Consumer switching experiences

Market performance enquiry

4 August 2015

Version control

Version	Date amended	Comments
1	24 November 2014	To address the feedback received
2	3 March 2015	To incorporate additional modelling of saves and provide additional evidence on switching patterns
3	16 April 2015	To incorporate feedback from Legal and the CE
4	20 May 2015	To incorporate feedback from the CE and GM Market Performance

Market Performance enquiries, reviews and investigations

The Authority may carry out an enquiry, review or investigation as a result of monitoring the industry or the market, or at the request of an external party. The Minister may also ask or direct the Authority to look into an issue.

An enquiry, review or investigation looks at the circumstances giving rise to an out-of–the-ordinary event, including the actions of participants. An enquiry, review or investigation may result in suggestions for Code amendments, market facilitation measures or in a finding that no further action is needed. In all of these cases the Authority usually publishes a report of its findings.

At the same time as it carries out a market performance enquiry, investigation or review, the Authority's compliance team may investigate whether there has been a breach of the Code, Act or Regulations. The two processes may run concurrently, but may not be completed at the same time.

Enquiries, reviews and investigations represent three stages in an escalating process, with increased effort and significance attached to each one.

Market Performance Enquiry (Stage I): At the first stage, the Authority carries out low-cost ad hoc analysis using existing data and resources. The purpose of an enquiry is to better understand circumstances, observed through routine monitoring, that appear to require closer inspection. The Authority would not usually announce it is carrying out an enquiry.

If the results of the enquiry show that the circumstances are unlikely to have any implications for the Authority's statutory objective – competitive, reliable and efficient operation of the electricity industry for the long-term benefit of consumers – the Authority is unlikely to take further action. The Authority publishes the results of its enquiry only if the matter is likely to be of interest to industry participants.

Market Performance Review (Stage II): The Authority will initiate a review if, at the end of a Stage I enquiry, it does not have enough information to understand the issue but it appears to be significant for the competitive, reliable or efficient operation of the electricity industry. The Authority makes relatively informal requests for information to relevant service providers and industry participants. There is typically a period of iterative information gathering and analysis. The Authority would usually publish the results of these reviews but would not announce it is undertaking this work unless there was a high level of stakeholder or media interest.

Market Performance Investigation (Stage III): At this stage, the Authority may exercise statutory information gathering powers under section 46 of the Electricity Industry Act 2010 to acquire the information it needs to investigate an issue in depth. The Authority would generally announce early in the process that it is undertaking an investigation and indicate when it expects to complete the work. The Authority generally publishes reports of Stage III investigations.

Executive summary

Electricity is a complex commodity. Its product differentiation, like natural gas, does not reside in its physical characteristics that are homogeneous to consumers. Instead, its differentiation is demonstrated by retailers through brand differentiation, the creation of innovative packages that bundle electricity with other electricity-related services, offers of a menu of contracts with different characteristics such as customer service quality, contract term, different levels of bill payment discounts, prepayment and insurance options or the possibility of bill consolidation of utility services such as a combined bill for electricity, natural gas, television and telecommunications services (Xevelonakis, 2005; Henderson et al., 2003). The success of these initiatives relies on consumer engagement and the intensity of consumer switching to support the development of a workably competitive retail market.

In the development of a workably competitive market, products and services that satisfy consumer needs and are presented in a comprehensible manner facilitate consumer engagement (Caldwell et al., 2013). Effective consumer engagement goes beyond consumers' experiences with retailers in the business relationship (Yang, 2014). It includes supporting consumers through the supply of information that contributes to consumer confidence in decision-making. Information on the products and services retailers offer and the accessibility of that information by consumers contributes to the consumers' engagement. Understanding what motivates consumers to invest in an ongoing business relationship with retailers and their continued purchase of the products and services offered by the retailer enhances consumer engagement (French et al., 2012).

This enquiry uses demographic, socioeconomic and attitudinal information for a simple random sample of 1,200 residential consumers of electricity in New Zealand to analyse their switching experiences in the retail market. The sample is a simple random sample that represents 600 potential switchers and 600 switchers. The sample stratification is consistent with the adult age distribution in the New Zealand population. These consumers participated in a national telephone survey conducted by UMR Research (UMR) in February 2014. Data from Statistics New Zealand (SNZ) supplemented the survey responses, particularly in cases where consumers refused to provide their annual household income. In addition, the average monthly electricity consumption and electricity expenditure for all consumers in the sample were obtained from Statistics New Zealand.

Two types of econometric models are used in analysing the survey responses. These models are the binary logit and the multinomial logit (MNL) model. These models use dependent variables that have a yes (equals 1) or no (equals 0) outcome. The binary logit model applies when the dependent variable in the econometric model represents only two possible choices from which the consumer is required to select one alternative. For the MNL model, the dependent variable represents four choices in this enquiry from which the consumer selects one alternative. The choices available to potential switchers are: to stay with a Big 5 or a non-Big 5 retailer when the binary logit model is relevant. In contrast, when the switchers are modelled within the binary logit model, the available choices are to switch to one of the Big 5 or non-Big 5 retailers. When the MNL model is used the choices available to potential switchers and switchers are combined to form a single set of four available choices from which one is chosen by the consumer.

Each dependent variable within a choice set represents a single alternative that is assumed mutually exclusive. Each decision-maker selects only one of the available alternatives. The assumption that underlies the models is utility maximisation. The choice that each consumer makes is assumed to be the choice that rewards the consumer with the highest level of utility. Though the utilities of the alternatives are unobservable to the modeller, the consumers' choice is observable. The analysis focuses on the

choices that consumers make and the influences that contribute to the retailer choices observed in the electricity market.

For the enquiry, each retailer is classified as either a Big 5 or non-Big 5 in the market. The Big 5 retailers in the market are Contact Energy Limited, Meridian Energy Limited, Trustpower Limited, Genesis Energy Limited and Mighty River Power Limited and their specialty brands. All other retailers are classified as non-Big 5 retailers.

The analysis reveals a number of outcomes that are expressed as whether or not the statistical evidence is strong or weak. Statistical evidence is strong (or weak) when the standard score of the parameter estimate is equal to or greater than (or less than) the positive value of the statistical benchmark for the significance level identified within this enquiry. For the negative value of the statistical benchmark, strong statistical evidence is associated with a parameter estimate whose value is negative and lower than negative value of the statistical benchmark.

There is strong statistical evidence that consumers younger than 45 years old are very active switchers in the retail market. In contrast, consumers 45 years and above are less active switchers in the retail market. Further, consumers who are associated with all adult households are also active switchers when compared to consumers whose households comprise one or more adults and one or more children. Regarding switching frequency, the majority of consumers are less likely to switch more than once in two years with the serial switchers being those consumers more often younger than 45 years.

There is evidence that consumers gather information and in the majority of cases switch to another retailer after gathering information from *What's My Number* or *Powerswitch* or both websites. An exception is the group of consumers aged 45 years to 55 years who check these websites yet remain with their existing retailer. This observation is recommended for future research. In addition, there is statistical evidence that retailers offer fixed-term contracts to first-time customers who decide to switch to another retailer.

While consumers report that the switching process is easy, there is some amount of difficulty being experienced by consumers as the age of a consumer increases. This result may signal that there are additional opportunities for using various communication channels in supplying consumer information on switching that can be provided by third-party suppliers who are willing to develop innovative business models that embrace the provision of switching services and consumer information.

In terms of use of the switching process, many consumers report that their decision to switch was initiated by another retailer who approached them about switching. The initial contact was established primarily by telephone or face-to-face contact by the competing retailer. Face-to-face contact includes door-to-door marketing. Fewer attempts at encouraging retail customers to switch to another retailer exist for retailers using digital communication such as email. Consumers younger than 45 years were least likely to switch to another retailer when approached by another retailer about switching.

Finally, consumers have perceptions of their retailer. There is strong statistical evidence that consumers perceive that providing value for money, doing business with well-established retailers and retailers who are reliable and secure matters in their selection of a retailer. There is weaker statistical evidence that satisfaction, service quality and being trustworthy are just as important as the other attributes for which strong statistical evidence exists.

The outcomes of this analysis are to be interpreted with caution as they are influenced by the level of representation of switchers and potential switchers within the age group segments for the adult population of New Zealand although the sample studied in support of this analysis is representative of the adult

population in New Zealand. In other words, the sample stratification by age does not extend to the sub-samples of switchers and potential switchers. Rather, the age stratification is limited to ensuring that the age distribution of the sample is similar to the age distribution of the adult population of New Zealand only, though the structure of the sample requires that 600 potential switchers and 600 switchers are included in the sample.

Future analysis can extend this work by including price information into the modelling. This approach will reveal insights into consumers' sensitivity to price and how such sensitivity influences consumers' motivations for switching or not switching in the retail market.

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1   Introduction

1.1   The Electricity Authority (the Authority) contracted UMR in February 2014 to conduct a national telephone survey of 1,200 residential electricity customers in New Zealand. The survey sought to discover the switching experiences of residential electricity customers in New Zealand by examining their demographic and socioeconomic characteristics, the retailers' customer retention strategies as well as the consumers' perceptions of their retailers. In addition, the survey investigated the information gathering habits of consumers in relation to their awareness of online consumer information websites, *What's My Number* and *Powerswitch*.

1.2   The survey sample comprised 600 potential switchers and 600 switchers. Potential switchers are retail customers who have not switched to another retailer in the previous two years or may have considered switching but choose to remain with their existing retailer. Switchers are retail customers who choose another retailer for their retail service.

1.3   The survey sample is a simple random sample that is stratified consistent with the age distribution of the adult population in New Zealand. This stratification criterion does not extend to the sub-samples of potential switchers and switchers. Twenty-five questions were asked of the survey participants. UMR prepared a statistical summary of the responses to the 25 questions posed to the survey respondents. A series of graphical displays of the summarised data was employed in the UMR report. Authority staff decided to conduct further analysis of the data yielded from the telephone survey conducted by UMR.

1.4   This document presents further analysis of the responses using the binary and multinomial logistic regression models to understand the choices of the sampled consumers in the retail market. The typical reference to these models is the binary and multinomial logit regression models. These econometric models use dependent variables with discrete rather than continuous values. These dependent variables have a yes (equals 1) or no (equals 0) structure and are mutually exclusive by assumption.

1.5   The binary logit model provides only two choices to the retail electricity customers with the possibility that each retail customer selects only one alternative. The choices available to the retail customers are specific to the sub-samples, potential switchers or switchers, for which certain effects apply to one of the two sub-samples.

1.6   The available choices for potential switchers are to stay with their retailers who are either one of the Big 5 or non-Big 5 retailers. In contrast, the available choices for switchers are to switch to another retailer. Their retailer is either one of the Big 5 or non-Big 5 retailers. Each consumer can select only one of the available choices.

1.7   The multinomial logit model provides a maximum of four choices for all consumers and uses the sample of 1,200 retail customers. This model requires also that only one choice can be selected by each consumer from the set of available alternatives presented. For the potential switchers, the relevant choices are staying with one of the Big 5 or non-Big 5 retailers while for switchers their choices are switching to one of the Big 5 or non-Big 5 retailers in the market.

1.8   In this analysis, the Big 5 retailers are: Contact Energy, Meridian Energy, Trustpower Limited, Genesis Energy, Mercury Energy and their specialty brands. All other retailers are classified as a non-Big 5 retailer.

1.9   The econometric analysis uses the binary logit econometric model to analyse the segmented sample of switchers and potential switchers separately. The effect that applies exclusively to switchers is the ease of switching. For potential switchers, the specific effects analysed are saves, the retailers' offers of fixed-term contracts and the switching process. The win-back effect is modelled using the sample of 1,200 retail customers since there are customers who returned to their previous retailer after a brief stay with their new retailer and there were customers who were unsure whether they had been switched from their existing retailer to the new retailer when they chose to return to the existing retailer.

1.10   For all other attributes modelled within the study, the MNL econometric model is applied to the combined sample of switchers and potential switchers. An alternative to the multinomial logit model for this study is the multinomial nested logit econometric model. Both models are suitable for dependent variables with a yes or no structure. This study chooses to use the MNL model due to the under-representation of consumers in a number of the sub-categories of the sample that results in severely skewed distributions of the responses provided in the survey and in some instances empty cells that produce a singular matrix when the determinant of the matrix is calculated.

1.11   The regression equations for the binary logit model are estimated using ordinary least squares techniques due to the normal distribution assumption that is associated with the model when the sample size exceeds 120 members. In contrast, the regression equations for the MNL model are estimated using the maximum likelihood technique.

1.12   The R open architecture software is used for the estimation of all regression equations in this study with the mlogit library of the software used for the multinomial logit regression. There are several packages available within the R environment for estimation of the binary logit model. The estimation outcomes are presented in tables. The coefficient estimates for the parameters (independent variables) in the models are accompanied by the test statistic value corresponding to the estimate which facilitates easy detection of the statistical significance of the estimate.

1.13   The report has four parts. First, the context or background of the retail choice problem is presented. Second, the theoretical properties of the binary and MNL econometric models are discussed. The data preparation and data cleaning processes are presented and the econometric modelling methodology follows thereafter. The list of variables for the regression equations appears in the appendix to this study. The fourth part of the report presents, interprets and discusses the results. Finally, policy-relevant conclusions are provided from the modelling outcomes observed.

Retail consumer choice decision-making

1.14   Retail consumer choice of an electricity retailer is a discrete choice problem that has a binary structure. The consumer either selects a specific retailer or not. The decision may result in the consumer remaining with the existing retailer or changing to another retailer. Often, selection of the retailer is influenced by the retail contract offered which includes price and non-price terms and conditions; or the consumer's behaviour may be influenced by the loyalty factor as expressed through a long established, open-ended contractual relationship that predates the introduction of retail competition in the electricity industry.

1.15   This analysis does not consider the structure or terms of retail service contracts, since retailers often claim such information is privileged and confidential to the contracting parties and therefore

is unavailable publicly. The only contractual information available for this analysis is whether the consumer is on a fixed-term contract with the retailer.

1.16   The analysis uses the demographic and attitudinal characteristics of individual retail customers, their perceptions of the retailers, the retailers' customer retention strategies and other attributes of the retail customers' household to associate the choices made by these consumers. Each retail customer's decision is structured quite readily for this analysis as a choice among four mutually exclusive available alternatives within the MNL econometric model:

(a)   stay with the existing retailer who is a Big 5 retailer;

(b)   stay with the existing retailer who is not a Big 5 retailer;

(c)   switch to another retailer who is a Big 5 retailer; or

(d)   switch to another retailer who is not a Big 5 retailer.

1.17   An ancillary objective of the analysis is to assess the likelihood of the retail consumer choosing a retailer who is not a Big 5 retailer given the observed attributes of the consumer and the consumer's household.

