

**RMR evaluation:  
Econometric approaches**

20 November 2014

ofgem

### Domestic Retail Market Review reforms implemented from August 2013

#### Simpler Market

- Limit suppliers to four core tariffs and simpler tariff structure to avoid confusion and enable comparisons.
- Balance innovation with complexity



#### Clearer Market

- **New communication tools** to help consumers engage with the market. **Existing communications** to be more useful and **engaging**



#### Fairer Market

- **Standards of Conduct** requirements to improve supplier–consumer interactions. Additional **consumer protection measures** for domestic consumers



*“We will monitor the direct **impact the RMR package is having on consumer engagement** and the impact this engagement is having on the market... We will review the package in full no later than 2017”*

Evidence-based approach needed:

To examine how far  
RMR is achieving  
improved  
consumer  
engagement

To understand which aspects  
of RMR are working/not  
working/unintended  
consequences; which  
consumers are  
benefitting/not benefitting

To understand if  
any observed  
change can be  
attributed to RMR  
vs other factors

To inform future  
policy

- Required consideration of evaluation approaches (not just monitoring)
  - Inherent challenges, e.g. scope & scale of RMR, attribution
- = scoping study by independent evaluation experts

Europe Economics

**RAMBOLL**

Randomised Control Trials



Establishing a control group(s) is too difficult/is not possible with national policies

Matching Pairs



Time series with multivariate



Time series data can be used to establish correlations between variables over time

Descriptive monitoring



No cause and effect could be attributed with this method, only monitoring and describing developments over time

Multi-year data collection for multivariate analysis and  
descriptive monitoring

### 1. Descriptive monitoring:

- Existing and additional indicators for descriptive monitoring

### 2. Bespoke consumer research:

- Large bespoke survey for:
  - multivariate analysis
  - covers four years (2014-17)
- Supported by qualitative research

### 3. Holistic context:

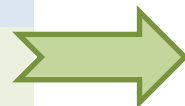
- Contextualise findings with wider market monitoring

### 4. Process assessment:

- Understand and monitor how rules have been implemented



Framework of insight  
designed around our  
*theory* of how we *expect*  
our proposals to impact  
consumer behaviour and  
the market



Framework of monitoring  
*compliance* with our *rules*.

Is our “theory”  
driving the  
results or is it  
how the rules  
were  
“implemented”?

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### 4. Process assessment:

- Understand and monitor how rules have been implemented

Descriptive monitoring taken in isolation, is not sufficient to establish whether the RMR has contributed to change.

We are therefore considering different types of statistical analysis that might help us to assess the impact that the RMR measures have on the three primary RMR objectives and, ultimately, consumer engagement.

## Aims of our modelling

- Based on the survey data we will assess for domestic retail energy markets,

a 'baseline' of consumer attitudes and behaviour  
assessing what drives consumer behaviour and consumers' views on this market

how consumers' behaviour and views change over time

what drives those changes

- We will assess these aspects every year and publish our findings in the State-of-the-Market report, for the first time in summer 2015.

Today we consider only aspects of consumer behaviour and views that we plan to assess using econometric modelling. *(For other approaches see our open letter dated 31 Jan 2014.)*

- Discussions around RMR **started in November 2010**.  
Baseline results for 2014 are unlikely to be entirely unaffected by RMR.
- We surveyed only domestic consumers **not a 'control group'** unaffected by RMR.
- The relationship between drivers and outcomes might be complex, for example **bidirectional**.  
*(eg. trust in own energy supplier to provide clear and helpful information might affect perceived ease of tariff comparison and may be affected by it)*
- Apparent changes over time may be driven by **unobserved factors**.

We can only interpret changes over time as consequence of RMR, if we are confident that our model controls for all non-RMR factors that may affect the outcome  
*(such as trust in energy suppliers or likelihood of switching).*



## Outcomes we propose to analyse

Access  
Assess  
Act

### Trust

- In own energy supplier / in energy suppliers in general
- Consumers' views on the ease of switching

### Comparability

- Consumers' views on the ease of tariff comparison
- Likelihood of comparing tariffs

### Engagement

- Likelihood of switching supplier
- Likelihood of switching tariff (with existing supplier)
- Likelihood of switching payment method (with exist. supplier)

Trust  
Understand  
Comparability

**Other changes in consumers' behaviour or views** will be assessed using descriptive statistics  
*(eg. views on whether they have the right amount of choice or whether they took action  
having received one of the key communications from suppliers)*

### We will use two types of models

#### ***Logistic regression***

- as a relatively simple description of relationships between explanatory factors and outcomes
- to identify which factors are correlated with given RMR outcomes

