Retail Market Review: A Structural Equation Modelling Analysis

Report Submitted to Ofgem

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1. Introduction and summary of findings

Ofgem launched the Retail Market Review (RMR) in late 2010 due to concerns that the retail energy market was not working effectively for consumers. Through the RMR they introduced a wide-ranging package of measures designed to address barriers to effective consumer engagement and make the retail energy market simpler, clearer and fairer for consumers. The changes were rolled out between August 2013 and June 2014, and included measures to simplify tariffs, provide clearer information to consumers through their regular communications (eg providing information to consumers about cheaper tariffs with their current supplier), and introduce new standards of conduct to ensure consumers are treated fairly in all their dealings with suppliers.

Ofgem expected that these new rules, over time, would cause significant change. As a result they decided to go beyond straightforward monitoring of market changes, and to proactively evaluate the effect of the reforms in contributing to change. This would help them to inform future policy development, understand where the reforms have had the least impact, and identify areas of the market where further intervention is required. In order to achieve this, Ofgem developed an evaluation framework, comprising a bespoke consumer survey, supplier compliance assessment and wider monitoring of quantitative market statistics. These elements would be supplemented with qualitative information from consumer studies and industry stakeholders to build a robust and holistic picture of the impact of the RMR. A baseline of results was established in 2014, prior to the rollout of most of the reforms, against which future changes could be measured.

This report summarises the findings of an econometric analysis of the results of the 2014 and 2015 bespoke face-to-face consumer surveys commissioned to TNS BMRB. The aim of the 2014 survey was to contribute towards the establishment of a baseline of consumer attitudes and behaviour in the early stages of the RMR interventions, and the survey was repeated in 2015 to examine any changes in these attitudes and behaviours. This analysis has three main objectives. The first is to analyse the interaction between these three aims and assess the degree to which they contribute to consumers' level of engagement. The second is to establish drivers of change in the three main aims of the RMR; to improve trust, increase consumer understanding, and improve consumers' ability to compare tariffs. The third is to establish how the interactions and drivers change over time. This will help to identify where the RMR measures have contributed to change, and also provide an understanding of those areas where changes are most likely to have a positive effect on consumer engagement, thus helping to inform future policy development.

The main findings of the analysis for 2015 are that trust, understanding and ability to compare tariffs have a small effect on consumers' level of engagement. Of these consumers, the level of understanding has the largest bearing on their engagement. There is a small positive relationship between ability to compare and engagement, and a small negative relationship between trust and engagement. There are also positive relationships between understanding and both trust and ability to compare, and between ability to compare, and trust. Those relationships are found in 2014 and 2015 for both the electricity and gas markets, apart from the relationship between comparability and engagement, which is found not to be statistically significant in 2014, though it is in 2015. What these findings tell us is that there are multiple direct and indirect effects between trust, understanding, comparability and engagement. Furthermore, the size of the effects for all the relationships described above is of similar magnitude in 2014 and 2015 apart from the path from comparability to trust, which seems to have increased from a low to a medium effect in 2015 in both the electricity and gas markets. Additionally, a diverse range of factors have an influence on

consumers' level of engagement, including recall of the RMR comparison tools such as the cheapest tariff message, satisfaction with their own electricity or gas supplier and having moved house in the last 12 months. The factors found to have a positive influence on consumers' trust include satisfaction with the interactions consumers had with their own and other energy suppliers, and receiving a letter about the requirement to treat them fairly. Factors such as clarity of the information presented in the bill or the annual summary, have a positive effect on increasing consumers' understanding. Finally, the ability to compare is positively affected by how easy it is to find information and when the amount of information available is right rather than too much.

The methodology underpinning these findings is called structural equation modelling (SEM) and is conducted in two parts. As trust, understanding, comparability and engagement are not directly observable using only one indicator, the first part of the analysis aims to provide a method for measuring each of these constructs for each survey respondent through a number of indicators from the survey. The second part of the analysis then examines the relationships between these different constructs, and their drivers. The analysis is based on the findings of the 2014 and 2015 evaluation surveys conducted by TNS BMRB, and the indicators and drivers used from the surveys are identical wherever possible.[1]

Structural equation modelling is a general modelling approach designed to measure constructs and testing specific hypothesis among those constructs and other drivers. The framework is very general and embeds many different models such as multi-group analysis, latent growth analysis, multilevel modelling, etc. However; SEM comes with its limitations. For example, building the models that measure the constructs is a complex exercise especially if the constructs are not clearly defined concepts. Furthermore, models with bidirectional relationships are not easily identified in cross-sectional studies. Most importantly, SEM does not build causal models. That implies that we cannot use survey data and prove whether one variable causes another or prove the direction of causal order between variables. Finally, SEM cannot solve the fundamental problem of unmeasured confounders. Despite those limitations found almost in any statistical modelling approach, SEM provides a general framework for testing specific hypotheses about our data.

The report is organised as follows:

- Section 2 presents the results of the first step of the analysis, which aims to measure the constructs understanding, trust, comparability, and engagement for the electricity and the gas markets.
- Section 3 discusses the results of the second part of the analysis, which looks at the relationships between trust, understanding, comparability and engagement, and their drivers.
- Section 4 provides a summary of the methodology employed in the analyses.

[1] The main difference are questions on whether the respondent has seen the Tariff Comparison Rate and the Personal Projection, which were only introduced in the 2015 survey as those measures were not yet implemented in the 2014 survey.

2. Measuring Trust, Understanding, Comparability and Engagement

In this section, we present the results from the models used to measure each construct. Each construct is measured using a carefully selected number of indicators (questions from the survey). The methods of exploratory factor analysis and confirmatory factor analysis have been extensively employed at this stage to finalise the indicators used to measure the constructs. These are termed 'latent' in that they may not be directly observable. The initial pool of indicators has been suggested by Ofgem based on the definitions provided for the constructs and the questions available in the questionnaire. A description of the indicators used for constructing the four constructs is given in Appendix A1. There are in total four constructs of interest: 'engagement with the energy markets', 'trust in the energy markets', 'understanding of the energy markets' and 'comparability of the energy markets'. All constructs given above except 'comparability' have been constructed separately for the gas and the electricity markets using questions that ask about gas and electricity separately.

The sample size is 6,151 in 2014 and 5,934 in 2015 in all the statistical analyses performed in this report. For all the covariates, the missing value categories 'don't know' (DK), 'refused' to answer (RF), and no answer have been treated as separate response categories. The software used for this analysis[2] uses all the available information and imputes the missing values so that the total sample used is the same as the total original sample size. That is, all the respondents of the survey are included in this analysis.

There are no obvious reasons as to why we cannot compare the constructs over 2014 and 2015. To check that this is the case, the data from the two periods are analysed simultaneously to assess the level of measurement non-equivalence for the indicators of the four constructs. Measurement equivalence implies that a respondent in 2014 and a respondent in 2015 with the same level of each construct, and similar characteristics, would give the same responses to the questions we use to measure those constructs and as such we can compare the results directly between the two years. For example, two respondents with the same level of trust are expected to give the same answer to the questions in the survey that we use to measure trust in 2014 and in 2015. The multi-group analysis with full measurement equivalence, which performs this analysis, gives a good fit. The results of the multi-group analysis are reported in Section 3.3.

Table 2.1 gives the estimated standardized coefficients of each indicator on the construct for both years and for both electricity and gas for the models presented in Figures 1 to 4. The models for gas and electricity give broadly the same results in both years. Differences occur in the second decimal point for almost all the values of the coefficients except for the indicator 'change tariff <1 year' where the differences are noticeable between gas and electricity in both years. All coefficients for electricity and gas are found to be statistically significant[3] . The loadings show how strongly each one of the indicators measure the construct. The higher the value the stronger the association between the indicator and the construct. The standardized coefficients indicate medium to high associations. Judging from the sign of the loadings, the wording of each indicator used in the analysis and the ordering of the response categories of each of the indicators, the constructs are labelled as follows:

- The construct 'engagement with the market' takes values from low engagement to high engagement.

