

Effective empowerment: empirical estimates of consumer switching behaviour¹

Catherine Waddams Price² and Catherine Webster

ESRC Centre for Competition Policy, University of East Anglia

December 2011

Abstract

European and US policy increasingly seeks to shape consumer decisions, making fundamental changes in ‘choice architecture’, both to benefit the individual decision maker and to improve market functioning. We use a unique data set directly incorporating consumers’ own beliefs about potential gains and time needed to search and switch across eight markets to identify separately what motivates consumers to search and switch (or not). Controlling for consumers’ expectations of gain and time needed, intrinsic markets differences and demographic factors, we find persistent variations in consumer responses across markets. We discuss the implications for design and implementation of appropriate policy interventions.

¹ The support of the Economic and Social Research Council (ESRC) is gratefully acknowledged. This paper is based on previous analysis of this data set by Yoonhee Tina Chang. We are very grateful for her contribution to organising the collection of the data and initial analysis. The authors thank audiences at seminars at the University of California Energy Institute, the Royal Economic Society, the Competition Law and Economics European Network and the ESRC Centre for Competition Policy for comments on earlier versions of this paper; and Steve Davies, Morten Hviid, Bob Sugden and Chris Wilson for helpful suggestions. The usual disclaimer applies.

² Also Centre on Regulation in Europe; Corresponding author: CCP, University of East Anglia, Norwich NR4 7TJ, UK; e: c.waddams@uea.ac.uk

“Better Choices: Better Deals. Consumers Powering Growth”

(Department of Business, Innovation and Skills/Cabinet Office paper, April 2011)

1) Introduction

Government policy focuses increasingly on consumer decision making. The European Commission and the UK government are both actively pursuing a strategy of altering the ‘choice architecture’ of consumers to achieve better outcomes both for the individuals concerned and for markets as a whole. At the EC level, the Consumer section of DG Sanco states that “Knowledge of consumer markets, of national consumer conditions and consumer behaviour in the EU helps make better European policies, and smarter regulation.” (DG Sanco, 2011a³). In the US and elsewhere, ‘default’ pension schemes are increasingly designed to guide employees to choose more ‘beneficial’ schemes (Bodie and Prast, 2011). In the UK, the Cabinet Office’s Behavioural Insights Team is exerting a profound effect on the approach of ministers, civil servants and regulators in its quest “to transform how government thinks about the behavioural aspects of public policy, making it easier for citizens to make better choices for themselves” (Cabinet Office⁴, 2011 p. 4). Amongst regulators, the Competition Commission has introduced consumer remedies in markets⁵ even where the main adverse effect is identified as a supply rather than demand failure (Garrod et al., 2009). The UK energy regulator is introducing radical restrictions on tariffs to enable consumers to make better choices and make the retail residential market more competitive (Ofgem, 2011). Some challenge the desirability of these interventions, but this paper focuses rather on evidence of their probably efficacy. Such remedies will improve outcomes, individual and societal, only if consumers can be actively engaged in the process of choice. If markets are to work well, consumers need to seek better deals to motivate firms to offer them. A particular danger arises if consumers believe that markets are competitive and so are inactive, while firms exploit this belief by raising prices (Waterson, 2003). Policy makers who want to avoid such outcomes can exploit information about consumer (dis)engagement which is familiar to marketing divisions; we provide insights into behaviour which are needed to ‘activate’

³ (DG Sanco, 2011 a http://ec.europa.eu/consumers/consumer_research/index_en.htm, accessed 27th November 2011).

⁴ Cabinet Office, 2011, Behavioural Insights Team. Annual update 2010–11, http://www.cabinetoffice.gov.uk/sites/default/files/resources/Behaviour-Change-Insight-Team-Annual-Update_acc.pdf ; accessed 27th november 2011

⁵ See Competition Commission 2003 *a, b*; 2006 *a, b, c*; 2007, 2009. For a review of consumer remedies see Garrod et al., 2009.

consumers through design of effective policies, while avoiding unintended (negative) consequences.

We use a specially commissioned survey which captures consumers' own expectations about potential gains from switching and the time it will take them to look around for better deals and change supplier. Much policy is designed to inform consumers more accurately, both about market conditions and their own consumption patterns. Such information can increase confidence, which we show is an important factor in motivating consumers. Our focus on expectations enables us to abstract from direct issues of information by utilising the consumers' own expectations as reported to interviewers. Such separation enables the development of appropriate policies to address the causes of poor choice, beyond 'non information' issues. In particular we focus separately on the searching and switching decision, and on differences between markets.

Search and switching behaviour are analysed across eight markets, all similar in that the consumer has an ongoing 'default relationship' with a retailer, and therefore needs to take active steps to change provider. All the markets are also subject to sector specific regulation (energy, telecommunications, financial), as well as general competition provisions, so multiple agencies have policy responsibility. We ask (relevant) respondents whether they have looked around for better deals or changed supplier in the last three years. We follow preceding literature in identifying the factors which determine activity in these markets, and our model exhibits similarities with earlier explanations, provides a good fit with the observations from the survey and indicates regularities consistent with a (perhaps boundedly) rational approach.

Using this model to control for these underlying factors, we explore the effect on searching and switching across markets of two crucial determinants: experience of activity in other markets; and an additional pound's expected saving from the activity, and discover robust evidence of significant differences. Despite controlling for other variables likely to affect activity, including different individual characteristics such as age, income and education; and varying propensities to search and switch in each market which should capture non price aspects, such as the varying importance of quality for different services, these persistent differences remain. Identifying and understanding such variations is crucial in designing appropriate policy responses in specific markets.

The next section discusses relevant literature, and section 3 presents the motivation of the model, the survey and the data. Results are presented in section 4, and section 6 concludes and addresses policy implications.

2) Literature

The recent literature in behavioural economics has produced both academic papers and policy recommendations across a range of consumer decisions and markets. Marshall et al (2010) explore switching behaviour in different cultures, and find that greater risk aversion is associated with lower market activity. Other papers explore examples of consumer decisions which do not conform to a model of a ‘rational’ economic agent. Rotemberg (2009) presents evidence that consumers have poor knowledge and awareness of prices, are often motivated by regret related to their own choices and anger at perceived unfairness in market opportunities, and have difficulty in choosing the best deal from a menu of price choices. Several papers provide empirical evidence of consumers choosing sub optimal deals for themselves from a menu of tariffs, either provided by a single supplier or by competitors: Economides *et al.*, 2006 and Miravete, 2003 for US telecoms; Agarwal *et al.* (2006) for US credit cards; Agarwal *et al.* (2009) for US credit markets; Lambrecht and Skiera (2006) for German internet provision; Wilson and Waddams Price (2010) for UK electricity consumers.

In its own work on the quality of consumer decisions, the UK energy regulator identifies two groups of consumers – those who search actively, and generally obtain good deals for themselves (less than a fifth of consumers); and the remaining eighty percent, around half of whom will switch if approached by sales representatives, and who often make poor decisions (Ofgem, 2008).

It has long been established that the confidence of beliefs will affect decisions (Tversky and Kahneman, 1981). Camerer’s survey (2001) provides several examples of such characteristics in practice. We explore whether consumer decisions, as measured by responses to questionnaire responses across a representative sample, are consistent with an underlying model of utility maximisation, albeit subject to ‘bounded rationality’ (Simon, 1991; Ellison, 2006)⁶. Because the data are from many respondents, we do not measure

⁶ This approach contrasts with that of DellaVigna (2009) and others, who suggest that an underlying model of maximising utility is inappropriate, in which case policy interventions, even if desirable for disciplining suppliers, would be much more difficult to design for consumers.

individual rationality directly, but rather whether the group as a whole displays such characteristics. Knowledge of how consumers respond to ‘carrots’ and ‘sticks’ in the market, and the influence of other factors, informs policy makers directly of whether and how to make effective interventions to improve outcomes for individuals and the market.

In modelling search and search and switching behaviour, we draw on literature which focuses on the effects of either search or switching costs or both. Klemperer (1995) derives the interaction between such costs and market outcomes. Wilson (2009) suggests that before starting their search, consumers will be more deterred by expected search costs than anticipated switching costs, because any investigation involves search costs for certain, but switching costs would be incurred only if a better deal is discovered.

The empirical effects of switching costs have been analysed in many settings, as reviewed by Farrell and Klemperer (2007). Typically, individual level analyses find that consumer demographics, often used as proxies for search and switching costs, explain little of observed switching activity (Chen and Hitt, 2002; Kiser, 2002) and that switching costs can vary between firms, a conclusion confirmed from studies using market level data (Shy, 2002; Kim *et al.*, 2003). . Relating search to the market conditions rather than individual characteristics, Lewis and Marvel (2011) show that consumers search more when prices rise and that firms respond by lowering their margins; dispersion also falls, ironically making search less rewarding.

Most of the studies which consider both search and switching costs use survey level data to investigate consumers’ decisions and the relative effects of search and switching costs.⁷ The decision to switch suppliers is usually estimated as a function of the gains available from doing so (objectively calculated from the researchers’ information about opportunities in the market); and a set of demographic and individual variables to proxy search and switching costs. Giuliatti *et al.* (2005) find that switching cost proxies appear to be the most influential factor in the decision to change suppliers for over 700 consumers in the newly opened UK gas market. While employing measures for the monetary gains available to each consumer from switching, and controlling for the possibility that some

⁷ In contrast, Moshkin and Shachar (2002) introduce and implement a methodology to identify how consumers are relatively constrained by the two costs. With only the use of panel dataset of US television viewers’ choices, they show that 71% of consumers’ behaviour is more consistent with the existence of search costs.

consumers were not aware of the option to switch, they find that the effects of consumers' expectations of both the time it would take to switch and of the difficulty of switching were greater than the effects of search cost proxies or demographic variables. Pomp *et al.* (2005) utilise a similar methodology across a series of nine different product markets in Holland. Their approach enables comparison of switching behaviour across markets while allowing for unobserved consumer effects, but is limited in that the controls for the gains available extend only to a binary measure of consumer beliefs about gains (i.e. whether they were high or not). They find that search cost factors appear to be insignificant in the decision to switch. These two studies are both restricted by the inability to separate the decision to search from the decision to switch. We build on their basic model to explore the different variations across markets in search and switching propensity.

