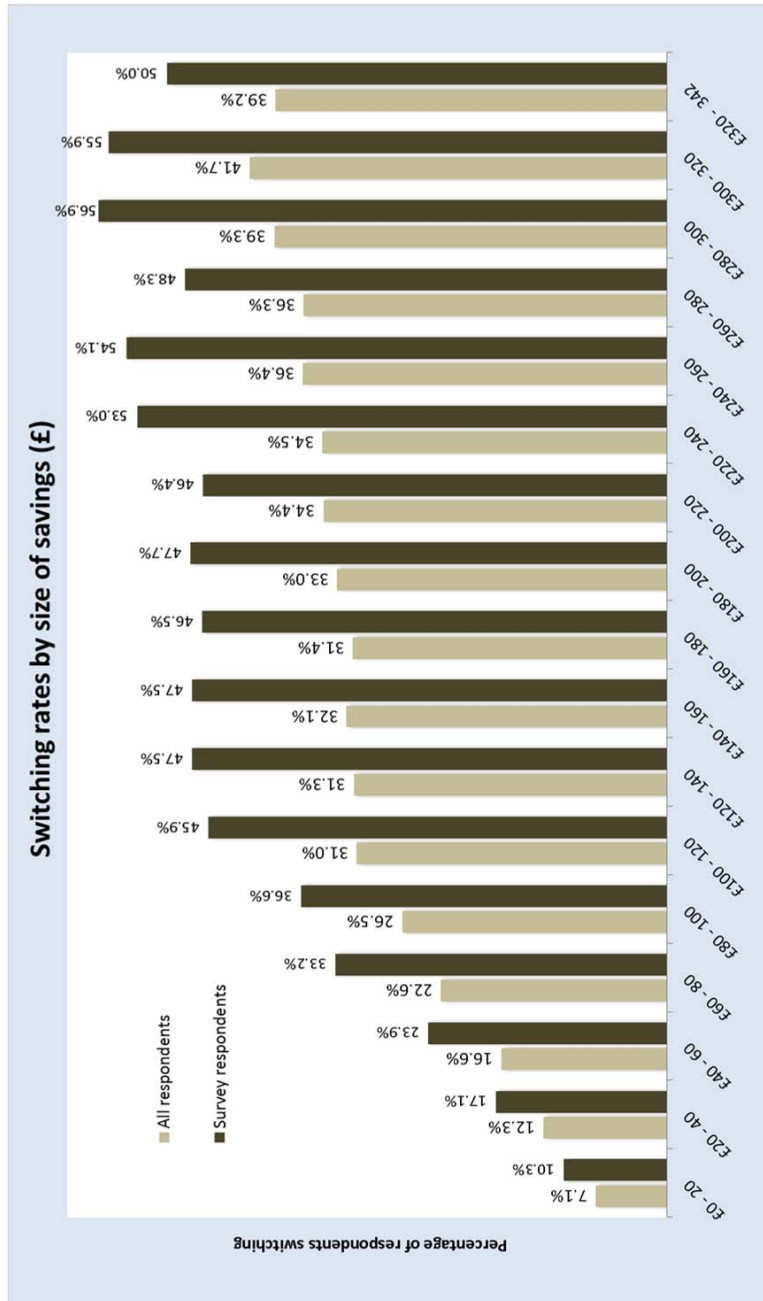
Switching is strongly related to the savings presented to participants, as might be anticipated. But despite the low additional switching costs (participants had only to complete a very simple additional form to enact their switch), we find that many participants in TBS did not change supplier, despite the offer of savings and several reminders from Which?. This suggests the presence of switching costs, in which householders appear prepared to 'leave money on the table' rather than change supplier. These switching costs may arise because respondents value their time very highly, or are anxious about the change itself, factors we have explored in the analysis. Hence, it seems that there are 'pure' switching costs, perhaps associated with psychological inertia in this market, which deter householders from changing supplier and capturing the financial gains available. This inertia is despite participants having already invested considerably more effort in their initial entry into TBS scheme than subsequently was required to complete a switch.

We conclude that confidence also plays an important role in deciding whether or not to switch. Those who had their actual energy bills in front of them were more likely to switch than those relying on memory for their energy expenditure/consumption; and these participants in turn were more likely to switch than those who relied on Which? to estimate their bills. The need for certainty may also lie behind the lower switching rate for those who were shown two offers rather than one, which significantly reduced the probability of a respondent changing supplier, even after holding the saving amount and many other variables constant.