#### ***Structural equation modelling*** (which encompasses path modelling and factor analysis),

- as a more complex representation of relationships between explanatory factors and outcomes
- to test whether there are more complex relationships between explanatory factors and outcomes
- to identify indirect effects
- to be able to consider constructs (such as consumer engagement) inferred from observed data

### Regression models for categorical variables (logit or probit)

*(suitable if the relationships are relatively simple)*

- The aspects we want to analyse are categorical variables;  
(of the type 'yes/no (binary), or 'very easy' 'easy', 'neither nor', 'difficult', 'very difficult' (ordinal)).
- To reflect this we will use **“binary logistic” and “ordered logistic” regression models (OLM)**.
  - logit results have a simpler interpretation
  - coefficients show effects on the odds ratio (e.g. on the odds of consumer switching)
  - otherwise there is no practical difference between logit and probit
  - OLM: explanatory variables are assumed to have the same effect on each category
- If this assumption of the OLM is violated, we will use a generalised ordered logit model instead  
(which allows to relax this assumption)

$$\text{logit}(\hat{\pi}(x)) = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \dots + \beta_n x_n$$

with  $x$  as outcome, eg. *'likelihood of comparing tariffs'* ...

$x_1, x_2, \dots$  as explanatory factors , eg. *'having looked in detail at last bill', 'heard of negative press'* ...

$\beta_1, \beta_2, \dots, \beta_n$  as estimated effects of the explanatory factors.

### To assess changes over time we will

- compare the results of our models run for each year individually, and
- using multi-year data add indicator variables for the year(s), eg.  $t_{2015}$ ,  $t_{2016}$  ..., where  $t_{2015} = 1$  for 2015 data and  $t_{2015} = 0$  for data from other years and

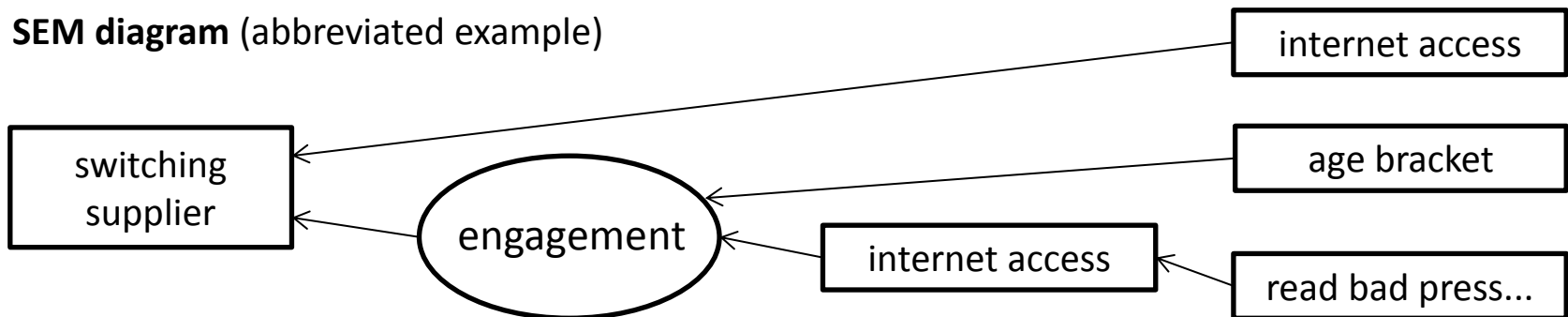
interact them with key explanatory factors to assess how their effects change over time

$$\text{logit}(\hat{\pi}(x)) = t_{2015} + t_{2016} + \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_2 x_2 t_{2015} + \beta_2 x_2 t_{2016} + \dots + \beta_n x_n$$

### Structural equation modelling (SEM, with factor analysis and path analysis as subset) (suitable if the relationships are complex)

- We will use this approach to assess whether more complex relationships between factors driving consumer behaviour and their views on the retail energy market explain **consumers' engagement** in the markets; ie.
- State the way in which the different explanatory factors are related (see example below)
  - Advantage: *Latent variables* can be included in addition to observed variables ○  
*Latent variables*: not directly observable constructs (eg. consumer engagement); estimated from observed variables □
  - Indicator*: observed variable used as indirect measure of such a construct
- Test whether the model appropriately describes the data; possibly adjust it (test again if required)
- If the models show an acceptable fit, consider implications for RMR evaluation

### SEM diagram (abbreviated example)



## Our questions

1. Which **factors** are in your view the most important drivers for each of the outcomes considered (the 7 outcomes considered are listed in slide 8)?
2. Do you think **logistic regression** is a useful and appropriate technique for evaluating the outcomes of a “simple, clear and fair market”? Would you suggest any other approach?
3. Do you think **structural equation modelling** is a useful and appropriate technique for the evaluation of consumer engagement? Would you suggest any other approach?
4. Do you have any **other comments** on the modelling approach?

**Thanks for your participation**