The Role of Attitudes and Marketing in Consumer Behaviours in the British Retail Electricity Market

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ABSTRACT

We examine characteristics associated with consumer (dis)engagement in the residential electricity market, a topic of increasing policy interest and intervention, introducing consumer attitudes and marketing recall as new factors. General attitudes are closely associated with electricity market activity, with considerable variation in the strength and statistical significance of these relationships, indicating very different motivations amongst consumers. Recall of direct marketing routes has little identifiable effect, while advice of family and friends is influential. We identify implications for communication by both suppliers and policy makers seeking to improve the functioning of such markets, including the necessity for a variety of approaches.

Keywords: Switching Behaviour; Electricity Market; Competition Policy.

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1. INTRODUCTION

Since retail energy markets have opened, regulators and competition authorities have placed increasing emphasis on the importance of active consumers who check and shop around for better deals, to ensure a well-functioning market. Electricity supply, like many other markets, involves a 'default' relationship: consumers remain with the same supplier unless they take action to switch. Inactive consumers may inhibit realisation of potential benefits from opening and deregulating markets which were previously supplied by an incumbent monopolist.[1] The European Commission (European Commission, 2010) and the Council of European Energy Regulators (Council of European Energy Regulators, 2015) have highlighted the role of consumer engagement in the market[2] and the UK Competition and Markets Authority (Competition and Markets Authority, 2016) identified 'weak consumer response' as the main feature of the British energy market which was imposing an Adverse Effect on Competition[3], though this conclusion has been challenged by Little-

1. Consumer behaviour plays a vital role in competition policy (e.g. Prendergast, 2002; Waterson, 2003; Wilson and Waddams Price, 2010). However switching is itself neither necessary nor sufficient to ensure a well-functioning market, and we discuss the interaction of consumer behaviour and the supply side of the market in our concluding section.

2. See for example the CEER position paper on well-functioning markets (Council of European Energy Regulators, 2015) http://www.ceer.eu/portal/page/portal/EER_HOME/EER_PUBLICATIONS/CEER_PAPERS/Customers/2015/C15-SC–36–03_V19_Well-functioning_retail_markets.pdf.

3. See Competition and Markets Authority (2016) https://assets.publishing.service.gov.uk/media/5773de34e5274a0da3000113/final-report-energy-market-investigation.pdf.

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child and others (Littlechild et al., 2017). Indeed the British regulator has been struggling to increase consumer participation for nearly ten years (Ofgem, 2011). Similar inertia is observed in US energy markets where householders have been given choice (see for example Hortaçsu al. (2017).

Earlier empirical evidence on electricity markets suggests that weak consumer response may be caused by search costs (Giulietti et al., 2014), the existence of switching inertia (Gärling et al., 2008; Hortaçsu al., 2017), limited capacity to choose efficiently between electricity suppliers (Wilson and Waddams Price, 2010), consumer inattention and/or brand loyalty (Gamble et al., 2009; Sitzia et al., 2015; Hortaçsu al., 2017). More recent work on collective auctions examines evidence from an opt-in auction (Deller et al., 2017a) and possibilities for opt-out auctions (Deller et al., 2017b).

In understanding the main factors explaining search and switching, most of the literature and much of the policy discussion have focused on observable consumer characteristics (e.g. age, employment, income and switching experience in other markets)[4]. While the focus of existing literature has been on the 'average' consumer, with little discussion of differences in consumer behaviours, Waddams Price and Zhu (2016a) present evidence of consumer heterogeneity across demographic groups and between the well informed and others. Regulators often have statutory duties based on demographic characteristics, which can be used to identify and target consumer groups: such policies are more likely to be effective if they take account of consumers' attitudes to markets more generally and their association with energy market activity, which is the focus of this paper. While He and Reiner (2017) relate energy switching to political sympathies, and Ek and Soderholm (2008) consider some psychological factors, this is the first study we know of which analyses such general purchasing attitudes in this context.

The effect of advertising and its different formats on consumers who face search costs when buying a product has been studied in the economic literature (see for instance Anderson and Renault's (2006) seminal paper on advertising products and/or price information), showing the influence of communication channels on consumer behaviour. The marketing literature usually focuses on different 'information cues' in advertising; that is, pieces of information relating to the product or service that is being offered, as proposed by Stern et al. (1981). More specifically, retailers often diversify their marketing strategies to persuade consumers to switch from rival firms. The importance of the role of advertising in promoting switching behaviour has been extensively studied in other industries; for example, Shum (2004) presents empirical evidence on the effect of advertising in prompting switching behaviour in the breakfast cereal market. However there has been little work on how consumers respond to different marketing *communications* in the economic analysis of searching and switching in electricity markets.

Our contribution is to explore the role of attitudes and different marketing communications in consumer search and switching behaviour, including differences as well as similarities between consumers. Using a specially commissioned survey of British consumers, we identify the potential relationships of attitudes to markets in general with consumer activity in searching for better deals and switching electricity supplier. Respondents were asked how far they agreed with different statements on general attitudes to markets. For example, a general approach to savings is measured by agreement with the statement "When making bigger purchases (e.g. holidays or furniture) I usually spend quite a lot of time looking around for deals that might save a few pounds". To assess time constraints, respondents were asked to rate: "I don't really have the time to spend looking around

4. For example in its final report on the energy market, the British Competition and Markets Authority (Competition and Markets Authority (2016) described 'weak response and consumer disengagement' according to age, income and type of household meter).

for deals that might save a few pounds" and "Life is too short to keep worrying about whether you are getting the best deal around". The role of different marketing communications on searching and switching is studied by asking respondents whether they recalled receiving advertising by other electricity suppliers (e.g. on internet, billboards, newspapers, magazines, etc.), direct marketing by telephone or by home visits, approaches in public places, direct mailing (post or email), and information from friends or family about a better deal from another electricity provider. We also analyse differences in consumer behaviours within groups of consumers who express similar attitudes to markets, and the implications of the findings for suppliers and policy makers.

Like many previous studies (for example Giulietti et al. (2005) and Ek and Söderholm (2008)), we base our analysis on the concept of a consumer choosing between inaction and action. We follow Wilson (2012), Honka (2014) and Waddams Price and Zhu (2016a) in analysing searching and switching as separate but simultaneous actions. Our unique data set includes information about search and switching behaviour in the electricity market, self-reported attitudes to markets in general, socio-economic characteristics, and information or marketing which respondents recall from different sources.

We find that while relatively few demographic characteristics consistently affect consumer activity, searching and switching in the retail electricity market are not only associated with consumers' more general attitudes but also that the effect of attitudes on the likelihood of searching and switching is similar in size to that of demographic characteristics like education, home ownership and internet use. In terms of marketing, we find that, on average, while recall of direct communications (i.e. telephone, home visits, approaches in public places, mail and email) has no effect on searching and switching behaviour, recall of advertising (e.g. on internet, newspapers or magazines) is negatively related to switching, while hearing of better deals from friends or family has a positive relationship with activity. We also show evidence of consumer heterogeneity both across and within groups which are defined by similar self reported attitudes. We confirm the strong relationship between searching/switching and expected gains for respondents who can estimate them and discuss the implications of regulatory policy which might limit such gains[5]. These findings both add to knowledge of consumer choice and can inform effective design and delivery of policies to increase consumer engagement, as well as identifying potential limitations of such interventions.

In the next section we present our methodology and describe the data set and variables for our econometric analysis. Section 3 presents the findings for both the full data set and within different subsets of consumers, while section 4 concludes the paper and discusses some implications for suppliers and policy makers in the market.

2. METHODOLOGY AND DATA SET

We model searching and switching in electricity as two different, but potentially related, consumer decisions. We build on the models presented in Giulietti et al. (2005) and Waddams Price and Zhu (2016a), but our approach introduces some significant differences and extensions to those papers. In contrast to Giulietti et al. (2005) and similar to Waddams Price and Zhu (2016a), we identify searching and switching as separate consumer activities; secondly, since we analyse a more mature market, our analysis focusses on consumers who are aware of the possibility of switching

5. Previous changes which restricted potential gains did indeed result in lower engagement and softened competition, for example the non-discrimination clauses (see Hviid and Waddams Price, 2012; Waddams Price and Zhu, 2016b; Competition and Markets Authority, 2016).

electricity provider[6]; and third, to retain the representativeness in our data set and explore the attitude factors introduced in this paper, the first step of our analysis omits consumer expectations about gains and losses, though we explore their influence and check consistency with earlier papers by using these variables for the minority of consumers who can provide such estimates (subsection 3.3). We extend the framework in Waddams Price and Zhu (2016a) in two innovative ways: first we focus on consumers' attitudes to markets, which allows us to capture a novel dimension of consumer behaviour in the retail electricity market; and secondly we explore the role of recalling information on marketing from a range of potential sources.