Considering only the energy market, Sturluson (2003) suggests the probability of switching is over four times higher for those consumers who have actively searched. Unlike Giulietti *et al.* (2005)'s findings, and Wilson's predictions (2009), Sturluson finds that search costs exert a larger effect than switching costs. However, this study is limited by the methodology used to construct a measure of consumers' expectations of the savings available from switching.

We follow the path of behavioural economics in seeking consistency (and identifying inconsistencies) across individual search and switching decisions (Foote *et al.*, 2009). The data for the current study rely on consumers' reports of their own beliefs about gains, search and switching time, the first time that such direct individual estimates have been available, as far as we are aware. Use of consumers' estimates of gains rather than researcher calculations from market intelligence enables the exclusion of consumers (mis)information. Direct estimates of anticipated costs enable us to identify the influence of other factors (such as age and gender) in their own right, as well as via any impact which they may have on these 'core' expectations. In this sense the study draws on the strengths of preceding empirical work to provide a more nuanced approach. Like Sturluson (2003), we focus on the factors which determine search behaviour, and then those that influence switching, amongst those who have searched; and like Pomp *et al.* (2005), we can compare behaviours and decisions of the same group of consumers across a range of different markets. The ability to distinguish between search and switching behaviour has direct implications for consumer policy as we discuss in our conclusions. The model enables us to identify and control for the factors which we find

determine search and switching, and to isolate the differences between markets. We control for (fixed) variations in switching behaviour across markets, and identify the different influence of experience of switching and of an additional pound of gain on both search and switching activity in different markets.

3) Modelling and data

In this section we first describe the motivation for the model we use, and then the survey and the data which it generated.

a) Motivation for model

Consumers maximising utility in a classic economic model would increase search and switching activity as anticipated monetary gains rose and the expected hours needed for searching and switching fell. The trade off between expected monetary gains and the value of the time vary between consumers according to their circumstances. In particular we would expect income to be crucial in determining the relation between activity, potential financial gain and time expended: respondents with higher income would be less likely to switch for given expected gains and anticipated time, since both the value of the monetary gain to them would be less and the opportunity cost of their time would be greater, raising the disincentive effect of the activity (see for example Brandstätter and Brandstätter, 1996). If the gain is expected to be competed away because other firms match the lower price, respondents would be less likely to make the switch because the current value of the accumulated expected gains is less if they last for a shorter time. The direct influence of more years of formal education on the length of time taken to change should be captured in the direct estimates of expected time, but higher levels of education may render the time spent less onerous as well as shortening it. Other demographic variables which might affect the trade-off between expected gains and costs include age and gender, either for intrinsic reasons or as a result of targeting by firms⁸. Quality dimensions (which vary between markets) may be captured by whether consumers believe it is important to trust suppliers, with consumers and markets where this is more important exhibiting less search and switching activity, *ceteris paribus*. Differences in homogeneity (and the importance of quality) across markets may also be

⁸ Giulietti et al. (2005) found that prepayment consumers were less likely to change suppliers in the early days of the gas market because they were less actively targeted by firms.

captured by the market dummies, with electricity essentially homogeneous by definition, and quality much more important in telecoms and financial markets.

Consumers' willingness to search and switch will also depend on how confident they are in their estimates of the potential gains and costs, and in their ability to realise them, with a greater willingness to act (for given central expectations of gain and pain) the less variation they perceive there to be around their central estimate. The part of this variance which is because prices in some markets are seen as more changeable than others will be picked up in market dummies; more consumer specific confidence is likely to higher (variance lower) if they have experience of switching in other markets.

Following previous literature and these arguments, the probabilities of searching and switching in each market can then be expressed in the following equations:

$$P(se) = a(\text{expected gain, anticipated search costs, anticipated switching costs, income, age, gender, supplier expected to match, important to trust supplier, switched in other markets}) \quad (1)$$

And to switch by

$$P(sw) = b(\text{expected gain, anticipated switching costs}^9, \text{income, age, gender, supplier expected to match, important to trust supplier, switched in other markets}) \quad (2)$$

A consumer's attitude to search and switching, and to the potential gains available, might vary between markets for several reasons. The searching and switching process may be less psychologically onerous for some products than for others, independently of the time consumers expect to spend; potential gains which are a very small proportion of expenditure may be regarded as less motivating than if gains represent a large share of the bill; and there may be more knowledge about some markets than others, for example because of advertising or information campaigns, so that consumers are more confident in their estimates. For these reasons the relationships in equations (1) and (2) might vary between markets.

Applying a utility maximisation model, once consumers are aware of a choice in any market they face a two stage decision: firstly whether or not to search; and secondly,

⁹ In these equations we do not distinguish between expected switching costs before and after search, which may itself produce information about the switching process. We discuss the implications of this in section 5.4 below.

depending on the information obtained during such search, whether or not to switch to a new provider. In the ‘relationship’ markets which we study, consumers continue to receive supply from their current provider unless they take action to move away from this default position. A utility maximising consumer will undertake such search if its expected benefits exceed its anticipated costs; these benefits in turn depend on the likelihood of finding a deal which is sufficiently superior to the status quo to justify the expected additional effort involved in switching. We can formalise this through ‘backwards induction’, using the modelling approach in Giulietti et al (2005).

The monetary value of the time spent searching and switching depends both on its opportunity cost and on the intrinsic (dis)pleasure of the search and switching activities. The opportunity cost depends on income, and the (dis)pleasure will be influenced by education, age and gender, and by experience and attitudes. We measure gains in monetary terms, which is appropriate for homogeneous products, where retailers offer essentially similar products, and any variation in quality depends on other stages of the supply chain (as in electricity distribution). While this characteristic does not extend to all markets included in the study, we expect any aggregate concerns about quality to be captured in the measure of whether it is important to trust suppliers and in market dummies.

We follow Giulietti et al. in using an expenditure function to derive an approximation using the consumer surplus difference

$$\int_1^{\tau} [CS_i(p'_n, \mathbf{p}, y_i, \mathbf{T}'_{in}) - CS_i(p_o, \mathbf{p}, y_i, \mathbf{T}'_{io})] dt - M_i(\cdot) - S_i(\cdot) > 0. \quad (3)$$

In modelling consumer switching based on consumer utility, we use an indirect utility function as in Giulietti *et al* (2005). We analyse the process of deciding whether or not to search and switch away from the current supplier in each of the eight markets (k=8), listed in the next section, by modelling the observed decision of a consumer to search and switch as resulting from two seemingly unrelated bivariate latent variables. Details are given in appendix 1.

Because of close correlation between consumers’ estimates of search and switching costs, we combined the two variables into a new variable, ‘total cost’, the sum of respondents’ estimates of time to search and to switch. The final models used for the initial bivariate probit estimations were as follows:

$P(se)=f(\text{expected gain, expected gain}^2, \text{expected gain*income, expected gain*education, expected gain*market, total cost, total cost*income, total cost*education, total cost*market, switched other, switched other*market, supplier expected to match, supplier expected to match*market, important to trust supplier, important to trust supplier*market, market, income, education, age, gender})$
(4)

$P(sw)=g(\text{expected gain, expected gain}^2, \text{expected gain*income, expected gain*education, expected gain*market, total cost, total cost*income, total cost*education, total cost*market, switched other, switched other*market, supplier expected to match, supplier expected to match*market, important to trust supplier, important to trust supplier*market, market, income, education, age, gender})$
(5)

b) The survey and the data

The data are from a large scale survey administered in the summer of 2005, especially commissioned to identify consumers' estimates of search and switching costs and expected gains from switching. The survey was conducted by Market and Opinion Research International and carried out among a nationally representative sample of 2027 adults aged 16 or over, interviewed face-to-face, in-home, in 167 sampling points across Great Britain. The survey used quota sampling which followed the Government Office Regions' set quota on demographics (age, gender, class etc.).

Respondents were asked which products the household consumed and paid for, from a list comprising electricity, mobile phone, fixed phone line rental, national and overseas calls, broadband internet, car insurance, mortgage and current bank account. These markets are similar in that they all require a 'relationship' between supplier and consumers which the consumer needs to sever in order to switch to an alternative provider, and they are all subject to (different forms of) sector regulation. But they differ in the degree of homogeneity of the product and the nature of regulatory oversight, the transparency of pricing structures, the information that consumers are likely to have about the charges levied by their own suppliers and others and in how long choice had been available. Respondents were asked whether they had a choice of supplier for each product (all did have such a choice). Respondents were included if they were aware that choice was available in the relevant market and were solely or jointly responsible for making decisions on who supplied that product.

Respondents were asked whether they had searched around for better deals and whether they had switched supplier in each market during the previous three years (other than when moving house). Asking people about both their search and switching had the benefit of being able to separately identify the influences of each activity, which is more difficult with observed behaviour. They were also asked how long such search and switching had taken and whether this was more or less than they had expected; or, if they had no experience, how long they would expect to have to spend on each activity. Unfortunately their responses on expected search time and expected switch time were sufficiently correlated ($R=0.50$, $p=0.00$) that the effects could not be separately identified and therefore a combined measure of total search and switching time was used, though the propensities to search and switch were separately estimated. We have also been unable to distinguish between any changes in expectations of switching time which resulted from the search process. We explore how expectations related to market activity and the implications for selection in section 5.4 below. Questions were also asked about how much they thought they could save in each market if they shopped around¹⁰; and respondents were asked whether they believed their supplier would match cheaper offers in the next few years. Those who thought this unlikely or very unlikely would have a greater incentive to change supplier for a given anticipated saving, since the saving would last for a longer period. Alongside these ‘expectations’ variables, characteristics such as age and gender were recorded to distinguish their direct effect on propensities to search and switch, as well as through the consumers’ evaluation of gains and costs from switching. Consumers were asked to report their current expenditure in each market, and their confidence in this estimate. The questions posed and the construction of the variables are reproduced in appendix 2.