This result provides support for Ofgem's plan to reduce the number of energy tariffs to stimulate consumer activity in the energy market. Overall, this evidence provides valuable insights for the Competition and Markets Authority (CMA) when considering consumer engagement in their energy market inquiry, and for policy makers assessing the potential for collective switching exercises to stimulate consumer activity.

6. Data Appendix

Chart A1

Switching rates by size of savings (£)

Percentage of respondents switching

Legend: All respondents, Survey respondents

| Size of savings (£)	All respondents	Survey respondents
£0 - 20	7.1%	10.3%
£20 - 40	12.3%	17.1%
£40 - 60	16.6%	23.9%
£60 - 80	22.6%	33.2%
£80 - 100	26.5%	36.6%
£100 - 120	31.0%	45.9%
£120 - 140	31.3%	47.5%
£140 - 160	32.1%	47.5%
£160 - 180	31.4%	46.5%
£180 - 200	33.0%	47.7%
£200 - 220	34.4%	46.4%
£220 - 240	34.5%	53.0%
£240 - 260	36.4%	54.1%
£260 - 280	36.3%	48.3%
£280 - 300	39.3%	56.9%
£300 - 320	41.7%	55.9%
£320 - 342	39.2%	50.0%

As has been found in previous studies, there is a clear correlation between the likelihood of switching and the size of saving offered. However, the rate of increase in the percentage of respondents switching as the saving offered increases is lower above the category of £100-120 than below it. Between the categories of £0-20 and £100-120 the percentage of respondents switching rises by 24-35 percentage points. Yet the increase in the switching rate between the £100-120 category and the £300-320 category is only around 10 percentage points.
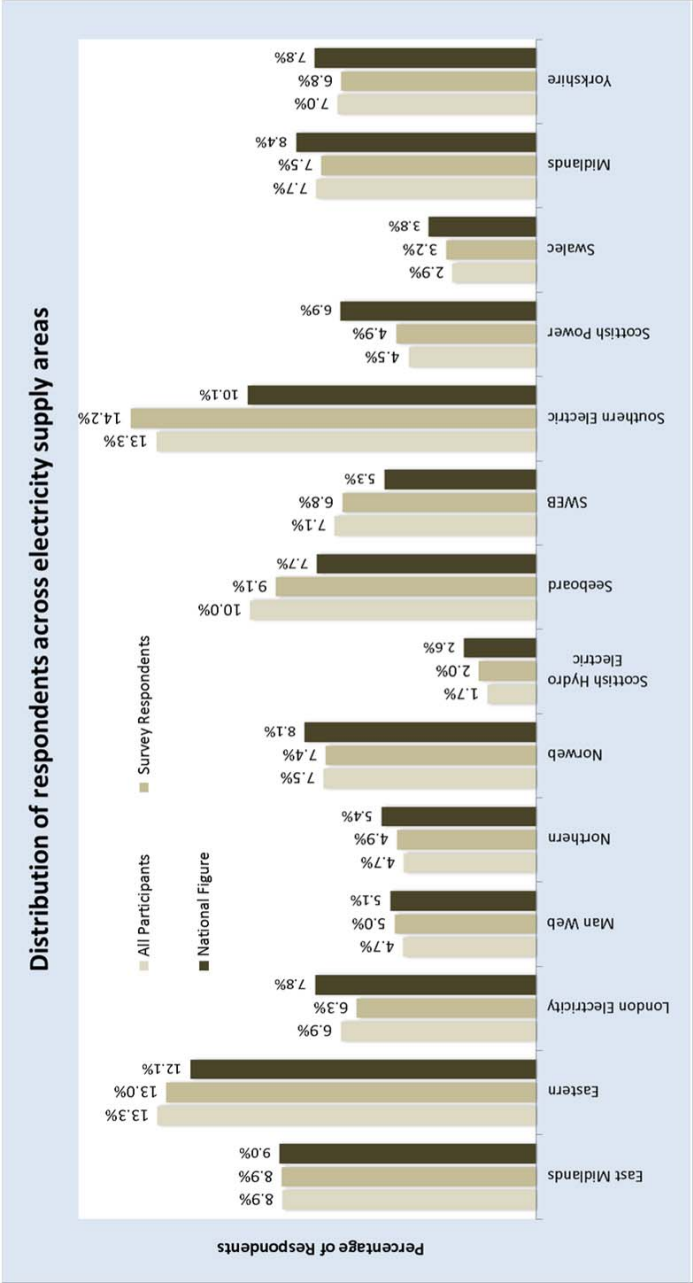
It is reasonable presume that when presented with the offer of savings consumers will perceive some uncertainty about whether the saving will actually materialise. Chart A2 illustrates the responses to a question asking for the degree of confidence which respondents had in the saving offer they received at TBS. As one would expect, switchers have a tendency to report a higher level of confidence in the savings actually being realised than non-switchers.