[2] I use Mplus 6
[3] At 5% significance level

- The construct ‘trust in the market’ takes values from low trust to high trust.
- The construct ‘understanding of the market’ takes values from low levels of understanding to high levels of understanding.
- The construct ‘comparability of the market’ takes values from low levels of comparability to high levels of comparability.

Both models show a very good fit. The fit statistics for all models are given at the bottom of Table 2.1. For a discussion of those fit statistics see Section 5. A RMSEA smaller than 0.05 indicates a good fit, a CFI close to 1 also indicates a good fit.

Table 2.1: Measurement model: estimated standardized construct loadings and measures of fit

	2014		2015	
	Electricity	**Gas**	**Electricity**	**Gas**
Estimated standardized construct loadings				
Engagement				
Awareness	0.273	0.270	0.324	0.303
Switched supplier <1 year	0.647	0.649	0.472	0.529
Number of switches	0.545	0.534	0.423	0.441
Changed Tariffs <1 year	0.524	0.271	0.647	0.490
Changed Tariff >1 year	0.224	0.226	0.220	0.352
Compared Suppliers <1 year	0.956	0.979	0.942	0.961
Compared Tariffs <1 year	0.747	0.737	0.950	0.950
Changed Payment Methods	0.362	0.377	0.323	0.302
Trust				
Trust to be fairly treated	0.948	0.943	0.932	0.935
Trust that own supplier provides clear and helpful information	0.929	0.925	0.899	0.910
Trust that supplier charges fair prices	0.907	0.914	0.912	0.912
Trust to be fairly treated by energy suppliers	0.645	0.662	0.620	0.646
Understanding				
Familiarity with the range of tariffs from current supplier	0.968	0.966	0.980	0.980
Familiarity with the features from your current tariff	0.888	0.906	0.906	0.913
Comparability				
Ease to compare different tariffs	0.832	0.822	0.801	0.790
Is hard to work out whether I would save	-0.464	-0.467	-0.525	-0.527
Fit Statistics				
RMSEA	0.023	0.024	0.022	0.021
p-value	1	1	1	1
CFI	0.964	0.954	0.968	0.970

3. Relationship between Trust, Understanding, Comparability and Engagement.

This section discusses the results from the models for the electricity and the gas markets. First I discuss the relationships among the constructs and then the relationships between the constructs and the covariates. Appendix B gives the estimated standardised regression coefficients for 2014 and 2015 respectively. A description of the list of covariates is given in Appendix A2.

The path diagrams of the models are given in Figures 1 and 2 for the electricity market in years 2014 and 2015 respectively, and in Figures 3 and 4 for the gas market in years 2014 and 2015 respectively. These figures present the path coefficients in standardised units. For example, Figure 1 shows that if understanding was increased by one standard deviation, while other drivers and constructs were held constant, engagement would increase by 0.171 standard deviations. Holding other variables in the model constant allows isolating the relationship between two variables. Since the path and regression coefficients (magnitudes of each effect) in all cases measure the relationship between two variables controlling for all other variables in the model we will not repeat it every time we give the interpretation of the estimated path coefficients and regression coefficients.

The results for the gas market are similar to the ones found in the electricity market in terms of statistical significance and magnitude. The estimated standardized path coefficients (direct effects) for the relationships among the constructs are given on the arrows. The path coefficients represent the effect of each construct on other constructs measured in standard deviations. In many applications an effect size smaller than 0.2 standard deviation change indicates a small effect, an effect size between 0.2 - 0.6 a moderate effect, and an effect size above 0.6 a large effect.

Electricity Market

For both years, all path coefficients are statistically significant except for the path from comparability to engagement in 2014 (see Figures 1 and 2). Most of the effects are of very small effect size such as the effect of trust on engagement, the effect of understanding on trust and the effect of comparability on engagement.

The construct ‘understanding’ has a small direct effect on engagement. It also has an indirect effect on engagement through comparability and through trust (ie its effect on engagement is mediating through trust and comparability) giving an estimated statistically significant total effect of 0.172 and 0.168 for 2014 and 2015 respectively, which are very close to the direct effect.

Trust has a small negative effect on engagement. The effect of trust on engagement is controlled by the common effect of understanding. Understanding has also a medium size effect on comparability.

In 2014, the direct effect of comparability on engagement is not statistically significant and the total effect is also non-significant and even smaller than the direct effect (0.019). In 2015, the direct effect of comparability on engagement is positive and statistically significant and the total effect, including the effect mediating through trust, is significant and smaller than the direct effect (0.047). Note that the effect of comparability on engagement is controlled by the common effect of understanding. The effect of comparability on trust is moderate and positive.

Figure 1: Estimated Path Coefficients, Electricity Market, 2014

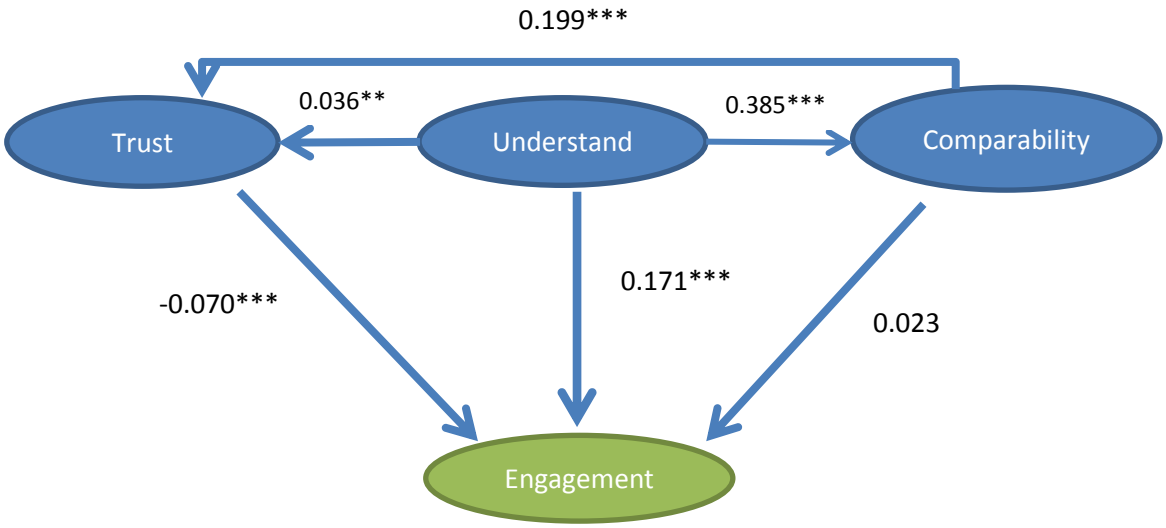
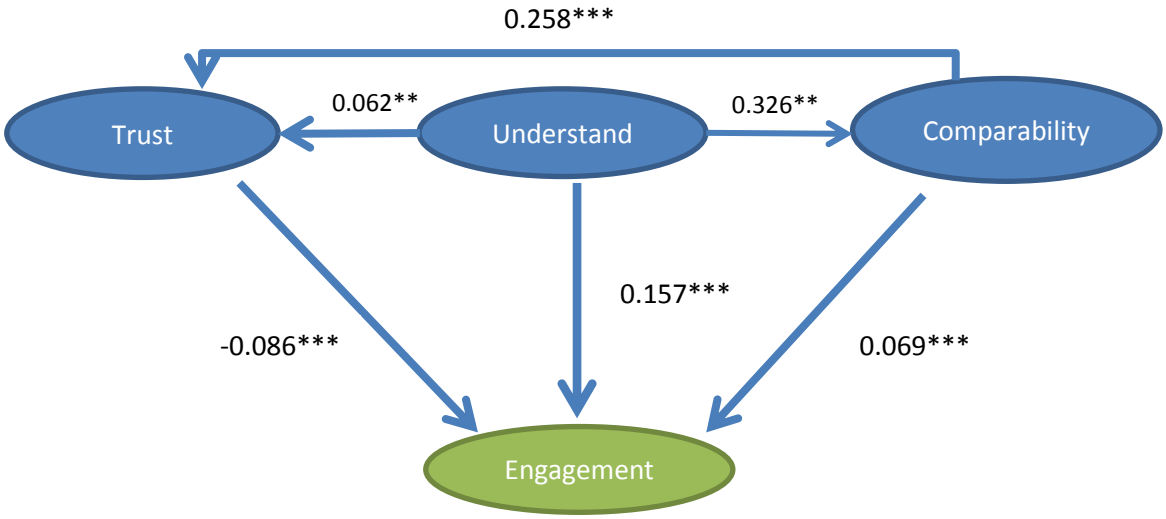


Figure 2: Estimated Path Coefficients, Electricity Market, 2015



*** Significance level 1%
** Significance level 5%
* Significance level 10%

Drivers of trust, understanding, comparability and engagement in the Electricity Market

I discuss in this section all the regression coefficients that are statistically significant[4] . A description of the covariates with their reference categories is given in Appendix A2, and Appendix B gives the estimated standardised regression coefficients for each of the models.