Our household data set was commissioned as a face-to-face stand-alone survey with a sample of 2537 adults aged 16 and over in Great Britain in January 2011. From the data set we analysed answers from the 1992 respondents who were aware that they had a choice of supplier[7] and were (singly or jointly) responsible for that choice. This analysed sample is representative of the Great Britain population, as shown in Table 7 in the Appendix.

Decisions are modelled as a (potentially) simultaneous search and switching activity: while search often precedes switching, switching may occur if information about a better deal is received and acted upon without confirmatory search. Some consumers may set out to switch, using search to verify a previous intention, while others may look around first, and then be persuaded to switch by the offers they identify. To reflect this potential relationship, we apply a bivariate probit model, so that whether the consumer searches ($y_1 = 1$) and switches ($y_2 = 1$) electricity supplier takes the following form:

$$Pr\left(y_1 = 1, y_2 = 1\right) = \Phi\left(A\beta, M\gamma, X\delta, \rho\right)$$

The vector A includes the consumer's attitudes, the vector M includes information/marketing variables, X includes socio-economic characteristics and experience of switching in other markets, β, γ and δ are the parameters to be estimated, and ρ is the correlation coefficient between the residuals of each of the two probit models.

Dependent variables. As identified in equation (1) above, a binary dependent variable, *search*, takes the value of 1 if the respondent reports that during the last three years she explored the possibility that another electricity supplier could offer a better deal, and takes the value 0 otherwise. A second binary dependent variable, *switch*, takes the value of 1 if the respondent reports having changed electricity supplier during the same period, and takes the value 0 otherwise.[8]

Attitude variables. Our main innovation is to incorporate A, relating activity directly to attitudes to markets in general. For example, consumers who express status quo bias by reporting general loyalty to their current providers, and those who do not check regularly for better deals across markets because they feel time constrained, might be less likely to search/switch electricity providers.

6. In Giulietti et al. (2005) 86% of the consumers were aware of alternative gas suppliers, while in our data set almost 93% of the consumers are aware of alternative electricity suppliers. While unawareness of choices is an interesting aspect of non switching, it suggests different remedies, and we focus only on those who are aware in this paper, to identify appropriate policy interventions for this group of consumers.

7. The 7% of respondents who said they were unaware of choice of supplier are younger, less likely to be working, married or living with a partner, to own their own home, be graduates or have experience of switching other services. Their lack of awareness seems to reflect an earlier stage in the life cycle.

8. We exclude the possibility of changing supplier as a result of moving house since this represents a different decision process.

Respondents were asked how far they agreed with five statements on general attitudes to markets. Each statement had six options (strongly agree, agree, neither agree nor disagree, disagree, strongly disagree, and do not know), and is coded –1 if the respondent disagreed (strongly or unspecified), +1 if she agreed (strongly or unspecified) and 0 if she neither agreed nor disagreed or did not know[9]. A general approach to savings is measured by agreement with the statement "When making bigger purchases (e.g. holidays or furniture) I usually spend quite a lot of time looking around for deals that might save a few pounds" (*big bargain hunter*). To assess time constraints, respondents were asked to rate: "I don't really have the time to spend looking around for deals that might save a few pounds" (*gain/time*) and "Life is too short to keep worrying about whether you are getting the best deal around" (*life too short*). Two statements measured 'loyalty', namely "Once I find a product or service that I think is OK, I tend to stick with it" (*status quo*) and "I would be upset if I purchased a product or service and later found out that I could have got a better deal" (*feel regret*).

The attitudes variables perform two roles in our analysis. Since a primary aim of the paper is to study how strongly consumer attitudes affect searching and switching, we assume that attitudes to markets in general influence the observed search and switching behaviour; therefore attitudes are used as explanatory variables in the searching and switching decision for an electricity supplier (section 3.1).[10] The second role of attitudes is in our consumer group analysis (section 3.2): we use the attitudes variables to identify groups of consumers, each of which reports similar viewpoints, and explore other determinants of consumer activity *within* each such group. Attitudes and market activity are likely to be related to unobservable consumer characteristics, and are both useful as indicators of such characteristics and may provide direct conduits for potential marketing and policy.

Information/marketing variables. Our second innovation, the inclusion of marketing variables, *M*, captures information on whether or not the respondent reported receiving information/marketing from various sources. Each source of information recalled is likely to increase *switching*. *Search* is likely to be stimulated by all such information except, perhaps, direct marketing, where telephone or doorstep approaches might deter active searching (but not switching) if they convinced the householder that a uniquely better deal was available to them at that time.

The sources which respondents were asked about included: advertising by other electricity suppliers (such as on the internet, billboards, newspapers, magazines etc.); direct marketing by telephone or by home visits; approaches in public places; direct mailing (post or email); and information from friends or family about a better deal from another electricity supplier. Each of these is represented by a binary variable where 1 indicates that such communication was received, and 0 that the respondent did not recall any message in this category.

Socio-economic variables. *X* captures those relevant factors, many identified in previous studies (e.g. Waddams Price and Zhu, 2016a), which suggested that younger and older people are more likely to be active than the middle aged, controlling for other factors; gender may play a role; those who live in single adult households are generally less active than those in these markets; higher educational qualifications, budgeting pressures and experience of switching in similar default services may increase activity. People living in rented accommodation generally have less incentive to switch supplier because they expect to enjoy the benefits for a shorter time, and may face additional switching barriers in electricity. Those who use the internet more frequently are likely to

9. The results are robust to categorising these variables on both binary and five point scales. Evidence is available from the authors on request.

10. Although some consumers may change their attitudes after their experience in the electricity markets, we think reverse causality is less likely because our attitude variables refer to 'shopping' in general and so should be more stable and less liable to effects from activity in any individual market.

find it easier to search and switch and so be more active. Our socio-economic variables include *age*, *gender*, *partner status* and *number of adults*; information about whether the house is in a *rural area*, *internet use* and *tenure status* for each respondent is also included. To avoid anticipated reluctance to provide income information, we construct a variable, *proxy income*, to capture the respondent's perception of the tightness of her budget. *Educational achievement* and *employed status* are each included as binary variables. Respondents were also asked whether, during the previous twelve years, they had changed their supplier of various other services, namely mobile telephone, broadband or dial-up internet, fixed-phone line rental, fixed phone calls package, car or home contents insurance, bank account or mortgage. The variable *switch other* takes the value 1 if such a change had been made in any of these markets, and 0 otherwise. Full variable definitions are given in Table 4. Many of these demographic variables could be used by suppliers and policy makers to direct interventions to particular groups.

3. ANALYSIS AND RESULTS

Amongst our sample, 28% reported switching supplier in the previous three years, but 44% of these switchers said they had not actively looked around for better deals. The characteristics of searchers and switchers are shown in Table 8 in the appendix, revealing that the main distinction in average characteristics is between those who searched and those who did not, whether or not such search was accompanied by switching. Compared to non searchers, the searchers are on average younger, more educated, more likely to be married or living with a partner, to be working, to have used the internet in the last week, to be big bargain hunters, have time to and feel it is worth looking around, are less loyal and more likely to feel regret if they have not got the best deal. In contrast to the clear difference between searchers and non searchers, switchers who did not search share broadly similar characteristics with non switching non searchers, and in the next section we explore these differences further.

We first explore the relationship between attitudes and activities for the 'average' consumer (section 3.1); we then divide the sample into three groups, each with similar attitudes, and analyse the relationships between search/switching and other factors within each group (section 3.2). In section 3.3 we introduce expectations to identify their effect and to compare our results with those of earlier studies. Throughout the main text we focus on the marginal effects of each variable on the joint activity of searching and switching.

3.1 The influence of attitudes and marketing on consumer behaviour

Table 1 shows that consumers' search and switching decisions are related to their attitudes to markets[11], controlling for demographic and other variables which are expected to affect switching. Activity is significantly related to each of the five attitudes: those who stick to a good product once they have found it, and those who do not have time to hunt for small savings are less likely to search and switch; while those who feel that life is too short to worry about better deals are less likely to search, but not significantly less likely to switch; those who report spending time looking around for better deals in general are also more likely to search in the electricity market, but not necessarily to switch. Feeling regret at not having got a better deal is weakly associated with more searching.