1.18   Within the consumer decision-making process, we assume rationality such that the choice to remain with the existing retailer or switch to another retailer returns positive net benefits to the retail customer. The decision-making process may be represented as a decision tree for the situation where the sample of 1,200 retail customers is considered.

1.19   A decision tree representation of the problem for the combined sample of customers appears in Figure 1, with ST representing the decision to stay and SW the decision to switch. B5 and NB5 are the descriptors for the group of Big 5 (B5) retailers and the group of non-Big 5 (NB5) retailers.

Figure 1: Hierarchical decision tree for retail customer switching
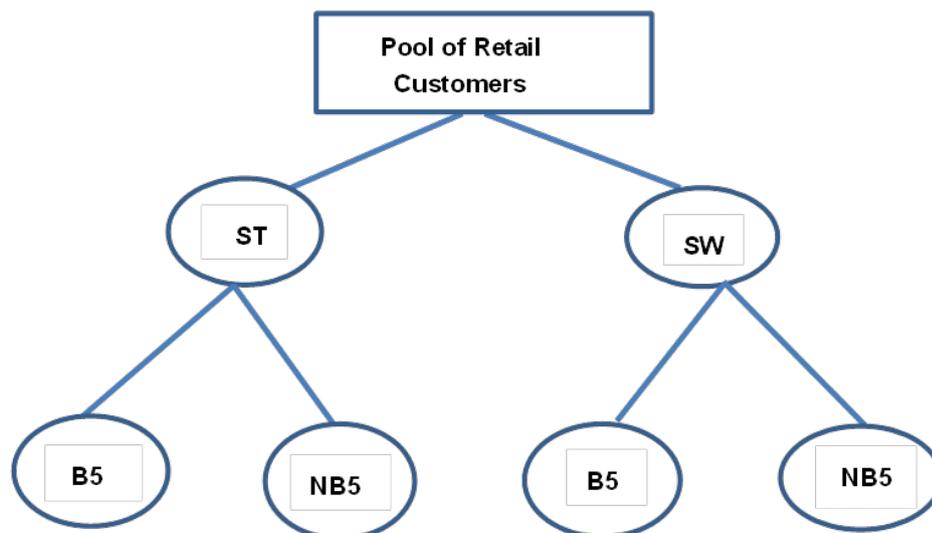
Source: Electricity Authority

1.20   An alternative structure of the consumer switching problem is a single-level decision tree as shown in Figure 2 when the combined sample is analysed. Either structure of the decision tree is appropriate for modelling the retail consumer choice problem though different parameter estimates will result. The two-tiered decision tree uses the multinomial nested logit econometric model while the single-level decision tree uses the MNL econometric model. Both the MNL and multinomial nested logit are non-linear regression models whose regression equations require transformation to a linear structure prior to estimation.

1.21   Both of these regression models require use of the sample of 1,200 consumers. The method of estimation for the models is maximum likelihood. The underlying theoretical structure and assumptions of the models selected for this study are explained in the section that follows.

Figure 2:   Single-level decision tree for retail customer switching
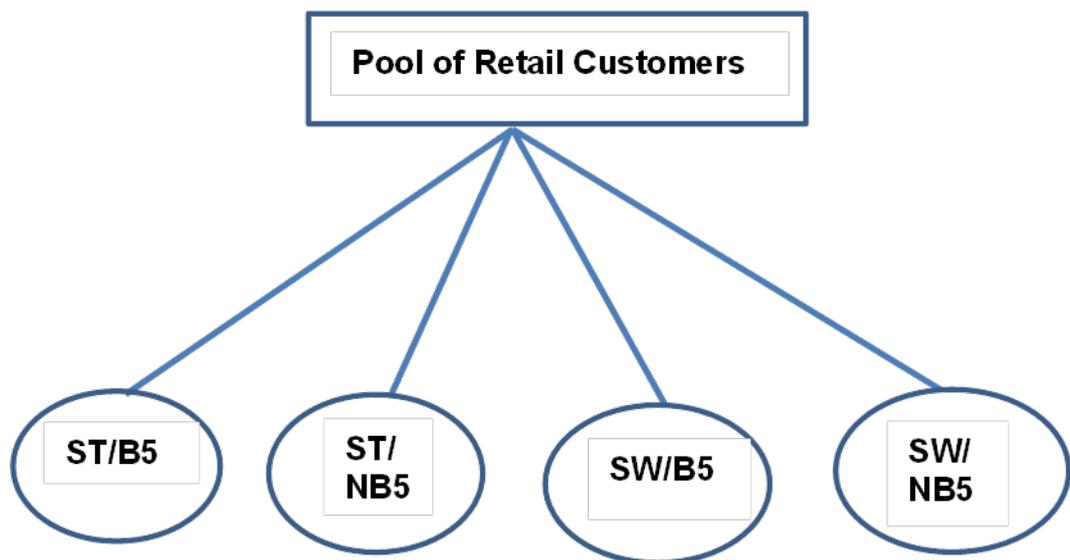
Source: Electricity Authority

2   Econometric model selection

2.1   This study applies two different models to model the consumer switching problem. The model applied to the sub-samples is presented first and an explanation of the model for the full sample follows.

2.2   The binary logistic model presents individual retail customers with two choices. The selection of one of the two choices depends on the utility that the retail customer derives from either choice. The model assumes that the consumer is rational and selects the alternative that provides greater utility. Therefore, utility maximisation is fundamental to the selection that the retail customer makes. Utility is maximised from ranking the choices available to the retail customer.

2.3   In this study, use of the binary logit regression model is reserved for the analysis of the segmented sample of switchers and potential switchers when attributes specific to those segments are analysed. The key assumptions for the model are:

(a)   The dependent variable represents two mutually exclusive alternatives.

(b)   The independent variables are linearly independent.

(c)   The model is correctly specified.

(d)   No relevant independent variables are omitted.

(e)   No irrelevant independent variables are included.

(f)   Each observation is drawn from a Bernoulli distribution.

(g)   The probability of an event is discrete. The probability distribution is a logistic curve that is a function of the independent variables.

(h)   The independent variables do not show high levels of multicollinearity.

(i)   The mean of the error term is 0, consistent with a normal distribution.

(j)   The dependent variable has a standardised logistic distribution with variance $\pi^2/3$ or a standard normal distribution with variance 1 or some other distribution with known variance.

2.4   The choice outcome from the model is viewed as the reflection of an underlying regression where the retail customer derives a benefit from the selection made. The benefit is measured as the difference between the alternative chosen and the other alternative that is not chosen. The idea is the retail customer chooses the alternative that provides the largest difference when compared to the alternative selected as the reference category against which all other alternatives are compared. The net result of the choice is not observable though the selected alternative is observed in the market.

2.5   Additional assumptions of the binary logit regression model are:

(a)   individuals face only two available alternatives from which only one is chosen

(b)   the individual's choice of an alternative depends on their individual characteristics, not on the attributes of the alternatives

(c)   the underlying distribution of the error term is a normal distribution with constant variance, or formally known as homoscedasticity. The error term has two components, a systematic and a random element.

2.6   The binary logit regression model that is estimated can be specified in terms of the log-odds ratio:

$$\hat{Z} = log \frac{p(x)}{1 - p(x)} = x'\beta + \epsilon$$

p is the probability of success; that is, the event has occurred. x is the vector of independent variables, the characteristics of the retail customers. The equation presumes that the logarithm of the odds of one choice relative to its alternative is a linear function of the independent variables. To determine the probability of the event, the equation for the log-odds ratio requires transformation. That transformation is accomplished by taking the natural antilogarithms of $\hat{Z}$ which results in:

$$e^Z = e^{x'\beta}$$

Solving for the probability that one of the two choices is selected with probability p, results in the specification for the logistic (cumulative density) distribution:

$$Prob(Y = j|x) = \frac{e^{x'\beta}}{1 + e^{x'\beta}} = \frac{1}{1 + e^{x'\beta}}$$

where j is the index for the alternative selected and Y is the dependent variable for the regression.

2.7   Therefore, the probability of a retail customer choosing the preferred alternative when a logistic distribution is assumed is:

$$Prob(Y = 1) = Prob(x'\beta + \epsilon > 0) = Prob(\epsilon < x'\beta) = F(x'\beta) = \frac{e^{x'\beta}}{1 + e^{x'\beta}} \quad (1)$$

When the event occurs, $Y = 1$, the probability of success is of interest. Y is the dependent variable. Alternatively, when $Y = 0$, this outcome reflects the alternative not chosen by the consumer and is regarded as the failure of the event with probability

$$Prob(Y = 0) = Prob(x'\beta + \epsilon < 0) = Prob(\epsilon > x'\beta) = 1 - F(x'\beta) = 1 - \frac{e^{x'\beta}}{1 + e^{x'\beta}}$$

$$= 1 - \frac{1}{1 + e^{x'\beta}} \quad (2)$$

$F(.)$ is the cumulative density function of the logistic distribution and the vector $x'\beta$ is the index function. The index function maps the probability of the event of interest to the independent variables in the regression. Observations in the model are assumed independent. When $Y = 1$, the choice of interest has occurred with probability $F(x'\beta)$ and the probability of its non-occurrence is $[1 - F(x'\beta)]$. When the probability of success and the independent observations are considered, the model leads to a joint probability or likelihood function:

$$Prob(Y_1 = y_1, Y_2 = y_2, \ldots \ldots, Y_n = y_n) = \prod_{y_i=0}[1 - F(x_i'\beta)] \prod_{y_i=1} F(x_i'\beta) \quad (3)$$

Equation (3) can be written compactly as:

$$L = \prod_{i=1}^{n}[F(x_i'\beta)]^{y_i}[1 - F(x_i'\beta)]^{1-y_i} \quad (4)$$

where y_i is the event of interest, retail customer i's choice of a retailer.

2.8   In this study, all independent variables are dummy variables except the average monthly electricity consumption and expenditure for each consumer's household which are represented by continuous variables. The marginal effect of a selected dummy variable requires computation of the value of the cumulative density function when the dummy variable equals 1 minus when the dummy variable equals 0. Mathematically, this expression is:

$$\Delta F(x'\beta) = [F(x'\beta)|D = 1] - [F(x'\beta)|D = 0]$$

2.9   Ordinary least squares techniques are used to estimate the binary logit model whether the assumption is the model has a t distribution or standard normal distribution. The latter assumption applies when the sample is larger than 120 observations where the t distribution approximates the standard normal distribution.

2.10   With the binary logit econometric model incapable of representing more than two choices, the shift to a more relevant model, either the MNL or multinomial nested logit regression model is made. The MNL model is selected for this study due to the under-representation of observations in cells when the cross-tabulations are calculated for multiple independent variables simultaneously. When this outcome exists, the determinant of the variance-covariance matrix is singular which means that the determinant for this matrix does not exist. The MNL overcomes this problem through higher level aggregation of the observations for the analysis of multiple independent variables simultaneously.

2.11   The motivation for the MNL model and the multinomial nested logit model is the idea of random utility maximisation. Both models are natural extensions to the binary logit model. Within the random utility maximisation model, the retail customer is an assumed utility maximiser subject to the available alternatives. The utility function for retail customer *i* for the selection of alternative *j* is represented as

$$U_{ij} = x_{ij}'\beta + \varepsilon_{ij} \qquad\qquad (5)$$

2.12 x_{ij} is a vector of individual retail customer characteristics or attributes that are invariant to the available alternatives and ε_{ij} is the error term that has an assumed generalised extreme value distribution, Gumbel or Weibull, for the MNL model.

2.13   The selection of alternative *j* is viewed as a rational choice that maximises utility for consumer *i*, among the *J* alternatives available to the consumer in the choice set. Underlying the choice *j* made by the consumer is a statistical model associated with the probability:

$$Prob(U_{ij} > U_{ik}) = Prob(Y_i = j) \, for \, each \, j \neq k \qquad\qquad (6)$$

U_{ij} and U_{ik} are the utility functions for the choices available to the retail customer *i*. The expectation is that, whenever the retail customer selects the alternative *j* rather than alternative *k*, the retail customer engages in rational decision-making through utility maximisation when $Y_{ij} = 1$. Otherwise, when $Y_{ij} = 0$, it must be that $U_{ij} \leq U_{ik}$. The dependent variable is specified as $Y_i = j \quad \forall \{j = 1, 2, \ldots, J\}$ where the symbol $\forall$ means for all in relation to the expression appearing within the parenthesis.

2.14   The multinomial distribution is assumed for the dependent variable. The probability of the dependent variable when *Y* equals 1 for the selected alternative is expressed as a log-odds ratio, where the selected alternative is compared relative to the baseline or reference category. This ratio is assumed independent of all other pairwise comparisons of alternatives, a property called the independence from irrelevant alternatives (*IIA*). It implies that the probabilities of the remaining alternatives are independent of the odds ratio.

2.15   The *IIA* assumption requires that no relevant variables for the regression are omitted or irrelevant variables included. Also, it is associated with the independence assumption that requires each alternative is mutually exclusive which follows from the assumption for the error terms. In addition, the *IIA* property requires that the independent variables are invariant to the alternatives though not across retail customers. This condition facilitates retail customer heterogeneity but restricts the distribution for the error terms to be independent and identically distributed with constant variance.

2.16   When the normality assumption of the error term is relaxed, the error term is assumed to follow a generalised extreme value distribution. For example, a Weibull distribution which is assumed for the MNL model although a Gumbel distribution could also be assumed. Estimation of such models using the maximum likelihood technique provides values for the model parameters – the intercept and slope coefficients. The objective is to provide meaningful results for the discrete dependent variable given the relationship between the dependent and independent variable(s).

2.17   The dependent variable is an indicator for the underlying continuous variable that is unobservable to the modeller. The standard MNL model specification is:

$$P(Y = j|x) = \frac{exp(w_j'\beta)}{\sum_{k=0}^{J} \exp(w_j'\beta)} \qquad (7)$$

where w is the vector of consumer characteristics and attributes of the alternatives, Y is the dependent variable represented as a vector of the alternatives that are available to retail customers and β is the vector of slope coefficients for the model. The MNL and binary logit models are similar when the choice set is restricted to two available choices which results in the MNL reducing to the binary logit model. The subscripts, which appear in equation (5), are dropped for ease of exposition hereafter.

2.18   The disturbance or error term for the MNL model assumes a generalised extreme value distribution such as the Weibull distribution with a cumulative density function

$$F(\varepsilon_{ij}) = exp(-e^{-\varepsilon_{ij}}) \qquad (8)$$

$F(\varepsilon_{ij})$ is a nonlinear cumulative density distribution that does not require the assumption of a homoscedastic variance for the error terms.