Engagement with the electricity market

Higher levels of engagement are found among respondents who:

- In both years, have moved in the last 12 months; are English speakers; regular internet users; older than 35 years old; and those who have caring responsibilities in the household.
- In 2015, recall seeing a message about savings by changing tariff; seeing a tariff comparison rate; and those who recall seeing a personal projection in the last 12 months.
- In 2014, those who are satisfied or neither satisfied nor dissatisfied with their own electricity supplier compared to dissatisfied respondents and those who found the information on price increase neither clear nor unclear compared to those who found it unclear.

Lower levels of engagement are found among respondents who

- In both years, are in social class DE rather than AB.
- In 2015 are in social class C1 or C2 rather than AB.
- In 2014 reported that they had no qualifications.

Trust in the electricity market

Higher levels of trust are found among respondents who

- In both years, are satisfied with their interactions with another energy supplier and with their own energy supplier and who have received a letter in the last 12 months from their supplier about their requirements to treat customers fairly. Furthermore, I find higher levels of trust in those who report to have a GCSE or reported to have no qualifications, those in social class group DE (when compared to AB), and those in age groups 65 and above.
- In 2015, are in social class group C1 and C2 rather than AB.

Lower levels of trust are found among respondents who:

- For both years, are satisfied with how their complaint was handled by the energy supplier; those who had cause to complain in the last 12 months but have not, among English speakers; and those who use the internet regularly.
- In 2015, have contacted a current or previous energy supplier to complain in the last 12 months.

Understanding of the electricity market

Higher levels of understanding are among those respondents who:

- In both years, found that the information in the annual summary and in the bill or statement was clearly presented; had a higher score on the amount of detail they read in the communications sent by the energy suppliers; are regular internet users; are in age group 35-64; and are in social class groups C2 rather than AB.
- In 2015, are in social class groups DE rather than AB.
- **I**n 2014, found that the information in the end of fix term notice and the price increase notice was clearly presented.

Lower levels of understanding are found among respondents who:

[4] at 5% significance level

- In both years, are from Wales or Scotland compared to those living in England and have caring responsibilities in the household.
- In 2014, have a GCSE or reported to have no qualifications.

Comparability of the market

Higher levels of comparability are found among those that:

- In both years, found it easy to find information and among those who believe that the amount of choice of range of tariffs available is right rather than too much. Furthermore, higher levels of comparability found among regular internet users and those with children.

Lower levels of comparability are found amongst those that:

- In both years, are 35-64 and 65 and over compared to the age group under 35 and among those respondents who have caring responsibilities in the household.
- In 2014 live in Wales rather in England.

Gas Market

Figures 3 and 4 give the estimated path coefficients for the model for the gas market. The path coefficients are statistically significant[5] except for the path from comparability to engagement in 2014. Most of the effects are small in magnitude such as the effect of trust on engagement, the effect of understanding on trust and the effect of comparability on engagement.

The latent construct 'understanding' has a small direct effect on engagement. It also has an indirect effect through comparability and through trust (i.e. its effect on engagement is mediated through trust and comparability) giving an estimated larger total effect of 0.172 and 0.145 in 2014 and 2015 respectively.

Trust has a very small negative effect on engagement. Understanding has also a medium size effect.

In 2014, the direct effect of comparability on engagement is not statistically significant and the total effect, when accounting for the indirect effect through trust, is also non-significant and smaller than the direct effect (0.019). In 2015, the direct effect of comparability on engagement is statistically significant and the total effect is also significant and of a smaller size than the direct effect (0.072).

The effect of understanding on trust is also statistically significant and small. The effect of comparability on trust is positive and of medium size.

[5] At 1% significance level

Figure3: Estimated Path Coefficients, Gas Market, 2014

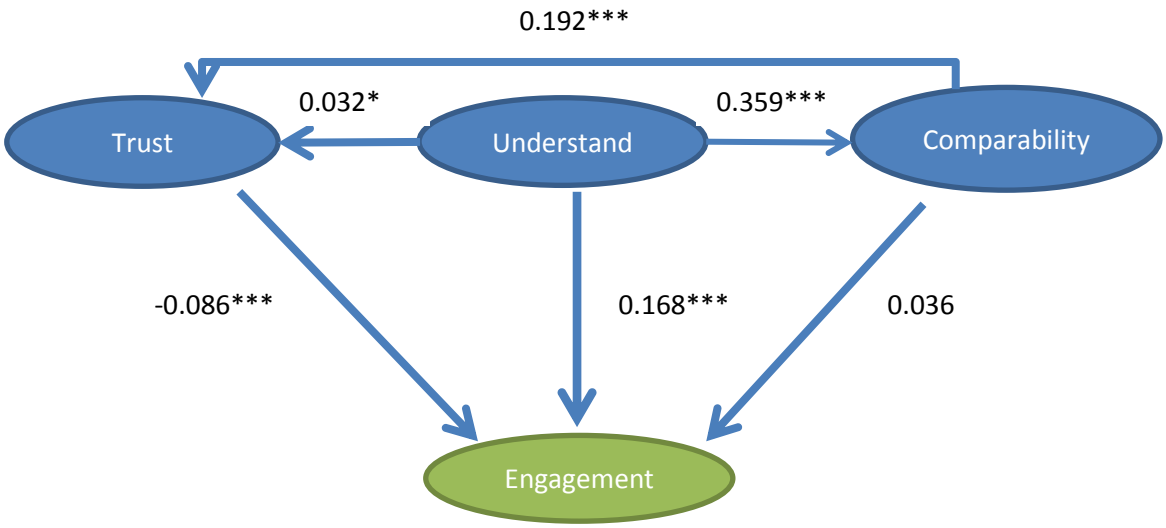
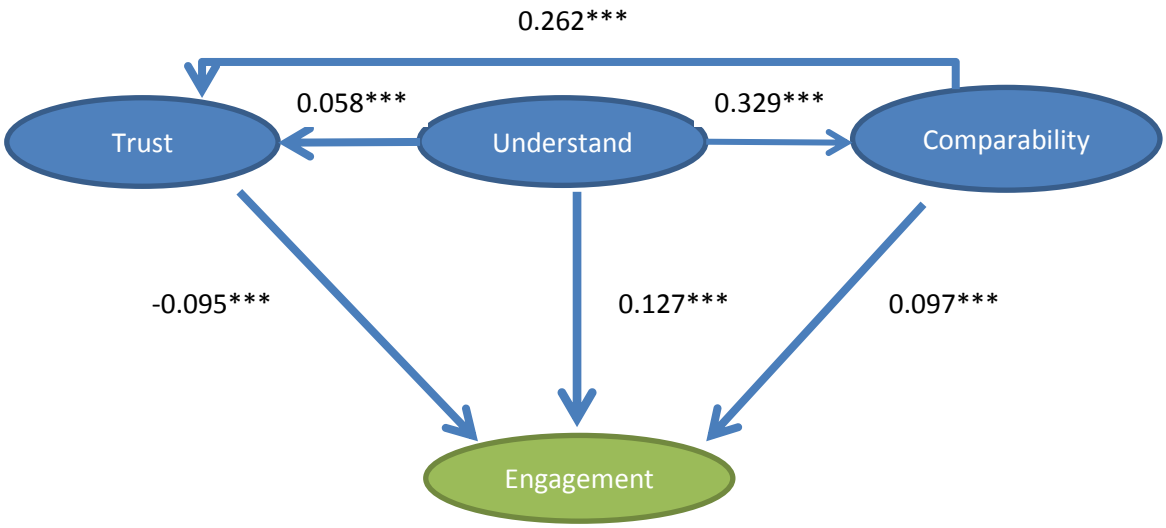