11. Although the attitudes questions deal with similar attitudes to markets, the correlations between them are all below 0.3, so we included attitudes as separate variables in the relationship between searching and switching and the likely determinants.

Table 1: Results for the Bivariate Probit Mode for searching and switching of 'average' consumer

Variable	Search	Switch	*dy* / *dx*
big bargain hunter	0.177***	0.041	0.027***
gain/time	–0.108***	–0.109***	–0.027***
life too short	–0.120***	–0.028	–0.019**
status quo	–0.291***	–0.253***	–0.067***
feel regret	0.077*	0.060	0.017*
advertising	–0.014	–0.278***	–0.034**
telephone	–0.014	–0.034	–0.006
doorstep	–0.004	0.027	0.003
public place	–0.093	–0.046	–0.017
mail/email	0.082	–0.045	0.005
friend/family	0.426***	0.136*	0.075***
switch other	0.301***	0.341***	0.069***
gender	0.133**	–0.021	0.014
age	0.024*	0.015	0.005*
age^2	–0.0003**	0.000	
education	0.285***	–0.028	0.032**
house area	0.065	0.076	0.017
marital status	0.116	0.078	0.024
employed status	–0.072	–0.091	–0.02
internet use	0.410***	0.207**	0.071***
adults	–0.004	–0.069	–0.009
tenure	0.239***	0.092	0.040***
proxy income	–0.044	–0.044	–0.011
constant	–1.852***	–0.784***	
Full Model:			
Observations	1965		
Prob > chi2	0.000		
Log-likelihood	–2037.4		
$\hat{\rho}$	0.567***		

*,**,*** indicate statistical significance at the 10%, 5% and 1% levels, respectively. *dy* / *dx* is the marginal effect on switching and searching, evaluated at the means of the independent variables.

The magnitude of the marginal effects on the joint search and switching decisions of each of the attitudes is similar in size to that of other discrete independent variables, such as education, tenure and internet use.

In terms of marketing, recall[12] of direct communication channels like telephone calls, home visits and mailing have no effect on searching and switching. On the other hand, recollecting advertising (e.g. on internet, newspapers or magazines) is negatively related to switching and hearing of better deals from friends or family has a positive relationship with activity, particularly with searching, once other factors are controlled for. The positive effect of information from friends or family on activity is expected because consumers usually value the information in the form of 'word-of-mouth' recommendations from people they know and trust when making purchases;[13] this is particularly likely in a context where consumers may find it difficult to know who and what to

12. While consumer recall of marketing is undoubtedly imperfect, Table 8 in the appendix shows that respondents recollect a substantial amount of activity in each category.

13. See, for instance, Nielsen Global Survey of Trust in Advertising.

trust among the overwhelming amount of information available from mixed sources. The negative relationship between marketing campaigns and switching can be explained differently. One possibility is that consumers value traditional advertising channels, like newspapers or magazines, less than recommendations from friends or family: the more consumers use friends and relatives, the less they respond to advertising (see for instance: Nelson, 1970; Bagwell, 2007). We also note that the negative effect of advertising is only significant within the loyal group, who may disproportionately display such characteristics (section 3.2). Other characteristics which are positively related to searching or switching electricity supplier include: being male, having a postgraduate degree, having used the internet in the previous week, owning one's home and having switched other (specified) products in the previous twelve years. Age has a weak *inverted* U-shaped relationship with searching, with most searching at around 40 years old.[14,15] The significance and the positive sign of $\hat{\rho}$ indicate that the searching and switching decisions are directly linked, and related to variables not included in the analysis.

Given the differences between searchers and non searchers established above, we consider separately the factors associated with switching for each of these groups (Tables 9 and 10 in the appendix). The negative relationship between switching and insufficient time observed for all respondents in Table 1 is significant only for non searchers, while that between sticking with satisfactory products is observed only amongst searchers, emphasising the difference between the two sets of consumers.

It is difficult to obtain information on consumers' previous expectations about their search and switching decisions. For example, Waddams Price and Zhu (2016a) report that only about half the respondents were able to provide estimates of how much they expected to gain from changing provider and how long they thought searching and switching would take. They show that anticipated gains of switching is an important factor for consumer activity for those consumers who can provide the estimates, but we do not know how far this is generalisable to other 'less informed' consumers. We decided to retain greater generality by omitting anticipated gains in our pooled data because relatively few respondents were able to provide such information. This omission can bias the reported effects of those factors included in Table 1. However in section 3.3 we find that among those consumers who could report expectations the attitudes, demographics and marketing variables have similar effects on searching and switching with and without the expected gains variables (see Tables 4 and 5), which reassures us that such biases are small.

To identify how far the innovative variables of marketing recall and attitudes add to the results of previous literature relating search and switching activity with only demographic variables, we repeated the analysis omitting marketing recall and attitudes. The result is shown in Table 11 in the appendix. Those demographic characteristics which are associated with activity at a significance level of 5% or above retain this relationship (at least at 10% significance) when the new variables are added, indicating the additional value of including marketing recall and attitudes to observable consumer characteristics in explaining consumer activity; and the overall fit (as indicated by the Log-likelihood value) of the model is better with the additional variables.

14. Other studies have found that the middle aged are less rather than more active than the young and the old, partly because of lower expectations of gains (where these were included in the analysis) amongst older people (see Waddams Price and Zhu, 2016a).

15. We have undertaken a number of robustness checks, including different categorisation for socio-economic, information/marketing and attitudes variables, which are available from the authors on request. None of these differences affects the qualitative results.

Table 2: Mean characteristics of each group

Consumer groups:	Shoppers	Time-poor	Loyal	Full Sample
Attitudes used for grouping				
big bargain hunter	0.97	0.99	0.06	0.63
gain/time	–0.80	0.99	0.31	0.09
life too short	0.01	0.44	0.77	0.41
status quo	0.68	0.86	0.94	0.83
feel regret	0.93	0.89	–0.11	0.52
Activity in the electricity market - proportion who had:				
searched	0.41	0.29	0.19	0.290
switched	0.37	0.26	0.23	0.286
Number of observations	*708*	*522*	*762*	*1992*

Having established the clear relationship between attitudes to markets in general and consumer activity in electricity, and differences when respondents are subdivided according to search activity, we explore differences in behaviour both within and between groups further by using cluster analysis to divide the sample into groups, each group determined by similarity of attitudes.

3.2 Division into consumer groups and energy market activity within each group

We use Ward's method[16] to identify three groups of consumers,[17] whom we denote 'Shoppers', 'Time-poor' and 'Loyal'. Table 2 shows the mean values of attitudes (which have a three point scale, –1, 0, +1) and activity in each group.

'Shoppers' are the least loyal customers, who have time to spend looking for better deals. They are younger, include more women, and experience more income pressure than the other groups (see Table 12).[18] The 'Time-poor' customers also look for bargains but experience greater time pressure; they are more likely to be graduates and employed than the other groups. The third, 'Loyal', group believe that life is too short to worry about getting the best deal; they are older, feel least income pressure and are least likely to have used internet in the previous week. The 'Loyal' group also recalled less general advertising from other suppliers, and reported less switching in other markets. Searching is least prevalent among the 'Loyal' consumers, but this group is no less likely to switch for better deals than those who are 'Time-poor'.[19] Having established the relationship between the

16. This is a standard hierarchical agglomerative linkage method, in which the fusion of two clusters is based on the size of an error sum-of-squares criterion. Intuitively, respondents in a group share common attitudes or the respondents are similar to one another according to their attitudes to markets, and differ from respondents in other groups. For details see Everitt et al. (2011). We tested the robustness of the results by clustering using the alternative methodology of k-means clustering and found that the qualitative results with both clustering methods are similar; details available from the authors on request.

17. We have identified at most three groups of different consumers for two main reasons. First, given the structure of the survey questionnaire and the definition of attitudes variables, the clustering algorithm is more efficient in identifying those consumers who have similar attitudinal responses around –1, 0 or 1. Second, a larger number of groups would have reduced the number of observations for the within-groups analysis, which would reduce the efficiency of the parameter estimations.

18. Our comparison of the groups in the main text and in the Appendix are restricted to variables which are different at 1% level of significance.