2.19   When only the retail customer characteristics are modelled, the conditional logit form of the MNL applies. Estimation of the standard MNL model results in estimates for the characteristics of the consumers and any retailer attributes when considered. Therefore, the model estimates the probability of specific choices made by retail customers contingent on the observability of their personal characteristics such as age, income, the retail customer's gender, inducement offered to switch, years of residence at their home and other household attributes for the retail customers. Those characteristics are known for the retail customers by the modeller and may differ among retail customers given their heterogeneity. There may be retail customer characteristics that remain unknown to the modeller. Such omitted variables from the regression will be accounted for within the error term.

2.20   Estimation of equation (7) produces a set of J +1 probabilities rather than J when the model seeks to compare J-1 available alternatives to a reference category or baseline. Therefore, one of the alternatives is selected as the baseline and the log-odds ratios are calculated for the J-1 alternatives which could also be achieved by normalisation when β_0 assumes a value equal to zero.

2.21   As a result, the probabilities are estimated on the basis of the following model:

$$Prob(Y = j) = \frac{exp(x'\beta_j)}{1 + \sum_{k=1}^{J} exp(x'\beta_k)} \qquad \forall\, j = 1, 2, \dots\dots, J.$$

for the selected alternative, and

$$Prob(Y = 0) = \frac{1}{1 + \sum_{k=1}^{J} exp(x'\beta_k)} \tag{9}$$

for the alternative that remains not selected.

2.22   The pairwise comparisons of the alternatives make use of the log-odds ratio. For the MNL, the ratio measures the logarithm of the probabilities of the chosen alternative relative to the probability of another alternative that remains not chosen as expressed in equation (10):

$$Prob(Y = j) = ln\left[\frac{P_{ij}}{P_{ik}}\right] = x'_i(\beta_j - \beta_k) \qquad j \neq k \tag{10}$$

The ratio does not depend on the values of the other choices, an outcome that results from the independence assumption for the error terms in the model.

2.23   For the econometric modelling, the full sample of 1,200 retail customers is used to model selected effects within the MNL modelling environment. The specific effects modelled are: consumer demographics; consumer search for information on possibilities for switching to another retailer; the ease of switching and the switching process; and the effects of win-backs, a customer retention strategy used by retailers to win the return of their customers who had departed for other retailers.

2.24   For potential switchers, the effects modelled are fixed-term contracts, the switching process and saves, another retailer retention strategy.

2.25   For switchers, the effects modelled are the ease of switching and the reason for switching.

3   Data preparation and cleaning

3.1   The data used in this analysis are sourced from the consumer switching experience survey conducted by UMR in February 2014 on behalf of the Authority with supplemental data sourced from Statistics New Zealand. The survey comprised 25 questions that enquired of the retail customers' demographics and socioeconomic situation, attitudes towards switching and searching for possibilities for switching to other retailers and the consumers' perceptions of their retailer. Supplementary data on annual household income, household average monthly electricity consumption and electricity expenditure are incorporated from Statistics New Zealand.

3.2   The anchor point for all data used in this analysis is the installation control point (ICP) for each retail customer in the survey sample. There were only three cases where retail customer information on electricity expenditure was missing for the relevant ICPs within the SNZ database. For these missing entries, the meshed block information from SNZ provided an approximate measure of the retail customers' missing information on the household's monthly electricity expenditure. For cases where the survey respondent refused to state the annual income of the household, the individual household income was used. If the individual data were also missing, the meshed block annual income was used. That information was also retrieved from SNZ. Less than 1 per cent of the retail customers in the sample refused to provide their annual household income.

3.3   In the regression models estimated, the only continuous variables are average monthly electricity consumption and electricity expenditure for the household of each retail customer in the survey sample. The other variables used in the analysis are dummy variables since the survey questions are structured with accompanying multiple choice answers or free form responses which were classified into major themes. An exception to the free form responses is the Likert scale that was used for the retailer perceptions which provided for uniformity in the treatment of the responses. Therefore, binary or dummy coding is applied to the dummy variables in the models.

3.4   The survey sample is a simple random sample of 1,200 retail customers. The sample frame consisted of 600 potential switchers and 600 switchers. In terms of the gender split of the sample, the sample comprised 652 male (54 per cent of the sample) respondents and 548 female (46 per cent) respondents. These respondents represented 12 age groups. Each age group represents a four-year age range. These age groups were collapsed to five classes for the construction of an approximately normal distribution for the age variable. This approach resulted in the following classes: group 1 (less than 45 years old); group 2 (45 years to 55 years); group 3 (55 to 65 years); group 4 (65 to 75 years); and group 5 (75 years and above). The category containing consumers who are younger than 45 years was selected as the reference group for this independent variable.

3.5   Another independent variable constructed for this analysis accounts for the switching frequency observed among retail customers in the past two years. There are four levels for this variable – none, once, twice and three or more times. The levels from the survey were retained in the data frame. The group of retail customers who switched to another retailer only once provides the reference category for this variable.

3.6   An independent variable was created for the retail customers' years of residence at their household address (correspondent with the ICP). In the survey, this residence variable was represented as five levels but was transformed to three levels for the analysis to avoid zero or low counts in cells when the variable is cross-tabulated with other independent variables for this analysis. As a result, the levels of the variable used in the econometric models reflect residence periods for less than five years, five to 10 years and more than 10 years. Residency for less than five years provided the reference category for this independent variable.

3.7   The household's annual income is another independent variable used in the analysis of switching experiences among consumers. The classification of household incomes within the survey represented eight levels and included a category for those survey respondents who chose not to respond to the question. Non-responses were less than 5 per cent of the sample. These cases of non-response were reduced through use of meshed block data sourced from SNZ where the individual information for the retail customers' household was missing. This variable was transformed into a variable consisting of five levels since there were extremely low counts of retail customers with annual household income below $20,000 in the sample. There were zero counts in cells when cross-tabulations between the combination of other retail customer characteristics and the retail customers' perceptions of their retailers. The five classes constructed in the data frame are $30,000 or less, between $30,000 and $50,000, $50,000 to $70,000, $70,000 to $100,000 and above $100,000.The reference category for the income variable is the group of consumers with annual income below $30,000.

3.8   Occupation of the consumer is another independent variable included in the analysis. Within the survey, 15 broad occupational categories were represented. Those categories were regrouped into three classes. The three classes are: occupation 1 for the retired, unemployed, students,

labourers, homemakers, mothers, residual categories and beneficiaries; occupation 2 represents the semi-skilled and skilled professions – trades, sales workers, technicians, drivers, machine operators, the self-employed, community and personal service workers, clerical and administrative workers and professionals; and occupation 3 represents managers only. The reference category is the first occupational group that contains the retirees, homemakers and the other members of occupation 1.

3.9   An independent variable that accounts for the number of children in the retail customers' household was created with three levels. The individual levels are none, one to two, and three or more. The reference category is households with no children.

3.10   As a contrast to the independent variable for children, there is an independent variable that captures the number of adults in the household. That variable accounts for the number of adults or household members above 18 years of age who live in the household. This variable has three levels. Group 1 contains nine households that were unsure or refused to indicate the number of adults in the household, plus 320 households with only a single adult. Group 2 has households with two adults and group 3 has households containing three or more adults. The nine households whose respondents refused to answer the question on the number of adults in the household should not materially alter the estimates for the regressions due to their representation within group 1 being less than 3 per cent of the members of the group and less than 1 per cent of the sampled consumers. The reference category for this variable is the group of households with one adult only.

3.11   Consumers who exercised the choice to switch had their preferences for completing the switch presented as an independent variable, the switching process. The variable reflected whether or not the consumer got the new retailer to start the switching process by finalising the decision with the losing retailer. Therefore, this variable is binary in structure with 1 representing that the acquiring retailer started to finalise the switch with the losing retailer. When the variable has a 0 value, the consumer initiated the switching decision. This variable is one of the variables used for the binary logit model in the analysis of potential switchers and their attitudes towards switching to another retailer.

3.12   For those consumers who switched, an independent variable, the reason for switching, captured their financial and non-financial reasons for deciding to change their current retailer. This independent variable has three levels: Group 1, those households that were offered a non-financial inducement to switch such as the convenience of bundling electric and gas purchases, the sale of generation assets, membership in a buying group and use of sustainable generation. Group 2 represents households that chose to switch due to unhappiness with the quality of service. The reasons offered were infrequent meter reading, lack of transparency concern, dissatisfied with the retailer's service and unhappiness with increased prices. The final group, Group 3, accounted for households that were offered financial inducements to switch. The inducements include a lower tariff, a lump-sum credit, a fixed price or a discount on the tariff when gas and electricity are purchased from the same retailer. The reference category is the group of consumers who received non-monetary inducements in exchange for switching to the retailer who offered the inducement. This variable was used in a separate analysis of switchers.

3.13   Another independent variable was structured to capture those retail customers subject to win-back[1] offers from retailers who lost their customers' business to other competing retailers. A win-

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[1] If a customer completes a switch from one retailer to another, and the losing retailer later convinces them to switch back, then a win-back has occurred.

back occurs when a consumer completes a switch from the existing retailer to another retailer, and the losing retailer later convinces the retail customer to switch back or return. The variable has two levels: group 1 collects all households in receipt of a financial or other inducement after switching to another retailer – the offer extended to the retail customer is intended to lure the customer to return to the retailer who lost their business; group 2 accounted for all other households that switched to another retailer but no offer was made for their return to the retailer who lost their business. This variable is binary in structure with a value of 0 when no inducement was offered and 1 when the retail customer was offered an inducement.

3.14 An independent variable for saved households was created to account for this type of customer retention strategy practised by retailers in the market. If a consumer is in the process of switching from one retailer (the 'losing retailer') to another retailer (the 'gaining retailer'), and the losing retailer manages to persuade the consumer to cancel the switching process before it is complete, a save has occurred. This variable has a binary structure where a zero value for the variable represents the group of retail customers who received no inducement to stay with their retailer whether or not the customer decided to switch to another retailer. The second group, group 2, accounts for all other potential switchers. This variable applies only to potential switchers in the analysis.

3.15 Another independent variable – fixed-term – also has a binary structure. Group 1 represents households that had no fixed-term contract among the sampled potential switchers and group 2 collects all other potential switchers. Consumers with fixed-term contracts face a temporary lock-in for the duration of the contract. The ability to switch when under a fixed-term contract may require the payment of a contract breach fee if the consumer wishes to switch to another retailer. Group 1 contains all retail customers without a fixed-term contract while group 2 collects all customers with a fixed-term contract. Only retail customers who are potential switchers were offered or not offered a fixed-term contract within the sample studied. There is no indication that consumers who switched to another retailer were offered fixed-term contracts based on the responses from survey respondents. This variable is reflected in the analysis of potential switchers.

3.16 Independent variables reflecting consumers' perceptions of their retailer and ease of the switching process were created as well for inclusion in the econometric model. The perception variables evaluate the relationship quality between the retailers and their customers, whether the company is trustworthy, provides value for money, good service, is reliable and secure, or well-established. Another retailer attribute considered is the importance of customer satisfaction. These perception variables were measured on a 5-point Likert scale similar to the scale used for the ease of switching variable. The Likert scale for each variable was converted into a binary variable.

3.17 For the satisfaction attribute, the groups are very satisfied and all other levels of satisfaction were grouped into another category to reflect lower levels of satisfaction and dissatisfaction. Similarly, for value for money, reliable and secure, trustworthy, good service and well-established, consumers who responded that the perception applies a lot to their retailer were grouped into a single category and all others were placed in another group. The approach to grouping the retail customers for the retailer attributes considered was guided by the research literature on customer satisfaction and defection rates (Jones et al., 1995). Jones et al. (1995), state that ratings lower than the highest level for the retailer attribute must be interpreted as the possibility for potential customer defection.

3.18   Similarly, for the ease of switching variable, either switching is accomplished easily or not, and therefore the variable has a binary structure. The ease of switching variable is a variable used in the analysis of switchers.

3.19   Finally, independent variables were constructed to account for whether consumers had engaged in gathering consumer information by consulting the two online consumer information websites, *What's My Number* and *Powerswitch*. Each variable is binary in structure; the variable has a value of 1 when the website is consulted and 0 otherwise.

3.20   The remaining variables used for the analysis are the dependent variables for the logit regression and the MNL regression model. In modelling the full sample of retail customers, the choice set contains four available alternatives: (i) stay with a Big 5 retailer; (ii) stay with a non-Big 5 retailer; (iii) switch to another Big 5; and (iv) switch to a non-Big 5 retailer. As a result, each retail customer faces a total of four possible choices within the MNL modelling environment when making the decision to stay or switch. For the logit regression model, the first two alternatives provided the available alternatives for potential switchers while the last two alternatives were specific to the switchers.

3.21   A list of the independent variables used in the econometric models is provided in the appendix to the report.

4   Econometric methodology and results

4.1   The objective of the study is to develop an understanding of the switching behaviour of retail customers and their selection of a retailer in the market. This understanding focuses on the retail customers' characteristics, their household demographics, attitudes towards switching and gathering information on the possibility of switching to another retailer, their perceptions of their retailer and the switching process in the retail market. The analysis also focuses on the retention strategies of retailers.

4.2   There are 10 regression equations estimated for this study. A list of the regressions appears in Table 1. Initially, a preliminary relationship between the retail customers' chosen alternative and the gender and age of the retail customers is modelled to gauge how the various age groups select a retailer in the market.

4.3   Retail customers differ in their characteristics, household composition, income, attitudes towards their purchase decisions and their relationships with the retailers. It is this observed heterogeneity among retail customers that must be understood to discover the motivations for the decision outcomes observed in the retail market. The retail customers' decision of where to purchase services in a competitive market requires consideration of a trade-off between the effort expended in gathering information on potential savings from switching to another retailer and the income or savings to be derived from the search that ultimately results from the decision made.

4.4   This study contains no information on the prices that retail customers face in the retail market nor the amount of time spent in gathering information and how these matters influence the choice of a retailer. These subjects are important to any discussion on consumers' switching experiences in the retail market and will require investigation in future surveys.

4.5   The retail customers' choice of a retailer involves a comparison of the service their current retailer provides and the competing offers from other retailers that are available in the market. As a

result, consumers assess whether remaining with their current retailer provides greater net benefits than switching to another retailer for the supply of the customer's electric service.

Table 1:   List of regressions estimated

Attributes	R1	R2a	R2b	R3	R4	R5	R6	R7	R8	R9	R10
Gender	x	x	x	x	x	x	x	x	x	x	x
Age	x	x	x	x	x	x	x	x	x	x	x
HH income				x							
Children		x	x	x							
Adults		x	x	x							
Switching frequency		x	x	x							
Occupation		x	x	x							
Residency duration		x	x	x							
Monthly electricity consumption		x		x	x		x				
Monthly electricity expenditure			x								
Online media consultation					x						
Reason for switching						x					
Save							x				
Fixed-term contract							x				
Switching process								x			
Ease of switching											x
Win-back									x		
Household perception of retailer										x	

Source: Electricity Authority

4.6   Customers may switch to another retailer even when the net benefits of staying with their existing retailer are greater than the net benefits of switching to another retailer when faced with a deteriorating business relationship between the customer and the existing retailer. These behaviours may result in decisions that are viewed as rational in some instances and irrational in other circumstances. This decision outcome highlights that there are subjective elements in the consumer decision-making process for which no market valuation exists such that what another

individual views as rational may be interpreted as irrational by others who have different valuations for the same elements of the decision.