Chart A2
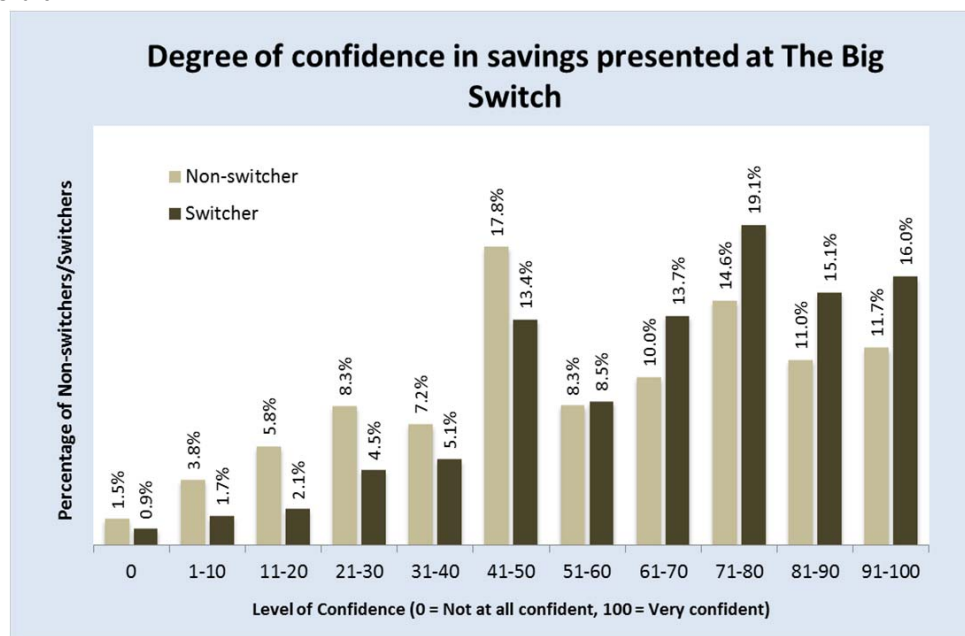
Charts A3 and A4 on the following pages relate to the situation of respondents before switches took place as a result of TBS.

Chart A3[20]

Chart A3: Distribution of respondents across electricity supply areas

Legend: All Participants; Survey Respondents; National Figure

Supply Area	National Figure	Survey Respondents	All Participants
Yorkshire	7.8%	6.8%	7.0%
Midlands	8.4%	7.5%	7.7%
Swalec	3.8%	3.2%	2.9%
Scottish Power	6.9%	4.9%	4.5%
Southern Electric	10.1%	14.2%	13.3%
SWEB	5.3%	6.8%	7.1%
Seeboard	7.7%	9.1%	10.0%
Scottish Hydro Electric	2.6%	2.0%	1.7%
Norweb	8.1%	7.4%	7.5%
Northern	5.4%	4.9%	4.7%
Man Web	5.1%	5.0%	4.7%
London Electricity	7.8%	6.3%	6.9%
Eastern	12.1%	13.0%	13.3%
East Midlands	9.0%	8.9%	8.9%