19. There are clear similarities to the 6 groups which Ofgem identified earlier in their Energy Supply Probe (2008) in particular between our 'Loyal' and their 'loyalists' and our 'Shoppers' and their 'confident deal seekers', which provides reassuring consistency, though not direct comparability since Ofgem's objective and methodology for dividing the groups differ from ours.

level of activity in the electricity market and general attitudes to purchasing, we explore the differences between the groups further by undertaking a separate biprobit analysis to identify which factors were related to these (different) activity levels *within* each group. The apparently perverse relationship between recalling general advertising and switching is attributable to its effects only amongst 'Loyal' users; while receiving offers by mail or email is associated with joint activity only among the 'Time-poor'. Despite the different characteristics of the groups, Table 14 shows that internet use and switching in other markets continue to be related to the joint activity of searching and switching electricity within all groups. However, even for these factors, relationships vary between the groups: internet use is related to searching in all groups, but only to switching for the 'Shoppers'; and experience of switching other products is more weakly associated with activity for the 'Loyal' than the other groups.

Graduates in all three groups are more likely to search, but the relationship is weaker among the 'Loyal' respondents. Gender and age variations are associated with searching differences in the electricity market only amongst 'Shoppers'; only within the 'Time-poor' group is feeling income constrained associated with more searching and switching, and only in this group are those without a job more likely to switch (though the 'Time-poor' feel less income pressure, on average, than the shoppers); home ownership shows a positive relationship with searching amongst 'Shoppers' and joint activity amongst the 'Time-poor' but not within 'Loyal' consumers.

3.3 Expected gains and losses

Previous research has shown the importance of anticipated savings and time taken to find a better deal and change supplier in motivating market activity, but (as in previous studies) including these expectations in our analysis necessarily excludes over half our representative sample, because so few consumers were able to provide the relevant estimates. Such ability to give these estimates itself identifies another important subset of consumers, whom we label 'informed'.[20] Descriptive statistics for those who are and are not able/willing to provide estimates of gain and pain are shown in Table 13; this informed set both searched and switched more than the group as a whole, and they were more likely to hold the attitudes generally associated with activity in the market.

The results of the biprobit analysis for the more informed set are shown in Table 4. Even without introducing additional variables, associations between activity and demographic, marketing and attitudes variables differ for this subgroup. While Tables 1 and 4 show a similar overall pattern, the smaller sample size results in some lower levels of statistical significance. The marginal effects of being a big bargain hunter, being time constrained and sticking with the status quo all show larger marginal effects in their relation with searching and switching, but two of these demonstrate lower levels of statistical significance; while tenure, feeling regret at poor purchases and feeling that life is too short to pursue the best deal are no longer statistically significant. Relationships between activity and other factors show a similar pattern, with lower levels of significance associated with seeing advertising, receiving information from friends and family, age, education, and switching experience in other markets.

To compare our results with other studies we repeat the bivariate probit analysis on this subset of informed consumers while controlling for their expectations. Specifically, we add to our base model (results in Table 4) the expected gains of switching (before and after searching), how

20. These consumers may, of course, simply be more confident (perhaps over confident) in providing estimates. There may also be doubts about the ability of consumers to recall their expectations at different stages of the searching and switching process, in some cases as long as three years previously.

Table 3: Results for the Bivariate Probit Model for searching and switching within groups

	Shoppers			Time-poor			Loyal		
Variable	Search	Switch	*dy / dx*	Search	Switch	*dy / dx*	Search	Switch	*dy / dx*
advertising	0.116	–0.181	–0.010	0.001	–0.198	–0.010	–0.097	–0.410***	–0.066**
telephone	–0.058	–0.088	–0.024	0.075	–0.115	0.000	0.002	0.063	0.008
doorstep	–0.219*	0.105	–0.017	–0.107	–0.113	–0.014	0.127	–0.006	0.015
public place	–0.113	–0.074	–0.030	0.023	–0.112	–0.004	–0.108	0.032	–0.009
mail/email	0.255**	–0.222**	0.001	0.224	0.296**	0.033*	–0.116	–0.097	–0.027
friend/family	0.377***	0.158	0.090**	0.606***	0.096	0.059**	0.486***	0.177	
0.088***									
switch other	0.656***	0.339*	0.136***	0.195	0.539***	0.037**	0.204	0.216	0.049*
gender	0.236**	–0.044	0.030	0.126	–0.090	0.005	0.160	0.096	0.032
age	0.047**	0.032	0.013**	0.044	0.020	0.004	0.009	0.007	0.002
age^2	–0.0005**	–0.0004*	0.000	0.000		0.000	0.000		
education	0.336***	–0.172	0.018	0.538***	0.088	0.051**	0.199*	0.123	0.042*
house area	0.133	0.118	0.040	0.097	0.328	0.022	0.085	–0.081	0.001
marital status	0.114	0.099	0.034	0.195	0.133	0.021	0.011	0.037	0.006
employed status	0.040	0.007	0.008	–0.268	–0.434**	–0.040**	–0.098	–0.076	–0.022
internet use	0.532***	0.338**	0.127***	0.475**	0.115	0.041**	0.359***	0.186	
0.064***									
adults	–0.101	–0.096	–0.032*	0.022	–0.070	–0.002	0.064	–0.037	0.003
tenure	0.352**	0.087	0.069**	0.292	0.260	0.032*	0.185	0.047	0.029
proxy income	–0.015	–0.023	–0.006	–0.239***	–0.181**	–0.027***	–0.014	0.006	–0.001
constant	–2.723***	–1.168**	–2.704***	–1.362**	–1.562***	–0.778			
Full Model:									
Observations	646		502		817				
Prob > chi2	0.000		0.000		0.000				
Log-likelihood	–409.7		–237.3		–458.6				
$\hat{\rho}$	0.498***		0.576***		0.648***				

*,**,*** indicate statistical significance at the 10%, 5% and 1% levels, respectively. *dy / dx* is the marginal effect on switching and searching, evaluated at the means of the independent variables.

Table 4: Results for the Bivariate Probit Model for searching and switching of 'informed' consumers

Variable	Search	Switch	*dy* / *dx*
big bargain hunter	0.203**	0.089	0.052**
gain/time	–0.071	–0.109**	–0.033**
life too short	–0.118**	0.085	–0.005
status quo	–0.266***	–0.280***	–0.099***
feel regret	0.033	0.007	0.007
advertising	0.036	–0.272**	–0.043
telephone	–0.057	–0.160	–0.039
doorstep	–0.112	–0.103	–0.039
public place	–0.086	0.045	–0.007
mail/email	0.085	–0.007	0.014
friend/family	0.299***	–0.142	0.021
switch other	0.285*	0.151	0.073*
gender	0.205**	–0.103	0.017
age	0.003	–0.028	–0.005
age^2	0.000	0.000	
education	0.228**	–0.178*	0.004
house area	0.071	0.082	0.027
marital status	0.042	0.102	0.026
employed status	–0.104	–0.013	–0.021
internet use	0.294**	0.250*	0.091***
adults	0.017	0.010	0.005
tenure	0.088	–0.042	0.008
proxy income	–0.004	–0.036	–0.007
constant	–0.871*	0.554	
Full Model:			
Observations	812		
Prob > chi2	0.000		
Log-likelihood	–1026.9		
$\hat{\rho}$	0.333***		

*,**,*** indicate statistical significance at the 10%, 5% and 1% levels, respectively. *dy* / *dx* is the marginal effect on switching and searching, evaluated at the means of the independent variables.

confident the respondent had been in those expected gains, expected searching and switching times and expectations about ease or difficulty of the searching/switching process: variable definitions are provided in Table 6. The results (in Table 5) show that, as in previous studies, expected gain is significantly associated with both searching and switching, but at a declining rate, so that increases in expected gains have less effect at high levels of gains than at lower levels. Confidence in such gains is also positively associated with market activity. In contrast, anticipated time required to search and switch does not have a strong relationship with whether the respondent reports that such activities have occurred. Comparison between Tables 5 and 4 shows that controlling for these expectations has little effect on the relationships of other variables to searching and switching.

