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Exercising Consumer Choice:

Switching gas suppliers in the UK residential market

by

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Management Brief

In 1996 Britain embarked on an economic experiment of an unparalleled nature in opening up to competition a market which has traditionally been supplied by a monopolist, when all gas consumers (on a regionally phased basis) were allowed to choose freely among suppliers. The experiment moved the regional markets, chosen from regulated monopoly to a significant degree of competition at a stroke. The UK gas market concerns a more homogeneous product and affects a much higher proportion of the population (85%) than did the experiment undertaken when the US opened up its airline markets. Moreover the experience set an important precedent for universal choice in the electricity market two years later in the UK, the world's first such nation-wide choice, and will be followed in the next few years by several other countries under European legislation. Similar experiments are taking place in a number of US States. Indeed it was the size and unprecedented nature of the change which led to the decision to introduce gas competition piecemeal, by region, since some commentators warned that the impact would otherwise be too dramatic for the institutional structures to handle. Additional interest was created by the widespread knowledge that the incumbent operator's prices were very uncompetitive - a consequence of long term contracts to purchase the material input at what were then high prices compared with current spot market levels. In consequence, savings of around 20% on the monopolist's prices were envisaged for the typical consumer who switched supplier.

The experiment was deliberately designed to allow customers to choose from alternative suppliers without altering the flow of gas to their homes. With no financial transaction costs for the consumers (the meters and pipelines belong to the infrastructure company BG Transco), a chemically homogeneous product delivered into their homes, and little difference amongst suppliers in terms of service standards, competition and initial advertising focused on price. For their part, consumers still had to bear the private costs associated with evaluating whether switching supplier was worthwhile. Undoubtedly for some, the conceptual problem of obtaining the same product through the same delivery mechanism but at a lower price from a different supplier was a real one. After three years of competition in some parts of the market, less than a third of consumers are switching away from the incumbent.

In this paper we explore the reasons behind this reluctance to switch gas supplier. We ask, in particular, whether apparent differences in switching costs across consumers affect the decision to switch supplier, and whether particular consumer groups demonstrate a greater reluctance to switch than others. Ours is the first paper to examine this particular question, and the results are preliminary, throwing up some puzzles. Nevertheless, our findings shed some light both on the effectiveness of the economic experiment and on whether specific regulatory safeguards need to be put in place for consumers who show a lower propensity to switch.

The results provide broad support for an investment model of the consumer switching decision, in which the decision depends on the costs of making the decision, the potential benefits, and the way consumers assess their relative values. By asking consumers about their attitudes and actions at different stages of the competitive process, we can identify the factors which affect each of these determinants of the switch. Costs are captured by willingness to consider switching and the savings required for making such a change. Costs seem to increase with bill size (or household size as proxy), and with employment and age of the respondent; they decrease with the level of income, previous experience in switching gas and telecoms provider (but not insurance company), and are closely related to switching costs in the electricity market. The role of direct debit as a payment method is ambiguous, and the analyses do not offer any conclusive evidence for differences in costs among consumers using different payment means. This result should be interpreted with caution in view of the inverse relationship between costs and income, suggesting that low income may be acting as a proxy for frequent payment methods and is in fact picking up higher costs for these households.

The decision to change supplier itself depends on benefits, costs and how they are assessed, and having identified factors which affect the costs of switching, we can isolate the additional factors which affect the decision itself. Switching probability increases with household size; since costs also seem to increase with household size, this indicates that benefits increase even faster with household size because of its correlation with bill size. Greater risk aversion makes switching less likely.

Income, age, education level and employment status do not seem to have affected actual switching levels, consistent with the results of MORI surveys for Ofgas. Frequent payers' costs ex ante do not seem to be any higher, since their required savings are lower; indeed, given that the measure of savings required underestimates the potential benefits more for this group of consumers than for others (because their demand is more price responsive), their switching costs relative to other consumers are likely to be even lower. But in observing behaviour we also find that such consumers are less likely to switch, even though they are, on average, slightly less risk averse.

There are two key interpretations: either the potential gains are lower, or they are prevented from changing as a result of their debt to the incumbent. The potential gains depend on whether they simultaneously switch payment method. If they do so, their potential gains are higher than for any other consumers, but it may be that they have a preference for their current method of payment; in this case their potential financial gains are indeed lower, since entrants offer much lower discounts on this type of payment than on direct debit. The alternative explanation is that consumers are prevented from switching because of debt with their current supplier. The regulator is currently considering removing the ability of suppliers to prevent consumers with debt from switching, which would reduce the switching costs for such households.

As utility markets are opened to competition, consumers play a much more active role in the development of the market through the choices that they exercise. Their decisions will influence the conditions of supply which are offered, and understanding the nature of that decision process is important in shaping the future of the market and its regulation. Our survey provides some insight into this process, which can help to inform these developments.

Exercising Consumer Choice:
switching gas suppliers in the UK residential market

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Abstract

In 1996 the UK government introduced competition into the UK residential gas market, the first such nation-wide experiment, and the forerunner of similar choice in the electricity market, both in the UK and later elsewhere. We report consumers' attitudes to and behaviour in switching suppliers based on a representative nation-wide survey at an intermediate stage, when some consumers had a choice of suppliers, and other markets were yet to be opened. We explore their attitudes and choices using an investment model of costs and benefits.