We analyse each household and market as an individual observation, i.e. we regard our data as a panel ($I \times K$) across households (I) and products (K). Each such household/market observation was included only if all the relevant variables described above were known for that case. We discuss the effect of this selection process in section 4.4 below.

4) Results

¹⁰ The question does not specify whether this estimate is of changed expenditure (i.e. incorporating any demand response to a lower price) or the amount that would be saved if demand were constant. For car insurance and current bank accounts, only a single unit is purchased, though cheaper rates might prompt an increased demand for quality (e.g. more comprehensive insurance). In other markets, demand is typically inelastic, so the ambiguity of the question should not have a substantial influence on the results.

In this section we present the results and discuss the factors which are found to be statistically significant in affecting consumer behaviour. We first focus on the ‘primary’ variables: expected gain, time anticipated to search and switch, and the trade off between them. Then we look at other factors, including demographics and experience. related behaviour and differences between markets). Taking account of all these determinants, we then explore variations between markets both in the effect of experience of switching in other markets and in the marginal effects of an additional expected pound gain. In subsection 4.4 we discuss issues of potential selection bias, and test the model for goodness of fit.

We first present some descriptive statistics and then the results of our modelling. Tables 1 to 3 present descriptive statistics for the main characteristics of the whole sample.

Table 1: Levels of awareness and activity

Market	Number responsible*	% of number responsible		
		Aware	Searched	Switched
Electricity	1,585	92	28	24
Mobile phone	1,551	97	30	24
Fixed phone line	1,404	87	14	9
National/international calls	1,307	89	18	13
Broadband	567	95	24	16
Car insurance	1,028	96	40	30
Mortgage	608	96	23	14
Current bank a/c	1,491	96	8	5
Average across markets		93	22	17

*This shows the number of respondents who are mainly or jointly responsible for the product in households that consume the product; percentages are of current market participants (respondents who are jointly or mainly responsible for the product in households where the product is consumed, including those that are unaware of choice).

Our sample, like the national experience, exhibits considerable differences in switching activity across markets. The levels of awareness and switching are consistent with contemporaneous levels in the UK. For example, we found that 92% of electricity consumers were aware of choice and 24% had switched provider. The corresponding figures from

Ofgem for the period were 93% (Ofgem, 2004, p.22) and 29% of customers (calculated from various Ofgem reports on the domestic retail market).

Table 2. Average expected savings from searching and switching (£ per month)

Market	Number	Exp max gains	Std. Dev.	av monthly bill	Exp gain /av bill	Av ratio of exp gain/bill
Electricity	617	9.50	12.99	35.82	0.27	0.31
Mobile phone	686	9.95	12.66	25.69	0.39	0.41
Fixed phone line	446	7.14	9.53	22.27	0.32	0.36
Calls	396	8.14	10.36	19.30	0.42	0.79
Broadband	236	6.86	8.78	19.99	0.34	0.35
Car insurance	481	19.60	34.94	53.90	0.36	0.51
Mortgage	217	44.57	47.79	427.89	0.10	0.12
Current bank a/c	313	5.28	18.65	7.32	0.72	0.98
Average across mkts		12.22		55.37	0.22	0.44

Table 3. Average expected search and switch time for each market (hours)

Market	<u>Expected search time</u>			<u>Expected switch time</u>		
	obs	Average	Std. dev	obs	Average	Std. dev
Electricity	1070	13.93	25.67	1081	16.71	29.45
Mobile phone	1135	10.03	21.42	1152	7.93	19.52
Fixed phone line	868	11.70	23.80	891	12.66	25.23
National/overseas calls	845	11.22	23.38	862	11.72	24.51
Broadband internet	399	11.25	22.63	389	14.61	27.21
Car insurance	758	11.86	23.24	753	7.54	19.50
Mortgage	419	27.32	33.33	413	30.49	35.08
Current bank account	978	19.20	29.40	985	22.61	32.18
Average across markets		13.85	25.58		14.53	27.21

There were also considerable market variations in the expected potential savings and anticipated time for searching and switching, as well as in the number of respondents who could provide such estimates, as tables 2 and 3 show. Descriptive statistics for other variables are shown in Appendix 2, table A3. Table 4 shows the main model results from a parsimonious bivariate probit model of searching and switching behaviour as given in equations (4) and (5), but excluding trust, reluctance to match and interactions – see full model in appendix 2.

Table 4. Determinants of searching and switching: part 1

Variable	SEARCH	SWITCH
Expected gain per month (£)	0.034*** (0.012)	0.038*** (0.012)
Expected gain per month squared (£)	-0.00003* (0.00002)	-0.0001*** (0.00002)
Expected search + switch time (hrs)	-0.001 (0.005)	-0.003 (0.005)
Age in years	-0.045*** (0.016)	-0.035** (0.014)
Age in years squared	0.0004** (0.0002)	0.0004** (0.0002)
Gender (1=male, 0=female)	-0.048 (0.086)	-0.123 (0.077)
Income (gross annual household in £000)	0.005* (0.003)	0.0002 (0.003)
Education (years)	0.051** (0.023)	0.018 (0.020)
Market (base case electricity)		
Mobile phone	0.093 (0.161)	0.204 (0.155)
Fixed phone line	-0.874*** (0.196)	-1.170*** (0.309)
National and overseas calls	-0.643*** (0.201)	-1.255*** (0.252)
Broadband internet	-0.605** (0.258)	-1.299*** (0.379)
Car insurance	0.273 (0.180)	0.028 (0.185)
Main mortgage	-0.781*** (0.293)	-1.222*** (0.428)
Current bank account	-0.770*** (0.270)	-0.752*** (0.287)
Switched other (1=yes, 0=no)	0.367** (0.144)	0.523*** (0.149)
Constant	-0.063 (0.468)	-0.075 (0.390)

Table 4. Determinants of searching and switching: part 2 (interactions with insignificant coefficients are not reported).

<i>INTERACTIONS -</i>	SEARCH EQUATION	SWITCH EQUATION
<i>- Expected gain per month (£)</i>		
with National and overseas calls (<i>base case electricity</i>)	0.007 (0.011)	0.020* (0.012)
with income (gross annual household in £000)	0.0001 (0.0001)	0.0002** (0.0001)
with education (in years)	-0.001** (0.001)	-0.001 (0.001)
<i>- Expected search and switch time (hrs) with market (base case elec)</i>		
with Broadband internet	0.006* (0.003)	0.007** (0.003)
with Main mortgage	0.003 (0.002)	0.005* (0.003)
<i>- Switched other and market (base case electricity)</i>		
Fixed phone line	0.491** (0.209)	0.0003 (0.003)
National and overseas calls	0.420** (0.211)	-0.003 (0.004)
Broadband internet	0.391 (0.280)	0.007** (0.003)
Car insurance	0.355* (0.188)	0.002 (0.003)
Main mortgage	0.563* (0.293)	0.005* (0.003)
Arc-hyperbolic tangent of rho	1.320*** (0.075)	
Rho	0.867***† (0.019)	
Wald chi2 (82)	485.85***	
Pseudolikelihood	-1742.317	
Obs.	1836	

Errors clustered by individual: 619 clusters. (Robust, cluster-adjusted standard errors in parentheses.) *, **,*** represent significant difference from zero at the 10, 5 and 1% levels respectively. †From a Wald test of rho=0.

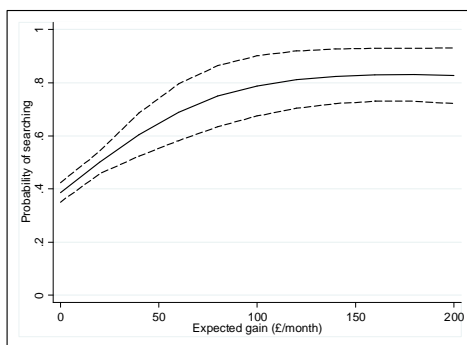
Table 4 summarises the statistically significant variables which affect the decisions to search and switch, using electricity as the base market. In exploring these results further we focus on two measures of activity: searching for a better deal with another supplier, and switching to an alternative supplier, given that search has occurred. The sample is particularly appropriate for this approach since so few people switched without first searching, and this presentation provides useful policy guidelines for influencing each of the two activities, which previous studies have found difficult to identify.

5.1 'Primary' factors

We first review the effects of the 'primary' variables which we might expect to motivate the switching decision, namely expected gain, expected time to search and switch, and the trade off between them which is likely to depend on income (affecting the value of time) and education (affecting the ease of the activity).

Figure 1: The effect of expected gain on the probability¹¹ of:

a: searching



b: switching-given-search

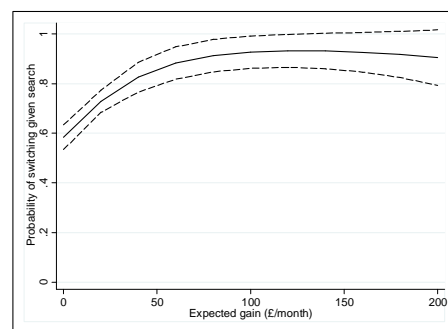


Figure 1 shows that both search and switching behaviour are positively related to expected gain; the relationship is quadratic, so the effect of additional gains on activity has a decreasing marginal effect on both searching and switching. This is consistent with the prospect theory predictions of Tversky and Kahneman (1981) and the findings of Marshall et al. (2010).

¹¹ The probability is averaged at each observation

However the time which people expect to spend in searching for a better deal and switching does not have a significant effect on the likelihood of activity, but there are small differences between the markets which are likely to reflect variations in the difficulty and (un)pleasantness which are anticipated in the search/switching activity. Tests across markets show no significant difference in the marginal effects of anticipated time on switching activity between markets, perhaps reflecting an expectation of little difference between them. We discuss differences between the effect of anticipated gains on activity in different markets in section 5.3 below.