We also explore the effect of controlling for anticipated savings and time taken to find a better deal and change supplier within each of the three groups, with the results shown in table 10. This analysis not only shows the consistency between our findings and previous similar work, but also the importance of distinguishing between more and less well informed/confident consumers. The only consistently significant relationship with activity across all three (informed) subgroups is

Table 5: Results for the Bivariate Probit Model for searching and switching of 'informed' consumers, controlling for expectations

Variable	Search	Switch	*dy* / *dx*
big bargain hunter	0.215**	0.116	0.058**
gain/time	–0.078	–0.113**	–0.034**
life too short	–0.095	0.138**	0.009
status quo	–0.257***	–0.268***	–0.094***
feel regret	0.022	–0.014	0.001
advertising	0.061	–0.209*	–0.027
telephone	–0.017	–0.108	–0.023
doorstep	–0.095	–0.071	–0.030
public place	–0.108	0.076	–0.005
mail/email	0.090	0.018	0.019
friend/family	0.250**	–0.294**	–0.018
switch other	0.297*	0.116	0.069*
gender	0.198**	–0.145	0.007
age	0.003	–0.027	0.001
age^2	0.000	0.0004*	
education	0.270**	–0.148	0.017
house area	0.099	0.068	0.029
marital status	0.052	0.089	0.025
employed status	–0.092	–0.008	–0.017
internet use	0.255*	0.228	0.080**
adults	0.015	0.006	0.004
tenure	–0.001	–0.127	–0.024
proxy income	–0.004	–0.031	–0.006
switchgainpresearch	0.003***	0.0004***	
switchgainpresearch^2	–0.000003***		
switchgainpreswitch	0.005***	0.0008***	
switchgainpreswitch^2	–0.000003***		
presearchextime	0.001*	0.0001*	
preswitchextime	0.000	0.000	0.000
presearchexeasy	0.171	0.03	
preswitchexeasy	0.111	0.198	0.000
confidpresearch	0.120	0.021	
confidpreswitch	0.319***	0.059***	
constant	–1.530***	–0.332	
Full Model:			
Observations	812		
Prob > chi2	0.000		
Log-likelihood	–970.8		
$\hat{\rho}$	0.271***		

*,**,*** indicate statistical significance at the 10%, 5% and 1% levels, respectively. *dy* / *dx* is the marginal effect on switching and searching, evaluated at the means of the independent variables.

the positive one between anticipated gains and switching, confirming earlier work which includes these factors. But, even here, the marginal effect varies between groups, and is almost twice as high for 'Shoppers' as for the 'Time-poor', where it is, in turn, twice as high as for those in the 'Loyal' group. Moreover, variations in confidence in the gain have a significant effect on search and switch only for the 'Time-poor'. Table 15 shows what would happen to the likelihood of searching and switching if the mean of expected gains halves in each group.

Our results are subject to some limitations. There might be information bias, especially if recall of search activity is greater for participants who later took active steps like switching; such bias would result in underestimating the number of respondents who searched and did not switch, so our findings on the search side would represent an upper bound. However, in support of our bivariate probit approach, the correlation coefficient between the residuals of each of the two probits, $\hat{\rho}$, is statistically significant and positive, confirming that there are unobserved factors which affect both searching and switching decisions.

4. CONCLUSION AND POLICY IMPLICATIONS

We contribute to the literature on consumer choice by presenting empirical evidence of the role of consumers' attitudes and different marketing communications on searching and switching behaviour in the retail electricity market. Our analysis not only improves the understanding of the factors explaining search and switching for the 'average' consumer but also presents evidence of consumer heterogeneity across groups of consumers with similar attitudes to markets. This new evidence both reflects and informs the policy debate, with its increasing focus on the distinction between active and inactive consumers; and has important implications for policy makers and suppliers on how to stimulate activity levels, and who is likely to benefit and lose from such campaigns, as we discuss below. We first summarise the main results, and then explore the policy implications in more detail.

Our first major result is that, in addition to confirming the few demographic characteristics which seem to determine engagement in the electricity market, searching and switching behaviour are significantly associated with consumers' attitudes to markets. In particular, those who stick to a good product once they have found it, and those who do not have time to hunt for small savings are less likely to search and switch; while those who feel that life is too short to worry about better deals are less likely to search, but not significantly less likely to switch; those who report spending time looking around for better deals in general are also more likely to search in the electricity market, but not necessarily to switch.

Our attitudes variables (i.e. big bargain hunter, gain/time, life is too short, status quo and feel regret) not only improved the explanatory power of the model for the 'average' consumer (see Table 1) but they also allowed us to identify three groups of consumers (namely 'Shoppers', 'Time-poor' and 'Loyal'). The differences in their search and switching behaviours both between and within groups constitute our second main finding. This is an important aspect because aggregate levels of engagement (whether regarded as high or low) hide a considerable variety of consumer response. Our separation into different groups also helps to identify some associations which are not evident across the sample as a whole; for example activity is associated with receiving mail or email only within the 'Time-poor' group.

Our third main result is that recollection of direct marketing channels (e.g. telephone calls, home visits and mailing) has little effect on searching and switching. On the other hand, while recall of general advertising (e.g. on internet, newspapers or magazines) seems to have a negative effect on switching, advice from family and friends is associated with greater searching (but not switching alone).

Our fourth finding confirms previous evidence that activity in the energy market is strongly associated with having switched other providers and that anticipated gains are strongly and positively associated with searching and switching amongst those consumers who are sufficiently informed and confident to provide estimates. The minority who could provide estimates of expected gains and time to switch represent a more active group of respondents who are more than twice

as likely to have both searched and switched as others. This continuity indicates that the findings related to the attitudes and marketing variables are consistent with previous literature in this area.

In policy terms, these findings can identify the best way of communicating messages, both in terms of tailoring the content of the messages (through the association between attitudes and activity) and identifying channels most likely to reach different groups (through recall of marketing). For example, the association between searching activity and being a big bargain hunter confirms that consumers who self identify as bargain hunters are likely to respond by more search to messages of potential savings; while it may be more effective to emphasise reductions in the time required for switching to those who feel that life is too short to stimulate their searching; and advertise 'cooling off' periods for those who feel regret at making the 'wrong' decisions. Our findings identify the statistical significance and strength of such 'intuitive' relationships.

One particularly policy relevant association is between activity and receiving mail or email, which is statistically significant only within the 'Time-poor' group. This group may be particularly responsive to the CMA's proposed remedy to stimulate postal marketing by making available to competing suppliers a database of those who haven't switched in the previous three years. However the absence of association between recalling such communication and energy activity amongst the 'Loyal' group, which contains the highest proportion of consumers who have not switched, suggests some limitations to the policy for those whom the initiative might most hope to reach. Similarly, some relationships, for example internet use, which hold across the group as a whole, apply differently within each of the subgroups. Internet use in the previous week is associated with greater searching in all three subgroups, but with switching activity per se only among the 'Shoppers', where its overall effect is also stronger. These findings suggest that internet based remedies may be particularly effective amongst those who are already active, rather than stimulating activity among the less engaged. These comparisons emphasise the importance of a variety of messages and communication channels, tailored to the characteristics and attitudes of the different groups.

Moreover our distinction between how searching and switching are separately, as well as jointly, related to different factors, enables further refinement in identifying the best opportunities to stimulate less active groups. Most of the associations with overall activity are driven by the relationship with searching, so targeting this behaviour is likely to be more effective in stimulating engagement in the market, particularly amongst older people and via greater internet use. For example, we note from Table 1 that both bargain hunters and those who feel regret at poor decisions are more likely to search than others, but their switching activities alone do not demonstrate a direct relationship to their attitudes. So to stimulate activity further amongst these groups, messages might focus on both identifying and being confident in finding a good deal. In contrast, a similar sized overall effect on searching and switching among those who felt they did not have time to seek good deals for small savings results from less activity in both searching and switching: engagement by those reporting this attitude may be more effectively increased by a message which would jointly stimulate both activities. An even larger negative relationship with both searching and switching is associated with preferring to stick to the status quo. If it is difficult to engage consumers who hold this view, a more radical approach may be called for here, perhaps introducing an opt-out form of collective switch as the new status quo, to deliver better outcomes to this group.

Designing and targeting tailored policies for different groups to encourage consumer engagement raises questions both of how best to improve the functioning of the market as a whole and which consumers are likely to benefit or lose as a result. Should potential policy or advertising campaigns be aimed at those who are already active (typified by our informed 'Shoppers'), to increase the frequency and effectiveness of their activity? or at those who are semi-engaged, and search and switch occasionally (the 'Time-poor'), to encourage them to do so more often? or at those who are

disengaged ('Loyal'), to bring them into the market? While our analysis has focused on consumer response, actions to stimulate activity will have repercussions both in terms of supply side response and market outcome. The current differentiation in pricing by suppliers between those who are more or less responsive to price offers may be sharpened by focusing on either the usually or occasionally active, increasing the gap between them and the relatively non participative, and perhaps enabling companies to differentiate even further between their offers to engaged and disengaged consumers. An alternative approach, engaging the inactive, might reduce demarcation between the groups and lead to less price discrimination, which many policy makers would welcome, though effective policies to engage the 'hard to reach' have proved expensive. If the objective is to reduce price discrimination, or to protect the inactive (either per se, or because they include a high proportion of those who are seen as vulnerable), then seeking to engage them directly may be the most appropriate policy, despite an anticipated high cost for relatively little response. This cost will, eventually, be recovered from consumers, including those who are the object of the policy. Our new evidence on the heterogeneity of consumer response informs such choices and indicates areas for further research to refine our findings and stimulate activity. However the findings of this paper raise questions about whether consumer response can be encouraged sufficiently to remove the Adverse Effect on Competition identified by the CMA. If such response is to be a major instrument to improve the market, the appropriate strategy for engaging customers depends on whether the objective is to enhance outcomes on average or to improve them for particular groups.