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Exercising consumer choice: switching gas suppliers in the UK residential market

1. Introduction

In 1996 Britain embarked on an economic experiment of an unparalleled nature in opening up to competition a market which has traditionally been supplied by a monopolist, when all gas consumers (on a regionally phased basis) were allowed to choose freely among suppliers. The experiment moved the regional markets chosen from regulated monopoly to a significant degree of competition at a stroke. The UK gas market concerns a more homogeneous product and affects a much higher proportion of the population (85%) than did the experiment undertaken when the US opened up its airline markets. Moreover the experience set an important precedent for universal choice in the electricity market two years later in the UK, the world's first such nation-wide choice, and will be followed in the next few years by several other countries under European legislation. Similar experiments are taking place in a number of US States. Indeed it was the size and unprecedented nature of the change which led to the decision to introduce gas competition piecemeal, by region, since some commentators warned that the impact would otherwise be too dramatic for the institutional structures to handle. Additional interest was created by the widespread knowledge that the incumbent operator's prices were very uncompetitive - a consequence of long term contracts to purchase the material input at what were then high prices compared with current spot market levels. In consequence, savings of around 20% on the monopolist's prices were envisaged for the typical consumer who switched supplier.

The experiment was deliberately designed to allow customers to choose from alternative suppliers without altering the flow of gas to their homes. With no financial transaction costs for the consumers (the meters and pipelines belong to the infrastructure company BG Transco), a chemically homogeneous product delivered into their homes, and little difference amongst suppliers in terms of service standards, competition and initial advertising focused on price. For their part, consumers still had to bear the private costs associated with evaluating whether switching supplier was worthwhile. Undoubtedly for some, the conceptual problem of obtaining the same product through the same delivery mechanism but at a lower price from a different supplier was a real one. After three years of competition in some parts of the market, less than a third of consumers are taking advantage of the opportunities to switch away from the incumbent.

In this paper we explore the reasons behind this reluctance to switch gas supplier. We ask, in particular, whether apparent differences in switching costs across consumers affect the decision to switch supplier, and whether particular consumer groups demonstrate a greater reluctance to

switch than others. Ours is the first paper to examine this particular question, and the results are preliminary, throwing up some puzzles. Nevertheless, our findings shed some light both on the effectiveness of the economic experiment and on whether specific regulatory safeguards need to be put in place for consumers who show a lower propensity to switch.

There have been several other surveys of the gas market. Waddams Price and Bennett (1999) report on two surveys in the South West undertaken in 1996 and 1997, and MORI have undertaken three surveys for Ofgas (Ofgas 1997, 1998a and b). Unlike these earlier studies, we frame the switching decision within an investment framework, separating factors into those affecting the costs and those affecting benefits of switching.

In the next section we develop an investment framework of consumer behaviour and in section 3 we report on the market opening, and the extensive survey of consumers we conducted at an intermediate stage of the process. At the time they were approached, some of the consumers we interviewed had changed suppliers, some had had the opportunity to switch supplier but had not done so, whilst others had not yet been offered such an opportunity[1]. Section 4 presents our main results at this stage of the experiment, and section 5 concludes.

2. Choice of supplier: an investment model

We consider the decision to change suppliers as an investment decision. Like most such decisions, the costs accrue at the start whereas the benefits come more gradually. Our conceptual framework involves the probability (P) of the event, switching supplier (S=1), occurring, which can be expressed as a function of costs (C), benefits (B) and risk aversion (R) for family i:

$$P_i = P(S=1)_i = P(N_i^* = N_i) = F(C_i, B_i, R_i; ?) \qquad (1)$$

$$\qquad\qquad\qquad\qquad\qquad\qquad\qquad\quad - \quad + \quad -$$

where ? represents a set of parameters and F is the distribution of (unobserved) net benefits, N. N_i^* is the critical value for family i (also unobserved)[1]. The expected signs of the coefficients are shown below each variable.

Switching suppliers is not irreversible in the sense of the options which Dixit and Pindyck (1994) consider, but both making the decision and reversing it each involve some costs for the consumer. The costs of 'reswitching' are similar (though probably not identical) to those of initial switching, and both can be divided into three groups: time costs, psychic costs of changing, and (in some cases) costs of release from the current contract. The first category, time costs, includes both

[1] By implication, $P(S=0) = 1-F(C_i, B_i, R_i; ?)$

searching and evaluation costs to find the most appropriate offer, and possible administrative time in filling forms. These costs are likely to be directly related to the value of time, so that those who have lower earnings (lower Y) or unemployed status (*not* EM) might have a lower opportunity cost. On the other hand, a higher level of education (ED) (to which income is positively related) might reduce the time required to reach and implement a switching decision. Opportunity cost also increases with household size (HS), since there are generally more demands on each individual's time.

Psychic costs of changing are more complex, and relate to consumer characteristics such as age (A) and familiarity with previous changes of supplier. Consumers who have switched in other markets (e.g. telecom, T, or insurance, I) are likely to have a lower psychic cost of switching gas suppliers, and to be predisposed to expect gains from switching (perhaps resolving any cognitive dissonance from earlier proactive behaviour in changing suppliers). Those with fuel debts may also incur the third category of costs: release from their current contracts, since suppliers can prevent consumers with debt from switching. Here, payment method (PM) matters; this is likely to be particularly relevant for prepayment meter users, who usually have a history of gas debt, and 80% of whom are believed still to be in debt to the incumbent (Offer and Ofgas, 1999). To the extent that people learn about the procedure from others, the length of time since the market has opened, L, is also important[2].

Thus, we can express the costs of switching as:

$$C = C(ED, EM, HS, Y, A, PM, L, T, I) \qquad (2)$$

$$\quad - \quad + \quad + \quad + \quad + \qquad - \quad - \quad -$$

(where we have dropped the i subscript for simplicity).

The main benefit from switching is savings in fuel cost. This will depend on the difference in the prices charged by the various suppliers and the amount of gas used (q). As income rises, the proportion spent on gas falls (Waddams and Bierman, 1999) with lower price elasticities for higher income households (Baker *et al*. 1989). As a consequence, the higher is income, the lower is the benefit from switching for a given level of consumption, and conversely, the higher is consumption, the greater is the benefit from switching for a given level of income. Price differentials are related also to payment method (PM). For those not already using direct debit, potential benefits are greater if when switching supplier they simultaneously change to this

[2] Consumers have also had more opportunity to switch where the market has been open for longer.

cheaper payment method [3]. Even if consumers stay with their current payment method, the price savings offered by entrants are generally greater for direct debit

The present value of savings depends on the expected flow of future savings and assumptions about the competitive process: if consumers expect the incumbent to match the savings currently offered by entrants in the near future, there will be more reluctance to switch. Previous experience with switching activity (e.g. T and I) will potentially influence this. Consumers in rented accommodation would expect lower total benefits (B) because they might anticipate moving to other premises, so we include housing tenure (H)[4].