Figure 4: Estimated Path Coefficients, Gas Market, 2015



*** Significance level 1%
** Significance level 5%
*Significance level 10%

Drivers of trust, understanding, comparability and engagement in the Gas market

I discuss in this section all the regression coefficients that are statistically significant. A description of the covariates with their reference categories is given in Appendix A2, and Appendix B gives the estimated standardised regression coefficients for 2014 and 2015 respectively.

Engagement with the gas market

Higher levels of engagement are found among respondents who:

- In both years, have moved in the last 12 months; are English speakers; regular internet users; older than 35 years old; and those who have caring responsibilities in the household.
- In 2015, recall seeing a message about savings by changing tariff; seeing a tariff comparison rate; and recall seeing a personal projection in the last 12 months.
- In 2014, those who are satisfied or neither satisfied nor dissatisfied with their own electricity supplier compared to dissatisfied respondents.

Lower levels of engagement are found among respondents who:

- In both years, are in social class DE rather than AB.
- In 2015, are in social class C1 or C2 rather than AB.

Trust in the gas market

Higher levels of trust are found among respondents who:

- In both years, are satisfied with their interactions with energy supplier and satisfied with their own energy supplier. Furthermore, I find higher levels in those who report to have a GCSE or equivalent level of education or reported to have no qualifications, and those in social class group DE rather than AB.
- In 2015, have received a letter in the last 12 months from their supplier about their requirements to treat customers fairly; are aged 65 and over rather than respondents under 35; and are in social class group C1 or C2 rather than AB.

Lower levels of trust are found among respondents who:

- For both years, contacted a current or previous energy supplier to complain; are satisfied with how their complaint was handled by the energy supplier; and those who had cause to complain in the last 12 months but have not complained; are English speakers; and use the internet regularly.
- In 2014, in the age group 35-64 when compared to respondents under 35.

Understanding of the gas market

Higher levels of understanding are found among those respondents who:

- In both years, found the information in the annual summary and in the bill or statement was clearly presented; had a higher score on the amount of detail they read the communications sent by the energy markets; and are regular internet users, in age group 35-64 rather than under 35, and in social class groups C2 rather than AB.
- **I**n 2014, found the information in the end of fix term notice and the price increase notice to be clearly presented.
- In 2015, are in social class groups DE rather than AB.

Lower levels of understanding are found among respondents who:

- In both years, are from Scotland compared to those living in England.

- In 2015, have caring responsibilities in the household, and those who are from Wales (when compared to those living in England).
- In 2014, report having no qualifications.

Comparability of the market

Higher levels of comparability are found among those that:

- In both years, found it easy to find information and among those who believe that the amount of choice of the range of tariffs available to them is right rather than too much. Furthermore, higher levels of comparability are found among regular internet users and those with children.

Lower levels of comparability are found amongst those that:

- In both years, are 35-64 and 65 and over compared to respondents under 35, and among those respondents who have caring responsibilities in the household.
- In 2014 live in Wales rather in England.

Multi-group analysis

To compare path coefficients and regression coefficients between the two years we need to ensure that the indicators that measure the constructs have remained equivalent over the two years. In other words, we need to check that the relationships between the indicators and the constructs have not changed from 2014 to 2015. To justify the above claim and allow us to confidently compare the constructs across the two years as we have done in the earlier sections of the report, I performed an analysis called multi-group analysis that shows that the relationships have remained the same. The table below presents the estimated mean values of the four constructs (with their p-values in brackets) for electricity and gas. Those results have been obtained by analysing both years simultaneously treating the two time points as separate groups without including the covariates into the model. The coefficients of the constructs and the thresholds for each indicator have been set equal across the two time points to facilitate the interpretation of the constructs in the two time points. For identification purposes, the mean of the constructs have been set equal to 0 in 2014 and set free to be estimated in 2015. Both models are a good fit according to the CFI index and the RMSEA. According to the results below the construct understanding of the electricity market seems to be on average higher in 2015 but the result is only significant at 11.4% significance level. The only significant result is found to be the mean level of Engagement with the electricity markets which according to the results below, it has decreased from 2014 to 2015 from 0 to -0.156. Those results do not account for the effect of covariates. A similar pattern emerges with the gas market. The fit of the fully constrained model (construct coefficients and thresholds) is good at indicating that the four constructs measure the same constructs in the two time periods. That assessment is necessary to provide a baseline for comparing the effects found in the two time periods.

Table 3.1: Multi-group analysis: estimated mean values of the constructs and measures of fit

Construct	Mean of the construct	
	2014	2015
Electricity		
Engagement	0	-0.156 (0.008)
Trust	0	-0.030 (0.156)
Understanding	0	0.152 (0.114)
Comparability	0	-0.012 (0.825)
RMSEA=0.047		
CFI=0.991		
Gas		
Engagement	0	-0.381 (0.025)
Trust	0	-0.041 (0.184)
Understanding	0	0.436 (0.136)
Comparability	0	-0.146 (0.312)
RMSEA=0.046		
CFI=0.990		

4. Definitions, Modelling and other information

SEM provides a general framework that brings together simultaneous equation models developed in econometrics, factor analysis theory developed mainly in psychometrics and path analysis developed mainly in sociology.

Type of Variables:

- **Exogenous variables**: variables that are not influenced by another variable in a model (e.g. in our analysis the variables understanding and social class are exogenous variable).
- **Endogenous variables**: variables that are influenced by other variables in a model (e.g. the construct 'engagement' is an endogenous variable).
- **Indicators/Manifest variables/observed variables/items**: variables that are directly observed and measured (e.g. have you switched tariffs in the last 12 months?).
- **Latent constructs/ latent variables/constructs/factors**: variables that are not directly measured (e.g. trust, intelligence, attitudes towards environment).
- **Covariate/explanatory variable/controlled variables/drivers**: variables you use in a model to control or explain effects on the endogenous variables (e.g. social class, marital status, found easy to switch etc.)

A structural equation model is made up of two parts:

- **Measurement model**: is part of the entire structural equation model and it is essential for measuring the constructs.
- **Structural model:** is a model for assumed causal relationships among the constructs controlling for covariates.

SEM allows the simultaneous estimation of a measurement model and a structural model. The methodology allows testing complex hypotheses on the relationships between indicators and latent constructs via the measurement model (measurement part) as well as relationships among latent constructs and covariates via the structural model (structural part). The structural model can estimate the effects of latent constructs and covariates, such as demographic and socio-economic variables, on other latent constructs. More on methods of estimation, goodness of fit and standardized coefficients for SEM can be found in Section 4 of this report.

Definitions of some of the most common latent variable models:

Confirmatory factor analysis (CFA) is mainly concerned with testing hypotheses about the values of construct coefficients (usually, that some are zero) whereas structural equation modelling (SEM) is concerned with estimating (linear and non-linear) relationships between constructs.

In the data analysis, we used both exploratory and confirmatory factor analysis, and structural equation modelling. Exploratory factor analysis (EFA) analyses a set of correlated indicators without knowing in advance either the number of constructs that are required to explain their interrelationships or their meaning or labelling. Depending on the q-construct model finally chosen (based on goodness-of-fit criteria and fit measures) and the rotation applied (orthogonal or oblique), one names the constructs according to the indicators to which each construct is related. In addition, residuals (terms comprising the margin of

error) are not allowed to be correlated with each other. Finally, note that the choice of the number of constructs depends on statistical criteria or rules that might not be clearly defined or valid.