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APPENDIX

Table 6: Variable Definitions

Variable	Definition
search	=1 if the respondent explored deals available at other electricity suppliers in the last three years, 0 otherwise.
switch	=1 if the respondent changed electricity supplier in the last three years, 0 otherwise.
big bargain hunter	When making bigger purchases (e.g. furniture or holiday) I usually spend quite a bit of time looking around for deals that might save a few pounds. =1 if agree or strongly agree, =0 neither agree nor disagree, =–1 if disagree or strongly disagree.
gain/time	I don't really have the time to spend looking around for deals that might save a few pounds. =1 if agree or strongly agree, =0 neither agree nor disagree, =–1 if disagree or strongly disagree.
life too short	Life is too short to keep worrying about whether you are getting the best deal around. =1 if agree or strongly agree, =0 neither agree nor disagree, =–1 if disagree or strongly disagree.
status quo	Once I find a product or service that I think is OK, I tend to stick with it. =1 if agree or strongly agree, =0 neither agree nor disagree, =–1 if disagree or strongly disagree.
feel regret	I would be upset if I purchased a product or service and later found out that I could have got a better deal. =1 if agree or strongly agree, =0 neither agree nor disagree, =–1 if disagree or strongly disagree.
same price	There isn't much point in changing electricity supplier because you end up paying pretty much the same whoever you are with. =1 if agree, =0 neither agree nor disagree, =–1 if disagree.
regular search	I regularly check the deals available at other electricity suppliers to be sure that I am not paying more than I need to. =1 if agree or strongly agree, =0 neither agree nor disagree, =–1 if disagree or strongly disagree.
enjoy search	I enjoy looking around for good deals. =1 if agree or strongly agree, =0 neither agree nor disagree, =–1 if disagree or strongly disagree.
advertising	=1 if respondent reports seeing advertising from other suppliers, 0 otherwise.
telephone	=1 if respondent reports contact by telephone from other suppliers, 0 otherwise.
doorstep	=1 if respondent reports visit at home from other suppliers, 0 otherwise.
public place	=1 if respondent reports contact in public place by other suppliers, 0 otherwise.
mail/email	=1 if respondent reports receiving postal mail or email from other suppliers, 0 otherwise.
friend/family	=1 if respondent reports being told about possible better deals by friends or family, 0 otherwise.
switch other	=1 if respondent has changed provider in another market (e.g. mobile, broadband internet, car insurance, bank account, etc.) in the last twelve years, 0 otherwise.
gender	=1 if male, 0 otherwise.
age	in years.
education	=1 if degree, postgraduate, etc., =0 if less than degree level.
house area	=1 if non-rural, =0 if rural.
marital status	=1 if married or living with partner, =0 if single or widowed or separated or divorced.
employed status	=1 if working (part-time or full-time), =0 if not working.
adults	Number of adults in the household.
internet use	Whether internet has been used last week. =1 if yes, =0 if less than last week.
tenure	=1 own home with or without morgage, = 0 if not.
proxy income	Household budget availability. =1 if very tight, =2 if tight, =3 if comfortable, =4 if very comfortable.
switchgainpresearch	Amount of money (£) respondent believed she could save per year by changing supplier before looked around for better deal.
switchgainpreswitch	Amount of money (£) respondent believed she could save per year by changing supplier.
presearchextime	Amount of time (in minutes) consumer believed it would take to find out about the deals available at other suppliers.
preswitchextime	Amount of time (in minutes) consumer believed it would take to change supplier.
presearchexeasy	How easy/difficult search is expected to be before search. =1 if very easy and fairly easy, or =0 if fairly difficult and very difficult.
preswitchexeasy	How easy/difficult switch is expected to be before switch. =1 if very easy and fairly easy, or =0 if fairly difficult and very difficult.
confidpresearch	=1 if before search the respondent is confident about amount she expected to save per year to the nearest 5 by changing supplier, 0 otherwise.
confidpreswitch	=1 if before switch the respondent is confident about amount she expected to save per year to the nearest 5 by changing supplier, 0 otherwise.

Table 7: Characteristics of the Full Sample and National Statistics

Variable	CCP Consumer Survey	National Statistics
gender	0.48	0.49
median age for those over 16	51.12	45–54
education	0.28	0.27
house area	0.86	0.82
marital status	0.65	0.52
employed status	0.53	0.54
internet use	0.73	0.77*
tenure	0.67	0.67
switched in last 3 years	0.29	0.33**

* Internet use: 77% of the households in Great Britain had an internet connection in 2011.

** This figure is based on Ofgem's (2011) retail market review figure 2.6, which indicates that the annualised market churn of the incumbents was 11% in 2010. This is consistent with Ipsos MORI's surveys which showed that 19% of customers switched electricity supplier in 2008, and 18% in 2010 (Ipsos MORI, 2014), and allowing for active consumers switching several times.

Table 8: Mean characteristics by activity undertaken

	Search & Switch		Search & No Switch		No Search & Switch		No Search & No Switch		t Test	
Variable	Obs	Mean (1)	Obs	Mean (2)	Obs	Mean (3)	Obs	Mean (4)	(1) vs (2)	(3) vs (4)
big bargain hunter	322	0.79	257	0.82	249	0.61	1,164	0.55	not sig	not sig
gain/time	322	–0.11	257	–0.08	249	–0.02	1,164	0.21	not sig	***
life too short	322	0.18	257	0.12	249	0.43	1,164	0.53	not sig	**
status quo	322	0.61	257	0.74	249	0.86	1,164	0.90	**	not sig
feel regret	322	0.63	257	0.65	249	0.57	1,164	0.45	not sig	**
advertising	322	0.61	257	0.80	249	0.59	1,164	0.66	***	**
telephone	322	0.36	257	0.41	249	0.35	1,164	0.39	not sig	not sig
doorstep	322	0.50	257	0.61	249	0.58	1,164	0.54	***	not sig
public place	322	0.28	257	0.35	249	0.31	1,164	0.29	*	not sig
mail/email	322	0.43	257	0.53	249	0.37	1,164	0.41	***	not sig
friend/family	322	0.25	257	0.29	249	0.16	1,164	0.16	not sig	not sig
switch other	322	0.89	257	0.92	249	0.88	1,164	0.76	not sig	***
gender	322	0.49	257	0.55	249	0.44	1,164	0.47	not sig	not sig
age	322	46.82	257	49.35	249	52.32	1,164	52.45	**	not sig
education	322	0.38	256	0.41	249	0.20	1,162	0.24	not sig	not sig
house area	322	0.88	257	0.89	249	0.88	1,164	0.85	not sig	not sig
marital status	322	0.72	257	0.74	249	0.61	1,164	0.61	not sig	not sig
employed status	322	0.60	257	0.63	249	0.48	1,164	0.50	not sig	not sig
internet use	322	0.89	257	0.87	249	0.69	1,164	0.66	not sig	not sig
adults	322	2.12	257	2.07	249	1.87	1,164	1.97	not sig	*
tenure	322	0.73	257	0.77	249	0.66	1,164	0.64	not sig	not sig
proxy income	318	2.50	252	2.60	247	2.51	1,151	2.56	not sig	not sig
expected gains of switching	251	125.88	202	88.67	190	120.72	452	45.88	***	***
expected time of searching	295	89.27	234	89.03	212	73.18	842	63.95	not sig	not sig
expected time of switching	291	65.88	238	79.42	229	55.62	820	61.91	not sig	not sig

*,**,*** indicate statistical significance at the 10%, 5% and 1% levels, respectively, while not sig indicates no statistical significance.