Figure 2: The impact of income on the marginal effects of expected gain on switching-given- search:

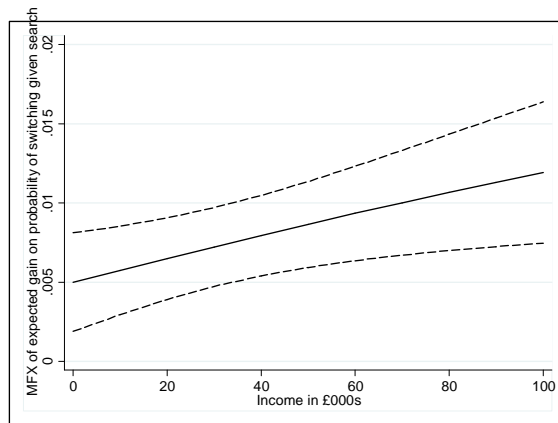
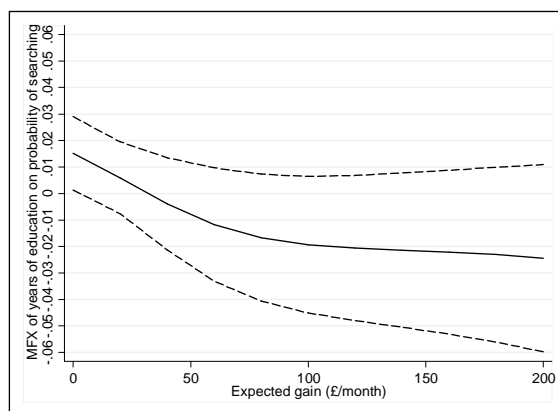


Figure 3: The marginal effects of education on the probability of searching:



The effect of income and education on the trade off between the anticipated gain and ‘pain’ of searching and switching, depicted in figures 2 and 3 is somewhat surprising. Income by itself has no significant effect on the probability of whether respondents will either search

or switch¹². But income is significant in affecting the probability of switching (but not searching) when interacted with expected gains, as shown in figure 2. The marginal effect of an additional pound's gain increases for higher levels of income (quadratic terms in income had no significant effect). In other words, controlling for other factors, those with higher income value a pound of gain more (reflected in their switching behaviour) than those on lower incomes.

In contrast, those with more education are more likely to search, but the interaction term with expected gains is negative. The combined effect of these is shown in figure 3: at low levels of expected gain, those with more years of formal education are more likely to search; while for higher gains, more education reduces the probability of search. Education seems to have no effect on the propensity to switch, beyond its effect on search activity.

The model presented in section 3 suggested that those with higher income would be less likely to search and switch (because of the higher opportunity cost of their time); while those with more schooling might expect to find the task easier, and so be more likely to search and switch than those with fewer years of education. Our explanation for these results lies in the very small role that the expected time for searching and switching plays in the overall decision of whether or not to be active in the market. So rather than reflecting a trade off between income and time, the income variable captures a characteristic of some groups to be more active which is independent of the expected effort spent¹³. This is more likely to mirror general confidence in the market place for those who have more income, and may also reflect less risk aversion for consumers who are not close to their budget constraint.

Correspondingly, the implied higher valuation of substantial gains by those with less education may reflect the influence of lower income. At lower gains, the ease of switching anticipated by those with more education deters them less than their counterparts who have less schooling. Note that education is likely to have affected the subjective expectations of

¹² In the first half of table 5 the relevant coefficient is not significantly different from zero at 95% confidence levels.

¹³ Hortaçsu et al. (2011) find higher income elasticities among high income residential electricity consumers.

time to search, and is already incorporated in the model, so this may reflect the expectation of easier searching amongst those with more formal education¹⁴.

In conclusion, amongst what we have defined as primary factors, we find that expected gain is the main driver for switching. The time expected for searching for a better deal and switching once that better deal is found, do not seem to deter respondents from activity in the market. In the next subsection we consider other influences on market behaviour.

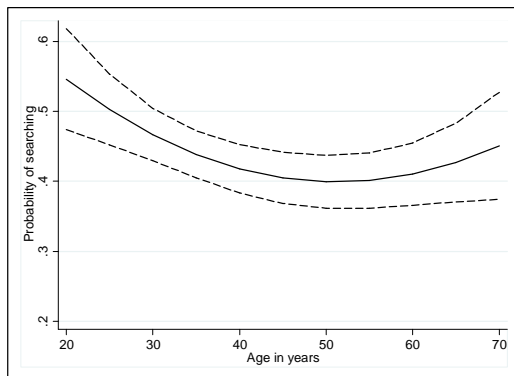
5.2 *'Secondary' factors*

Turning to other influences on search and switching behaviour, the strongest stimulus to activity in any one market is whether the respondent has switched in any of the other markets included in the survey. Having switched in at least one other market increased the likelihood of searching by 20 percentage points on average, and the propensity to switch-given-search by 26 percentage points (for example raising the probability from 50% to 76%). This result could be interpreted either that being active in one market provides information (perhaps about price dispersion) or experience (on gains achieved) which encourage consumers to search and switch in other markets; or that an unobserved variable (for example a personality trait) induces searching and switching in all markets, as much marketing literature would imply. This effect varied across markets, suggesting that experience is at least a partial factor, and these differences are discussed in the next subsection.

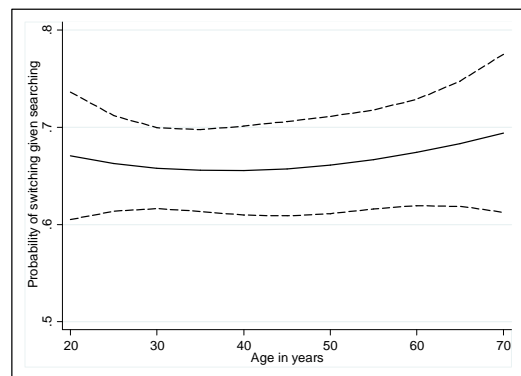
¹⁴ The data show no evidence of any correlation between education levels and anticipated time to search and switch.

Figure 4: The effect of age on the probability of:

a: searching



b. switching-given-search



As in other similar surveys we found a U-shaped relationship with age, and the source of this pattern from its separate effect on the searching and switching components of activity. Figure 4 shows that searching is less prevalent amongst older respondents, but that the graph turns up just before retirement age in the late 50s. In contrast, the probability of switching-given-search is positively related to age after 35 years, with a small decrease between 20 and 35 (figure 4b), consistent with Agarwal et al's paper which suggests that older consumers benefit from their greater experience and are therefore likely to be more confident and active in the market¹⁵.

A number of other factors had no statistically significant effect on activity and did not improve the equation's fit, including whether respondents expected suppliers to match better offers (i.e. how long they thought any gains from switching might endure) and whether it was important to trust suppliers. Any market specific quality issues are likely to be captured in the market dummies which are discussed in the next subsection.

5.3 Differences between markets

The market dummies reported in table 4 show that the probability of both searching and switching varies significantly between markets: consumers are less likely to look for better deals and change provider for fixed line phones, broadband, mortgage and current accounts

¹⁵ Unlike Agarwal et al. (2009) and Wilson and Waddams Price (2010) we do not capture the quality of the consumer decision, merely the effect of consumers' age on their activity level. Gender did not have a significant effect on activity.

than they are for electricity. Such differences reflect the descriptive data shown in table 1 and represent a range of market specific factors, such as the ease of finding a good deal, the presence of intermediaries such as switching web sites, advertising and sales activity, whether an annual reminder is sent, concern about quality issues which might make consumers more reluctant to switch and how long a market has been open to competition.

More striking is that even after these market differences (and other variables) have been taken into account, differences between markets remain in two important aspects: the effect of having switched in another market; and the marginal effect of an additional pound's expected gain. Table 5 shows how experience of activity elsewhere affects the propensity to search and switch in each market.

Table 5: The change in probability of activity if respondent has switched in (one or more) other markets

Market	Search	Switch	Switch-given- search	Search and switch
Electricity	0.138*** (0.054)	0.189*** (0.053)	0.137** (0.055)	0.164*** (0.047)
Mobile phone	0.086* (0.052)	0.134** (0.053)	0.091** (0.045)	0.115** (0.048)
Fixed phone line	0.269*** (0.054)	0.300*** (0.048)	0.405*** (0.135)	0.256*** (0.041)
National/overseas calls	0.272*** (0.062)	0.427*** (0.049)	0.550*** (0.081)	0.340*** (0.043)
Broadband internet	0.258*** (0.076)	0.440*** (0.057)	0.646*** (0.114)	0.343*** (0.052)
Car insurance	0.254*** (0.055)	0.245*** (0.056)	0.126** (0.057)	0.256*** (0.053)
Mortgage	0.318*** (0.081)	0.314*** (0.072)	0.287* (0.158)	0.285*** (0.061)
Current bank account	0.089 (0.056)	0.088* (0.0480)	0.139 (0.111)	0.072* (0.039)
ALL	0.195*** (0.031)	0.247*** (0.029)	0.257*** (0.038)	0.214*** (0.027)

While experience seemed to have no significant effect on searching or switching for current bank accounts, it raised the propensity to search by 32 percentage points for car insurance, and switching-given-search by an enormous 65 percentage points in broadband. These

differences, shown in table 5, are statistically significant and robust for both searching and switching-given-search.

Even after controlling for these differences, there remains a small but significant and intriguing further variation between markets, namely in the effect of an additional pound's gain, on consumers' propensity to search and switch. As table 4 and figure 1 show, greater expected gain increases activity across markets and the effect of additional expected gain on activity declines as the level of expected gain increases. Table 6 shows how the marginal effect of an additional expected pound per month potential gain varies across markets.