Confirmatory factor analysis (CFA) postulates certain relationships between the indicators and the constructs, assuming a pre-specified pattern for the model parameters (construct coefficients, structural parameters, residual variances). CFA is mainly used for testing a hypothesis arising from theory. Therefore, the number of constructs and the indicators that will be used to measure each construct are known in advance.

We should note here that there is not always a clear distinction between an EFA and a CFA. Researchers improve the fit of a CFA model by reducing the number of constraints and by allowing for more parameters to be estimated. Also, results from an EFA might lead a researcher to exclude certain indicators from the analysis. Both of those strategies will result in mixing together elements of EFA and CFA. SEM develops from CFA by studying the relationships between the latent constructs.

Effect Decomposition of a Bivariate Relationship

In SEM (or Path Analysis) we distinguish 3 types of causal effects:

1. Direct - the influence of one variable on another that is unmediated by any other variable in the model, i.e. each single headed arrow represents a direct effect.
2. Indirect - effect that is mediated by at least one intervening variable.
3. Total causal effect - sum of the direct and indirect effects.

Scaling of the constructs, Goodness-of-fit and measures of fit, Modification Indices

The constructs have no natural scaling. Both the origin and the unit of measurement are arbitrary and therefore they must be chosen in advance. The origin of the constructs is usually set to zero. There are two alternative ways of setting the scale of a construct and they lead to equivalent solutions: (1) standardizing the constructs, assuming that they have zero means and unit variances in the population, and (2) forcing the scale of the construct to be the same as one of the indicators. Usually we choose the indicator that best represents the construct and set its construct coefficient equal to one.

Goodness-of-fit and measures of fit

Chi-square test statistics and residuals can be used to assess the suitability of a SEM. In addition, fit indices, model selection information criteria, and modification indices are used for helping us decide on the best fitted model and on how to improve the goodness of fit.

Fit indices: Because of the limitation of the chi-squared statistic alternative standardized forms of the chi-squared statistic have been proposed in the literature, which are less sensitive to the sample size and to the assumption that the model holds exactly in the population. Fit indices are based on the sample and estimated (reproduced) covariance matrices. I give below the ones that are used most widely and are known to be more robust.

The root mean square error of approximation (RMSEA) takes into account the fact that the model might hold approximately rather than exactly in the population. It favours simpler models and also takes sample size into account. It has been suggested that values smaller than 0.05 indicate a close fit. Values between

.05 and .08 suggest reasonable error of approximation, and values greater than 0.08 indicate a poor fit. A p-value and a confidence interval can be computed.

The comparative fit index (CFI) takes values between 0 and 1. CFI values close to 1 indicate a very good fit. CFI computes the relative improvement in the overall fit of the fitted model compared to a null model; this is usually the independence model (where the observed variables are assumed to be uncorrelated).

Weighted root mean square residual (WRMR) is a measure of the mean absolute value of the covariance residuals. This is a standardized summary of the average covariance residuals. Covariance residuals are discrepancies between the sample covariance matrix and the reproduced covariance matrix estimated under the model, assuming that the model is correct. The smaller the WRMR is, the better the fit. Perfect model fit is indicated by SRMR=0 and higher values indicate a worse fit. A value less than 1 indicates a good fit.

Modification Indices

It is necessary for every model to make certain assumptions; one common assumption is that a parameter is equal to a given value, often zero (e.g. saying there is no direct relationship between two variables). Modification indices can be used to help evaluate how reasonable these assumptions are by giving the researcher a sense of what happens when those assumptions are relaxed.

Standardized Coefficients

Standardized coefficients, and, with some models, R^2, can be obtained using the **standardize** option of the **output:** command. Mplus produces three forms of standardized coefficients, labelled, **stdyx**, **stdy**, and **std**.

The std column contains coefficients standardized using the variance of continuous constructs. The stdyx column contains the coefficients standardized using the variance of the background (covariates) and/or indicators of the constructs, in addition to the variance of continuous constructs.

<u>Recommendations for the parameters of the measurement model</u>

- Use stdy or stdyx for construct coefficients.
- For binary indicators use stdy or std.
- For continuous indicators use stdyx.

<u>Recommendations for the parameters of the structural model</u>

- For factors regressed on factor use std.
- When covariates are continuous use stdyx.
- When covariates are binary use std.

Estimation methods

In path analysis, there are two covariance matrices: the sample covariance matrix of the indicators and the theoretical covariance matrix derived from the model. The elements of the covariance matrix that correspond to the hypothesised model, is a function of the model parameters such as intercepts, construct coefficients (factor loadings), error variances, and covariance terms. Commercial software provides many different ways of estimating a confirmatory factor analysis model and structural equation models for continuous and categorical observed variables. These include unweighted least squares (ULS), generalised least squares (GLS), weighted least squares (WLS), and maximum likelihood. In the case of ordinal, binary and mixed categorical and continuous data, WLS is recommended.

References

Bartholomew, D.J., Steele, F. Moustaki, I. and Galbraith, J. (2008) *Analysis of Multivariate Social Science Data.* Chapman and Hall.

Appendix A1: List of indicators for the four constructs

The variables used for constructing the latent constructs have been selected from the list of indicators provided by Ofgem after discussions of preliminary results based on exploratory and confirmatory factor analysis (see Section 5 for definitions).

In appendices A1 and A2, the indicators for the four constructs and the list of covariates are outlined in relation to the relevant survey questions. Some of these questions have been asked to respondents separately for gas and electricity. Questions referring to suppliers may also relate to gas and electricity separately, or both if the supplier is the same for both fuels.

A1.1. Measuring engagement with the energy markets

Engagement	**Survey Question**		
Variable	**Electricity**	**Gas**	**Values**
Awareness	Number of actions consumers think are possible (created from Question 14 of the survey) • Change their payment method with their current supplier • Change their tariff with their current supplier • Switch to a different supplier		0: None 1: Only one or two 2: All
Switched supplier <1 year	In the last 12 months, have you switched your electricity supplier?	In the last 12 months, have you switched your gas supplier?	0: No/rf/dk 1: Yes
Number of switches	How many times have you ever switched your electricity supplier?	How many times have you ever switched your gas supplier?	0: Never/rf/dk 1: Once 2: Twice 3: Thrice 4: Four or more
Changed Tariffs <1 year	In the last 12 months, did [you/you also] change the tariff you were on with your existing electricity supplier (without switching supplier)?	In the last 12 months, did [you/you also] change the tariff you were on with your existing gas supplier (without switching supplier)?	0: No/rf/dk 1: Yes
Changed Tariff >1 year	Have you ever changed your tariff with an existing electricity supplier?	Have you ever changed your tariff with an existing gas supplier?	0: No/rf/dk 1: Yes
Compared Suppliers <1 year	In the last 12 months, did you compare your tariff with other electricity suppliers?	In the last 12 months, did you compare your tariff with other gas suppliers?	0: No/rf/dk 1: Yes
Compared Tariffs <1 year	In the last 12 months, did you compare your tariff with your existing electricity supplier?	In the last 12 months, did you compare your tariff with your existing gas supplier?	0: No/rf/dk 1: Yes
Changed Payment Methods	In the last 12 months, did you change the payment method with your existing electricity supplier?	In the last 12 months, did you change the payment method with your existing gas supplier?	0: No/rf/dk 1: Yes