Thus we write[5]:

$$B = B(q, PM, Y, H, T, I) \qquad (3)$$
$$\quad + \quad - \quad + \; - \; -$$

Risk aversion, R, affects the way in which a consumer assesses the balance between costs and benefits of switching. The more risk averse is a consumer, the less likely are they to switch, since the (uncertain) potential benefits will be valued less relative to the (better understood and more immediately incurred) costs of changing suppliers. Risk aversion is concerned with an internal rather than objective assessment of how the market will change in the future. It is likely to be linked to other characteristics which affect the factors described above (e.g. age), and to have played a part in previous decisions about changing suppliers in other markets. Consumers who are unwontedly pessimistic about long term benefits from switching and who are risk averse are likely to be the most reluctant to switch (and might form a group which the regulator feels should receive some form of continued protection because of potential exploitation of their loyalty).

To analyse the role that the various factors discussed above play in the switching decision, we collected data at the individual and household level. These provide information about the various factors influencing cost and benefit, and we use these factors to assess the effects both on activity in switching suppliers (where the market was open) and on the attitude to switching amongst all consumers, including those who had not yet had an opportunity to do so.

[3] Payment method before switching suppliers would have two opposing influences on the likelihood of switching. Those already on Direct Debit probably have lower psychic costs of changing; but those who are not yet paying by the cheapest means have an additional benefit from switching if they simultaneously change payment method, offering them a 'double dividend'. On balance we would expect those already paying by direct debit to be more likely to change.

[4] For them, this is similar to the decision on investment in insulation and other energy saving measures

[5] Note that conceptually costs and benefits will be identified so long as employment and education characteristics are significant in (2) and quantity is significant in (3).

3. The Survey

The survey involved face to face interviews with individuals in 1,865 households, representative in terms of region and socio-economic characteristics, through the addition of a module to the Office of National Statistics Omnibus Survey administered in December 1997 and January 1998. The present analysis includes only the 1,354 individuals who were head of household or their partners in households connected to the mains gas supply, and so likely to be involved in decisions about switching gas suppliers. The main survey includes information on household type and tenure, and individual information on income, education, employment and class. Our additional module asked about gas and electricity payment and consumption, whether and when there had been any change in supplier, attitudes to switching supplier (including savings required to change), experience of switching telecoms and insurance suppliers, expectations about the gas market, and included a question to measure the individual's risk aversion.

At the time of the survey, 29% of consumers had a choice of suppliers, but only 12% had had this opportunity for more than a few weeks. The timetable for market opening and the prices offered by the various suppliers at the time of the survey are given in Appendix 1. Within areas that had been opened for nine months or more, between 25 and 30% of the sample had switched suppliers. The figures are comparable with those reported in a survey conducted by MORI for Ofgas at the same time (Ofgas, 1998a).

In areas where switching was possible, we identified whether the household had taken advantage of this opportunity. In order to test attitudes, especially in areas where switching was not yet possible, all consumers were also asked what savings they would require to make it worth their while to change suppliers. We then related the outcomes (in terms of behaviour and savings required) to the factors that our investment model suggests would affect them.

Although some figures for expenditure on gas were available it proved difficult to resolve these to a common basis. We therefore also used household size as a surrogate for consumption. An equivalence scale weighting each adult as 1 and each child as 0.6 was found to be consistent with the sub-sample of those interviewees for whom we did have reliable expenditure data (see Appendix 2)[6].

3.1 Attitudes to switching

We examined attitudes to switching by assessing the characteristics of those who said they would consider switching supplier in the next year (POTSW = 1). Responses were considered from all those who had not yet switched, both in areas already open and those still to be opened, but with a dummy variable to indicate whether the area was already competitive in order to identify any differences in attitude caused by the opening of the market and attendant marketing by entrants.

We interpret responses in the light of the investment model outlined in section 2. Potential switchers declare that they will consider switching, which we can interpret as a willingness to start the search and evaluation process, while the actual switchers are those who have undertaken the exercise and decided that the benefits exceed the costs. One plausible hypothesis is that consumers who have not yet undertaken the switching exercise are more aware of the costs than of the benefits, whereas knowledge of the benefits becomes clearer during the decision process. Identifying potential switchers thus provides information on how different consumers evaluate the costs of switching ex ante. We undertook a probit analysis of whether or not consumers said they were likely to switch, using the independent variables included in equation (2). Conceptually, under this hypothesis, the higher the costs, the less likely they are to switch, so:

$$P(potsw=1) = 1-G_a(C; ß) \qquad (4a)$$

where $G_a(C)$ is the distribution of costs and ß is the set of parameters. Alternatively, if potential switchers also consider benefits, we have:

$$P(potsw=1) = G_b(B, C; ?) \qquad (4b)$$

3.2 Savings required before switching suppliers

Attitudes to switching were further explored and quantified through the minimum level of savings (MNSave) which consumers said they would require in order to switch gas supplier. Conceptually, by inversion of (1), MNSave is the value of B which renders P(S=1) for a particular family. Thus we write:

$$MNSave_i = H(C, R; d) \qquad (5)$$

$$\qquad\qquad + \ +$$

where d is a set of parameters on the relevant variables. Broadly, the same set of explanatory variables (emanating from the determinants of C_i in (2)) was used as in (4a) [7]. We also

[6] See Deaton and Muellbauer (1980) for a discussion of the derivation and validity of consumption equivalence scales based on expenditure data under fixed tariff structures.