4.7 The analysis determines whether or not the parameter estimate (coefficient of the independent variable) is statistically significant or insignificant. The estimate is significant when the test statistic value that is labelled as a t-value or z-value in the tables of estimates is equal to or greater than 1.96 or less than or equal to -1.96. These values provide the statistical benchmark at the 5 per cent level of statistical significance which is equivalent to the 95 per cent level of confidence for the relevant distribution of the model estimated.

4.8 As a result, a t-value of 2 suggests strong statistical evidence exists that the independent variable influences the retail customer's choice of a retailer. Similarly, a t-value of -2 suggests strong statistical evidence exists for an independent variable. In contrast, a t-value of 1.90 suggests that there is weak statistical evidence that the independent variable influences the retail customer's selection of a retailer, while a t-value of -1.2 suggests that there is weak statistical evidence that the independent variable influences the customer's selection of a retailer.

Demographic effect

4.9 A number of demographic characteristics are examined for their effect on the retail customer's choice of a retailer. The focus is to assess the decision-making of different age groups after accounting for the age, gender and occupation of the retail customer, the number of children in the household, the number of adults in the household, how often the retail customer has switched to another retailer in the past two years, the retail customer's period of residency at the household address and the customer's average monthly electricity consumption or expenditure.

4.10 First, a very basic regression equation is estimated to analyse the relationship between gender and age of the retail customer and the decision made by the consumer:

$$U = [\beta_0 + \beta_1 female + \beta_2 age] \qquad\qquad (R1)$$

The coefficient estimates for the regression equation R1 are presented in Table 2.

4.11 When retail customers younger than 45 years are considered, there is strong statistical evidence that these consumers switch to another retailer, who is most often a Big 5 retailer. Also, there is slightly weaker statistical evidence that retail customers in this age group will stay with their retailer and that retailer is most often a Big 5 retailer as well.

4.12 In accounting for the gender of the retail customer, the results indicate that there is strong statistical evidence that male customers who are younger than 45 years (the intercept terms) are more likely to switch to another Big 5 retailer. Their coefficient estimate is 3.81. In addition, there is evidence that female consumers are more likely to stay with the Big 5 retailer given that their coefficient estimate is 4.05 (= 3.6085 + 0.4468). Both coefficient estimates are statistically significant at a significance level that is less than one-tenth of 1 per cent. It is plausible that females in this age group have young families and are too time-deprived to search for opportunities to switch to another retailer.

Table 2:   Effect of gender and age on the decision outcome

Independent variable	Coefficient estimate	Standard error	t-value	Probability (>|t|)
Intercept$_{stb5}$	3.6085	0.7357	4.9051	9.34e-07*
Intercept$_{swnb5}$	2.1720	0.7658	2.8362	0.00456*
Intercept$_{swb5}$	3.8131	0.7356	5.1833	2.179e-07*
Female$_{stb5}$	0.4468	0.2984	1.4973	0.1343
Female$_{swnb5}$	0.2911	0.3291	0.8847	0.3763
Female$_{swb5}$	0.1317	0.3015	0.4368	0.6623
45–54 yrs$_{stb5}$	-1.7664	0.7689	-2.2974	0.0216*
45–54 yrs$_{swnb5}$	-1.9760	0.8183	-2.4147	0.0157*
45–54 yrs$_{swb5}$	-2.1656	0.7713	-2.8078	0.005*
55–64 yrs$_{stb5}$	-1.7476	0.7620	-2.2934	0.0218*
55–64 yrs$_{swnb5}$	-1.5279	0.7989	-1.9124	0.0558*
55–64 yrs$_{swb5}$	-2.0337	0.7633	-2.6641	0.008*
65–74 yrs$_{stb5}$	-1.0404	0.8152	-1.2763	0.2018
65–74 yrs$_{swnb5}$	- 0.6959	0.8497	-0.8191	0.4127
65–74 yrs$_{swb5}$	-1.2161	0.8157	-1.4854	0.1374
75 yrs+$_{stb5}$	-1.7261	0.7834	-2.2033	0.0276*
75 yrs+$_{swnb5}$	-0.9768	0.8149	-1.1987	0.2307
75 yrs+$_{swb5}$	-2.0543	0.7856	-2.615	0.0089*

Source: Electricity Authority
Note: 1. Model chi-square = 39.935; $p < 0.001$; Log likelihood = -1328

4.13   Therefore, although consumers who are younger than 45 years are inclined to switch to another retailer, the females in the group exhibit a lower chance of switching to another retailer, particularly a Big 5 retailer.

4.14   As a group, consumers whose ages are between 45 years and 55 years are more likely to stay with their retailer which is most often a Big 5 retailer. There is much weaker statistical evidence that retail customers in this group will switch to another retailer such as a non-Big 5 retailer. In this group, males and females are more likely to stay with the Big 5 retailer instead of switch to another retailer. This group may also be challenged with finding time to check for opportunities to switch to another retailer particularly when young children and retired adults are present in the household.

4.15   Further, retail customers who are 55 years and above are more likely to stay with their retailer. Only males between the ages of 65 years and 74 years are more likely to switch to another retailer. All other retail customers whether male or female are likely to stay with their retailer. In both situations, the retailer chosen is a Big 5 retailer.

4.16 Probabilities of the decision outcomes for the individual age groups are presented in Table 3. This table shows stronger evidence that retail customers stay with their existing retailer and weaker evidence that many retail customers switch to another retailer based on the calculated probabilities.

Table 3: Probability of chosen alternative based on gender and age group

Age group/Gender	Stayed (B5)	Stayed (NB5)	Switched (B5)	Switched (NB5)
<45 years				
All	0.24	0.005	0.25	0.05
Male	0.09	0.003	0.12	0.02
Female	0.15	0.002	0.13	0.03
45–54 years				
All	0.041	0.005	0.028	0.007
Male	0.016	0.002	0.013	0.003
Female	0.025	0.003	0.015	0.004
55–64 years				
All	0.042	0.005	0.032	0.007
Male	0.016	0.002	0.015	0.003
Female	0.026	0.003	0.017	0.004
65–74 years				
All	0.085	0.005	0.073	0.026
Male	0.033	0.003	0.034	0.011
Female	0.052	0.002	0.039	0.015
75 years+				
All	0.043	0.005	0.032	0.020
Male	0.017	0.002	0.015	0.008
Female	0.026	0.003	0.017	0.011
All	0.45	0.0250	0.41	0.11
Male	0.18	0.0127	0.19	0.05
Female	0.27	0.0127	0.22	0.06

Source: Electricity Authority

4.17 Three additional equations were estimated to account for the demographic effects of retail customers and their households. Equation R2a explores the relationship between the gender, age and occupation of the retail customer, years of residence of their household at their home address, the customers' switching frequency, the number of children and adults in the customers' household, the customers' average monthly electricity consumption and the retailer chosen by the customer.

4.18 The regression has a number of statistically significant variables which are presented as **Model I** in Table 4.

$$U = \begin{bmatrix} \beta_0 + \beta_1 female + \beta_1 age + \beta_2 child + \beta_3 adult + \beta_4 sfreq \\ + \beta_5 occupation + \beta_6 residence \\ + \beta_7 average\ monthly\ electric\ consumption \end{bmatrix} \quad (R2a)$$

4.19   The base or reference category for all MNL regressions is the alternative that the retail customer chooses to stay with a non-Big 5 retailer. That default or reference category is established through normalisation to a value of zero for this alternative. As a result, all coefficient estimates for the regressions estimated herein reflect the difference between the selected alternative and the reference alternative which has been normalised to a value of zero.

4.20   The statistical significance of all coefficient estimates is evaluated at the 5 per cent level throughout the document rather than report the actual level of significance of the variable. This corresponding standard score for this level of statistical significance is +1.96 and -1.96 due to the sample size, 1,200 retail customers. A sample of this size is assumed to have an approximately normal distribution rather than the typical t distribution that is associated with small samples for the logit regression model. The standard score reflects a two-sided test where 2.5 per cent of the area under the curve is assigned to each tail of the statistical distribution.

4.21   In equation R2a, the independent variables are the gender, age and occupation of the customer, the number of children in the customer's household, the switching frequency of the retail customer in the previous two years, the years of residence at the household's address and the average monthly electricity consumption of the retail customer.

4.22   All of the age groups and the independent variable for average monthly electricity consumption have statistically significant coefficient estimates at the 5 per cent level of significance. Only consumers with ages between 65 and 75 years did not have a significant coefficient estimate for those consumers who chose to stay with a Big 5 retailer though all other alternatives for the group had significant coefficient estimates.

4.23   When the number of children in the household is considered, the evidence shows that households with one or two children are likely to stay with their retailer who most often is a Big 5 retailer. The least likely alternative chosen by consumers in households with one or two children is switching to another retailer who is a non-Big 5 retailer. Both coefficient estimates for the switching variables which account for the presence of one or two children in the household are statistically significant but the coefficient estimates for staying with the existing retailer are not statistically significant. As a result, households with one or two children are likely to stay with their retailer, who is most often a Big 5 retailer.

4.24   For households with three or more children, there is also very strong evidence that those households are unlikely to switch to another retailer who is a non-Big 5 retailer. Their decision is most often to stay with their retailer which is a Big 5 retailer. When switching to another retailer is considered by these consumers, there is evidence that they will choose to switch to another Big 5 retailer.

4.25   In modelling the number of adults in the household, the group of retail customers who belong to households with one adult was used as the reference category. The sample yields weak evidence that the number of adults in the household influences the consumers' selection of a retailer. Households with two adults are more likely to switch to another retailer, preferably one of the Big 5 retailers, though households in this group are least willing to choose a non-Big 5 retailer. Similar conclusions are obtained for households with three or more adults.

Table 4:   Coefficient estimates for the demographic variables

Independent variable	Model I	Model II
$Constant_{stb5}$	3.747* (3.41)	2.408* (1.82)
$Constant_{swnb5}$	4.882* (4.10)	3.261* (2.23)
$Constant_{swb5}$	5.520* (4.88)	4.116* (2.99)
$Female_{stb5}$	0.458 (1.44)	0.44 (1.40)
$Female_{swnb5}$	0.227 (0.62)	0.20 (0.55)
$Female_{swb5}$	0.198 (0.59)	0.18 (0.52)
$Age\ 45–54_{stib5}$	-1.981* (-2.46)	-2.05* (-2.57)
$Age\ 45–54_{swnb5}$	-2.975* (-3.36)	-3.06* (-3.48)
$Age\ 45–54_{swb5}$	-2.859* (-3.45)	-2.92* (-3.55)
$Age\ 55–64_{stb5}$	-2.256* (-2.64)	-2.42* (-2.82)
$Age\ 55–64_{swnb5}$	-2.987* (-3.21)	-3.20* (-3.43)
$Age\ 55–64_{swb5}$	-3.047* (-3.47)	-3.22* (-3.64)
$Age\ 65–74_{stb5}$	-1.845 (-1.95)	-2.05* (-2.15)
$Age\ 65–74_{swnb5}$	-2.643* (-2.58)	-2.90* (-2.81)
$Age\ 65–74_{swb5}$	-2.513* (-2.59)	-2.72* (-2.78)
$Age\ 75+_{stb5}$	-2.805* (-2.85)	-3.00* (-3.03)
$Age\ 75+_{swnb5}$	-3.360* (-3.13)	-3.61* (-3.35)
$Age\ 75+_{swb5}$	-3.579* (-3.51)	-3.79* (-3.69)
$Child2_{stb5}$	-0.804 (-1.76)	-0.544 (-1.22)
$Child2_{swnb5}$	-1.380* (-2.49)	-1.04 (-1.90)
$Child2_{swb5}$	-1.173* (-2.40)	-0.90 (-1.87)
$Child3_{stb5}$	-0.887 (-1.17)	-0.63 (-0.84)
$Child3_{swnb5}$	-3.054* (-3.04)	-2.67* (-2.69)
$Child3_{swb5}$	-1.753* (-2.20)	-1.48* (-1.89)
$Adult2_{stb5}$	-0.387 (-1.00)	-0.070 (-0.19)
$Adult2_{swnb5}$	-0.821 (-1.87)	-0.452 (-1.06)
$Adult2_{swb5}$	-0.288 (-0.70)	0.033 (0.08)
$Adult3_{stb5}$	-0.121 (0.56)	0.446 (0.84)
$Adult3_{swnb5}$	-0.473 (-0.74)	0.253 (0.42)
$Adult3_{swb5}$	0.21 (0.37)	0.814 (1.45)
$Switching\ freq(=2)_{stb5}$	-1.19 (-1.70)	-1.29 (-1.87)
$Switching\ freq(=2)_{swnb5}$	-0.75 (-1.09)	-0.875 (-1.30)
$Switching\ freq(=2)_{swb5}$	-0.33 (-0.51)	-0.43 (-0.68)

Independent variable	Model I	Model II
Switching freq(≥3)$_{stb5}$	-2.71 (-1.78)	-2.675 (-1.78)
Switching freq(≥3)$_{swnb5}$	-2.07 (-1.51)	-2.04 (-1.51)
Switching freq(≥3)$_{swb5}$	-1.40 (-1.17)	-1.36 (-1.17)
Switching freq(=0)$_{stb5}$	-0.11 (-0.29)	-0.05 (-0.13)
Switching freq(=0)$_{swnb5}$	-3.43* (-7.42)	-3.37* (-7.34)
Switching freq(=0)$_{swb5}$	-3.47* (-8.24)	-3.41* (-8.17)
Occupation2$_{stb5}$	-1.06* (-2.35)	-1.04* (-2.33)
Occupation2$_{swnb5}$	-1.58* (-3.11)	-1.56* (-3.10)
Occupation2$_{swb5}$	-1.39* (-2.92)	-1.38* (-2.92)
Occupation3$_{stb5}$	-0.77 (-1.14)	-0.88 (-1.29)
Occupation3$_{swnb5}$	-1.81* (-2.23)	-1.87* (-2.31)
Occupation3$_{swb5}$	-0.85 (-1.19)	-0.95 (-1.34)
Residence2$_{stb5}$	0.15 (0.32)	-0.056 (-0.12)
Residence2$_{wnb5}$	-0.07 (-0.12)	-0.11 (-0.19)
Residence2$_{swb5}$	0.18 (0.35)	0.096 (0.19)
Residence3$_{stb5}$	-0.003 (-0.01)	0.05 (-0.12)
Residence3$_{swnb5}$	0.28 (0.60)	0.39 (0.60)
Residence3$_{swb5}$	0.36 (0.84)	0.41 (0.70)
Elec. consumption$_{stb5}$	0.003* (3.64)	-
Elec. consumption$_{swnb5}$	0.004* (4.14)	-
Elec. consumption$_{swb5}$	0.003* (3.66)	-
Elec. expenditure$_{stb5}$	-	0.017* (2.82)
Elec. expenditure$_{swnb5}$	-	0.021* (3.08)
Elec. expenditure$_{swb5}$	-	0.018* (2.81)

Source: Electricity Authority

4.26   The switching frequency of households was another variable modelled for its influence on the consumers' selection of a retailer. There was no statistically significant evidence that retail customers who had switched two or more times in the past two years have a strong inclination to stay with their retailer. It is very likely that these customers will switch to another retailer based on their switching frequency in the previous two years with the chosen retailer being a Big 5 retailer. A similar conclusion exists for retail customers who switched three or more times in the past two years.