---

[20] The source of the national figures is Table 5.3 of 'Electricity Distribution Annual Report 2010-11', Ofgem (2012), available at: https://www.ofgem.gov.uk/ofgem-publications/46553/electricitydistributionannualreportfor201011.pdf.
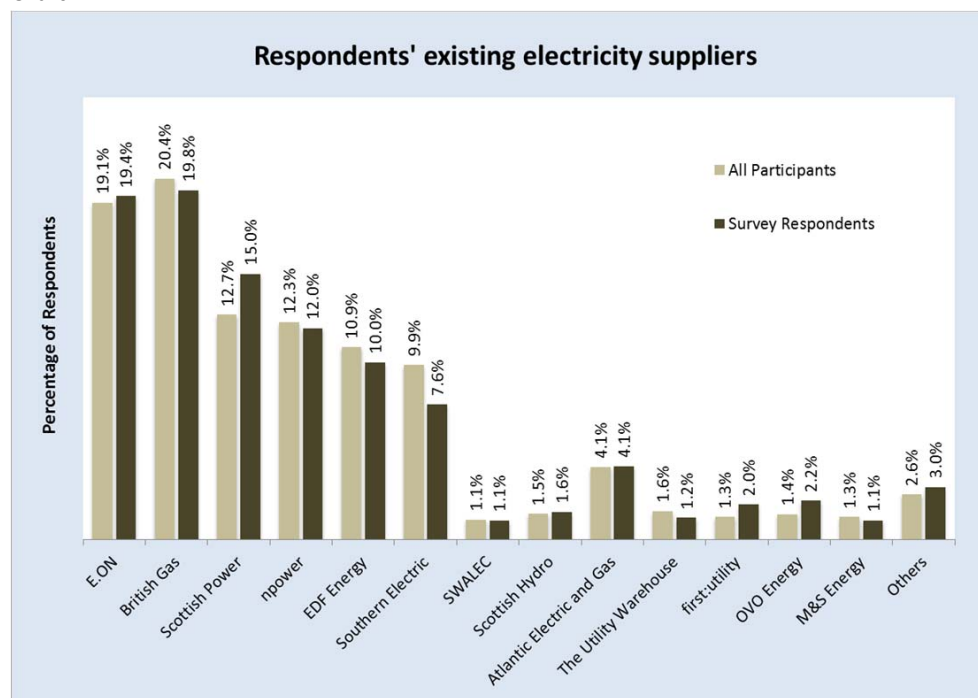
Chart A4

Respondents' existing electricity suppliers

Table A1 The demographic and socio-economic characteristics of those receiving one and two offers

Statistic	One Offer	Two Offers
Age group containing median age[1]	55-64	55-64
% Male	71.84	71.42
% With first degree or higher	60.11	60.7
% Who fully or partly own their home	93.3	93.57
% Households containing at least one person who is employed (part-time or full-time)	53.23	52.79
% Receiving a disability benefit	7.79	7.37
% Receiving an energy related benefit (excluding Winter Fuel Payments)	8.38	8.43
Income category containing median income	£35,000-39,999	£35,000-39,999
Total Number of Observations	**4,943**	**4,804**

[1] Age data were only available for 6,282 respondents.

Table A1 shows that the demographic and socio-economic differences between respondents receiving one or two offers were small in magnitude and not statistically significant. To a large extent, Table A2, also shows limited differences between those receiving one and two offers in terms of their motivation for taking part in TBS and their circumstances when TBS took place. The exceptions to this concern respondents viewing monetary savings as a reason to take part in TBS, respondents

asking their existing supplier for a better deal and respondents wanting additional support as part of TBS. For these statistics, there was a statistically significant difference between those shown one and two offers. That a greater percentage of those shown two offers wanted additional support as part of TBS perhaps indicates that being shown two offers resulted in some additional confusion.

Table A2 A comparison of the motivation for taking part in TBS and of the circumstances surrounding TBS for those receiving one and two offers

Statistic	One Offer %	Two Offers %
Motivation		
'To save money' as reason for taking part in TBS	77.14*	75.58*
Worried 'something might go wrong with the switching process'	25.96	26.06
Worried 'the best deal is not available'	25.15	26.14
Asking existing supplier for a better deal	18.23*	21.27*
Circumstances of TBS		
Strongly Agree/Agree with 'The timing of TBS was an especially busy period'	18.53	19.40
No additional support wanted as part of TBS[1]	71.91*	68.97*
Basing decision on actual energy bill	68.84	69.55
Total Number of Observations	**4,943**	**4,804**

* Indicates a significant difference at the 5% level between the statistic for those receiving one offer and those receiving two offers.