Table 6: Marginal effects of gain (additional £/month) by market¹⁶

Market	Marginal effect on probability of:			
	Search	Switch	Switch-given-search	Search and switch
Electricity	0.006** (0.003)	0.010*** (0.003)	0.008*** (0.002)	0.008*** (0.003)
Mobile phone	0.007** (0.003)	0.009*** (0.003)	0.005*** (0.002)	0.008*** (0.003)
Fixed phone line	0.008** (0.004)	0.009*** (0.003)	0.009** (0.004)	0.008*** (0.003)
National/ overseas calls	0.008** (0.003)	0.012*** (0.002)	0.012*** (0.003)	0.010*** (0.002)
Broadband internet	0.001 (0.005)	0.004 (0.004)	0.006 (0.005)	0.001 (0.004)
Car insurance	0.003* (0.001)	0.007*** (0.002)	0.008*** (0.002)	0.006*** (0.001)
Mortgage	0.001* (0.001)	0.003*** (0.001)	0.004 (0.001)	0.003*** (0.001)
Current bank account	0.004*** (0.001)	0.003*** (0.001)	0.003 (0.003)	0.003*** (0.001)
ALL	0.005*** (0.001)	0.008*** (0.001)	0.007*** (0.001)	0.007*** (0.001)

Standard errors calculated using delta method in parentheses.

***, **, * represents 1, 5 and 10% significant difference from zero respectively.

An additional expected pound's gain has a weakly different effect on searching across markets, but a much stronger effect on switching¹⁷. These vary from no statistically

¹⁶ To check that differences were not due to the different average bills and gains in each market, this comparison was reproduced at an average consumption level across markets, with very similar results.

significant effect of a one pound additional expected gain on switching for broadband, to an increase of one percentage point in switching for fixed line calls. We have confirmed that this is not merely a feature of the quadratic form of the relationship between activity and anticipated benefits, given the different size of expected gains in different markets. Rather the underlying relationship between both searching and switching and expected gains (shown in aggregate in figure 1) varies across markets.

These variations, although small, indicate persistent differences in how a pound of gain is valued (measured by its effect particularly on switching activity), even after taking account of the effect of income, education, the influence of experience (via switching in other markets), different market conditions captured by market dummies, the anticipated time taken to search and switch and other plausible factors are controlled for.

5.4 Selection issues and fit of equation

Only one fifth of respondents could provide estimates of all the ‘primary’ variables – how much they expected to gain from changing provider, how long they thought searching and switching would take and income¹⁸. We were concerned about two potential sources of bias: those who could provide estimates may have been more likely than others to be searchers and switchers; and the searching and switching process itself may have resulted in different expectations of both potential gain and time required to make the change. For the first, we have compared the groups of those who could and couldn’t provide the respective estimates (see appendix 4). Amongst those who were aware of choice and responsible for deciding about providers, those who were included in the analysis (because they could provide all the necessary estimates) were indeed more likely to have searched and switched; they were also younger, more likely to be male, have more years of formal education, have switched provider in other markets, believe trust was important, and anticipated higher expected gains and lower expected switch time. These differences confirm that the group included in the

¹⁷ Chi squared tests using standard errors using the delta method give figures of 12.41* and 34.03*** (where * and *** indicate statistically significantly different at 10% and 1% respectively).

¹⁸ There was an earlier selection process in including only those who were responsible for choosing the provider and aware of choice of provider. Such respondents were (statistically) significantly older, likely to have lower income, more education, to have switched other products, and to think it is important to trust suppliers in each market (see table appendix 3). However since we are interested in the population which is both responsible and aware of choice, these differences merely show that the population we are sampling differs from a stratified sample of all adults.

analysis is more active than respondents as a whole, and that caution needs to be exercised in extending the findings to the overall population of consumers. However there was no significant difference in the expected search time of those who were and were not included in the analysis.

The second potential issue of bias arises in identifying the causality of the relationship between switching and search activity and the 'primary' variables of potential gain and effort. Activity in the market could have affected respondents' estimates of gain and time taken to search and switch, rather than vice versa. Cognitive dissonance may also have played a part, with respondents exaggerating (ex post) the justification for their (in)activity. The raw associations shown in table A7 (Appendix 4) naturally raise this question. Despite the danger of this reverse causality, and particularly its effect on searching and switching estimates, the probit model does not attribute (in)activity to expectations of time taken to search and switch, but rather to expected gains.

We have been able to address this issue both by asking those who have switched what they thought they could save beforehand, as well as by constructing the expectations of time as far as possible from prior estimates (see tables A1 and A2 in appendix 2). Amongst those who have switched, their mean expectations of gain before they switched were significantly higher than the gains they thought they could make by switching again, as one would expect if they believed they had realised a substantial portion of the potential gains in making the change. While we are not able to identify specific potential gains available in the market to check how realistic individual expectations were, we were able to make some calculations in the electricity market, where homogeneity makes comparisons easiest. Amongst consumers who had searched, those who were still with their electricity incumbent expected to be able to save an average of around £4.6 more per month than those who were not. Since incumbents were charging around 10% (£3.6 per month) more than non incumbents at this period (Ofgem, 2008), on average consumer expectations amongst searchers reflected the market circumstances fairly accurately. When non searchers were included, there was no significant difference in expectations of potential gain between those who were and were not with the incumbent, suggesting that the search had yielded correct information in this instance.

Table 7: Predicted probabilities of activity by market
 (standard errors in round brackets)
 [observed ratios in square brackets]

Market	Probability of:			
	Search	Switch	Switch-given-search	Search and switch
Electricity	0.444*** (0.021) [0.470]	0.414*** (0.025) [0.438]	0.741*** (0.030) [0.804]	0.360*** (0.024) [0.378]
Mobile phone	0.530*** (0.025) [0.496]	0.471*** (0.025) [0.443]	0.776*** (0.026) [0.756]	0.416*** (0.024) [0.375]
Fixed phone line	0.323*** (0.027) [0.307]	0.246*** (0.025) [0.225]	0.544*** (0.057) [0.610]	0.213*** (0.022) [0.187]
National/overseas calls	0.382*** (0.031) [0.383]	0.338*** (0.027) [0.339]	0.529*** (0.038) [0.750]	0.276*** (0.025) [0.288]
Broadband internet	0.360*** (0.038) [0.367]	0.321*** (0.033) [0.307]	0.601*** (0.048) [0.644]	0.256*** (0.031) [0.236]
Car insurance	0.649*** (0.026) [0.651]	0.502*** (0.027) [0.540]	0.708*** (0.030) [0.771]	0.476*** (0.027) [0.502]
Mortgage	0.423*** (0.041) [0.421]	0.339*** (0.037) [0.331]	0.626*** (0.057) [0.707]	0.298*** (0.035) [0.298]
Current bank account	0.180*** (0.030) [0.170]	0.123*** (0.024) [0.128]	0.522*** (0.060) [0.725]	0.100*** (0.021) [0.123]
ALL	0.444*** (0.026) [0.438]	0.371*** (0.012) [0.376]	0.663*** (0.019) [0.745]	0.326*** (0.0120) [0.327]

Table 7 shows that the equation predicted probabilities of switching which provided a close fit with the observed frequencies of searching and switching in each market. For example the model predicts that the probability of searching in the electricity market is 44%, while the proportion of searchers in the sample was 47%. We conclude that activity as reported by the respondents exhibits regularities which are consistent with our underlying model. These regularities included patterns of difference in behaviour between markets which have important implications for policy.

5) Policy Discussion and Conclusions

Our model predicts well the factors which stimulate those consumers in our sample to be active, and shows that anticipated gains are an important stimulus, while variation in expected time required has little deterrent effect in most markets. Such findings reflect the typical marketing approach of salespeople in these markets: “Switch to us and save £100 a year on your bills”. A vendor at the door seeks to convey confidence to consumers in the amount that will be saved, and several indicators suggest that confidence is an important element in the switching decision. The significance of potential gains for the respondents to our survey underlines the importance of consumers believing both that there are potential gains available, and that they will be able to appropriate them if they change suppliers. Regulators who want to stimulate activity need to continue alerting consumers to potential gains from switching, as well as providing confidence that they can achieve them for themselves.

Variations in confidence levels are likely to be important factors in market differences. Table 8 collects together for comparison the three dimensions of divergence between markets which are reported in tables 4, 5 and 6 above. These are the market dummies (showing shifts in the different levels of activity across markets); the varying effects on each market of experience of switching in others; and the effects of an additional pound gain across markets.

Table 8: Variations between markets (source tables in brackets)

For searching					
	A	B	C	D	E
		Sign interacts market dummies (4)			
Market (source tale)	Fixed effects relative to electricity (4)	variable	coefficient	Switched other markets (5)	Marginal effects of gain (6)
Electricity	Base market	Base market	Base market	0.138*** (0.054)	0.006** (0.003)
Mobile phone	0.093 (0.161)			0.086* (0.052)	0.007** (0.003)
Fixed phone line	-0.874*** (0.196)	Switched other	0.491** (0.209)	0.269*** (0.054)	0.008** (0.004)
Nat/overseas calls	-0.643*** (0.201)	Switched other	0.420** (0.211)	0.272*** (0.062)	0.008** (0.003)
Broadband internet	-0.605** (0.258)	Search & switch time	0.006* (0.003)	0.258*** (0.076)	0.001 (0.005)
Car insurance	0.273 (0.180)	Switched other	0.355* (0.188)	0.254*** (0.055)	0.003* (0.001)
Mortgage	-0.781*** (0.293)	Switched other	0.563* (0.293)	0.318*** (0.081)	0.001* (0.001)
Current bank account	-0.770*** (0.270)			0.089 (0.056)	0.004*** (0.001)
For switching-given-search					
Electricity	Base market	Base market	Base market	0.137** (0.055)	0.008*** (0.002)
Mobile phone	0.204 (0.155)			0.091** (0.045)	0.005*** (0.002)
Fixed phone line	-1.170*** (0.309)			0.405*** (0.135)	0.009** (0.004)
Nat/overseas calls	-1.255*** (0.252)			0.550*** (0.081)	0.012*** (0.003)
Broadband internet	-1.299*** (0.379)	Search & switch time Switched other	0.007** (0.003) 0.007** (0.003)	0.646*** (0.114)	0.006 (0.005)
Car insurance	0.028 (0.185)			0.126** (0.057)	0.008*** (0.002)
Mortgage	-1.222*** (0.428)	Search & switch time Switched other	0.005* (0.003) 0.005* (0.003)	0.287* (0.158)	0.004 (0.001)
Current bank account	-0.752*** (0.287)			0.139 (0.111)	0.003 (0.003)

The strongest evidence on the importance of confidence from the study is the statistically significant and numerically large effect on switching propensity from having switched in at least one other markets across all areas (column D of table 8). Some of this may be related to (unobserved) characteristics of the consumers themselves (some are ‘switching types’), which we discuss further below, but the variation between markets demonstrates that this is not just person specific. While the experience of switching in other markets increases the propensity to search and switch in all markets except current accounts, the size of the effect varies considerably. It is highest for search in the mortgage market, partly counteracting the lower intrinsic level of searching in this market, relative to electricity (column A), showing that experience is particularly valuable in providing confidence for this high expense financial market where confidence may be particularly low. Experience provides a particularly strong stimulus to *switching* in the broadband and fixed phone markets. This may partly reflect bundling, since such products are often sold together.