4.27   When the occupation of consumers is considered in the selection of a retailer, the group of retirees, students, beneficiaries, homemakers and unskilled employees was designated as the reference category. The sample shows strong evidence that the occupational category of semi-skilled, skilled and professional employees has statistically significant coefficient estimates for all the alternatives listed in the table. However, there is evidence also that consumers in this

occupational category are less likely to switch to another retailer such as a non-Big 5 retailer. However, the evidence is not strong enough to make a definitive prediction of the most likely type of retailer that these consumers will select when choosing to switch to another retailer though they are very likely to stay with their retailer, which most often is a Big 5 retailer.

4.28   Interestingly, the occupational group that contains managers (occupation 3) has a significant coefficient estimate for those consumers who switched to another retailer that is a non-Big 5 retailer. Consumers who are employed in this occupational category are more likely to stay with their retailer, which most often is a Big 5 retailer though when switching to another retailer is contemplated, their selection most often is another Big 5 retailer.

4.29   The coefficient estimates of the skilled, semi-skilled and other professionals (occupation 2) reveal that those retail customers chose to stay with the incumbent retailer (-1.06) or switch to another incumbent retailer (-1.39). Occupation 3 accounts for the managers whose estimated coefficients indicate that these retail customers are more likely to stay with a Big 5 retailer or switch to another Big 5 retailer.

4.30   The length of the retail customers' residence at a specific address was included as one of the attributes in the regression with the idea that longevity at the home address may motivate retail customers to continue the relationship with their existing retailer. The regression results show evidence that retail customers who reside for five years to 10 years at the same address are least likely to switch to another retailer that is a non-Big 5 retailer. Instead, there is statistically insignificant evidence that these customers are likely to switch to another retailer that is a Big 5 retailer. There is weaker statistical evidence that there are many customers in the group who are willing to stay with their retailer that is a Big 5 retailer.

4.31   In contrast, there are retail customers who have resided at the same address for 10 or more years (residence 3) who are more likely to switch to another retailer. These customers switch either to a Big 5 or a non-Big 5 retailer. None of the coefficient estimates for this variable are statistically significant.

4.32   The final variable modelled in this regression equation is the retail customers' average monthly electricity consumption. All of the coefficient estimates for this variable are statistically significant. The coefficient estimates signal that consumers are equally willing to stay with their existing retailer or switch to another retailer, whether a Big 5 or a non-Big 5 retailer. Usually the coefficient estimates for this variable are evaluated at the mean value which is 634.5 kWh rather than when the variable is a dummy variable and has a value of 1 when the characteristic applies to the consumer and 0, otherwise. In using this alternative approach, the result shows that the customer' selection of a retailer is indifferent to their level of electricity consumption. Instead, the customer is interested in being the least expensive tariff offered by the retailer chosen.

4.33   All coefficient estimates for this variable have a positive sign which is an indication that as the consumers' monthly average consumption of electricity increases, retail customers will seek less costly alternatives to support their consumption. Those alternatives may include subscription to another tariff with the existing retailer or switching to another retailer that has a tariff which allows retail customers to minimise their cost of electricity consumption.

Table 5:   Adult and children presence in households and retailer choice

No. of teens and adults	Stayed (B5)	Stayed (NB5)	Switched (B5)	Switched (NB5)
No children				
1 Adult	0.0538	0.0024	0.0562	0.0267
2 Adults	0.0581	0.0024	0.0657	0.0194
3 Adults	0.0948	0.0024	0.1394	0.0359
1–2 children				
1 Adult	0.0279	0.0024	0.0219	0.0088
2 Adults	0.0301	0.0024	0.0256	0.0064
3 Adults	0.0491	0.0024	0.0542	0.0124
>= 3 children				
1 Adult	0.0287	0.0024	0.0186	0.0027
2 Adults	0.0311	0.0024	0.0218	0.0020
3 Adults	0.0458	0.0024	0.0378	0.0033

Source: Electricity Authority

Note: 1. The choice of a non-Big 5 retailer is the reference category and therefore the probability for this category is constant across all available choices.

4.34   Table 5 provides probability details for retail customers with households that either have children absent or present. As shown in the table, customers with three or more adults in their household and no children present are more inclined to switch to another retailer. The retailer of choice for this group is a Big 5 retailer. The statistical evidence appears weaker for customers with two adults or less and no children present in the household. These customers are inclined to stay with their existing retailer, which is usually a Big 5 retailer.

4.35   For customers whose households have one or two children, there is evidence that these retail customers are equally likely to stay with their retailer or switch to another retailer. The sample shows evidence that their choice of retailer is a Big 5 retailer. Finally, consumers whose households have at least three children are more inclined to stay with their retailer rather than switch to another retailer. It is plausible that these consumers most likely belong to households that do not allocate much time for information gathering or considering marketing offers from other retailers in the market.

4.36   Generally, retail customers switch to other retailers in the market though most often their choice is one of the Big 5 retailers. Also, for those customers who are not motivated to switch to another retailer either because of no interest in switching or the potential savings are inadequate to support switching to another retailer, their choice of retailer is usually one of the Big 5 retailers. Given the observed patterns of switching, as one considers the characteristics of retail customers, the composition of their household and other demographic variables, the strongest statistical evidence in the consumers' selection of a retailer is associated with the age of the retail customer. Retailers who wish to attract customers to their business may wish to understand the characteristics of the various age groups so that their marketing targets the different segments in the consumer population suitably.

4.37   A second regression equation was estimated as a variant to the regression equation 2a. That equation includes all of the variables in equation R2a but excludes the average monthly electricity

consumption variable. In the place of the excluded variable, the average monthly electricity expenditure of the retail customer is included in the regression equation. This alternative modelling captures the price and quantity effects of electricity consumption on the retail customers' choice of a retailer. The regression equation is:

$$U = \begin{bmatrix} \beta_0 + \beta_1 female + \beta_2 age + \beta_3 child + \beta_4 adult + \beta_5 sfreq \\ + \beta_6 occupation + \beta_7 residence \\ + \beta_8 monthly\ electricity\ expenditure \end{bmatrix} \quad (R2b)$$

4.38   The coefficient estimates for this model appear as **Model II** in Table 4. There is consistency in the statistical significance of the coefficient estimates in Table 4 for **Model I** and **Model II**. An exception is the variable for one to two children where **Model II** yields estimates that are statistically insignificant for this variable. This outcome indicates that there is weak evidence that households with one or two children and average monthly electricity expenditure are unlikely to switch to another retailer.

4.39   The significant coefficient estimates for the household's electricity consumption and expenditure variables in **Model I** and **Model II** provide evidence that many retail customers are interested in managing their electricity bill. Those customers who choose to stay with their retailer seem risk averse, which has contributed to their choice to become a passive customer of their retailer. These customers may be willing to manage their consumption nevertheless. Those customers who are attracted to the idea of switching to another retailer exhibit the willingness to be proactive about price risk management rather than leave that role to their retailer exclusively.

4.40   When the customers' choice of a retailer results in the selection of the retailer who satisfies their electricity demand at least cost, the efficiency feature of the Authority's statutory objective is achieved in the retail market.

4.41   These initial regressions are refined with the inclusion of household income in the regression model as shown in the regression equation R3. The average monthly household electricity consumption is used in subsequent regressions rather than the average monthly household electricity expenditure.

4.42   A third regression equation was estimated to assess the effects of gender, age, the presence or absence of children in the household, the consumer's frequency of switching, years of residence at the household address, occupation and annual household income on the choice of a retailer. The regression equation is:

$$U = \begin{bmatrix} \beta_0 + \beta_1 gender + \beta_2 age + \beta_3 child + \beta_4 adult + \beta_5 sfreq \\ + \beta_6 HH\ income + \beta_7 occupation + \beta_8 residence \\ + \beta_9 average\ monthly\ electric\ consumption \end{bmatrix} \quad (R3)$$

4.43   Based on the results for **Model III** as presented in Table 6, the inclusion of household annual income results in only one statistically significant coefficient. The significant coefficient estimate represents those consumers with annual household income equal to or greater than $100,000 who chose to switch to a non-Big 5 retailer.

Table 6: Coefficient estimates of demographic and household income variables

Independent variable	Model III	Independent variable	Model III
Constant$_{stb5}$	3.59* (3.19)	Switching freq(=2)$_{stb5}$	-1.04 (-1.48)
Constant$_{swb5}$	4.72* (3.87)	Switching freq(=2)$_{swnb5}$	-0.53 (-0.79)
Constant$_{swb5}$	5.27* (4.54)	Switching freq(=2)$_{swb5}$	-0.23 (-0.35)
Female$_{stb5}$	0.45 (1.40)	Switching freq(=3)$_{stb5}$	-2.61 (-1.72)
Female$_{swnb5}$	0.19 (0.52)	Switching freq(=3)$_{swnb5}$	-1.91 (-1.39)
Female$_{swb5}$	0.18 (0.53)	Switching freq(=3)$_{swb5}$	-1.33 (-1.11)
Age 45–54$_{stb5}$	-2.00* (-2.48)	HHInc$_{stb5}$($30K–$49.9K)	0.54 (0.99)
Age 45–54$_{swnb5}$	-2.99* (-3.37)	HHInc$_{swnb5}$($30K–$49.9K)	0.50 (0.82)
Age 45–54$_{swb5}$	-2.89* (-3.47)	HHInc$_{swb5}$($30K–$49.9K)	0.57 (0.98)
Age 55–64$_{stb5}$	-2.29* (-2.65)	HHInc$_{stb5}$ ($50K–$69.9K)	0.07 (0.13)
Age 55–64$_{swnb5}$	-3.03* (-3.22)	HHInc$_{swnb5}$ ($50K–$69.9K)	0.35 (0.56)
Age 55–64$_{swb5}$	-3.05* (-3.44)	HHInc$_{swb5}$($50–$69.9K)	0.48 (0.81)
Age 65–74$_{stb5}$	-1.86 (-1.95)	HHInc$_{stb5}$ ($70K–$99.9K)	-0.41 (-0.75)
Age 65–74$_{swnb5}$	-2.71* (-2.62)	HHInc$_{swnb5}$($70K–$99.9K)	-0.83 (-1.30)
Age 65–74$_{swb5}$	-2.48* (-2.52)	HHInc$_{swb5}$ ($70K–$99.9K)	-0.15 (-0.26)
Age 75+$_{stb5}$	-2.85* (-2.87)	HHInc$_{stb5}$ (>=$100K)	-0.75 (-1.44)
Age 75+$_{swb5}$	-3.47* (-3.21)	HHInc$_{swnb5}$ (>=$100K)	-1.56* (-2.47)
Age 75+$_{swnb5}$	-3.56* (-3.45)	HHInc$_{swb5}$ (>=$100K)	-0.43 (-0.77)
Child2$_{stb5}$	-0.67 (-1.44)	Occupation2$_{stb5}$	-0.86* (-1.84)
Child2$_{swnb5}$	-1.18 (-2.09)	Occupation2$_{swnb5}$	-1.28* (-2.42)
Child2$_{swb5}$	-1.03 (-2.07)	Occupation2$_{swb5}$	-1.27* (-0.63)
Child3$_{stb5}$	-0.85 (-1.11)	Occupation3$_{stb5}$	-0.44 (-0.63)
Child3$_{swnb5}$	-3.02* (-2.99)	Occupation3$_{swnb5}$	-1.31 (-1.56)
Child3$_{swb5}$	-1.71* (-2.14)	Occupation3$_{swb5}$	-0.62 (-0.83)
Adult2$_{stb5}$	-0.30 (-0.71)	Residence2$_{stb5}$	0.15 (0.32)
Adult2$_{swnb5}$	-0.70 (-1.50)	Residence2$_{wnb5}$	-0.07 (-0.12)
Adult2$_{swb5}$	-0.26 (-0.60)	Residence2$_{swb5}$	0.20 (0.39)
Adult3$_{stb5}$	0.05 (0.08)	Residence3$_{stb5}$	0.012 (0.03)
Adult3$_{swnb5}$	-0.20 (-0.30)	Residence3$_{swnb5}$	0.28 (0.59)
Adult3$_{swb5}$	0.33 (0.55)	Residence3$_{swb5}$	0.38 (0.87)

Independent variable	Model III	Independent variable	Model III
Switching freq(=0)$_{stb5}$	-0.14 (-0.35)	Elec. consumption$_{stb5}$	0.003* (3.89)
		Elec. consumption$_{swnb5}$	0.004* (4.59)
Switching freq(=0)$_{swnb5}$	-3.50* (-7.45)	Elec. consumption$_{swb5}$	0.003* (3.83)
Switching freq(=0)$_{swb5}$	-3.51* (-8.23)		

Source: Electricity Authority

4.44 **Model III** highlights that there is weak statistical evidence that the annual household income of retail customers has a strong influence on the consumers' selection of a retailer. However, it provides weak statistical evidence that retail customers whose annual household income is between $30,000 and $49,999 are more likely to switch to another retailer which is often a Big 5 retailer. Similar conclusions apply for each of the remaining income groups. The results also show that retail customers with annual household income equal to or greater than $100,000 are very unlikely to consider switching to a non-Big 5 retailer when switching to another retailer is contemplated.

4.45 The probabilities for a series of relationships between the retail customers' switching frequency and annual household income given the customers' selection of a retailer and, the customers' age, annual household income and selection of retailer appear in Table 7 to Table 12.

4.46 In Table 7, the results confirm that retail customers who have never switched in the past two years are likely to stay with their existing retailer. The probability of this outcome is 86.55 per cent. The probability of switching to another retailer although the retail customer did not switch in the past two years is 13.45 per cent. For retail customers who have switched once in the past two years, the probability of staying with their retailer is 19.33 per cent compared with a probability of 80.67 per cent for switching to another retailer.