[7] We explored this factor further in unreported experiments by examining the effect not only on the absolute level of savings required (indicating the value of total savings) but also on these savings as a proportion of bill size, where we could estimate this.

experimented with separating the sample into those who believed they were likely to switch electricity suppliers and those who were not, to identify any differences.

3.3 Decision to change supplier

To identify how both costs and benefits had contributed to making decisions to switch, we undertook three probit analyses using (1) for areas where the market had already opened[8]. In two analyses we included all those in areas where there was a choice of supplier, and in the third, only those who were not using frequent payment methods (prepayment etc.). In these analyses we looked for the combined effect of the variables in equations (2) and (3), since they enter into (1).

Table 1 describes the variables used and their labels.

Table 1: Variable definitions

Y	Log of respondent's reported gross personal income (£000s)
HS	1*num of adults in hhold+0.5*number of children
Q	Last Expenditure on gas expressed as a monthly figure
R	Qualitative scale of 4 (most risk averse) through zero (risk neutral) to –2 (risk lover) was divided by income
A	1 if respondent was aged 65 or over, 0 otherwise
H	1 if home-owner or buying with mortgage, 0 otherwise
ED	1 if left full-time education at over the age of 15, 0 otherwise
EM	1 if respondent was employed, 0 otherwise
PMDD	1 if paying for gas by monthly or quarterly direct debit, 0 otherwise
	1 if paying quarterly for gas, 0 if otherwise
T	1 if "BT only" customer, 0 otherwise
PE	1 if respondent said they would consider switching electricity in the next year, 0 otherwise
CI	1 if in an area opened to competition, 0 otherwise
S	1 if switched supplier, 0 otherwise
PF	1 if paying for gas by some frequent pay scheme (typically pre-payment meter, fuel direct, stamps or budget card)
PFHS	PAYF*DEQUIV
L	Log of number of months competition has been in place
I	1 if consumer has switched either car or house insurance in last twelve months, 0 otherwise
MNSAVE	Minimum amount the individual will require to save in order to switch supplier
POTSW	Willing to consider switching supplier

[8] Although a few households in other areas claimed to have switched supplier this was due either to misunderstanding or households signing up ahead of the market opening, and the numbers are too small to be helpful.

4. Results

Table 2 summarises the results of estimating the models discussed above, and details and diagnostics are presented in Appendix 3. In Table 2, we report whether each coefficient on the independent variables is statistically significant from zero (at confidence levels of 10, 5 and 1%) and the sign of each coefficient where it is significant.

Table 2: Summary of Results

Analys.ref	a	b	c	d	e	f	g	h	i
cons samp	ABDE	AB	ABCDEF	ABC	ABDE	AB	BC	BCEF	BCEFins
Nos	936	690	1007	750	936	690	198	278	221
dep var	**POTSW**	**POTSW**	**MNSAVE**	**MNSAVE**	**MNSAVE**	**MNSAVE**	**switched**	**switched**	**switched**
ind vars									
Constant			***+	***+	***+	***+		*-	
Y	***+	***+	***-	***-	***-	***-			
Q	excl	*+	excl	***+	excl	***+	***-	excl	excl
HS	*+	excl	**+	excl	**+	excl	excl	*+	***+
R			**-		*-				***-
A	***-	**-							
H	*+	*+							
ED			*+		*+				
EM			**+	*+	**+	*+			
PMMD							**+		
T	***+	***+	*-		*-				
PE	excl	excl	***-	***-	***-	***-	***+	***+	excl
ind vars	excl	excl	excl	excl	excl	excl	excl	excl	*+
CI	***-	**-	**+		**+		excl	excl	excl
L	excl	excl	excl	excl	excl	excl	***+	***+	***+
S	none	none	***-		none	none	n/a	n/a	n/a
PFHS		excl	**+	excl	*+	excl	excl	**+	

4.1 Attitude to switching gas suppliers

We first examine the attitude to switching to obtain information about anticipated costs. All those who had not already changed supplier (only some of whom had had the opportunity to do so) were asked whether they would consider changing their gas supplier over the coming 12 months. Those who answered in the affirmative were classified as potential switchers, and probit analyses of this decision undertaken (analyses a and b). Within the sample are included those in an area open to competition who might have considered switching but decided against it, and to control for this bias we add a dummy variable CI to reflect whether the person is in an area of competition (CI=1) and for which we expect a negative coefficient (which it yields). Analysis A

includes all those that had not switched, and analysis B is restricted to the subset of these who did not use frequent payment methods (and for whom the bill size was known). The base case is of a respondent with average income, bill size (or household size where this is used as a proxy) and risk aversion, under 65, not a houseowner, left school before the age of 15, unemployed, paying quarterly, not having changed telephone supplier and not in an area open to competition.

It shows that non-switchers that had not taken an opportunity to change were less likely to consider switching than those who had not yet had such a choice, indicating that consumers are heterogeneous in taste for switching. In both analyses, and in accord with the theory, the likelihood of switching was positively related to whether consumers had already switched telecoms supplier. Consumers were less likely to consider switching if they were over 65. More surprisingly, the likelihood of switching was *positively* related to income, indicating strongly that demand effects appear to be relevant. This suggests that consumers expect the costs of switching gas suppliers to be lower as income increases, and if they have experience of changing telecoms suppliers, and that psychic costs are higher for older respondents.

4.2 Savings required in order to switch supplier

We explored these costs further by analysing the savings which consumers said they would require before changing suppliers. As explained in section 3 above, we treat these savings as a proxy for the expected costs of making the decision, and we would expect them to be inversely related to willingness to consider switching. The results of several regressions of required savings are summarised in columns c to f of table 2, and explained further in Appendix 3.