A different pattern emerges from the varying marginal effects of gain across markets: an additional pound’s gain has a different effect on activity according to the market in which it is anticipated. So an extra pound’s expected gain stimulates more search in the electricity, mobile phone and fixed telephone markets than it does for car insurance and mortgages. Similarly such increased prospects of gain cause more switching among searchers in fixed line phones, car insurance and electricity than for broadband, mortgages and current accounts. The lack of marginal responsiveness in these markets is consistent with low consumer confidence in the size of the additional gain which they anticipate, making them reluctant to respond to the additional gain by exerting more effort.

The ‘shifts’ in underlying propensity to switch are shown by the market dummies in table 4 and columns A and C of table 8. These reflect a variety of disparities, including the amount of advertising and marketing, perceptions of ease of searching and switching and concern about quality levels which are common across each market but vary between markets. Such factors will affect confidence both in the estimate of gains available and whether these savings can be achieved without having to take repeated further action.

These differences across markets provide evidence for regulators who wish to increase activity in their markets. They will want to explore the interpretation and causes of these market differences in more depth to understand these relationships better and devise

appropriate policies. However increasing (well founded) consumer confidence is likely to be an important element in their strategy. Authorities who want to increase switching need to engender the same confidence as does the doorstep salesperson, while of course ensuring that it is based on unbiased information. Initiatives such as the UK energy regulator is taking to simplify tariffs, to develop its own price comparison tool and to administer the confidence code for commercial price comparison websites (Ofgem, 2011) would clearly help improve both the quality of consumer information and their (justified) confidence levels.

Some types of consumer are more likely to switch (in any market) than others. We have already noted that those who have experience of switching are more likely to be active, partly because of the confidence that such experience will engender. But demographic features such as age are also important. The findings confirm the conclusions of other studies that activity is more likely amongst younger and older respondents than amongst those between 35 and 50. We identify its causality clearly in the propensity to search, where the U-shaped curve is clear, whilst amongst searchers, there is very little difference in switching between different age groups. Regulators who are seeking to influence the less active middle aged part of the population should concentrate their policy on encouraging this group to search, since their propensity to switch thereafter seems similar to others.

This distinction between search and subsequent switching behaviour is important in designing policy to affect activity levels and improve outcomes for consumers. If Ofgem's categorisation into active searching consumers (who choose well) and passive consumers (who often choose poorly when lobbied to switch) extends to other markets, policy to increase quantity and quality of switching should focus on increasing active searching. Knowing the characteristics of such searchers and what motivates their activity enables more effective targeting, and maximises the spill-over effects from switching other products.

Consumers seem to be little deterred by longer time needed to search and switch except in broadband and, for switching, in the mortgage market. Specific policy interventions in these markets to lower expectations of time needed (by reducing the hassle) would increase consumer propensity to switch. One example of such action which supports our findings and offers a policy response to the issues was provided by the UK communications regulator. In September 2010 Ofcom proposed simplifying the procedure for switching, noting that "nearly half (45%) of consumers with broadband or a landline think that switching communications

provider is too much hassle” (Ofcom, 2010). Policy makers who want to increase consumer activity need to overcome a more general consumer reluctance to engage with the market, rather than address specific concerns about the time required to get the best deals and change supplier.

While the model generates predictions which fit the data well, we note that the large number of missing observations means that our sample includes a much higher proportion of ‘activists’ than the population as a whole. Our analysis has not addressed how ‘well’ respondents chose in their switching. Virtually all the switchers had looked around for a better deal first, so those who switch fall into Ofgem’s category of ‘active’ consumers, who are likely to make better decisions. The selection issues discussed above suggest that the passive consumers who may have switched without first searching (the vast majority in Ofgem’s categorisation) may have been excluded because of incomplete answers to the survey. So policy conclusions from the sample analysed here apply to the most active group of consumers. By understanding their approach and what encourages them to switch, policy makers can develop better targeted encouragement for consumers, and rules for firms in how the switching choices are presented. Our data adds to evidence on what motivates consumers, and implications for how policy makers can assist them to make choices.

But policy based on our evidence will not necessarily raise participation amongst those who are much more disengaged from the market and were unable to provide estimates for one or more of our key variables. Given the variability amongst the sample analysed, research is clearly needed to understand further the drivers of (in)activity amongst the disengaged group who are excluded from the study.

In conclusion, we have provided evidence to show variations in searching and switching behaviour which exhibit distinct patterns both across markets and types of consumers. Differences in switching levels across markets are well documented; using our empirical data of consumers’ own expectations of potential gains and time required, we have shown that the behaviour of respondents in searching and switching conforms well to an underlying model of responding to potential gains. Policy makers can use this evidence to devise policies to empower consumers, increase (effective) activity in relevant markets, and generate additional pressure on firms to provide a good deal for their customers. Once such policies have been devised, field experiments to test how consumers respond in real markets and real time are

needed to refine instruments so that they deliver the maximum benefit to individuals, markets and economies.

References

Agarwal S., Chomsisengphet S., Liu C. and Souleles N.S.(2006) *Do Consumers Choose the Right Credit Contracts?* Federal Reserve Bank of Chicago Working Paper 2006-11.

Agarwal, S., Driscoll, J.D., Gabaix, X. and Laibson, D. (2009) The Age of Reason: Financial Decisions over the Lifecycle, *Brookings papers on Economic Activity*, 2009, 2, 51-117

Bodie, Zvi and Prast, Henriette M. (2011) Rational Pensions for Irrational People: Behavioral Science Lessons for the Netherlands (September 1, 2011). Netspar Discussion Paper No. 09/2011-076. Available at SSRN: <http://ssrn.com/abstract=1933693>

Brandstätter, E. and Brandstätter, H. (1996) "What's money worth? Determinants of the subjective value of money." *Journal of Economic Psychology*, [17, 4](#), 443-464

Camerer, C., (2001). "Prospect theory in the wild: Evidence from the field" in D. Kahneman and A. Tversky (eds.), *Choices, Values and Frames*, Cambridge: Cambridge University Press

Chen, P. Y. and Hitt, L. M. (2002). "Measuring Switching costs and the Determinants of Customer Retention in Internet-Enabled Business: A Study of the Online Brokerage Industry." *Information Systems Research*, 13(3), pp.255-274.

Competition Commission (2003a) Veterinary Medicines, April.

Competition Commission (2003b) Extended Warranties on Domestic Electrical Goods, September.

Competition Commission (2006)a, Store Card Credit Services, March.

Competition Commission (2006)b Domestic Bulk Liquefied Petroleum Gas, June.

Competition Commission (2006)c, Home Credit, November.

Competition Commission (2007), Northern Ireland Personal Banking, May.

Competition Commission (2009) Payment Protection Insurance, January

DellaVigna, S. (2009). "Psychology and Economics: Evidence from the Field." *Journal of Economic Literature*, 47, 315-372

Department of Business, Innovation and Skills (2011) *Better Choices: Better Deals Consumers Powering Growth*, <http://www.bis.gov.uk/assets/biscore/consumer-issues/docs/b/11-749-better-choices-better-deals-consumers-powering-growth>

Economides N., Seim K. and Viard V.B. (2006). "Quantifying the Benefits of Entry into Local Phone Service" *RAND Journal of Economics*, 39, 3, 699-730.

Ellison, G. (2006). "Bounded Rationality in Industrial Organisation," in R. Blundell, W. Newey and T. Persson (eds.), *Advances in Economics and Econometrics: Theory and Applications, Ninth World Congress*, Cambridge: Cambridge University Press.

Farrell, J. and Klemperer, P. (2007). "Coordination and Lock-In: Competition with Switching Costs and Network Effects," in M. Armstrong and R. Porter (eds.), *Handbook of Industrial Organization, Vol 3*, North-Holland.

Foote, C.L., Goette, L. and Meier, S. (2009) Behavioral Economics: Its Prospects and Promises for Policymakers in *Policy making insights from behavioural economics*. Boston: Federal Reserve Bank of Boston

Garrod, L., Hviid, M., Loomes, G., Waddams Price, C. (2009). Competition Remedies in Consumer Markets, *Loyola Consumer Law Review*, 21:4: 439-495. Chicago

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

Greene, W. H. (2007). *Econometric Analysis*, 6th ed., New Jersey: Prentice Hall.

Kim, M., Kliger, D. and Vale, B. (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 Organisation*, 20(4), pp.349-365.

Klemperer, P. (1995). "Competition When Consumers Have Switching Costs: An Overview with Applications to Industrial Organisation, Macroeconomics and International Trade." *Review of Economic Studies*, 62(4), pp.515-539.

Lambrecht A. and Skiera B. (2006). "Paying Too Much and Being Happy About It: Existence, Causes and Consequences of Tariff Choice Biases" *Journal of Marketing Research*, vol. XLIII, pp. 212-223, May.