4.47 Retail customers who had switched twice in the past two years have a probability of 11.2 per cent of staying with their retailer compared to 88.8 per cent probability of switching to another retailer. Finally, retail customers who had switched three or more times in the past two years have a probability of 10.58 per cent of staying with their existing retailer and an 89.42 per cent probability of switching to another retailer.

4.48 Generally, in all instances when the consumer has switched at least once in the past two years, the sample shows strong statistical evidence that the consumer will switch again to another retailer. Most often the selected retailer is one of the Big 5 retailers when the customer's annual household income is ignored. The focus in Table 9 through to Table 12 is on the age of the retail customer and their annual household income given the switching frequency.

Table 7: Switching frequency, annual household income and retailer choice

Switching frequency and retailer choice	<30K	30K–49.99K	50K–69.99K	70K–99.99K	>=100K
Never					
Stayed (B5)	0.0193	0.0332	0.0201	0.0147	0.0108
Stayed (NB5)	0.0008	0.0008	0.0008	0.0008	0.0008
Switched (B5)	0.0019	0.0035	0.0028	0.0019	0.0014
Switched (NB5)	0.0010	0.0015	0.0012	0.0004	0.0002
Once					
Stayed (B5)	0.0195	0.0336	0.0203	0.0149	0.0111
Stayed (NB5)	0.0008	0.0008	0.0008	0.0008	0.0008
Switched (B5)	0.0536	0.0969	0.0792	0.0477	0.0387
Switched (NB5)	0.0263	0.0400	0.0309	0.0118	0.0059
Twice					
Stayed (B5)	0.0056	0.0091	0.0055	0.0012	0.0008
Stayed (NB5)	0.0008	0.0008	0.0008	0.0008	0.0008
Switched (B5)	0.0340	0.0581	0.0475	0.0141	0.0105
Switched (NB5)	0.0118	0.0172	0.0133	0.0017	0.0008
>= 3 times					
Stayed (B5)	0.0015	0.0026	0.0016	0.0012	0.0008
Stayed (NB5)	0.0008	0.0008	0.0008	0.0008	0.0008
Switched (B5)	0.0146	0.0263	0.0215	0.0102	0.0105
Switched (NB5)	0.0037	0.0057	0.0044	0.0015	0.0008

Source: Electricity Authority

4.49   In Table 8, there is evidence that retail customers with annual household incomes less than $30,000 are likely to switch to another retailer who most likely is a Big 5 retailer. Retail customers in all of the other income groups are likely to switch to another retailer as well when the switching frequency of the retail customer is ignored. In all cases, the probability of switching to a non-Big 5 retailer is lower than the probability of staying with a Big 5 retailer except for retail customers with annual household incomes between $50,000 and $70,000.

Table 8: Annual household income and retailer choice

Retailer choice	<30K	30K–49.99K	50K–69.99K	70K–99.99K	>=100K
Stayed (B5)	0.0459	0.0785	0.0475	0.0319	0.0233
Stayed (NB5)	0.0033	0.0033	0.0033	0.0033	0.0033
Switched (B5)	0.1041	0.1848	0.1510	0.0739	0.0611
Switched (NB5)	0.0428	0.0644	0.0498	0.0155	0.0077

Source: Electricity Authority

4.50   Table 9 shows the relationship between annual household income and age of the retail customer given that these customers had never switched in the past two years. Retail customers who are younger than 45 years have a 63.57 per cent probability of staying with their retailer when their annual household income is below $70,000 compared with a 22.5 per cent probability for those

retail customers who are younger than 45 years and whose annual household income is $70,000 or above. For this group of retail customers, there is a 10.43 per cent probability of switching to another retailer when their annual household income is below $70,000 and the probability is 3.5 per cent for retail customers whose annual household income is $70,000 and higher.

4.51   Further, retail customers whose ages are between 45 and 54 years have a 66.83 per cent probability of staying with their existing retailer when their annual household income is below $70,000 and a 24.84 per cent probability when their annual household income is $70,000 or more. For this age group, the probability of retail customers switching to another retailer is 6.27 per cent when their annual household income is below $70,000 and 2.04 per cent when their annual household income is $70,000 or more.

Table 9:   Age of consumer, household income and no prior switching in past two years

Age	Decision	<30K	30K–49.99K	50K–69.99K	70K–99.99K	>=100K
<45 years	Stayed (B5)	0.0115	0.0199	0.0120	0.0088	0.0064
	Stayed (NB5)	0.0002	0.0002	0.0002	0.0002	0.0002
	Switched (B5)	0.0012	0.0022	0.0018	0.0012	0.0009
	Switched (NB5)	0.0006	0.0008	0.0007	0.0001	0.0001
45–54 years	Stayed (B5)	0.0018	0.0031	0.0014	0.0010	0.0010
	Stayed (NB5)	0.0002	0.0002	0.0002	0.0002	0.0002
	Switched (B5)	0.0001	0.0002	0.0001	0.0001	0.0001
	Switched (NB5)	0.0001	0.0001	0.0000	0.0000	0.0000
55–64 years	Stayed (B5)	0.0016	0.0028	0.0017	0.0013	0.0009
	Stayed (NB5)	0.0002	0.0002	0.0002	0.0002	0.0002
	Switched (B5)	0.0001	0.0003	0.0002	0.0001	0.0001
	Switched (NB5)	0.0001	0.0001	0.0001	0.0000	0.0000
65–74 years	Stayed (B5)	0.0016	0.0051	0.0031	0.0022	0.0017
	Stayed (NB5)	0.0002	0.0002	0.0002	0.0002	0.0002
	Switched (B5)	0.0003	0.0006	0.0005	0.0003	0.0002
	Switched (NB5)	0.0002	0.0003	0.0002	0.0001	0.0000
75 years+	Stayed (B5)	0.0013	0.0023	0.0014	0.0010	0.0007
	Stayed (NB5)	0.0002	0.0002	0.0002	0.0002	0.0002
	Switched (B5)	0.0001	0.0003	0.0002	0.0001	0.0001
	Switched (NB5)	0.0001	0.0002	0.0001	0.0001	0.0000

Source: Electricity Authority

4.52   In the 55 years to 64 years age group, there is a 64.2 per cent probability that retail customers with annual household incomes below $70,000 will stay with their retailer and a 24 per cent probability of staying with their retailer for retail customers with annual household income equal to or greater than $70,000. The probability of switching to another retailer is 8.9 per cent for retail

customers whose annual household income is below $70,000 and the probability is 2.3 per cent for retail customers whose annual household income is $70,000 or more.

4.53   For retail customers between 65 and 74 years, there is a 62.47 per cent probability of staying with their retailer when their annual household income is below $70,000 and a 22.88 per cent probability of staying with their existing retailer when their annual household income is $70,000 or more. Retail customers in this age group have an 11.3 per cent probability of switching to another retailer when their annual household income is below $70,000 and a 3.62 per cent probability of switching to another retailer when their annual household income is $70,000 or more.

4.54   For retail customers whose age is 75 years and above, there is a 61.1 per cent probability of staying with their retailer when their annual household income is below $70,000 but a 23.16 per cent probability when their annual household income is $70,000 or more. In contrast, real customers in this age group have a 12.03 per cent probability of switching to another retailer when their annual household income is below $70,000 and a 3.71 per cent probability when their annual household income is $70,000 or more.

Table 10:   Age of decision-maker, household income and switching once

Age	Decision	<30K	30K–49.99K	50K–69.99K	70K– 99.99K	>=100K
<45 years	Stayed B5)	0.0117	0.0201	0.0122	0.0089	0.0065
	Stayed (NB5)	0.0002	0.0002	0.0002	0.0002	0.0002
	Switched (B5)	0.0334	0.0224	0.0493	0.0282	0.0241
	Switched (NB5)	0.0147	0.0604	0.0173	0.0066	0.0033
45–54 years	Stayed (B5)	0.0018	0.0032	0.0019	0.0014	0.0010
	Stayed (NB5)	0.0002	0.0002	0.0002	0.0002	0.0002
	Switched (B5)	0.0030	0.0055	0.0045	0.0029	0.0022
	Switched (NB5)	0.0016	0.0024	0.0018	0.0007	0.0003
55–64 years	Stayed (B5)	0.0017	0.0029	0.0017	0.0013	0.0009
	Stayed (NB5)	0.0002	0.0002	0.0002	0.0002	0.0002
	Switched (B5)	0.0039	0.0070	0.0057	0.0037	0.0028
	Switched (NB5)	0.0024	0.0036	0.0028	0.0011	0.0005
65–74 years	Stayed (B5)	0.0030	0.0051	0.0031	0.0023	0.0017
	Stayed (NB5)	0.0002	0.0002	0.0002	0.0002	0.0002
	Switched (B5)	0.0091	0.0165	0.0135	0.0088	0.0028
	Switched (NB5)	0.0046	0.0069	0.0054	0.0021	0.0005
75 years+	Stayed (B5)	0.0013	0.0023	0.0014	0.0010	0.0007
	Stayed (NB5)	0.0002	0.0002	0.0002	0.0002	0.0002
	Switched (B5)	0.0042	0.0075	0.0040	0.0040	0.0030
	Switched (NB5)	0.0031	0.0047	0.0014	0.0014	0.0007

Source: Electricity Authority

4.55   The outcomes in Table 9 are consistent with expectations as consumers who had not switched to another retailer in the past two years should be expected to have a much higher probability of

staying with their retailer than switching to another retailer in spite of the consumers' annual household income.

4.56   In Table 10, there is evidence that retail consumers in all age groups, with the exception of the 45–55 years age group, and whose annual household income is below $70,000 share similar probabilities of switching to another retailer. These retail customers switched only once in the past two years to another retailer. Similar conclusions can be drawn for retail customers who switched twice or three or more times to another retailer in the past two years in the market.

4.57   Specifically, in Table 10, consumers whose ages occur between 45 and 55 years have a 21.09 per cent probability of staying with their retailer when their annual household income is below $70,000 and a 7.8 per cent probability of staying with their retailer when their annual household income is $70,000 or more. Consumers in this age group have a 53.46 per cent probability of switching to another retailer when their annual household income lies below $70,000 and a 17.6 per cent probability when their annual household income is $70,000 or more.

4.58   In contrast, for retail customers 75 years and above who switched once in the past two years, there is an 11.99 per cent probability that these retail customers will stay with their existing retailer when their annual household income is below $70,000 and a 4.5 per cent probability when their annual household income is $70,000 or more. For retail customers in this age group who chose to switch to another retailer, the probability is 63.68 per cent for retail customers whose annual household income is below $70,000 and a 19.8 per cent probability when their annual household income is $70,000 or more.

4.59   Retail customers whose ages lie between 55 and 64 years and who have switched once in the past two years have a 15.83 per cent probability of staying with their retailer when their annual household income is below $70,000 and a 5.9 per cent probability of staying with their retailer when their annual household income is $70,000 or more.

4.60   In summary, Table 10 shows that, for retail customers who switched once to another retailer in the past two years, there is a greater likelihood that these retail customers will switch again. The sample also contains evidence that retail customers whose ages lie between 45 years and 65 years are weakly active in switching to another retailer relative to the other age groups.

4.61   Table 11 provides additional evidence of the probability outcomes when retail customers stay with their existing retailer or switch to another retailer given their age and annual household income. Retail customers whose ages lie between 45 years and 55 years and whose annual household income is below $70,000 have a 17.3 per cent probability of staying with their retailer and a 3.76 per cent probability of staying with their retailer when their annual household income is $70,000 or more.

4.62   Retail customers whose ages lie between 45 and 55 years and who have switched twice in the past two years to another retailer have a 67.66 per cent probability of staying with the retailer when their annual household income is below $70,000 and an 11.3 per cent probability of switching to another retailer when their annual household income is $70,000 or more.

4.63   When retail customers have switched twice to another retailer in the past two years, their probability of staying with their retailer lies between 8 per cent and 11 per cent when their annual household income is less than $70,000 and that probability is between 1 per cent and 3.76 per cent when their annual household income equals $70,000 or more.

Table 11:   Age of decision-maker, household income and switching twice

Age	Decision	<30K	30K–49.99K	50K–69.99K	70K–99.99K	>=100K
<45 years	Stayed (B5)	0.0032	0.0055	0.0033	0.0007	0.0005
	Stayed (NB5)	0.0002	0.0002	0.0002	0.0002	0.0002
	Switched (B5)	0.0202	0.0365	0.0298	0.0088	0.0066
	Switched (NB5)	0.0063	0.0096	0.0074	0.0009	0.0005
45–54 years	Stayed (B5)	0.0005	0.0009	0.0005	0.0001	0.0001
	Stayed (NB5)	0.0002	0.0002	0.0002	0.0002	0.0002
	Switched (B5)	0.0016	0.0029	0.0023	0.0008	0.0006
	Switched (NB5)	0.0007	0.0010	0.0008	0.0001	0.0000
55–64 years	Stayed (B5)	0.0008	0.0008	0.0005	0.0001	0.0001
	Stayed (NB5)	0.0002	0.0002	0.0002	0.0002	0.0002
	Switched (B5)	0.0042	0.0042	0.0035	0.0010	0.0008
	Switched (NB5)	0.0015	0.0015	0.0012	0.0002	0.0001
65–74 years	Stayed (B5)	0.0008	0.0014	0.0008	0.0002	0.0001
	Stayed (NB5)	0.0002	0.0002	0.0002	0.0002	0.0002
	Switched (B5)	0.0055	0.0100	0.0082	0.0024	0.0018
	Switched (NB5)	0.0019	0.0030	0.0023	0.0003	0.0001
75 years+	Stayed (B5)	0.0004	0.0006	0.0004	0.0001	0.0001
	Stayed (NB5)	0.0002	0.0002	0.0002	0.0002	0.0002
	Switched (B5)	0.0025	0.0045	0.0037	0.0011	0.0008
	Switched (NB5)	0.0013	0.0020	0.0016	0.0002	0.0001

Source: Electricity Authority

4.64   In contrast, when retail customers have switched twice in the past two years to another retailer, their probability of switching to another retailer lies between 67.66 per cent and 78.15 per cent when their annual income is below $70,000 and their probability is between 9.4 per cent and 11.9 per cent when their annual household income is $70,000 or more.

4.65   Table 12 presents the probabilities for those retail customers who switched three or more times in the past two years. The sample shows evidence of declining interest in switching across the various age groups of retail customers when their annual household income is below $70,000 and modest increases in switching for instances where their annual household income is $70,000 or more.

4.66   For example, retail customers who are younger than 45 years and have switched three or more times in the past two years have a 6 per cent probability of staying with their retailer when their annual household income is less than $70,000 and an 8.8 per cent probability of staying with their retailer when they have switched to another retailer twice in the past two years and have an

annual household income that lies below $70,000. When their annual household income is $70,000 or higher, these retail customers have a 2.35 per cent probability of staying with their retailer compared with a 1.08 per cent probability when retail customers in this age group have switched twice in the past two years and have an annual household income that is less than $70,000.