A1.2. Measuring trust in the energy markets

Trust	Survey Question			
Variable	**Energy**	**Electricity**	**Gas**	**Values**
Trust in own supplier to treat you fairly in their dealings with you	To what extent do you trust or distrust your energy supplier to treat you fairly in their dealings with you?	To what extent do you trust or distrust your electricity supplier to treat you fairly in their dealings with you?	To what extent do you trust or distrust your gas supplier to treat you fairly in their dealings with you?	1: Strongly distrust 2: Tend to distrust 3: Neither nor 4: Tend to trust 5: Completely trust
Trust in own supplier to provide clear and helpful information	To what extent do you trust or distrust your energy supplier to provide clear and helpful information?	To what extent do you trust or distrust your electricity supplier to provide clear and helpful information?	To what extent do you trust or distrust your gas supplier to provide clear and helpful information?	1: Strongly distrust 2: Tend to distrust 3: Neither nor 4: Tend to trust 5: Completely trust
Trust in own supplier to charge you a fair price	To what extent do you trust or distrust your energy supplier to charge you a fair price?	To what extent do you trust or distrust your electricity supplier to charge you a fair price?	To what extent do you trust or distrust your gas supplier to charge you a fair price?	1: Strongly distrust 2: Tend to distrust 3: Neither nor 4: Tend to trust 5: Completely trust
Trust in energy suppliers in general.	And please tell me the extent to which you trust or distrust energy suppliers in general to be fair in the way they deal with customers or citizens?			1: Strongly distrust 2: Tend to distrust 3: Neither nor 4: Tend to trust 5: Completely trust 6: Rf/dk [6]

[6] '6' is treated as missing value.

A1.3. Measuring understanding of the energy markets[7]

Understanding	Survey Question		Values
Variable	**Electricity**	**Gas**	
Familiarity with the range of tariffs from current supplier	How familiar would you say you are with the range of different tariffs available to you from your current electricity supplier?	How familiar would you say you are with the range of different tariffs available to you from your current gas supplier?	0: Not very familiar/not at all familiar /rf/dk/ 1: Completely familiar /fairly familiar
Familiarity with the features from your current tariff	How familiar would you say you are with the features of your current electricity tariff? I mean the rate you pay and any discounts, any standing charges that apply, exit fees or benefits that you receive.	How familiar would you say you are with the features of your current gas tariff? I mean the rate you pay and any discounts, any standing charges that apply, exit fees or benefits that you receive.	1: Completely familiar 2: Fairly familiar 3: Not very familiar 4: Not at all familiar 98: Don't know 99: Refused

A1.4. Measuring comparability in the energy markets

Comparability	Survey Question	
Variable	**All Respondents**	**Values**
Ease to compare different tariffs	How easy or difficult do you believe it is to compare different tariffs for electricity or gas?	1: Very difficult 2: Quite difficult 3: Neither nor 4: Quite easy 5: Very easy 98: Don't know 99: Refused
Hard to work out whether I would save	It's too hard to work out whether I would save or not if I switched.	1: Agree strongly 2: Tend to agree 3: Neither agree nor disagree 4: Tend to disagree 5: Disagree strongly 98: Don't know 99: Refused

[7] The measurement of understanding originally included question 86 of the survey (How familiar would you say you are with the range of different energy tariffs available to you from energy suppliers in general?) has been removed because it is highly correlated with the other two questions on familiarity, giving numerical problems in the estimation. Excluding a highly correlated variable is not expected to change the results from the analysis.

Appendix A2: List of Covariates

This section gives the list of covariates used for each latent construct.

A2.1. Covariates used for explaining Engagement with Electricity and Engagement with Gas

Energy	Electricity	Gas	Values reference category in bold
How satisfied or dissatisfied are you with the overall service you receive from your current energy supplier?	How satisfied or dissatisfied are you with the overall service you receive from your current electricity supplier?	How satisfied or dissatisfied are you with the overall service you receive from your current gas supplier?	0: Not asked **1: Dissatisfied** 2: Neither/nor 3: Satisfied
Thinking about the information that you wanted about your existing electricity tariff or energy use, how easy or difficult was to find the information you wanted**?**			0: Not asked **1: Quite difficult Very difficult** 2: Neither nor/rf/dk 3: Quite Easy/very easy
Thinking about the information that you wanted about your existing electricity tariff or energy use, how easy or difficult was to understand the information you wanted?			0: Not asked **1: Very difficult** 2: Neither nor/rf/dk 3: Easy/very easy
I moved houses in the last 12 months			**0: No** 1: Yes
Annual Summary - how clearly was the information presented?			0: Not responded (respondent did not recall receiving the communication) **1: Very unclearly/Quite unclearly** 2: Neither clearly or unclearly/rf/dk 3: Quite clearly/very clearly
Bill or statement - how clearly was the information presented?			0: Not responded (respondent did not recall receiving the communication) **1: Very unclearly/Quite unclearly** 2: Neither clearly or unclearly/rf/dk 3: Quite clearly/very clearly
Price increase notice - how clearly was the information presented?			0: Not responded (respondent did not recall receiving the communication) **1: Very unclearly/Quite unclearly** 2: Neither clearly or unclearly/rf/dk 3: Quite clearly/very clearly
End of fixed term notice - how clearly was the information presented?			0: Not responded (respondent did not recall receiving the communication) **1: Very unclearly/Quite unclearly** 2: Neither clearly or unclearly/rf/dk 3: Quite clearly/very clearly
Cheapest tariff message - recall seeing a message about savings by changing tariff?			**0: No** 1: Yes

Tariff Comparison Rate - recall seeing a Tariff Comparison Rate in the last 12 months?	**0: No** 1: Yes
Personal Projection - recall seeing a personal projection in the last 12 months?	**0: No** 1: Yes

A2.2. Covariates used for explaining Trust in Electricity and Trust in Gas

Energy	**Electricity**	**Gas**	**Values** reference category in bold
How satisfied or dissatisfied are you with the overall service you receive from your current energy supplier?	How satisfied or dissatisfied are you with the overall service you receive from your current electricity supplier?	How satisfied or dissatisfied are you with the overall service you receive from your current gas supplier?	0: Not asked **1: Dissatisfied** 2: Neither/nor 3: Satisfied
In the last 12 months have you received a letter or leaflet from your supplier about their requirements to treat customers fairly?			**0: No** 1: Yes
In the last 12 months have you contacted a current or previous energy supplier to complain?			**0: No** 1: Yes
Thinking of the last time you complained, taking everything into account regarding the complaints process, how satisfied or dissatisfied were you overall with the way in which your complaint was handled by the energy supplier?			**0: No** 1: Yes
Have you had cause to complain in the last 12 months but have not done so? Excluding comments about price			**0: No** 1: Yes
How satisfied or dissatisfied overall were you with the way the supplier dealt with you?			0: Not asked **1: Very dissatisfied/ quite dissatisfied/neither**, nor 2: Very satisfied / quite satisfied

A2.3. Covariates used for explaining Understanding of Electricity and Understanding of Gas

All Respondents	Values reference category in bold
In how much detail did you read your regular communications?	Scores from 0-12
Annual Summary - how clearly was the information presented?	0: Not responded (respondent did not recall receiving) **1: Very unclearly/Quite unclearly** 2: Neither clearly or unclearly/rf/dk 3: Quite clearly/very clearly
Bill or statement - how clearly was the information presented?	0: Not responded (respondent did not recall receiving) **1: Very unclearly/Quite unclearly** 2: Neither clearly or unclearly/rf/dk 3: Quite clearly/very clearly
Price increase notice - how clearly was the information presented?	0: Not responded (respondent did not recall receiving) **1: Very unclearly/Quite unclearly** 2: Neither clearly or unclearly/rf/dk 3: Quite clearly/very clearly
End of Fixed Term notice - how clearly was the information presented?	0: Not responded (respondent did not recall receiving) **1: Very unclearly/Quite unclearly** 2: Neither clearly or unclearly/rf/dk 3: Quite clearly/very clearly