Lewis, M.S. and Marvel, H.P. (2011) When Do Consumers Search? *Journal of Industrial Economics*, LIX, 3, 457-483, September

Marshall, R., T.C. Huan, Y. Xu, and I. Nam (2010) "Extending prospect theory cross-culturally by examining switching behaviour in consumer and business-to-business contexts" *Journal of Business Research*, in press

Miravete E.J. (2003). "Choosing the Wrong Calling Plan? Ignorance and Learning" *American Economic Review* vol. 93(1) p.297-310

Moshkin, N. V. and Shachar, R. (2002). "The Asymmetric Information Model of State Dependence." *Marketing Science*, 21(4), pp.435-454.

Ofcom (2010) Nearly half of consumers put off by switching communications provider, press release, September 10, 2010, <http://media.ofcom.org.uk/2010/09/10/nearly-half-of-consumers-put-off-by-switching-communications-provider-2/>

Ofgem (2004) *Domestic Competitive Market Review 2004, A review document*, Ofgem, London

Ofgem (2008) *Energy Supply Probe*, Ofgem, London

Ofgem (2011), *The Retail Market Review: Domestic Proposals*, Ofgem, London

Pomp, M., Shestalova, V. and Rangel, L. (2005). "Switch on the Competition: Causes, Consequences and Policy Implications of Consumer Switching Costs." CPB Working Paper, No.97.

Rotemberg, J. J. (2009). "Behavioral Aspects of Price Setting, and their Policy Implications", in Foote, C.L., Goette, L. and Meier, S. (eds) *Policy making insights from behavioural economics*. Boston: Federal Reserve Bank of Boston

Shy, O. (2002). "A Quick and Easy Method for Estimating Switching Costs." *International Journal of Industrial Organisation*, 20(1), pp.71-87.

Simon, H. (1991). *Models of My Life*, Basic Books Inc., New York.

Sturluson, J. T. (2003). "The Importance of Consumer Search and Switching Costs for Competition in Electric Power Retailing" in *Topics in the Industrial Organization of Electricity Markets*, Stockholm EFI Publication No.614.

Tversky, Amos and Kahneman, Daniel (1981) the Framing of Decisions and the Psychology of Choice, *Science*, 211, 4481, 453-458

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

Wilson, C. M. (2009). *Market Frictions: A Unified model of Search and Switching Costs*, CCP Working Paper 09-3.

Wilson, C.M. and Waddams Price, C. (2010) Do Consumers Switch to the Best Supplier?, *Oxford Economic Papers*, 62: 647-668

Appendices

Appendix 1: Econometric model

The underlying process of search and switching decisions is represented by the latent variable model described in the following relationships,

$$y_{ik1}^* = X_{ik1}'\beta_1 + \varepsilon_{ik1} \quad (7)$$

$$y_{ik2}^* = X_{ik2}'\beta_2 + \varepsilon_{ik2} \quad (8)$$

where ik indicates the i th consumer in the k th market, the subscript 1 relates to the search decision and the subscript 2 to the switch decision. The error terms ε_{ik1} and ε_{ik2} are assumed to be normally distributed but not necessarily independent across equations, or within equations across markets.

The column vector, X_{ik1} in equation (7) identifies the set of factors affecting the search decision and the vector X_{ik2} in equation (8) represents factors affecting the decision to change supplier. Since the two decisions are believed to be closely correlated, the model includes the same set of variables as factors which would potentially affect search and switching decisions.

Consumers who have searched for better deals are observed as $y_{ik1}=1$ if $y_{ik1}^*>0$, and those who have switched suppliers are observed as $y_{ik2}=1$ if $y_{ik2}^*>0$. We analyse the search and switching decision process using a bivariate probit model. The interrelatedness of the two decisions is captured not only through the inclusion of the same variables as factors that influence the decisions, but also through allowing correlation of the unobserved factors affecting the two decisions ε_{ik1} and ε_{ik2} , measured by the parameter, ρ .

The likelihood function of this seemingly unrelated bivariate probit model (Greene 2008) is:

$$\ln L(\beta_1, \beta_2, \rho) = \sum_i \sum_k \ln \Phi_2[(2y_{ik1} - 1)X_{ik1}'\beta_1, (2y_{ik2} - 1)X_{ik2}'\beta_2, (2y_{ik1} - 1)(2y_{ik2} - 1)\rho] \quad (9)$$

It is possible to obtain several predicted probabilities from this model. The unconditional probabilities of search and switch respectively are shown below:

$$P(y_{ik1} = 1) = \Phi(X'_{ik}\beta_1) \quad (10)$$

$$P(y_{ik2} = 1) = \Phi(X'_{ik}\beta_2) \quad (11)$$

The unconditional probabilities are the same as would be obtained from two univariate probit models of the decision to search and switch separately.

It is also possible to calculate the predicted probability of switching, given that the respondent has searched (unconditional mean function):

$$P(y_{ik2} = 1 | y_{ik1} = 1) = \Phi_2(X'_{ik}\beta_1, X'_{ik}\beta_2, \rho) / \Phi(X'_{ik}\beta) \quad (12)$$

The joint probability that individual i in the k th market searches between alternative suppliers is:

$$P(y_{ik1} = 1, y_{ik2} = 1) = \Phi_2(X'_{ik}\beta_1, X'_{ik}\beta_2, \rho) \quad (13)$$

Results reported later include the marginal effects of a continuous covariate on the predicted probabilities of searching, switching, switching-given-search and searching and switching (Greene, 2008, p. 821). We report the marginal effects of the variables on the probability of searching, and of switching-given-search. For a discrete change, the difference in the predicted probabilities with $d=1$ and $d=0$ is assessed.

Appendix 2: Relevant questions from the survey and construction of variables

Relevant questions from the survey

QA. Firstly, could you tell me if you are involved solely, jointly or not at all in the decision of which supplier to use for any of these services or products? (Solely, Jointly, Not at all)

Q1. In your area, do you have a choice of more than one provider for the following products? (Yes, No, Don't know)

Q2. Which of the following does your household currently have and pay for?

Q4. Using the words on this card, how important or unimportant is it to trust your provider for the following products? (Very important, Fairly important, Neither important nor unimportant, Fairly unimportant, Very unimportant, Don't know)

Q5. Have you looked around for a new provider for any of the following products at any time in the last three years, that is, since May 2002? (Yes, No, Don't know)

Q11. Apart from when moving home, have you switched provider of any of these products in the last three years, that is, since May 2002? (Yes, No, Don't know)

Q15. (Ask all who switched any) Please tell me how much time you spent searching around and looking for the necessary information before you switched each relevant product area? (No time at all, Up to an hour, 1 to 3 hours, 4 to 8 hours, About 1 day, 2 to 3 days, 4 to 6 days, A week or more, Don't know)

Q17. (Ask if any time spent searching at Q15) Would you say it took more time than expected, less time than expected or as long as expected to search for information? (More time than expected, As expected, Less time than expected, Don't know)

Q23. (Ask all who switched any) How much of your own time did it take to switch PRODUCT AREA after you made a decision? (No time at all, Up to an hour, 1 to 3 hours, 4 to 8 hours, About 1 day, 2 to 3 days, 4 to 6 days, A week or more, Don't know)

Q29. (Ask all not switched but searched in any area) How much time did it take you to search for the necessary information on PRODUCT AREA? (No time at all, Up to an hour, 1 to 3 hours, 4 to 8 hours, About 1 day, 2 to 3 days, 4 to 6 days, A week or more, Don't know)

Q33. (Ask all not switched but searched in any area) How long do you think it would have taken of your own time to switch once you had all the necessary information for switching? (No time at all, Up to an hour, 1 to 3 hours, 4 to 8 hours, About 1 day, 2 to 3 days, 4 to 6 days, A week or more, Don't know)

Q35. (Ask all non-switchers who have not searched) How much of your own time did you think it would take you to find enough information to decide whether and to whom to switch PRODUCT AREA? (No time at all, Up to an hour, 1 to 3 hours, 4 to 8 hours, About 1 day, 2 to 3 days, 4 to 6 days, A week or more, Don't know)

Q36. (Ask all non-switchers who have not searched) Once you have found all the necessary information to choose a new supplier, how much of your own time do you think it would take to switch PRODUCT AREA? (No time at all, Up to an hour, 1 to 3 hours, 4 to 8 hours, About 1 day, 2 to 3 days, 4 to 6 days, A week or more, Don't know)

Q38. (Ask all relevant switchers) How much did you originally expect to save per month by switching PRODUCT AREA?

Q43 Approximately how much do you pay on average per month for each of these PRODUCT AREAS?

Q44. (Ask all if answered Q43) To what extent would you agree or disagree that you are confident your estimate for PRODUCT AREAS is accurate?

Q46. (Ask all relevant) How much is the most you think you could save per month if you shopped around for PRODUCT AREA?

Construction of expected time spent searching and switching and expected gains.

The expected search time (*exsetime*) and the expected switching time (*exswtime*) are constructed from different questions for different consumer groups according to the table below.

Table A1. Construction of expected search and switching time

<u>Consumer group</u>	<i>time spent searching?</i>	<i>more or less than expected?</i>	<i>expected search time ex ante?</i>	<i>switching time ex post?</i>	<i>expected switching time ex ante?</i>
<i>Searched & switched</i>	Q15	Q17	Adjusted Q15 by one scale down or up according to Q17.	Q23	
<i>Searched but not switched</i>	Q29				Q33
<i>Not searched nor switched</i>			Q35		Q36
<i>Not searched (Q15=0) and switched</i>	0 from Q15	Q17	Adjusted, but not downwards	Q23	

The construction of the maximum expected gains from switching (*exgainmax*) variable differs by whether or not the consumer was a switcher. Table A2 below describes how this variable was constructed.