Table 12: **Age of decision-maker, household income and switching three or more times**

Age	Decision	<30K	30K–49.99K	50K–69.99K	70K–99.99K	>=100K
<45 years	Stayed (B5) Stayed (NB5) Switched (B5) Switched (NB5)	0.0009 0.0002 0.0091 0.0021	0.0016 0.0002 0.0164 0.0032	0.0009 0.0002 0.0134 0.0025	0.0007 0.0002 0.0049 0.0008	0.0005 0.0002 0.0066 0.0005
45–54 years	Stayed (B5) Stayed (NB5) Switched (B5) Switched (NB5)	0.0001 0.0002 0.0008 0.0002	0.0002 0.0002 0.0015 0.0003	0.0001 0.0002 0.0012 0.0003	0.0001 0.0002 0.0008 0.0001	0.0001 0.0002 0.0006 0.0000
55–64 years	Stayed (B5) Stayed (NB5) Switched (B5) Switched (NB5)	0.0001 0.0002 0.0003 0.0011	0.0002 0.0002 0.0019 0.0005	0.0001 0.0002 0.0016 0.0004	0.0001 0.0002 0.0024 0.0003	0.0001 0.0002 0.0018 0.0001
65–74 years	Stayed (B5) Stayed (NB5) Switched (B5) Switched (NB5)	0.0002 0.0002 0.0025 0.0006	0.0004 0.0002 0.0045 0.0010	0.0002 0.0002 0.0037 0.0008	0.0002 0.0002 0.0024 0.0003	0.0001 0.0002 0.0018 0.0001
75 years+	Stayed (B5) Stayed (NB5) Switched (B5) Switched (NB5)	0.0001 0.0002 0.0011 0.0004	0.0002 0.0002 0.0020 0.0007	0.0001 0.0002 0.0017 0.0005	0.0001 0.0002 0.0011 0.0002	0.0001 0.0002 0.0008 0.0001

Source: Electricity Authority

4.67   When the switching behaviour for retail customers younger than 45 years is considered, there is a 72 per cent probability that these customers will switch to another retailer when their annual household income is lower than $70,000 and a 78.15 per cent probability when retail customers in this age group have switched twice in the past two years and their annual household income is less than $70,000. When their annual household income is $70,000 or more and these retail customers have switched three or more times in the past two years, there is a 19.64 per cent probability that they will switch to another retailer and an 11.92 per cent probability that they will switch to another retailer when consumers in this age group have switched twice in the past two years.

4.68   For those retail customers whose age occurs between 45 years and 55 years and whose annual household income is below $70,000 there is a 13.77 per cent probability that they will stay with their existing retailer when they have switched three or more times in the past two years compared with a 17.3 per cent probability when the retail customers in this age group have

switched twice in the past two years and their annual household income is less than $70,000. When retail customers in this age group have an annual household income that is $70,000 or more and these customers have switched three or more times in the past two years, there is a 6.9 per cent probability that they will stay with their existing retailer when their switching frequency is ignored. There is a 3.76 per cent probability that they will stay with their retailer when they have switched twice in the past two years and their income is $70,000 or more.

4.69   The switching behaviour for retail customers whose age occurs between 45 and 55 years shows that there is a 58.58 per cent probability of these customers switching to another retailer when they have switched three or more times in the past two years and have an annual household income that is less than $70,000. In contrast, retail customers who switched twice in the past two years in this age group and who have a similar level of annual household income have a 67.66 per cent probability of switching to another retailer.

4.70   When the annual household income is $70,000 or more and retail customers are between 45 and 55 years old, there is a 20.73 per cent probability of switching to another retailer although these retail customers have switched three or more times in the past two years. Alternatively, when the retail customers in this age group have switched twice in the past two years and their annual household income is $70,000 or more, there is an 11.28 per cent probability that these customers will switch to another retailer.

4.71   Retail customers whose age occurs between 55 and 65 years and who have switched three or more times in the past two years have a 10.58 per cent probability of staying with their retailer when their annual household income is below $70,000. In contrast, retail customers in the same age group with annual household income less than $70,000 have a probability of 11.88 per cent although they have switched twice in the past two years to another retailer. Retail customers in this age group whose annual household income is $70,000 or more and who switched three or more times in the past two years have a 2.34 per cent probability of staying with their retailer. In addition, retail customers within this age group have a 5.9 per cent probability of staying with their retailer when they switched only twice in the past two years and their annual household income is $70,000 or more.

4.72   The sample shows evidence that the switching behaviour of retail customers whose ages lie between 55 and 65 years suggests that there is a 62.33 per cent probability that these customers will switch to another retailer although they switched three or more times in the past two years and their annual household income lies below $70,000. In contrast, retail customers who switched twice in the past two years and whose annual household income lies below $70,000 have a 76.3 per cent probability of switching to another retailer within this age group. For those retail customers whose annual household income equals $70,000 or more, and have switched three or more times in the past two years, there is a 21.7 per cent probability that these retail customers will switch to another retailer. In comparison, there is a 9.45 per cent probability that retail customers in this age group will switch to another retailer when they have switched twice in the past two years and their annual household income is $70,000 or more.

4.73   There are retail customers whose age occurs between 65 and 75 years who are quite eager to switch to another retailer although these customers have switched three or more times in the past two years. For retail customers in this age group whose annual household income lies below $70,000 and who have switched three or more times in the past two years, there is a 66.3 per cent probability that these retail customers will switch to another retailer. In contrast, there is a 77.8 per cent probability of switching to another retailer for retail customers in this age group who

have switched twice in the past two years and whose annual household income is $70,000 or more. There is a 23.5 per cent probability that retail customers in this age group will switch to another retailer given their record of switching three or more times in the past two years. In addition, there is an 11.67 per cent probability that customers in this age group will switch to another retailer although they have switched twice in the past two years and their annual household income is $70,000 or more.

4.74   The tendency for inertia within the 65 years to 74 years age group is low whether these retail customers have switched three or more times or twice in the past two years and their annual household income is below $70,000. The probabilities are 6.9 and 8.9, respectively, for retail customers who switched three or more times, or twice in the past two years. For annual household incomes that are $70,000 or more, the probability of staying with the existing retailer is 3.2 per cent for retail customers who have switched three or more times in the past two years and 1.59 per cent for those customers who switched twice in the past two years.

4.75   In summary, retail customers are motivated to switch in all age groups despite their inclination to switch to other Big 5 retailers primarily. Retail customers with annual household incomes below $70,000 and whose ages are between 45 and 55 years appear to be slightly tentative about switching to other retailers compared with the other age groups. The tendency for inertia in this age group seems to arise after they have switched twice within the past two years.

4.76   In the next section of this study, the focus shifts to the effects of information gathering behaviour on the consumers' selection of a retailer in the market.

Effect of consumer information gathering

4.77   We examined the reasons why many consumers choose to stay with their existing retailer. The survey results show that many consumers continue to remain with their retailer which is often a Big 5 retailer rather than pursue opportunities for switching to another retailer. This behaviour is observed in the retail market even after consulting the consumer information websites, *What's My Number* and *Powerswitch*.

4.78   In the United Kingdom, Ireland and Australia, consumer information is supplied by private, public and even non-profit entities. While in New Zealand, public entities – the Electricity Authority and Consumer New Zealand – are the primary providers of consumer information on switching in the electricity retail market, it is possible that, with time, private suppliers of consumer information may enter the retail market with innovative business models that possibly result in the provision of consumer information in combination with other consumer services.

4.79   In the telephone survey conducted by UMR, the focus on consumer information is on whether consumers are aware of the consumer information websites and whether they have visited one or both websites. In future survey work, the introduction of questions that explore the time spent by consumers browsing or researching information on switching at these websites may prove helpful in providing deeper insight into the information gathering behaviour of consumers in the retail market.

4.80   The current absence of this information inhibits exploration of consumers' information gathering habits in relation to the frequency and duration of their visits to the websites and content interests at the websites. The Authority collects information on visits to its *What's My Number* (WMN) website though such information cannot be associated with the ICPs representative of consumers in the sample for this survey.

4.81 Sorting retail customers who engage in search from those retail customers who do not, while evaluating the retailer selections made by both groups, should offer insights into the characteristics of the searchers and non-searchers and their associated decisions. As a result, the regression equation estimated is:

$$U = [\beta_0 + \beta_1 female + \beta_2 age + \beta_3 WMN + \beta_4 PWRSW + \beta_4 average\ monthly\ electric\ consumption] \quad (R4)$$

The results appear as **Model IV** in Table 13.

Table 13: Coefficient estimates for the consumer information gathering effect variables

Independent variable	Model IV
Constant$_{stb5}$	2.39* (2.53)
Constant$_{swnb5}$	1.19 (1.19)
Constant$_{swb5}$	2.93* (3.09)
Female$_{stb5}$	0.58 (1.92)
Female$_{swnb5}$	0.46 (1.37)
Female$_{swb5}$	0.28 (0.92)
Age45–54$_{stb5}$	-1.73* (-2.24)
Age45–54$_{swnb5}$	-1.90* (-2.32)
Age45–54$_{swb5}$	-2.12* (-2.74)
Age55–64$_{stb5}$	-1.46 (-1.90)
Age55–64$_{swnb5}$	-1.18 (-1.46)
Age55–64$_{swb5}$	-1.72* (-2.23)
Age65–74$_{stb5}$	-0.64 (-0.78)
Age65–74$_{swnb5}$	-0.25 (-0.29)
Age65–74$_{swb5}$	-0.81 (-0.98)
Age75+$_{stb5}$	-1.24 (-1.56)
Age75+$_{swnb5}$	-0.38 (-0.45)
Age75+$_{swb5}$	-1.55 (-1.94)
WMN2$_{stb5}$	-0.29 (-0.79)
WMN2$_{swnb5}$	-0.24 (-0.58)
WMN2$_{swb5}$	-0.52 (-1.40)
Powerswitch2$_{stb5}$	-0.11 (-0.27)
Powerswitch2$_{swnb5}$	-0.60 (-1.36)
Powerswitch2$_{swb5}$	-0.28 (-0.69)
Elec. consumption$_{stb5}$	0.002* (3.20)
Elec. consumption$_{swnb5}$	0.002* (3.06)
Elec. consumption$_{swb5}$	0.002* (3.07)

Source: Electricity Authority

4.82 Table 13 presents the results for the effect of consumer information gathering at the websites. The coefficient estimates for *What's My Number* and *Powerswitch* are statistically insignificant. The statistical insignificance of the estimates may be related to the combination of explanatory variables modelled in the regression equation and possibly the distribution of representation among retail customers who visit and do not visit the consumer information websites.

4.83 The regression results show that retail customers who stayed with their existing retailer are less likely to visit the *What's My Number* website though this group of customers is more likely to visit *Powerswitch*. It is possible that their interest is in examining all the available competing offers of retailers which *Powerswitch* provides while *What's My Number* focuses on providing information on the potential savings to be derived from switching to another retailer.

4.84 These consumer information websites have specific roles in the provision of consumer information. *What's My Number* provides an estimate of the potential total savings to be derived from switching to another retailer while *Powerswitch* has a focus on the presentation of a menu of tariff offerings from retailers in the market and facilitates the retail customer's application to switch to another retailer.

4.85 Table 14 presents probabilities for consumer information gathering in the retail market. There is evidence from the sample that retail customers gather information from at least one of the two consumer information websites. That probability is 66.7 per cent compared with the probability of not visiting either website, which is 33.3 per cent.

Table 14: Probability of consumer information gathering at the websites

Decision	No *Powerswitch*, no *WMN*	*Powerswitch*, no *WMN*	*WMN*, no *Powerswitch*	*WMN*, *Powerswitch*
Stayed (B5)	0.129	0.115	0.094	0.084
Stayed (NB5)	0.005	0.005	0.005	0.005
Switched (B5)	0.154	0.118	0.092	0.068
Switched (NB5)	0.044	0.025	0.036	0.019

Source: Electricity Authority

4.86 An examination of the group of retail customers who choose to stay with their retailer shows that there is a 30.31 per cent probability that these customers who visited either the *What's My Number or Powerswitch* website choose to stay with their existing retailer. In contrast, retail customers who visited at least one of the consumer information websites have a 69.69 per cent probability of staying with their retailer. This evidence seems to suggest that there are some retail customers who are interested in switching but see no reason to switch after visiting either website. This outcome is possibly due to the availability of inadequate savings from switching to another retailer.

4.87 For the group of switchers, there is evidence that there is a 35.6 per cent probability that consumers who visited neither website will switch to another retailer while there is a 64.4 per cent probability that retail customers who visited at least one of the consumer information websites will

switch to another retailer. In this case, there appears to be a larger number of retail customers who have been successful in locating opportunities for switching to other retailers in the market after visiting at least one of the consumer information websites.

4.88   These results clearly show that retail customers visit the consumer information websites and act on the information gathered from the websites. More often than not, the decision results in a switch to another retailer.

4.89   Another aspect to gathering information on possibilities for switching to another retailer is the behaviour towards information gathering among the age groups. These probabilities are presented in Table 15.

Table 15: Probabilities of consumer information gathering by age group

Age and choice	No *Powerswitch*, no *WMN*	*Powerswitch*, no *WMN*	*WMN*, no *Powerswitch*	*WMN*, *Powerswitch*
<45 years				
Stayed (B5)	0.06826	0.0607	0.0500	0.0444
Stayed (NB5)	0.00104	0.0010	0.0010	0.0010
Switched (B5)	0.09268	0.0691	0.0540	0.0402
Switched (NB5)	0.01967	0.0107	0.0153	0.0083
45–54 years				
Stayed (B5)	0.0117	0.0104	0.0086	0.0076
Stayed (NB5)	0.0010	0.0010	0.0010	0.0010
Switched (B5)	0.0028	0.0080	0.0063	0.0047
Switched (NB5)	0.0108	0.0015	0.0022	0.0012
55–64 years				
Stayed (B5)	0.0122	0.0109	0.0090	0.0080
Stayed (NB5)	0.0010	0.0010	0.0010	0.0010
Switched (B5)	0.0129	0.0096	0.0075	0.0056
Switched (NB5)	0.0046	0.0025	0.0036	0.0020
65–74 years				
Stayed (B5)	0.0245	0.0218	0.0180	0.0160
Stayed (NB5)	0.0010	0.0010	0.0010	0.0010
Switched (B5)	0.0287	0.0214	0.0167	0.0124
Switched (NB5)	0.0104	0.0057	0.0081	0.0044
>=75 years				
Stayed (B5)	0.0125	0.0111	0.0091	0.0081
Stayed (NB5)	0.0010	0.0010	0.0010	0.0010
Switched (B5)	0.0094	0.0094	0.0074	0.0055
Switched (NB5)	0.0064	0.0046	0.0065	0.0036

Source: Electricity Authority

4.90   For retail customers who are younger than 45 years, there is a 66.2 per cent probability that these retail customers visit at least one of the consumer information websites and a 33.8 per cent probability that retail customers in this age group visit neither website. Further, there is a 29.4 per cent probability that retail customers who visited at least one of the websites will stay with their

existing retailer compared with a 12.9 per cent probability for retail customers who visit neither website.