[1] The categories of additional help that were available to respondents were: a reminder phone call, phone support, a simpler switching process or something else.

Table A3 on the following page shows the differences between those respondents receiving one and two offers in terms of financial factors and the non-price characteristics of the offers. Firstly, the median bill size was £70 higher for those receiving two offers compared to those only receiving one offer, although, this difference was not statistically significant. Also, Table A3 indicates that those receiving two offers were less likely to prefer the supplier offered to them regarding the environment and ethics than those individuals who only received one offer by a large margin.

Table A3 Financial and non-price factors determining the attractiveness of TBS offer(s) for those receiving one and two offers

Statistic	One Offer	Two Offers
Financial Factors		
Median size of bill (£)	1132	1203.5
Median size of saving (£)	103.67	109.27
Saving as percentage of existing bill	9.75	10.14
% Paying by Direct Debit	98.71	98.44
% Existing energy deal includes an exit fee	16.06	16.72
Non-Price Factors	**%**	**%**
Not happy with customer service of existing supplier	21.78*	19.82*
Stating an ethical supplier/a supplier's environmental friendliness as key motivation for switching[1]	13.90	14.24
Preferring offered supplier over existing supplier re: ethics/the environment	43.17*	29.48*
Preferring offered supplier over existing supplier re: payment method	5.56	6.18
Total Number of Observations	**4,943**	**4,804**

* Indicates a significant difference at the 5% level between the statistic for those receiving one offer and those receiving two offers.
[1] Respondents were asked to select up to three factors (from a range of eleven factors) which they thought would be most important in persuading them to switch energy supplier.

7. References

Agarwal, S., S. Chomsisengphet, C. Liu and N.S. Souleles (2005), 'Do consumers choose the right credit contracts?', Center for Financial Studies, CFS Working Paper No. 2005/32

Annala, S., S. Viljainen, and J. Tuunanen (2013), 'Rationality of supplier switching in retail electricity markets', International Journal of Energy Sector Management, 7(4), pp. 459-477

Bertrand, M., D. Karlan, S. Mullainathan, E. Shafir and J. Zinman (2010), 'What's advertising content worth? Evidence from a consumer credit marketing field experiment', Quarterly Journal of Economics, 125(1), pp. 263-306

Calem, P. S. and L. J. Mester (1995), 'Consumer Behavior and the Stickiness of Credit-Card Interest Rates', American Economic Review, 85(5), pp. 1327-1336

Colton, R.D. (2006), 'Municipal Aggregation for Retail Natural Gas and Electric Service: Potentials, Pitfalls and Policy Implications', Fisher, Sheehan & Colton, Public Finance and General Economics

Dekel, E., B. L. Lipman and A. Rustichini (2009), 'Temptation-driven preferences', Review of Economic Studies, 76(3), pp. 937-971

DellaVigna, S. and U. Malmendier (2006), 'Paying not to go to the gym', American Economic Review, 96(3), pp. 694-719

Department for Energy and Climate Change (2013), 'Helping Customers Switch: Collective Switching and Beyond', available at: https://www.gov.uk/government/publications/helping-customers-switch-collective-switching-and-beyond

Dhar, R. (1997), 'Consumer preference for a no-choice option', Journal of Consumer Research, 24(2), pp. 215-231

Ek, K. and P. Söderholm (2008), 'Households' switching behavior between electricity suppliers in Sweden', Utilities Policy, 16(4), pp. 254-261

European Commission (2010), 'The functioning of the retail electricity staff working paper', Comission Staff Working Paper, SEC(2010) 1409 final, Brussels

Farrell, J. and P. Klemperer (2007), 'Coordination and lock-in: Competition with switching costs and network effects', Chapter 31 in M. Armstrong and R.M. Porter (eds.) 'Handbook of Industrial Organization', Volume 3, Elsevier: North Holland, pp. 1967-2072

Faulkner, K. (2010), 'Community Choice Aggregation in California', Working paper

Flores, M. and C. Waddams Price (2013), 'Consumer behaviour in the British retail electricity market', Centre for Competition Policy, Working Paper 13-10

Frank, R. G. and K. Lamiraud (2009), 'Choice, price competition and complexity in markets for health insurance', Journal of Economic Behavior & Organization, 71(2), pp. 550-562