We find confirmation of some results reported in 4.1 above, with savings required positively related to being in an area already open to competition. Potential to switch electricity supplier decreased required savings[9], while being employed and being in a competitive area increased them. Though payment method did not on its own influence the savings required, the product of frequent payment and household size sometimes increased them. Other variables were less consistent in their effect. Perversely, the savings required to switch were consistently affected by the level of income, which lowered required savings, and bill size (or household size as proxy), which raised them. This finding indicates either that these variables are acting as proxies for some other factor (e.g. education level) which makes it easier to switch, or that it is picking up difficulties for some low income families in moving supplier. In one of the two analyses where switchers were included, costs were lower for those who had already changed supplier,

[9] Note that some "dual fuel" deals were on offer.

suggesting again that experience with switching reduces the cost of future changes and that consumers are heterogeneous. Where the risk aversion variable was significant, it always reduced the savings required, suggesting that costs are lower for risk averse individuals. This is surprising but not necessarily inconsistent with the negative impact of risk aversion in the switching decision, which affects the relative assessment of costs and benefits.

4.3 The switching decision

Likely benefits, as well as costs, are expected to play a more significant role in making the actual decision to switch, along with risk attitudes. The three probit analyses (columns g to i of table 2) bring together both the costs and benefits of switching. The base case is as in probits a and b. We consistently find that potential electricity switchers are more likely to have switched gas supplier. Within the sample excluding frequent payers (column g), those with larger bill sizes appear less likely to switch, but when household size is instead used as a proxy for the larger samples, it has a positive effect on switching, consistent with the theory. Of course, those who have switched will have a lower bill, on average, so the billsize coefficient combines two effects. In line with our expectations, risk aversion has a negative effect in one analysis (column i); those paying monthly are more likely to switch in one analysis, and, where they are included, frequent payers are less likely to have switched.

The finding that time since the market has been open to competition (h) has an impact, suggests that there is some element of "wait and see" about switching (consistent with a Dixit and Pindyck view of the world). However in analysis h the product of household size and payment method had a positive influence on the probability of switching, suggesting that potential saving because of higher consumption was a positive influence on switching within the frequent payers group (who on average had a lower consumption level than others, though this may have represented a higher proportion of their income).

The role of the willingness to switch electricity suppliers can be interpreted as endogenous to the decision to change gas supplier. Having switched gas supplier was consistently directly related to whether consumers said they were likely to switch electricity supplier, suggesting a generally good experience amongst those who had already switched gas supplier. Yet, where an indicator of whether they had changed insurance company replaced this variable, the positive relationship was repeated, suggesting that this group constitute ‘natural switchers’ in some sense.

5. Concluding Remarks

The results provide broad support for an investment model of consumer switching decisions, in which the decision depends on the costs of making the decision, the potential benefits, and the way consumers assess their relative values. By asking consumers about their attitudes and actions at different stages of the competitive process, we can identify the factors which affect each of these determinants of the switch. Costs are captured by willingness to consider switching and the savings required for making such a change. Costs seem to increase with bill size (or household size as proxy), and employment and age of the respondent; they decrease with the level of income, previous experience in switching gas or telecoms provider (but not insurance company), and are closely related to switching costs in the electricity market. The role of direct debit as a payment method is ambiguous, and the analyses do not offer any conclusive evidence for differences in costs among consumers using different payment means. This result should be interpreted with caution in view of the inverse relationship between costs and income, suggesting that low income may be acting as a proxy for frequent payment methods and is in fact picking up higher costs for these households.

The decision to change supplier itself depends on benefits, costs and how they are assessed, and having identified factors which affect the costs of switching, we can isolate the additional factors which affect the decision itself. Switching probability increases with household size; since costs also seem to increase with household size, this indicates that benefits increase even faster with household size because of its correlation with bill size (though bill size itself seemed to decrease the chance of switching). Greater risk aversion makes switching less likely.

Income, age, education level and employment status do not seem to have affected actual switching levels, consistent with the results of MORI surveys for Ofgas. Frequent payers' costs ex ante do not seem to be any higher, since their required savings are lower; indeed, given that the measure of savings required underestimates the potential benefits more for this group of consumers than for others (because their demand is more price responsive), their costs relative to other consumers are likely to be even lower. But in observing behaviour we also find that such consumers are less likely to switch, even though they are on average slightly less risk averse.

There are two interpretations: either the potential gains are lower, or they are prevented from changing as a result of their debt to the incumbent. The potential gains depend on whether they simultaneously switch payment method. If they do so, their potential gains are higher than for any other consumers, but it may be that they have a preference for their current method of

payment (see for example Doble, 1998); in this case their potential financial gains are indeed lower, since entrants offer much lower discounts on this type of payment than on direct debit (see appendix 1). The alternative explanation is that consumers are prevented from switching because of debt with their current supplier. The regulator is currently considering removing the ability of suppliers to prevent consumers with debt from switching, which would reduce the switching costs for such households.

As utility markets are opened to competition, consumers play a much more active role in the development of the market through the choices that they exercise. Their decisions will influence the conditions of supply which are offered, and understanding the nature of that decision process is important in shaping the future of the market and its regulation. Our survey provides some insight into this process, which can help inform these developments.

Appendix 1. Timetable of gas market competition

Table A1.1: Month of market opening, percentage of gas users in our sample and proportion that had switched supplier

Month of market opening	Percentage of gas users in our sample	of which % switching supplier at least once
April-96	5%	27%
February-97	2%	25%
March-97	5%	30%
November-97	17%	10%
February-98	12%	2%
March-98	15%	1%
April-98	14%	2%
May-98	19%	1%
May-98	13%	2%
Total	100.0%	5.9%

The small numbers in the last five rows of column 3 represent consumers who signed up with new suppliers ahead of market opening in their area.