A2.4. Covariates used for explaining Comparability

All Respondents	Values reference category in bold
And thinking about the information that you wanted about your existing gas tariff or energy use, how easy or difficult was to find the information that you wanted?	0: Not asked (respondent did not look) **1: Very difficult** 2: Neither nor/rf/dk 3: Easy/very easy
And thinking about the information that you wanted about your existing gas tariff or energy use, how easy or difficult was to understand the information that you found?	0: Not asked (respondent did not look) **1: Very difficult** 2: Neither nor/rf/dk 3: Easy/very easy
Recall seeing a message about savings by changing a tariff?	**0: No** 1: Yes
Thinking about the amount of choice of range of different tariffs available.	0: Too little 1: About the right amount **2: Too much** 3: DK/rf

A2.5. Socio-demographic variables

All Respondents	**Values** reference category in bold
Age	**0: <35** 1:35-64 2: 65+
Government region	**1: England** **2:** Wales 3: Scotland
Social class	**1: A and B** 2: C1 3: C2 4: D and E
Education	**1: Professional Qualifications, Degree, Post-graduate degree** 2: A levels, HND/HNC 3: GCSE, GNVQ, ONC 4: No formal qualifications, rf, dk
English is first or main language	**0: No** 1: Yes
Has children	**0: No child** 1: Has Children
Regular internet user: Uses the internet at least once a week	**0: No** 1: Yes
Do you or your partner have a long term illness or caring responsibilities in the household?	**0:No** 1:Yes

Appendix B: Regression Results from the Structural Models, 2014 and 2015

Table B1. Estimated standardized regression coefficients (STD) between 'Engagement' and covariates, Electricity and Gas Market, 2014 and 2015

Engagement	Electricity				Gas			
	2014		2015		2014		2015	
Variable	**STD**	**p-value**	**STD**	**p-value**	**STD**	**p-value**	**STD**	**p-value**
English is first or main language	**0.471**	0	**0.219**	0.001	**0.425**	0	**0.235**	0.002
Regular internet user	**0.186**	0	**0.182**	0	**0.214**	0	**0.197**	0
Has children	**0.154**	0	0.061	0.105	**0.124**	0.001	0.07	0.064
Age: 35-65	**0.186**	0	**0.15**	0.001	**0.178**	0	**0.156**	0.002
Age: 65+	**0.197**	0	**0.176**	0.002	**0.193**	0.001	**0.188**	0.003
Social class: C1	-0.05	0.241	**-0.138**	0.001	-0.063	0.141	**-0.155**	0.002
Social class: C2	-0.059	0.223	**-0.168**	0.001	-0.089	0.071	**-0.162**	0.004
Social class: D or E	**-0.188**	0	**-0.23**	0	**-0.176**	0	**-0.236**	0
Education: A levels, HND, HNC	-0.006	0.898	-0.011	0.805	0.022	0.629	-0.04	0.359
Education: GCSE, GNVQ, ONC	-0.034	0.412	-0.038	0.323	0.012	0.767	-0.03	0.44
Education: No formal qualifications	**-0.121**	0.019	-0.07	0.153	-0.079	0.136	-0.033	0.508
Government region: Wales	0.004	0.949	0.027	0.676	0.057	0.394	0.005	0.947
Government region: Scotland	-0.013	0.806	-0.033	0.509	0.019	0.715	0.002	0.969
A member of the household has long-term illness	**0.106**	0.002	**0.077**	0.019	**0.084**	0.013	**0.072**	0.04
Moved houses in the last 12 months	**0.3**	0	**0.129**	0.01	**0.267**	0	**0.151**	0.004
Looked for further information: I did not look	**-1.561**	0	**-1.517**	0	**-1.613**	0	**-1.387**	0
Looked for further information: neither easy nor difficult to find	-0.04	0.71	-0.113	0.164	0.001	0.993	-0.073	0.369
Looked for further information: easy or very easy to find	0.048	0.536	0.03	0.636	0.014	0.864	0.044	0.502
Satisfied with current supplier: question not asked	**0.261**	0.005	-0.916	0.893	0.012	0.891	-0.77	0.924
Satisfied with current supplier: neither satisfied nor dissatisfied	**0.226**	0.001	-0.048	0.462	**0.279**	0	-0.03	0.641
Satisfied with current supplier: satisfied or very satisfied	**0.275**	0	0.005	0.936	**0.369**	0	0.088	0.17
Annual Summary - did not recall receiving it or glancing at it	0.022	0.771	-0.067	0.382	0.08	0.302	-0.084	0.275
Annual Summary – found the information neither clearly nor unclearly presented	0.019	0.829	-0.072	0.424	0.058	0.512	-0.041	0.651
Annual Summary – found the information quite clearly/very clearly presented	-0.014	0.85	-0.09	0.217	0.02	0.792	-0.108	0.149
Bill - did not recall receiving it or glancing at it	-0.07	0.336	-0.034	0.668	**-0.192**	0.01	0.01	0.899
Bill – found the information neither clearly nor unclearly presented	**0.174**	0.035	0.013	0.884	0.025	0.769	0.076	0.384

Bill – found the information quite clearly or very clearly presented	-0.046	0.507	-0.084	0.249	-0.129	0.065	-0.003	0.97
Price Increase Notification – found the information neither clearly nor unclearly presented	-0.155	0.055	-0.032	0.746	-0.138	0.102	-0.045	0.656
Price Increase Notification – found the information quite clearly or very clearly presented	**-0.191**	0.037	-0.065	0.583	-0.126	0.172	0.022	0.858
Price Increase Notification – found the information neither clearly	**-0.225**	0.004	-0.097	0.315	**-0.171**	0.033	-0.016	0.873
End of Fixed term tariff – found the information neither clearly nor unclearly presented	-0.123	0.324	**-0.292**	0.013	-0.011	0.931	**-0.337**	0.007
End of Fixed term tariff – found the information quite clearly or very clearly presented	-0.076	0.617	-0.042	0.78	0.025	0.871	-0.149	0.315
End of Fixed term tariff – found the information neither clearly	0.066	0.603	-0.087	0.458	0.175	0.183	-0.1	0.35
Recall seeing a cheapest tariff messaging	0.023	0.522	**0.112**	0.001	-0.01	0.784	**0.147**	0.001
Recall seeing a tariff comparison rate in the last 12 months			**0.115**	0.001			**0.119**	0.005
Recall seeing a personal projection in the last 12 months			**0.132**	0			**0.135**	0.001

Table B2. Estimated standardized regression coefficients (STD) between 'Trust' and covariates, Electricity and Gas Market, 2014 and 2015

Trust	Electricity				Gas			
	2014		2015		2014		2015	
Variable	**STD**	**p-value**	**STD**	**p-value**	**STD**	**p-value**	**STD**	**p-value**
English is first or main language	**-0.228**	0	**-0.132**	0.007	**-0.208**	0	**-0.11**	0.023
Regular internet user	**-0.29**	0	**-0.207**	0	**-0.286**	0	**-0.219**	0
Has children	0.01	0.742	-0.029	0.366	0.01	0.75	-0.01	0.746
Age: 35-65	-0.066	0.053	-0.038	0.306	**-0.09**	0.009	-0.03	0.427
Age: 65+	**0.09**	0.045	**0.106**	0.024	0.069	0.123	**0.102**	0.03
Social class: C1	0.034	0.353	**0.077**	0.041	0.02	0.598	**0.068**	0.073
Social class: C2	-0.017	0.683	**0.093**	0.031	-0.013	0.744	**0.102**	0.018
Social class: D or E	**0.152**	0	**0.178**	0	**0.156**	0	**0.163**	0
Education: A levels, HND, HNC	0.034	0.371	-0.024	0.539	0.026	0.502	-0.035	0.372
Education: GCSE, GNVQ, ONC	**0.11**	0.001	**0.083**	0.015	**0.108**	0.001	**0.084**	0.014
Education: No formal qualifications	**0.141**	0	**0.121**	0.002	**0.115**	0.004	**0.115**	0.004
Government region: Wales	0.066	0.164	-0.081	0.109	0.044	0.38	-0.097	0.059
Government region: Scotland	-0.024	0.551	-0.012	0.773	-0.058	0.143	-0.017	0.696
A member of the household has long-term illness	-0.013	0.612	**0.067**	0.017	-0.02	0.447	**0.072**	0.012
Satisfied with current supplier: question not asked	**-0.239**	0	**-0.367**	0	**-0.07**	0	**-0.079**	0
Satisfied with current supplier: neither satisfied nor dissatisfied	**0.569**	0	**0.425**	0	**0.566**	0	**0.361**	0
Satisfied with current supplier: satisfied or very satisfied	**1.373**	0	**1.331**	0	**1.336**	0	**1.222**	0
In the last 12 months have received a leaflet about the Standards of Conducts	**0.059**	0.022	**0.106**	0	0.043	0.105	**0.099**	0
In the last 12 months, have you contacted a supplier to complain?	-0.098	0.064	**-0.177**	0.001	**-0.101**	0.057	**-0.208**	0
Satisfied with the way the complaint was handled by the supplier?	**-0.183**	0.009	**-0.265**	0	**-0.205**	0.004	**-0.233**	0.001
Did had cause to complain in the last year but have not done so?	**-0.215**	0.001	**-0.577**	0	**-0.234**	0	**-0.614**	0
Satisfaction with supplier interactions?: no interaction in the last 12 months	**0.267**	0	0.106	0.097	**0.273**	0	0.108	0.095
Satisfaction with supplier interactions?: quite satisfied or very satisfied	**0.324**	0	**0.219**	0.002	**0.326**	0	**0.232**	0.001