Gamble, A., E. A. Juliusson and T. Gärling (2009), 'Consumer attitudes towards switching supplier in three deregulated markets', The Journal of Socio-Economics, 38(5), pp. 814-819

Gärling, T., A. Gamble and E. A. Juliusson (2008), 'Consumers' switching inertia in a fictitious electricity market', International Journal of Consumer Studies, 32(6), pp. 613-618

Giulietti, M., J. Otero and M. Waterson (2004), 'Supply competition and price behaviour in the UK electricity supply industry', Working paper

Giulietti, M., C. Waddams Price and M. Waterson (2005), 'Consumer Choice and Competition Policy: a Study of UK Energy Markets', Economic Journal, 115(506), pp. 949-968

Giulietti, M., M. Waterson and M.R. Wildenbeest (2014), 'Estimation of search friction in the UK electricity market', Journal of Industrial Economics, forthcoming

Gul, F. and W. Pesendorfer (2001), 'Temptation and self-control', Econometrica, 69(6), pp. 1403-1435

Honka, E. (2014), 'Quantifying search and switching costs in the US auto insurance industry', Working paper

Hortaçsu, A., S. A. Madanizadeh, and S. L. Puller (2012), 'Power to choose? an analysis of choice frictions in the residential electricity market', Working paper

Ipsos-MORI (2012), 'Customer Engagement with the Energy Market – Tracking Survey 2012', Report prepared for Ofgem

Iyengar, S. S. and M. R. Lepper (2000), 'When choice is demotivating: Can one desire too much of a good thing?', Journal of Personality and Social Psychology, 79(6), pp. 995-1006

Iyengar, S. S. and E. Kamenica (2010), 'Choice proliferation, simplicity seeking, and asset allocation', Journal of Public Economics, 94(7-8), pp. 530-539

Juliusson, E. A., A. Gamble and T. Gärling (2007), 'Loss aversion and price volatility as determinants of attitude towards and preference for variable price in the Swedish electricity market', Energy Policy, 35(11), pp. 5953-5957

Kim, M., D. Kliger and B. Vale (2003), 'Estimating switching costs: the case of banking', Journal of Financial Intermediation, 12(1), pp. 25-56

Kiser, E. K. (2002), 'Predicting household switching behavior and switching costs at depository institutions', Review of Industrial Organization, 20(4), pp. 349-365

Kleit, A. N., A. V. Shcherbakova and X. Chen (2012), 'Restructuring and the retail residential market for power in Pennsylvania', Energy Policy, 46, pp. 443-451

Klemperer, P. (1987), 'Markets with consumer switching costs', Quarterly Journal of Economics, 102(2), pp. 375-394

Klemperer, P. (1995), 'Competition when consumers have switching costs: An overview with applications to industrial organization, macroeconomics, and international trade', Review of Economic Studies, 62(4), pp. 515-539

Knittel, C. R. (1997), 'Interstate long distance rates: search costs, switching costs, and market power', Review of Industrial Organization, 12(4), pp. 519-536

Kreps, D. M. (1979), 'A representation theorem for 'preference for flexibility'', Econometrica, 47(3), pp. 565-577

Lambrecht, A. and B. Skiera (2006), 'Paying too much and being happy about it: Existence, causes and consequences of tariff-choice biases', Journal of Marketing Research, 43(2), PP. 212-223

Laufer, J., B. MacDonald, B. Pike and M. Zhou (2013), 'Community Choice Aggregation: Municipal Bulk Buying of Electricity in Massachusetts'

Littlechild, S. (2008), 'Municipal aggregation and retail competition in the Ohio energy sector', Journal of Regulatory Economics, 34(2), pp. 164-194

Kamenica, E. (2008), 'Contextual inference in markets: On the informational content of product lines', American Economic Review, 98(5), PP. 2127-2149

McFadden, D. (2006), 'Free markets and fettered consumers', American Economic Review, 96(1), pp. 3-29

Miravete, E. J. (2003), 'Choosing the wrong calling plan? Ignorance and learning', American Economic Review, 93(1), PP. 297-310

Miravete, E. J. (2004), 'The doubtful profitability of foggy pricing', CEPR Discussion Papers, No. 6295

Ofgem, Office of Fair Trading and Competition and Markets Authority (2014), 'State of the Market Assessment', available at: https://www.ofgem.gov.uk//publications-and-updates/state-market-assessment

Ortoleva, P. (2013), 'The price of flexibility: Towards a theory of thinking aversion', Journal of Economic Theory, 148(3), pp. 903-934.