Table A1.2: Gas Tariffs for Domestic customers at 31 December 1997

Company	Refer to Notes		Consumption kWh/year		REGULAR TARIFFS (PENCE) STANDARD CREDIT		QUARTERLY DIRECT DEBIT		MONTHLY DIRECT DEBIT		PREPAYMENT METER TARIFFS	Consumption KWh/quarter			
	AREA		min	max	P/kWh	S/C	P/kWh	S/C	P/kWh	S/C	AREA	Min	max	P/kWh	Annual S/C
Amerada	A,B,C	1	0	73238	1.275	3559	1.25	3559	1.25	3559	A,B,C	0	1143	2.23	1533
		2	0	73238	1.2	3559	1.175	3559	1.175	3559	A,B,C	1144	18309	1.653	1533
		3	0	73238	1.38	3559	1.35	3559	1.35	3559					
Beacongas	A,B,C	4	0	73238	1.3	2600	1.3	1800	1.3	1800	A,B,C	0	1143	2.23	1537
											A,B,C	1144	18309	1.653	1537
Britsh	A,B,C	5	0	3999	2.35	0	2.13	0	2.13	0	A,B,C	0	3999	2.961	0
Fuels Gas			4000	9999	1.69	0	1.53	0	1.53	0	A,B,C	4000	9999	2.1	0
			10000	19999	1.42	0	1.36	0	1.36	0	A,B,C	10000	73238	1.753	0
			20000	24999	1.34	0	1.31	0	1.31	0					
			25000	44999	1.3	0	1.28	0	1.28	0					
			45000	73238	1.25	0	1.2	0	1.2	0					
British	A,B	6	0	73238	1.486	3792	1.401	3292	1.3	3650	ALL	0	1143	2.23	1536
Gas	REST	6	0	73238	1.486	3792	1.401	3292	1.401	3292	ALL	1144	18309	1.65	1536
Calortex	A,B		0	73238	1.257	3750	1.194	3563	1.131	3375	A,B,C	0	18309	1.624	3411
	C		0	73238	1.218	3750	1.157	3563	1.096	3375					
Eastern	A,B,C	7	0	73238	1.185	3102	1.114	2916	1.114	2916	A,B,C	0	1143	2.23	1533
											A,B,C	1144	18309	1.653	1533
Energi	A,B		0	73238	1.233	3144	1.189	3032	1.189	3032	A,B	0	18309	1.633	3788
	A,B		0	73238	1.635	0	1.586	0	1.586	0	C	0	18309	1.587	3408
	C		0	73238	1.204	3068	1.159	2960	1.159	2960					
	C		0	73238	1.635	0	1.586	0	1.586	0					
London	A,B,C	8	0	73238	1.25	3504	1.25	3103	1.198	2920	A,B,C	0	1143	2.23	1537
Electricity											A,B,C	1144	18309	1.654	1537
Midlands	A,B		0	73238	1.18	3285	1.15	3285	1.15	3285	A,B	0	18309	1.623	3409
Gas															
Northern	A,B	9	0	73238	1.18	3066	1.18	3066	1.11	2956	A,B,C	0	1143	2.14	1475
Electricity	C	9	0	73238	1.18	3066	1.16	3030	1.13	2555	A,B,C	1144	18309	1.587	1475
Northern	C	10	0	73238	1.295	3500	1.195	3000	1.195	3000	C	0	18309	1.623	3409
Energy															
Scottish	B		0	73238	1.25	3741	1.25	3741	1.138	3646	B,C	0	18309	1.587	3409
Power	C	11	0	73238	1.195	3741	1.195	3741	1.138	3646					
Southern	A,B,C	12	0	73238	1.263	3227	1.2	3059	1.2	3059	A,B,C	0	1143	2.23	1537
Electric											A,B,C	1144	18309	1.654	1537
Sterling	B	7	0	73238	1.3	2500	1.25	2500	1.25	2500	B	0	18309	1.588	3409
Swalec	A,B,C	10	0	73238	1.189	3033	1.159	2956	1.159	2956	A,B,C	0	18309	1.587	3410
SWEB	A,B		0	73238	1.234	3146	1.185	3020	1.185	3020	A,B	0	18309	1.489	3832
	A,B		0	3743	2.269	0	2.178	0	2.178	0					
	A,B		3744	73238	1.151	0	1.105	0	1.105	0					
York	A,B,C	11	0	73238	1.175	3570	1.175	3470	1.125	3470	A,B,C	0	1143	2.14	1475
Gas											A,B,C	1144	18309	1.587	1475
Yorkshire	A,B,C		0	73238	1.19	3600	not offered		1.15	3170	A,B,C	0	18309	1.623	3409
Electricity															

NOTES:

A=SW England; B=SE England; C=Scotland & NE England; REST=Not SW&SE England; ALL=England, Wales & Scotland

1 Prices fixed until 1/2001, £15 off Monthly Direct Debit after 1 yr,£30 penalty if switching before 2001
2 5% off first year then additional 1% for every year thereafter UP TO 10%; £15 off MDD after 1 yr
3 100 airmiles on sign up, 1 airmile per £6 spent; £15 off Monthly Direct Debit after 1 yr
4 £2 discount per quarter for pre-payment meter users
5 Prices fixed for 1year from sign up; £10 penalty if switching within the 1st year.
6 £2 off per quarter for standard credit prompt payers
7 Prices fixed until April 98
8 £4 per year prompt payment for Standard Credit and Quarterly direct debit customers
9 Prices fixed until Dec 98
10 Prices fixed for 1year from sign up
11 Prices fixed until Nov 98
12 Prices fixed until 1 Jan 99

Source: Consumers' Association

Appendix 2

To derive the equivalence scale using monthly bill size we selected observations where

a) the respondent reported a positive gross personal income, in order to capture income effects. Expenditure on commodities is of course related to household expenditure far more closely than to a head of household's income, however, in the absence of better data, and not seeking to place any interpretation on the size of the coefficient, we use the respondent's reply to our question on income.
b) the indication of savings computed to a proportion of bill size (PROPSAVE) less than one, in order to ensure that our measure was based on consumer responses exhibiting *prima facie* rational behavior.
c) there would be some relationship between consumption and bill payment. We thus included only those paying quarterly by cash or cheque on receipt of a bill. The method appeared to be justified as it also eliminated specification bias and heteroscedasticity (switching variance) associated between quarterly and monthly bill payers, and between standard credit tariff users not paying by cash or cheque.