Table A2. Construction of expected gains

<u>Consumer group</u>	<i>Expected gains ex ante</i>
<i>Switched</i>	Q38
<i>Not switched</i>	Q46

Table 3A: Summary statistics

Variables	Obs	Mean	S.D.	Min	Max
Expected gain (£ per month)	3392	12.223	23.065	0	400
Expected search time (hours)	6472	13.848	25.583	0	100
Expected switch time (hours)	6526	14.526	27.206	0	80
Expected total time (hours)	6033	28.289	45.691	0	180
Age (years)	16216	43.393	17.542	15	99
Gender (1=male, 0=female)	16216	0.469	0.499	0	1
Education (years)	16216	12.523	2.377	11	20
Income (household annual gross, £000)	8568	24.483	18.395	2.25	100
Switched in other markets (1=yes, 0=no)	16216	0.398	0.489	0	1
Trust important (1=yes, 0=no)	9541	0.919	0.273	0	1
Supplier reluctant to match (1=yes, 0=no)	9541	0.152	0.359	0	1

Appendix 3: Full model

Table A4. shows the results from the full model described in equations (17) and (18). Importance of trust (*trust*), supplier reluctant to match (*reluctmat*) and their associated interactions were subsequently dropped as they did not significantly improve the model fit.

Table A4. Results from a seemingly unrelated bivariate probit model of searching and switching(full model)

Variable	SEARCH EQUATION	SWITCH EQUATION
Expected gain per month (£)	0.036*** (0.012)	0.037*** (0.012)
Expected gain per month squared (£)	-0.00003* (0.00002)	-0.0001*** (0.00002)
Expected search time + expected switch time (hrs)	-0.002 (0.006)	-0.004 (0.005)
Age in years	-0.044*** (0.0002)	-0.033** (0.015)
Age in years squared	0.0004** (0.002)	0.0003** (0.0002)
Gender (1=male, 0=female)	-0.051 (0.086)	-0.127 (0.078)
Income (gross annual household in £000)	0.005* (0.002)	0.0002 (0.003)
Education (in years)	0.050** (0.023)	0.016 (0.020)
Trust important	0.136 (0.170)	0.116 (0.154)
Supplier reluctant to match	0.199 (0.198)	0.401 (0.397)
Switched other (1=yes, 0=no)	0.372** (0.144)	0.533*** (0.149)
Constant	-0.245 (0.508)	-0.254 (0.426)
Market (base case electricity)		
Mobile phone	0.110 (0.166)	0.233 (0.160)
Fixed phone line	-0.819*** (0.198)	-1.064*** (0.313)
National and overseas calls	-0.604*** (0.206)	-1.199*** (0.451)
Broadband internet	-0.635** (0.259)	-1.302*** (0.420)
Car insurance	0.282 (0.187)	0.090 (0.191)

Main mortgage	-0.939*** (0.304)	-1.199*** (0.451)
Current bank account	-0.749*** (0.280)	-0.664** (0.301)
<hr/>		
Expected gains interacted with market (base case electricity)		
Mobile phone	0.002 (0.010)	-0.0004 (0.010)
Fixed phone line	0.008 (0.015)	0.006 (0.015)
National and overseas calls	0.007 (0.011)	0.021* (0.012)
Variable	SEARCH	SWITCH
	EQUATION	EQUATION
Broadband internet	-0.023 (0.016)	-0.015 (0.016)
Car insurance	-0.009 (0.008)	-0.006 (0.009)
Main mortgage	-0.011 (0.008)	-0.012 (0.009)
Current bank account	0.0002 (0.010)	-0.010 (0.010)
<hr/>		
Total cost interacted with market (base case electricity)		
Mobile phone	0.003 (0.003)	0.003 (0.003)
Fixed phone line	0.002 (0.003)	0.0001 (0.003)
National and overseas calls	0.002 (0.003)	-0.003 (0.004)
Broadband internet	0.006 (0.003)	0.007** (0.003)
Car insurance	0.002 (0.003)	0.002 (0.003)
Main mortgage	0.003 (0.002)	0.005* (0.003)
Current bank account	-0.0004 (0.003)	-0.00002 (0.003)
<hr/>		
Reluctant to match interacted with market (base case electricity)		
Mobile phone	-0.046 (0.263)	-0.097 (0.276)
Fixed phone line	-0.326 (0.311)	-0.626 (0.547)
National and overseas calls	-0.257 (0.321)	-0.018 (0.406)
Broadband internet	0.241 (0.396)	-0.013 (0.366)
Car insurance	-0.068	-0.359

	(0.297)	(0.292)
Main mortgage	0.416	-0.344
	(0.359)	(0.353)
Current bank account	-0.127	0.545
	(0.396)	(0.391)
<hr/>		
Switched other interacted with market (base case electricity)		
Mobile phone	-0.144	-0.180
	(0.176)	(0.170)
Fixed phone line	0.492**	0.757***
	(0.209)	(0.287)
National and overseas calls	0.428**	1.118***
	(0.212)	(0.248)
Broadband internet	0.423	1.252***
	(0.278)	(0.398)
Car insurance	0.347*	0.142
	(0.187)	(0.187)
Main mortgage	0.640**	0.638*
	(0.293)	(0.346)
Current bank account	0.009	-0.030
	(0.286)	(0.292)
<hr/>		
<i>Expected gain interaction with income and education</i>		
Variable	SEARCH EQUATION	SWITCH EQUATION
Income (gross annual household in £000)	0.0001	0.0002**
	(0.0001)	(0.0001)
Education (in years)	-0.002**	-0.001
	(0.001)	(0.001)
<hr/>		
<i>Expected cost interaction with income and education</i>		
Income (gross annual household in £000)	0.00003	0.0001
	(0.0001)	(0.0001)
Education (in years)	-0.0002	-0.0002
	(0.0004)	(0.0004)
<hr/>		
Arc-hyperbolic tangent of rho	1.334***	(0.076)
Rho	0.870***†	(0.019)
Wald chi2 (100)	540.87***	
Pseudolikelihood	-1732.94	
Obs.	1836	

Errors clustered by individual (619 clusters). Robust, cluster-adjusted standard errors in parentheses. *, **, *** represent significant difference from zero at the 10, 5 and 1% levels respectively.

†From a Wald test of $\rho=0$.

Appendix 4: Selection issues

Table A5: Differences between those who are responsible and aware and those who are not:

Variable		Responsible and aware	Not responsible and/or aware	Two-tailed sig.
AGE	Mean	44.10	37.75	0.000
	S.D.	15.48	18.74	
	Obs	8878	2702	
GENDER	Female (%)	4652 (52.40)	1409 (52.15)	0.817
	Total	8878	2702	
INCOME	Mean	26.85	28.34	0.020
	S.D.	18.68	20.07	
	Obs	4943	1161	
EDUCATION	Mean	12.79	12.25	0.000
	S.D.	2.53	2.13	
	Obs	8878	2702	
SWITCHED OTHER	Yes (%)	3889 (43.80)	907 (33.57)	0.000
	Total	8878	2702	
RELUCTANT TO MATCH	Yes (%)	1333 (15.01)	114 (17.19)	0.131
	Total	8878	663	
TRUST IMPORTANT	Yes (%)	8189 (92.24)	576 (86.88)	0.000
	Total numbers	8878	663	

Table A6: Differences between those who are missing any variables used in the estimation and those who are included (amongst those who consume, are responsible for product and aware of choice only).

Variable		In estimation sample	Not in estimation sample (i.e. at least one missing)	Two-tailed sig.
AGE	Mean	40.58	44.98	0.000
	S.D.	13.54	15.80	
	Obs	1772	7106	
GENDER	Female (%)	855 (48.25)	3797 (53.43)	0.000
	Total	1772	7106	
INCOME	Mean	27.07	26.73	0.543
	S.D.	18.24	18.92	
	Obs	1772	3171	
EDUCATION	Mean	12.89	12.77	0.059
	S.D.	2.43	2.55	
	Obs	1772	7106	
SWITCHED OTHER	Yes (%)	973 (54.91)	2916 (41.04)	0.000
	Total	1772	7106	
RELUCTANT TO MATCH	Yes (%)	265 (14.95)	1068 (15.03)	0.937
	Total	1772	7106	
TRUST IMPORTANT	Yes (%)	1656 (93.45)	6533 (91.94)	0.032
	Total	1772	7106	
EXPECTED GAIN	Mean	13.61	10.90	0.001
	S.D.	25.49	20.35	
	Obs	1772	1456	
EXPECTED SEARCH TIME	Mean	13.63	13.73	0.889
	S.D.	24.46	25.76	
	Obs	1772	4333	
EXPECTED SWITCH TIME	Mean	13.27	14.83	0.035
	S.D.	25.75	27.57	
	Obs	1772	4376	
SEARCHED	Yes (%)	807 (45.54)	1264 (17.79)	0.000
	Total	1772	7106	
SWITCHED	Yes (%)	678 (38.26)	870 (12.43)	0.000
Total numbers		1772	6999	

Table A7: Expectation differences between active and inactive consumers

Variables	(1) Yes			(2) No			Mean difference	
	Obs.	Mean	Std. Err.	Obs.	Mean	Std. Err.	t-test	d.f.
<u>Searched</u>								
Expected maximum gain (<i>exgainmax: £ per month</i>)	1321	17.033	0.800	2071	9.154	0.386	8.871***	1937
Expected search time (<i>exsetime: in hours</i>)	1897	12.741	0.558	4575	14.308	0.386	-2.309**	3778
Expected switch time (<i>exswtime: in hours</i>)	1932	10.516	0.533	4594	16.212	0.420	-8.390***	4365
<u>Switched</u>								
Expected maximum gain (<i>exgainmax: £ per month</i>)	1110	18.924	0.906	2268	8.978	0.374	10.147***	1497
Expected search time (<i>exsetime: in hours</i>)	1476	12.236	0.610	4996	14.325	0.370	-2.757***	6470
Expected switch time (<i>exswtime: in hours</i>)	1536	9.341	0.573	4990	16.121	0.401	-9.695***	3171

N.B.:

1. The number of observations is for the panel ($I \times K$) of individuals (i) across markets (k).
2. The mean difference t -tests were conducted for the base variables without interaction terms.
3. Equal variances were not assumed for all tests other than expected search time (switchers *v.* non-switchers) where the population variances are not significantly different according to Levene's test.
4. For those tests where equal variances were not assumed, we report Satterthwaite's degrees of freedom.
5. *, **, *** imply t -statistics that have two-tailed significance at the 10%, 5% and 1% levels respectively.