Park, M. (2011), 'The economic impact of wireless number portability', Journal of Industrial Economics, 59(4), pp. 714-745

Pomp, M. and V. Shestalova (2007), 'Switching Costs in Netherlands Energy Markets: Can Liberalisation Bring Benefits to Small Customers?', De Economist, 155(3), pp. 305-321

Pomp, M., V. Shestalova and L. Rangel (2005), 'Switch on the competition; causes, consequences and policy implications of consumer switching costs', CPB Netherlands Bureau for Economic Policy Analysis, Document No. 97

Rader, N. and S. Hempling (2000), 'Promoting competitive electricity markets through community purchasing: The role of municipal Aggregation', American Public Power Association, Washington D.C.

Salies, E. (2005), 'A Measure of Switching Costs in the GB Electricity Retail Market', MPRA Paper No. 28255.

Samuelson, W. and R. Zeckhauser (1988), 'Status quo bias in decision making', Journal of Risk and Uncertainty, 1(1), pp. 7-59

Sarver, T. (2008), 'Anticipating regret: Why fewer options may be better', Econometrica, 76(2), pp. 263-305

Scheibehenne, B., R. Greifeneder and P.M. Todd (2010), 'Can There Ever Be Too Many Options? A Meta-Analytic Review of Choice Overload', Journal of Consumer Research, 37(3), pp. 409-425

Shi, M., J. Chiang and B.D. Rhee (2006), 'Price competition with reduced consumer switching costs: The case of "wireless number portability" in the cellular phone industry', Management Science, 52(1), pp. 27-38

Sitzia, S., J. Zheng and D.J. Zizzo (2012), 'Complexity and Smart Nudges with Inattentive Consumers', Centre for Competition Policy, Working Paper 12-13

Stango, V. (2002), 'Pricing with consumer switching costs: Evidence from the credit card market', Journal of Industrial Economics, 50(4), pp. 475-492

Tversky, A. and E. Shafir (1992), 'Choice under conflict: The dynamics of deferred decision', Psychological Science, 3(6), pp. 358-361

Waddams Price, C. (2004), 'Spoilt for Choice? The Costs and Benefits of Opening UK Residential Energy Markets', Centre for Competition and Regulation

Waddams Price, C. (2013), 'Shedding Light on Consumer Behaviour in Energy Markets', Chapter 5 in Mehta, J. (ed.), 'Behavioural Economics in Competition and Consumer Policy', ESRC Centre for Competition Policy: Norwich, Norfolk, pp. 71-78

Waddams Price, C. and M. Bennett (1999), 'New gas in old pipes: opening the UK residential gas market to competition', Utilities Policy, 8(1), pp. 1-15

Waddams Price, C., C. Webster and M. Zhu (2013), 'Searching and Switching: Empirical estimates of consumer behaviour in regulated markets', Centre for Competition Policy, Working Paper 13-11

Waterson, M. (2003), 'The role of consumers in competition and competition policy', International Journal of Industrial Organization, 21(2), pp. 129-150

Weber, S., A. Baranzini and E. Fragniere (2009), 'Consumers' choices among alternative electricity programmes in Geneva – an empirical analysis', International Journal of Global Energy Issues, 31(3), pp. 295-309.

Wilson, C.M. (2006), 'Markets with Search and Switching Costs', MPRA Paper No.131

Wilson, C. M. (2012), 'Market frictions: A unified model of search costs and switching costs', European Economic Review, 56(6), pp. 1070-1086

Wilson, C. M. and C. Waddams Price (2010), 'Do consumers switch to the best supplier?', Oxford Economic Papers, 62(4), pp. 647-668

Zhu, M. (2013), 'Searching and Switching Across Markets: Is Consumer 'Inertia' the Result of a Mistake or a Preference?', Chapter 4 in Mehta, J. (ed.), 'Behavioural Economics in Competition and Consumer Policy', ESRC Centre for Competition Policy: Norwich, Norfolk, pp. 63-