The aim was to derive an equivalence scale (Deaton and Muellbauer, 1980, Chapter 8, for a discussion) relating consumption to the number of people in the household that offered the greatest internal consistency within our data set. Our results are reported below in table A2.1

Table A2.1 Ordinary Least squares regression with the log of the monthly bill size as the dependent variable

Label	Definition
Y	Log of respondent's gross personal income
NUMADULT	Number of adults in household
NUMCHILD	Number of children in household
ED	1 if left full time education at or over the age of 15; 0 if left before or has no education
MNSAVE	a proxy for the importance placed on gas in the consumer's consumption bundle
H	1 if owner/owner with mortgage (associated with bigger properties)
EM	1 if respondent was employed indicating possible lower consumption

DEPENDENT VARIABLE : log(monthly bill size) Mean= 3.06 S.D.= .6326
Model size: Observations = 300 Parameters = 8
Residuals: Sum of squares= 93.835 Std.Dev.= .567
R-squared= .216, Adj. R-squared = .197
Model test: 11.47 ~ F[7, 292] Prob value = .00000
Jarque-Bera Test for normality of errors: 8.32 ~χ^2[2]
Ramsey's RESET Test for mis-specification: 0.746 ~ F[3, 289]
White's test for Heteroscedasticity: 0.984 ~χ^2[33]

Variable	**Coefficient**	**St. Error**	**t-ratio**	**P[|T|>t]**	**Mean X**
Constant	1.291	.3697	3.490	.0006	
Y	.105	.0406	2.589	.0101	9.013
NUMADULT	.180	.0497	3.616	.0004	1.812
NUMCHILD	.102	.0357	2.856	.0046	0.566
ED	.138	.994	1.393	.1647	0.816
MNSAVE	.045	.750	5.967	.0000	6.885
H	.129	.768	1.680	.0941	0.730
EM	-.139	.872	-1.558	.1202	0.553

The ratio of the coefficients on NUMADULT to NUMCHILD yield an equivalence scale of HS= numadult+0.6*numchild

Appendix 3

As the survey took place at an intermediate stage of the roll-out of competition where savings were also related to payment method, we defined a system of dummy variables to control for the effects of

a) payment methods and tariffs, the combination of which we hypothesise affect private (transaction) costs. A given consumer is expected to incur lower transactions cost in paying for a given amount of gas if using monthly direct debit, and higher transactions costs if paying by a frequent payment method, in comparison to paying for the same gas by one of the other standard credit payment methods.

b) the existence of competition and whether they switched supplier

Table A3.1 summarises the samples

Table A3.1 Sample Summary
1354 GAS USERS

			Gas user located in:		
Gas user's payment details			Area not open to Com-petition	Area open CI = 1	
tariff	**payment method**			Consumer didn't switch	Consumer switched Supplier
monthly direct debit tariff	monthly direct debit	PMDD =1	A	B	C
standard credit tariff, with possible discounts for early payment	monthly standing order, quarterly direct debit or standing order				
	cash or cheque with quarterly bill				
	budget scheme: (cards, stamps, fuel direct)	PAYF= 1	D	E	F
prepayment meter tariff	prepayment meter				

A test of whether frequent payers should be further divided into prepayment users and those on budget schemes was carried out. Separate dummies for consumers on a budget payment scheme (BS=1), a prepayment meter (PPM=1) and their household sizes (BSHSIZE and PPMHSIZE) instead of PF and PFHS were used in analysis c below. A test of the joint hypothesis that the coefficient to BS is equal to PPM, and the coefficient of BSHSIZE is equal to that of PPMHSIZE, could not be rejected (Wald test: $0.29 \sim \chi^2[2]$).

The analyses in the following tables are referenced by their labels a to i in Table 2.

For the probit analyses (a,b,g,h,i) the following tests are reported:

a) goodness of fit using Zavoina and McKelvey's (1975) method (Z-M statistic)
b) Likelihood Ratio test of all parameter coefficients being zero (LR model test)
c) Jarque-Bera test of third and fourth sample moments of the residuals (JB normality test, *cf* Bera *et al.*, 1984)
d) Lagrange Multiplier Test for heteroscedasticity (LM hetero test, *cf*. Greene, 1997, pp889-890).

The results reported for the probits are the marginal effect of each variable on the probability of switching where this is evaluated at the mean of the independent variables and hence these are also reported.

Analysis c involves OLS while d, e, and f use OLS with White's Heteroscedastic Consistent Covariance Matrix (HCCM). R^2, adjusted R^2, model F-test and Ramsey's RESET test refer to the reported regression. The JB test for normality in the residuals and White's test for heteroscedasticity refer to OLS in analyses c to f.

Table 2 Ref:	a		B	
Estimator	Probit		Probit	
Sample (Table A3.1)	ABDE		AB	
Observations	936		690	
Mean of POTSW	0.515		0.542	
Standard Deviation	0.500		0.499	
Z-M statistic	0.445		0.438	
LR model test	113.05~χ^2[12]		73.25~χ^2[10]	
JB normality test	0.01~χ^2[2]		0.19~χ^2[2]	
LM hetero test	13.92~χ^2[9]		17.52~χ^2[9]	
Variable	**Partial derivative (t-ratio)**	**Mean value**	**Partial derivative (t-ratio)**	**Mean value**
Constant	-1.101 (-3.723)		-.926 (-2.914)	
Y	0.133 (4.183)	9.047	.120 (3.423)	9.159
q	Excluded		.001 (1.777)	2.227
HS	0.041 (1.826)	2.250	Excluded	
R	0.006 (1.294)	3.63	-.005 (1.041)	3.466
A	-.182 (-2.663)	.201	-.181 (-2.387)	.207
NT	0.083 (1.888)	.736	.099 (1.802)	.830
ED	-0.029 (-0.426)	.867	-.055 (-.710)	.875
EM	-0.009 (-0.192)	.589	.013 (.226)	.626
PMDD	-0.015 (-0.391)	.434	-.058 (-1.382)	.555
T	-0.209 (-4.956)	.782	-.168 (-3.394)	.791
CI	-0.109 (-2.724)	.250	-.121 (-2.525)	.212
PF	0.136 (1.200)	.182	None	
PFHS	-.048 (-1.153)	.439	None	