Table 9: Probit of switching (switch =1) amongst searchers and non-searchers

	Searchers (search =1)		Non-Searchers (search =0)	
Variable	Coefficient	*dy* / *dx*	Coefficient	*dy* / *dx*
big bargain hunter	–0.068	–0.027	–0.002	0.000
gain/time	–0.018	–0.007	–0.127***	–0.031***
life too short	0.079	0.031	–0.046	–0.011
status quo	–0.266***	–0.105***	–0.127	–0.032
feel regret	–0.007	–0.003	0.067	0.016
advertising	–0.494***	–0.189***	–0.198**	–0.051**
telephone	0.055	0.022	–0.095	–0.023
doorstep	–0.075	–0.029	0.085	0.021
public place	–0.084	–0.033	0.039	0.010
mail/email	–0.075	–0.029	–0.065	–0.016
friend/family	–0.118	–0.047	0.018	0.004
switch other	–0.171	–0.066	0.428***	0.094***
gender	–0.118	–0.047	–0.041	–0.010
age	–0.047*	–0.018*	0.036**	0.009*
age^2	0.0004		–0.0003**	
education	–0.160	–0.063	–0.163	–0.039
house area	–0.039	–0.015	0.117	0.028
marital status	–0.121	–0.047	0.128	0.031
employed status	–0.149	–0.059	–0.053	–0.013
internet use	0.190	0.075	0.080	0.020
adults	0.101	0.040	–0.165***	–0.041***
tenure	0.044	0.018	0.003	0.001
proxy income	–0.065	–0.026	–0.020	–0.005
constant	2.395***		–1.681***	
Full Model:				
Observations	569		1396	
Prob > chi2	0.000		0.000	
Log-likelihood	–364.3		–620.6	

*,**,*** indicate statistical significance at the 10%, 5% and 1% levels, respectively. *dy* / *dx* is the marginal effect on switching and searching, evaluated at the means of the independent variables.

Table 10: Probit of searching (search =1) amongst switchers and non-switchers

	Switchers (switch =1)		Non-Switchers (switch =0)	
Variable	Coefficient	*dy* / *dx*	Coefficient	*dy* / *dx*
big bargain hunter	0.160*	0.063*	0.173**	0.038**
gain/time	–0.028	–0.011	–0.132***	–0.029***
life too short	–0.042	–0.017	–0.185***	–0.040***
status quo	–0.265**	–0.104**	–0.260***	–0.056***
feel regret	0.015	0.006	0.116*	0.025*
advertising	–0.011	–0.004	0.193*	0.040*
telephone	0.071	0.028	–0.013	–0.003
doorstep	–0.162	–0.063	0.081	0.018
public place	–0.211	–0.083	–0.024	–0.005
mail/email	0.170	0.066	0.084	0.018
friend/family	0.334**	0.128**	0.485***	0.124***
switch other	–0.234	–0.090	0.443***	0.083***
gender	0.198	0.077	0.178**	0.039**
age	–0.034	–0.013	0.053***	0.012***
age^2	0.000		–0.0005***	
education	0.436***	0.167***	0.316***	0.075***
house area	–0.034	–0.013	0.058	0.012
marital status	–0.069	–0.027	0.156	0.033
employed status	–0.147	–0.057	0.035	0.008
internet use	0.525***	0.207***	0.256**	0.053**
adults	0.231***	0.091***	–0.076	–0.017
tenure	0.355**	0.140**	0.146	0.031
proxy income	–0.067	–0.026	–0.013	–0.003
constant	0.407		–3.226***	
Full Model:				
Observations	565		1400	
Prob > chi2	0.000		0.000	
Log-likelihood	–339.8		–553.8	

*,**,*** indicate statistical significance at the 10%, 5% and 1% levels, respectively. *dy* / *dx* is the marginal effect on switching and searching, evaluated at the means of the independent variables.

Table 11: Comparisons of Models

	Demographics only Model			Demographics + Marketing			Demographics + Marketing + Attitudes		
Variable	Search	Switch	*dy / dx*	Search	Switch	*dy / dx*	Search	Switch	*dy / dx*
gender	0.132**	–0.025	0.014	0.135**	–0.023	0.015	0.133**	–0.021	0.014
age	0.026**	0.017	0.005**	0.026**	0.014	0.005**	0.024*	0.015	0.005*
age^2	–0.0003***	–0.0002*		–0.0003**	0.000		–0.0003**	0.000	
education	0.282***	0.000	0.036**	0.298***	–0.004	0.037**	0.285***	–0.028	0.032**
house area	0.088	0.087	0.02	0.091	0.100	0.023	0.065	0.076	0.017
marital status	0.134*	0.087	0.028*	0.120	0.084	0.025	0.116	0.078	0.024
employed status	–0.089	–0.125*	–0.027*	–0.106	–0.119	–0.029*	–0.072	–0.091	–0.020
internet use	0.512***	0.268***	0.091***	0.463***	0.232***	0.081***	0.410***	0.207**	0.071***
adults	–0.007	–0.059	–0.010	0.004	–0.063	–0.007	–0.004	–0.069	–0.009
tenure	0.307***	0.150*	0.056***	0.269***	0.113	0.047***	0.239***	0.092	0.040***
proxy income	–0.061*	–0.050	–0.014*	–0.062*	–0.054	–0.015**	–0.044	–0.044	–0.011
advertising				0.020	–0.259***	–0.028*	–0.014	–0.278***	–0.034**
telephone				–0.018	–0.035	–0.007	–0.014	–0.034	–0.006
doorstep				–0.025	0.015	–0.001	–0.004	0.027	0.003
public place				–0.059	–0.032	–0.011	–0.093	–0.046	–0.017
mail/email				0.054	–0.059	0.000	0.082	–0.045	0.005
friend/family				0.466***	0.176**	0.088***	0.426***	0.136*	0.075***
switch other				0.366***	0.382***	0.082***	0.301***	0.341***	0.069***
big bargain hunter							0.177***	0.041	0.027***
gain/time							–0.108***	–0.109***	–0.027***
life too short							–0.120***	–0.028	–0.019**
status quo							–0.291***	–0.253***	–0.067***
feel regret							0.077*	0.060	0.017*
constant	–0.936***	–1.660***		–2.039***	–0.968***		–1.852***	–0.784**	
Full Model:									
Observations		1965			1965			1965	
Prob > chi2		0.000			0.000			0.000	
Log-likelihood		–2133.7			–2090.8			–2037.4	
$\hat{\rho}$		0.582***			0.587***			0.567***	

*,**,*** indicate statistical significance at the 10%, 5% and 1% levels, respectively. *dy / dx* is the marginal effect on switching and searching, evaluated at the means of the independent variables.