Table B3. Estimated standardized regression coefficients (STD) between 'Understanding' and covariates, Electricity and Gas Market, 2014 and 2015

Understanding	Electricity				Gas			
	2014		2015		2014		2015	
Variable	**STD**	**p-value**	**STD**	**p-value**	**STD**	**p-value**	**STD**	**p-value**
English is first or main language	0.043	0.532	-0.08	0.231	0.033	0.643	-0.084	0.216
Regular internet user	**0.169**	**0**	**0.24**	0	**0.175**	0	**0.275**	0
Has children	0.016	0.683	0.016	0.699	0.035	0.388	0.041	0.352
Age: 35-65	0.072	0.104	**0.15**	0.002	**0.095**	0.037	**0.192**	0
Age: 65+	0.051	0.374	0.027	0.652	0.048	0.415	0.068	0.282
Social class: C1	0.04	0.422	0.088	0.087	0.078	0.133	0.063	0.244
Social class: C2	**0.142**	**0.011**	**0.177**	0.003	**0.105**	0.067	**0.16**	0.01
Social class: D or E	0.077	0.152	**0.178**	0.001	0.04	0.476	**0.135**	0.019
Education: A levels, HND, HNC	0	0.997	0.007	0.903	0.043	0.406	0.025	0.66
Education: GCSE, GNVQ, ONC	**-0.118**	**0.009**	-0.001	0.976	-0.074	0.116	0.034	0.486
Education: No formal qualifications	**-0.198**	**0**	-0.07	0.205	**-0.114**	0.044	-0.044	0.452
Government region: Wales	**-0.152**	**0.038**	**-0.327**	0	-0.138	0.086	**-0.403**	0
Government region: Scotland	**-0.213**	**0**	**-0.172**	0.004	**-0.14**	0.015	**-0.214**	0.001
A member of the household has long-term illness	-0.015	0.685	**-0.107**	0.008	-0.044	0.248	**-0.119**	0.005
In how much detail did you read your communications?	**0.073**	**0**	**0.073**	0	**0.077**	0	**0.065**	0
Annual Summary – did not recall receiving it or glancing at it	**0.259**	**0.001**	**0.361**	0	**0.297**	0	**0.385**	0
Annual Summary – found the information neither clearly nor unclearly presented	0.097	0.296	0.075	0.473	0.105	0.282	0.11	0.309
Annual Summary – found the information quite clearly/very clearly	**0.424**	**0**	**0.483**	0	**0.467**	0	**0.498**	0
Bill – did not recall receiving it or glancing at it	**0.529**	**0**	**0.359**	0	**0.5**	0	**0.31**	0.001
Bill – found the information neither clearly nor unclearly presented	0.142	0.108	0.148	0.162	0.066	0.474	0.127	0.232
Bill – found the information quite clearly or very clearly presented	**0.498**	**0**	**0.307**	0	**0.406**	0	**0.287**	0.001
Price Increase Notification – found the information neither clearly nor unclearly presented	**0.503**	**0**	0.192	0.113	**0.553**	0	0.17	0.179
Price Increase Notification – found the information quite clearly or very clearly presented	**0.219**	**0.038**	-0.208	0.156	**0.221**	0.044	-0.166	0.276
Price Increase Notification – found the information neither clearly	**0.329**	**0**	0.024	0.84	**0.365**	0	0.022	0.864
End of Fixed term tariff – found the information neither clearly nor unclearly presented	**0.349**	**0.018**	0.062	0.685	**0.378**	0.013	-0.045	0.777
End of Fixed term tariff – found the information quite clearly or very clearly presented	**0.429**	**0.013**	0.227	0.219	**0.375**	0.035	0.064	0.735
End of Fixed term tariff – found the information neither clearly	**0.354**	**0.018**	0.163	0.291	**0.312**	0.044	0.111	0.485

Table B4. Estimated standardized regression coefficients (STD) between 'Comparability' and covariates, Electricity and Gas Market, 2014 and 2015

Comparability	Electricity				Gas			
	2014		2015		2014		2015	
Variable	**STD**	**p-value**	**STD**	**p-value**	**STD**	**p-value**	**STD**	**p-value**
English is first or main language	0.062	0.354	0.054	0.381	0.073	0.281	0.053	0.396
Regular internet user	**0.105**	**0.011**	**0.12**	0.005	**0.113**	0.007	**0.113**	0.011
Has children	**0.08**	**0.035**	**0.116**	0.004	**0.08**	**0.037**	**0.102**	0.012
Age: 35-65	**-0.293**	**0**	**-0.299**	0	**-0.295**	0	**-0.323**	0
Age: 65+	**-0.523**	**0**	**-0.582**	0	**-0.515**	0	**-0.612**	0
Social class: C1	0.045	0.334	0.028	0.559	0.021	0.664	0.025	0.614
Social class: C2	-0.007	0.898	0.037	0.494	-0.002	0.971	0.036	0.517
Social class: D or E	0.035	0.482	-0.022	0.663	0.037	0.464	-0.017	0.748
Education: A levels, HND, HNC	0.052	0.269	0.06	0.226	0.044	0.363	0.053	0.295
Education: GCSE, GNVQ, ONC	0.015	0.717	0.016	0.707	0.004	0.934	0.008	0.864
Education: No formal qualifications	-0.026	0.61	-0.078	0.132	-0.054	0.294	-0.086	0.104
Government region: Wales	**-0.134**	**0.032**	0.093	0.18	**-0.14**	0.024	0.129	0.079
Government region: Scotland	-0.012	0.805	-0.036	0.519	-0.061	0.226	-0.013	0.824
A member of the household has long-term illness	**-0.089**	**0.009**	**-0.167**	0	-0.089	0.01	**-0.154**	0
Looked for further information: I did not look	**0.524**	**0**	**0.396**	0	**0.449**	0	**0.482**	0
Looked for further information: neither easy nor difficult to find	**0.337**	**0.025**	**0.333**	0.029	0.22	0.17	**0.399**	0.018
Looked for further information: easy or very to find	**1.115**	**0**	**0.918**	0	**1.04**	0	**0.945**	0
Has seen a cheapest tariff messaging	0.033	0.395	-0.042	0.287	0.042	0.284	-0.027	0.506
Thinking about the amount of choice of range of different tariffs available - too little choice	0.089	0.056	**-0.115**	0.037	0.046	0.317	**-0.165**	0.002
Thinking about the amount of choice of range of different tariffs available - about right amount	**0.743**	**0**	**0.698**	0	**0.716**	0	**0.671**	0
Thinking about the amount of choice of range of different tariffs available - refuse or don't know	**0.14**	**0.043**	**0.122**	0.026				