Table 2 Ref:	c	d	e	f
Estimator	OLS	OLS (HCCM)	OLS (HCCM)	OLS (HCCM)
Sample (Table A3.1)	ABCDEF	ABC	ABDE	AB
Observations	1007	750	936	690
Mean of MNSAVE	£7.61	£7.24	£7.71	£7.31
Std. Dev.	4.614	4.437	4.647	4.467
R-squared	.1212	.136	.118	.138
Adj. R-squared	.1092	.121	.105	.124
Model F test:	9.81 ~ F[14, 992]	9.67 ~ F[12, 737]	9.48~ F[13, 922]	9.87~F[11, 678]
Jarque-Bera test	35.47 ~ χ^2[2]	26.99 ~ χ^2[2]	31.80~χ^2[2]	23.44~χ^2[2]
RESET test	1.75 ~ F[3, 989]	1.22 ~ F[3, 734]	2.02~F[3,919]	1.11~F[3, 675]
White's hetero test	106.44 ~χ^2[86]	91.18 ~ χ^2[66]	100.94~χ^2[71]	92.00~χ^2[65]
IndependentVar.	**Coeff. (t-ratio)**	**Coeff. (t-ratio)**	**Coeff. (t-ratio)**	**Coeff. (t-ratio)**
Constant	15.905 (6.792)	15.168 (6.772)	15.415 (6.755)	14.856 (6.398)
Y	-1.127 (-4.461)	-1.045 (-4.250)	-1.086 (-4.489)	-1.023 (-4.013)
q	Excluded -	0.023 (4.395)	Excluded -	0.024 (4.419)
HS	0.434 (2.378)	Excluded -	0.412 (2.236)	Excluded -
R	-0.068 (-2.003)	-0.039 (-1.137)	-0.058 (-1.718)	-0.036 (-1.019)
A	0.668 (1.206)	0.264 (0.442)	0.807 (1.367)	0.428 (0.679)
HT	0.104 (0.290)	-0.152 (-.332)	0.076 (0.192)	-0.251 (-0.527)
ED	0.928 (1.687)	0.975 (1.513)	1.064 (1.767)	1.105 (1.632)
EM	0.952 (2.332)	0.923 (1.938)	0.992 (2.313)	0.934 (1.884)
PMDD	0.230 (0.739)	0.123 (0.381)	0.225 (0.712)	0.132 (0.395)
T	0.625 (1.832)	0.574 (1.481)	0.643 (1.784)	0.588 (1.434)
PE	-2.255 (-7.531)	-2.079 (-6.478)	-2.315 (-7.615)	-2.088 (-6.298)
CI	0.809 (2.456)	0.547 (1.427)	.772 (2.247)	0.474 (1.193)
S	-1.700 (-2.864)	-0.786 (-1.317)	None -	None -
PF	-1.213 (-1.328)	None -	-1.082 (-1.057)	None -
PFHS	0.656 (1.976)	None -	0.644 (1.675)	None -

Table 2 Ref:	g		h		I	
Estimator	Probit		Probit		Probit	
Sample	BC		BCEF		BCEF	
Observations	198		278		221	
Mean of SWITCHED Standard Dev.	0.263 0.441		0.196 0.398		0.226 0.419	
Z-M statistic	0.498		0.561		0.601	
LR model test	41.61~χ^2[11]		58.76~χ^2[13]		43.14~χ^2[13]	
JB normality test	27.94~χ^2[2]		88.6~χ^2[2]		41.88~χ^2[2]	
LM hetero test	11.64~χ^2[10]		15.57~χ^2[10]		17.01~χ^2[10]	
Variable	**Partial derivative (t-ratio)**	**Mean value**	**Partial derivative (t-ratio)**	**Mean value**	**Partial derivative (t-ratio)**	**Mean value**
Constant	-0.378 (-0.717)		-.569 (-1.683)		0.186 (0.362)	
Y	.011 (.193)	9.06	.012 .342	2.046	-0.076 (-1.429)	2.19
q	-.035 (2.612)	2.29	excluded		Excluded	
NS	Excluded		.057 (2.018)	2.189	.118 (3.276)	2.294
R	.006 (.088)	4.31	.001 (.286)	4.256	-0.025 (-2.062)	4.020
A	.078 (.645)	0.20	.067 (.882)	.212	.071 (0.709)	.138
HT	-.145 (-1.614)	.833	-.011 (-.210)	.687	.428 (0.590)	.794
ED	-.092 (-0.782)	.893	-.070 (-.946)	.817	-.037 (-0.361)	.861
EM	.025 (.234)	.641	.012 (.182)	.568	-.014 (-0.166)	.660
PMDD	.154 (2.198)	.591	.058 (1.348)	.489	.054 (1.029)	.574
T	-.039 (.469)	.828	-.023 (-.446)	.806	-.065 (-1.060)	.301
PE	.282 (4.208)	.490	.142 (3.206)	.450	Excluded	
I	Excluded		excluded		.907 (1.804)	.411
L	.094 (2.913)	1.679	.074 (3.397)	1.464	.074 (2.903)	1.568
PF	None		-.506 (-2.527)	.237	-.542 (-1.706)	.163
PFHS	None		.136 (2.195)	.501	.118 (1.252)	.356

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