Table 12: Characteristics of the groups

	Obs			Mean			Std. Dev.			t Test		
Variable	Shoppers	Time-poor	Loyal	Shoppers (1)	Time-poor (2)	Loyal (3)	Shoppers	Time-poor	Loyal	(1) vs (2)	(2) vs (3)	(1) vs (3)
switched	654	507	831	0.38	0.21	0.26	0.49	0.40	0.44	***	**	***
searched	654	507	831	0.41	0.14	0.29	0.49	0.35	0.45	***	***	***
big bargain hunter	654	507	831	0.97	–0.21	0.87	0.20	0.82	0.44	***	***	***
gain/time	654	507	831	–0.83	0.15	0.79	0.37	0.88	0.54	***	***	***
life too short	654	507	831	0.01	0.64	0.58	0.90	0.69	0.74	***	not sig	***
status quo	654	507	831	0.70	0.93	0.86	0.66	0.34	0.45	***	***	***
feelregret	654	507	831	0.91	–0.07	0.58	0.35	0.84	0.71	***	***	***
same price	654	507	831	0.14	0.81	0.49	0.91	0.50	0.79	***	***	***
regular search	654	507	831	–0.43	–0.85	–0.48	0.86	0.44	0.78	***	***	not sig
advertising	654	507	831	0.70	0.62	0.66	0.46	0.49	0.47	***	*	not sig
telephone	654	507	831	0.37	0.40	0.38	0.48	0.49	0.49	not sig	not sig	not sig
doorstep	654	507	831	0.56	0.57	0.53	0.50	0.50	0.50	not sig	not sig	not sig
public place	654	507	831	0.35	0.26	0.28	0.48	0.44	0.45	***	not sig	***
mail/email	654	507	831	0.43	0.44	0.42	0.49	0.50	0.49	not sig	not sig	not sig
friend/family	654	507	831	0.23	0.15	0.19	0.42	0.36	0.39	***	not sig	**
switch other	654	507	831	0.89	0.73	0.82	0.31	0.45	0.39	***	***	***
gender	654	507	831	0.42	0.53	0.50	0.49	0.50	0.50	***	not sig	***
age	654	507	831	48.34	57.53	49.41	16.24	18.55	16.53	***	***	not sig
educ	654	506	829	0.29	0.22	0.31	0.45	0.42	0.46	**	***	not sig
house area	654	507	831	0.86	0.85	0.87	0.34	0.35	0.34	not sig	not sig	not sig
marital status	654	507	831	0.69	0.56	0.66	0.46	0.50	0.47	***	***	not sig
employed status	654	507	831	0.53	0.41	0.60	0.50	0.49	0.49	***	***	***
internet use	654	507	831	0.80	0.57	0.76	0.40	0.50	0.42	***	***	not sig
adults	654	507	831	2.06	1.88	2.02	0.86	0.83	0.85	***	***	not sig
tenure	654	507	831	0.66	0.67	0.68	0.47	0.47	0.47	not sig	not sig	not sig
proxy income	646	503	819	2.46	2.62	2.57	0.89	0.95	0.95	***	not sig	**
switchgainpresearch	414	239	442	96.70	56.06	89.92	142.49	84.95	121.44	***	***	not sig
switchgainpreswitch	427	240	459	99.93	58.05	95.52	132.29	104.44	136.19	***	***	not sig
presearchextime	559	353	671	76.58	64.82	75.77	110.68	92.76	106.08	*	not sig	not sig
preswitchextime	557	360	661	64.82	61.34	65.65	117.21	96.02	99.75	not sig	not sig	not sig
presearchexeasy	618	445	765	0.81	0.77	0.81	0.39	0.42	0.39	*	*	not sig
preswitchexeasy	620	456	765	0.79	0.75	0.79	0.41	0.43	0.41	not sig	not sig	not sig
confidpresearch	384	201	401	0.75	0.62	0.64	0.44	0.49	0.48	***	not sig	***
confidpreswitch	409	207	422	0.78	0.63	0.67	0.42	0.48	0.47	***	not sig	***

*,**,*** indicate statistical significance at the 10%, 5% and 1% levels, respectively, while not sig indicates no statistical significance.

Table 13: Descriptive Statistics: Consumers who can estimate expectations ('informed') and full sample

	Obs		Mean		Std. Dev.	
Variable	Informed	Full Sample	Informed	Full Sample	Informed	Full Sample
switched	812	1,992	0.43	0.287	0.50	0.45
searched	812	1,992	0.46	0.291	0.50	0.45
big bargain hunter	812	1,992	0.75	0.63	0.61	0.71
gain/time	812	1,992	–0.01	0.09	0.94	0.92
life too short	812	1,992	0.26	0.41	0.89	0.84
status quo	812	1,992	0.76	0.83	0.61	0.51
feel regret	812	1,992	0.62	0.52	0.70	0.75
same price	812	1,992	0.28	0.46	0.89	0.81
regular searcher	812	1,992	–0.41	–0.56	0.84	0.76
advertising	812	1,992	0.69	0.66	0.46	0.47
telephone	812	1,992	0.39	0.38	0.49	0.49
doorstep	812	1,992	0.59	0.55	0.49	0.50
public place	812	1,992	0.34	0.30	0.47	0.46
mail/email	812	1,992	0.45	0.43	0.50	0.49
friend/family	812	1,992	0.22	0.19	0.41	0.39
switch other	812	1,992	0.89	0.82	0.31	0.38
gender	812	1,992	0.51	0.48	0.50	0.50
age	812	1,992	48.76	51.12	15.47	17.38
education	812	1,989	0.33	0.28	0.47	0.45
house area	812	1,992	0.86	0.86	0.35	0.34
marital status	812	1,992	0.71	0.65	0.45	0.48
employed status	812	1,992	0.60	0.53	0.49	0.50
internet use	812	1,992	0.83	0.73	0.38	0.45
adults	812	1,992	2.06	2.00	0.81	0.85
tenure	812	1,992	0.72	0.67	0.45	0.47
proxy income	812	1,968	2.61	2.55	0.92	0.93
switchgainpresearch	812	1,095	96.62	85.09	123.97	124.19
switchgainpreswitch	812	1,126	99.11	89.20	129.11	129.47
presearchextime	812	1,583	78.80	73.61	116.26	104.99
preswitchextime	812	1,578	67.48	64.37	109.32	105.40
presearchexeasy	812	1,828	0.82	0.80	0.39	0.40
preswitchexeasy	812	1,841	0.81	0.78	0.39	0.42
confidpresearch	812	986	0.67	0.68	0.47	0.47
confidpreswitch	812	1,038	0.70	0.70	0.46	0.46

Table 14: Results for the Bivariate Probit Model of searching and switching by sub-group, controlling for expectations

Variable	Shoppers			Time-poor			Loyal		
	Search	Switch	*dy / dx*	Search	Switch	*dy / dx*	Search	Switch	*dy / dx*
advertising	0.034	–0.252	–0.049	–0.197	–0.257	–0.077	0.257	–0.255	0.013
telephone	0.090	–0.056	0.004	0.016	0.162	0.031	–0.315	–0.266	–0.072*
doorstep	–0.308*	0.021	–0.051	0.135	–0.515**	–0.069	–0.175	–0.054	–0.032
public place	–0.159	–0.048	–0.004	0.081	0.310	0.068	–0.106	0.059	–0.010
mail/email	0.206	–0.125	0.009	–0.295	–0.079	–0.056	0.215	0.136	0.047
friend/family	0.316*	–0.266	–0.010	0.374	–0.181	0.014	0.263	–0.412	–0.012
switch other	0.871***	0.683**	0.241***	0.455	0.321	0.106*	- 0.059	–0.459	–0.058
gender	0.311**	–0.173	0.017	0.167	–0.337	–0.035	0.229	0.002	0.034
age	0.019	0.032	0.003	0.004	–0.019	0.0008	–0.026	–0.084**	–0.0004
age^2	0.000	0.000		0.000	0.000		0.000	0.001**	
education	0.668***	–0.178	0.067	0.156	0.129	0.046	–0.112	–0.316	–0.049
house area	0.101	–0.035	0.011	0.382	–0.080	0.045	–0.206	0.233	–0.002
marital status	0.313	0.188	0.096*	–0.156	0.242	0.023	–0.299	–0.146	–0.064
employed status	0.229	0.069	0.057	–0.186	–0.112	–0.048	–0.510**	–0.182	–0.097*
adults	–0.056	–0.028	–0.017	0.053	0.143	0.033	0.032	–0.093	–0.005
internet use	0.410*	0.257	0.123**	–0.148	0.441	0.062	0.545*	0.229	0.094***
tenure	–0.129	–0.264	–0.084	0.121	–0.456	–0.059	0.239	0.151	0.049
proxy income	–0.016	–0.007	–0.005	0.122	0.129	0.041	–0.068	–0.127	–0.024
switchgainpresearch	0.002		0.0003	0.006***		0.0005**	0.008***		0.0008***
switchgainpresearch^2	–0.000001			–0.00001**			–0.00002**		
switchgainpreswitch		0.0073***	0.0013***		0.006***	0.0008***		0.004***	0.0004***
switchgainpreswitch^2		–0.00001***			–0.000006**			–0.000002	
presearchextime	0.001**		0.0003**	0.000		0.000	0.000		0.000
preswitchextime	0.001	0.000	0.000	–0.002	–0.001	0.000	0.000	0.000	0.000
presearchexeasy	0.240		0.045	0.196		0.028	0.135		0.020
preswitchexeasy	0.290	0.226	0.000	–0.200	0.268	0.024	0.182	0.114	0.037
confidpresearch	0.020		–0.010	0.615***		0.088***	0.155		0.023
confidpreswitch		0.367*	0.082**		0.536**	0.094***		0.210	0.022
constant	–2.887***	–2.141***		–1.482	–1.641	–0.329	1.969*		
Full Model									
N		360			217			235	
Prob > chi2		0.000			0.020			0.012	
Log-likelihood		–420.34			–243.75			–256.69	
$\hat{\rho}$		0.221**			0.363***			0.279**	

*,**,*** indicate statistical significance at the 10%, 5% and 1% levels, respectively. *dy / dx* is the marginal effect on switching and searching, evaluated at the means of the independent variables.

Table 15: Predicted probability of searching and switching by group

	Shoppers	Time-poor	Loyal
At the mean of expected gain	0.30	0.20	0.14
If the mean of expected gain halves	0.24	0.17	0.11

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