4.91   It appears that the higher probability of staying with the retailer after visiting at least one of the consumer information websites compared with visiting neither website signals that, though retail customers in this age group have visited at least one of the consumer information websites, there are some retail customers unmotivated to switch either because the potential savings are inadequate or they are beneficiaries of a counteroffer from their current retailer after attempting to switch to another retailer. With additional modelling, more insight on this aspect can be gleaned from the responses provided in the survey.

4.92   In contrast, there are retail customers who are under 45 years of age who switch to another retailer although they either have visited neither website or have visited at least one of the consumer information websites. These probabilities are 20.9 and 36.8 per cent, respectively. This result shows that there are retail customers in this group who are willing to switch to another retailer even without gathering any information from either website.

4.93   Retail customers whose age lies between 45 and 54 years have a similar profile for visiting at least one of the consumer information websites or neither of the websites as the retail customers who are younger than 45 years. There is a 16 per cent probability that retail customers whose ages occur between 45 years and 55 years will stay with their retailer when they have visited neither website compared with a 37.17 per cent probability when retail customers in this group have visited at least one of the consumer information websites.

4.94   Also, there is a 17 per cent probability that consumers whose age lies between 45 and 55 will switch to another retailer although they have not visited either of the consumer information websites. In contrast, there is a 29.9 per cent probability when consumers in this age group visited at least of one of the consumer information websites. The behaviour in this age group shows that there is interest in switching though the premium that they place on switching to another retailer may be quite different from those retail customers under 45 years. In addition, there may be retail customers in this group who may have attempted to switch to another retailer but the counteroffer from their existing retailer has discouraged them from considering the possibility of switching to another retailer as well.

4.95   For retail customers whose age lies between 55 and 65 years, there is a 14.3 per cent probability that these retail customers will stay with their existing retailer when they have visited neither consumer information website compared with a 33.4 per cent probability when they have visited at least one of the consumer information websites. There is also an 18.9 per cent probability that retail customers who visited no website will switch to another retailer compared with a 33.3 per cent probability when they have visited at least one of the websites.

4.96   These results show that retail customers whose age lies between 55 years and 65 years are indifferent between staying with their retailer and switching to another retailer when they have visited at least one of the websites. Therefore, retail customers in this age group who have visited at least one of the consumer information websites provide no certainty of switching to another retailer or switching to another retailer when they have visited at least one of the consumer information websites.

4.97   Among consumers whose age lies between 65 years and 75 years there is a 33.6 per cent probability that these consumers have visited neither consumer information website compared to a 66.4 per cent probability that at least one of the websites was visited. There is a 13.3 per cent

probability that retail customers in this age group will stay with their retailer when neither website is visited compared with a 30.6 per cent probability when retail customers in this age group have visited at least one of the websites.

4.98   For retail customers whose age occurs between 65 and 75 years there is a 20.3 per cent probability that these retail customers will switch to another retailer when they have visited neither website compared with a 35.7 per cent probability   For the 1,200 sample members, there were 889 households approached by another company about switching: 480 retail customers chose not to switch their retailer; 371 retail customers had not switched when they have visited at least one of the consumer information websites.

4.99   Finally, retail customers who are 75 years and older have a 29.96 per cent probability of visiting neither consumer information website but a 70 per cent probability of visiting at least one of the consumer information websites. Specifically, there is a 13.8 per cent probability that retail customers in this age group will stay with their retailer when they have visited neither consumer information website compared with a 32.14 per cent probability when they have visited at least one of the websites. In contrast, there is a 16.16 per cent probability that retail customers in this age group will switch to another retailer when they have visited neither website compared with a 37.9 per cent probability of switching to another retailer when they have visited at least one of the consumer information websites.

4.100   The results for consumer information gathering appears to suggest that there are a number of retail customers who are motivated to seek opportunities for switching to another retailer though their search may result in the decision to stay with their retailer. It is possible that the potential savings from switching are inadequate or they have been offered an improved tariff by their existing retailer when they have attempted to switch to another retailer. There is also evidence that retail customers have switched despite not gathering information, though that statistical evidence is weaker than the case where retail customers engage in gathering information and make the decision to switch to another retailer.

4.101   As a result, there is stronger statistical evidence that consumers are motivated to search for information on the possibility of switching and enjoying the rewards of a lower electricity bill when the savings are realised. However, there is weaker statistical evidence that retail customers who choose to stay with their retailer without engaging in the gathering of consumer information and attempting to switch to another retailer dominates for all age groups. Therefore, although the coefficient estimates are statistically insignificant, the sample provides insights on the inclinations of consumers' behaviour towards the gathering of information on switching to another retailer in the retail market.

4.102   The primary reason offered by respondents in the survey for not switching is, although competing offers were made and switching was considered, the deal or counteroffer from their existing retailer made it unattractive to switch to another retailer. Most often the retailer with whom retail customers stayed with or switched to was a Big 5 retailer. As a result, there appears to be a significant premium on loyalty in the business relationship between retailers and their customers among the Big 5 retailers which non-Big 5 retailers have been trying to establish with their customers while building their reputation in the retail market.

4.103   Non-Big 5 retailers may wish to explore offering tariffs that strengthen their product and brand differentiation in the retail market. Their differentiation may be accomplished through offering a menu of innovative services to their potential customers which separates them from the Big 5

retailers while earning the opportunity to grow their customer base and remaining competitive in the retail market.

4.104 There are emerging changes internationally in the provision of consumer information. As mentioned earlier in this section, private providers of consumer information have emerged in the retail market in the United Kingdom, Ireland and Australia. In the United Kingdom, there is *which?Switch*, a public entity similar to Consumer New Zealand that is complemented by a private company, *uSwitch*, whose consumer information offers and consumer switching services extend beyond the electricity industry. In Ireland there is *Switcher* and in Australia, there is *switchwise*. In Ireland, *Switcher* is accredited by the regulator for the energy industry as *uSwitch* is in the United Kingdom by the energy regulator, Ofgem. In Australia, *switchwise*, is a partnership with all the other electric utilities. These examples show that there are opportunities for other business models in the provision of consumer information that may emerge in New Zealand with time as service innovations occur in the retail market.

Effect of reason for switching

4.105 Another effect examined is the reasons retail customers offered for switching to another retailer given the retailer selections in the market. The analysis of this effect offers an opportunity to understand how the reasons for switching align with the retailer selections made. In studying this effect, the sample of 1,200 consumers had to be split into potential switchers and switchers with only switchers used in the analysis of this effect. The effect is modelled in equation R5 as:

$$Z = [\beta_0 + \beta_1 female + \beta_2 age + \beta_3 reason\ for\ switching] \qquad (R5)$$

4.106 The binary logit regression model is the relevant model for this effect since consumers who choose to switch to another retailer have only two choices: select either a Big 5 or a non-Big 5 retailer.

4.107 The reason for switching variable in the regression was structured into three categories. The first group, RFS1, accounted for consumers who received a non-financial inducement to switch. An example of an inducement offered by the retailers to their potential customers is the convenience to bundle their electricity and gas purchases. Included in RFS1 are retail customers who disagree with the sale of the retailer's generation assets, retail customers who are members of a buying group and customers who have a preference for sustainable generation. Only one respondent stated that their reason for switching was due to the parent company's decision to sell their generation assets.

4.108 Also, this group includes retail customers who moved to another address or switched because of the *What's My Number* campaign. There were only two survey respondents who indicated that their motivation for switching was triggered by the *What's My Number* campaign and these respondents could not be placed in a separate class. Their placement in a class results in a matrix whose determinant does not exist. The technical term for this condition is that the matrix is orthogonal. This group, RFS1, is the reference category for this independent variable that accounts for the reasons for switching to another retailer.

4.109 The second group, RFS2, contains retail customers who are disgruntled with the quality of service their retailer delivers. These retail customers complained about the lack of transparency of their retailer, the infrequent meter reading of the retail customer's meter, the retail customer's unhappiness with increased retail prices and general dissatisfaction with the service provided by the retailer.

4.110 The final group, RFS3, contains retail customers who received a financial inducement to switch. The financial inducements that retailers offer are a lower tariff price, a lump-sum credit, a fixed rate for a specified period, a competitive night time rate or a cheaper gas price.

4.111 The estimated coefficients for this regression appear in Table 16. None of the coefficient estimates for the reason for switching variable is statistically significant though the coefficient estimates for consumers younger than 45 years (the intercept term or constant) and consumers whose age is 75 years or more have statistically significant coefficient estimates.

Table 16: Coefficient estimates for the reason for switching effect

Independent variable	Model V
Constant	1.90* (3.91)
Female	-0.13 (-0.70)
Age45–54	-0.18 (-0.52)
Age55–64	-0.52 (-1.68)
Age65–74	-0.53 (-1.68)
Age75+	-1.08* (-3.45)
RFS2	-0.28 (-0.57)
RFS3	-0.29 (-0.69)

Source: Electricity Authority

4.112 The regression results show that there are similar probabilities for retail customers who receive financial inducements (reason for switching 3) from their retailers and those customers who are frustrated with their retailer's service quality (reason for switching 2). These retail customers are more likely to switch to another Big 5 retailer than to a non-Big 5 retailer for all of the age groups.

4.113 The regression results show that whether a retail customer receives a financial inducement or is dissatisfied with the service the retailer provides, the customer is very likely to switch to another retailer. Most often that switch results in the selection of another Big 5 retailer.

4.114 Table 17 provides the probability outcomes of the reason for switching effect. The sample of switchers shows statistical evidence that the primary motivation for switching to another retailer is associated with reasons that are equally related to the financial inducements that retailers offer to their retail customers in the market to attract them to their customer base and the service quality frustrations that retail customers experienced with their previous retailer. In all age groups, there is a higher probability of the consumer selecting a Big 5 retailer. The retailer selection is independent of whether or not a financial inducement is provided to the retail customer or the retail customer experiences service quality frustrations.

4.115 The probability of switching to another Big 5 retailer is particularly higher when retail customers do not receive a financial inducement to switch or are disgruntled about their retailer's service quality. This outcome reinforces the idea that consumers' motivations for switching to another retailer are associated more with their interest in minimising the cost of their electricity consumption and the cost of that consumption which is reflected in their electric bill.

4.116 There are a few retail customers who discovered that the offer from their competing retailer was not as competitive as their promotion represented once the fine print of the contract was reviewed. Those retail customers remained for a short time with the acquiring retailer and decided to return to their previous retailer.

Table 17: Probabilities of the reason for switching effect

Age and reason for switching	Switched (B5)	Switched (NB5)
<45 years		
Reason for switching 1	0.093	0.015
Reason for switching 2	0.070	0.015
Reason for switching 3	0.069	0.015
45–54 years		
Reason for switching 1	0.077	0.015
Reason for switching 2	0.059	0.015
Reason for switching 3	0.058	0.015
55–65 years		
Reason for switching 1	0.055	0.015
Reason for switching 2	0.042	0.015
Reason for switching 3	0.041	0.015
65–74 years		
Reason for switching 1	0.055	0.015
Reason for switching 2	0.042	0.015
Reason for switching 3	0.041	0.015
>=75 years		
Reason for switching 1	0.032	0.015
Reason for switching 2	0.024	0.015
Reason for switching 3	0.024	0.015

Source: Electricity Authority

4.117 Another aspect to the study is the customer retention strategies that retailers have used in the retail market to maintain their customer base.

Effect of customer retention strategies

4.118 Often the decision to switch to another retailer is dampened by the customer retention efforts of retailers as evident from the counteroffers made after the switch has occurred that may result in a win-back. The win-back occurs when the retail customer decides to return to the previous retailer after a brief period with the new retailer. Another retention strategy is to offer retail customers counteroffers when the customers are in the switching process, typically known as a save. A save occurs when the retail customer decides to stay with the existing retailer when approached by the existing retailer while the retail customer is in the switching process.

4.119 Usually, losing retailers do not pursue their departed customers in an effort to regain their business (Jones & Sasser, Jr., 1995; Keaveney, 1995; Xevelonakis, 2005). The marketing literature seems to suggest that the cost of re-acquiring customers may prove more costly after departure than saving customers prior to their departure. Also, there is the possibility in some instances that attracting departed retail customers may be more costly than the acquisition cost of new customers with whom the retailer has not done business in the past.

4.120   Lesser success is observed among service providers who seek the return of their customers in other utility services with switching experiences. In fact there is more recorded evidence that securing the retention of customers through satisfying their needs makes switching less attractive (Xevelonakis, 2005).

4.121   The marketing literature on consumer intention behaviour acknowledges that pursuing the return of departed consumers usually results in customer loss to competitors. The strategy is often very unattractive to service providers due to the increased marketing costs to be incurred in developing a different marketing strategy for this customer segment relative to the recruitment of customers who had never been served previously by the business.

4.122   In the UMR survey, there were three related customer retention strategies that were used. Retailers would try to save their customers who seek to switch to other retailers by offering a lump-sum credit or a tariff discount to those retail customers who had switched to another retailer at least once in the past two years. Another strategy is retailers would primarily offer a lump-sum credit and a fixed-term contract to retail customers who seek to switch to another retailer for the first time. The final strategy is losing retailers offer their recently departed customers a lump-sum credit or a tariff discount in exchange for their customers' return.

4.123   The first two strategies are different approaches to saving customers. The first effect modelled is saves and the offer of a fixed-term contract by the retailer. This modelling effort requires the separation of the 1,200 sampled consumers into sub-samples – switchers and potential switchers. The potential switchers are the only consumers required in the analysis of the effect of saves and the fixed-term contracts offered by retailers in the market. The regression estimated for this effect is:

$$Z = [\beta_0 + \beta_1 gender + \beta_2 age + \beta_3 save + \beta_4 switching\ frequency \\ + \beta_5 average\ monthly\ electricity\ consumption \\ + \beta_6 fixed\ term\ contract] \qquad (R6)$$

4.124   The save variable is binary in structure such that either a household was saved or not saved. Also, the fixed-term contract has a similar binary structure such that either the household was or was not offered a fixed-term contract when saved. When the save variable equals 1 and the fixed-term variable equals 0, this outcome represents the save strategy where only the financial inducement is offered to the retail customer. In contrast, when the save and fixed-term contract variables equal 1, this outcome represents the save effect when first-time switchers are saved and offered a fixed-term contract by the retailer.

4.125   The results for the regression equation R6 appear in Table 18**.**

Table 18: Coefficient estimates for the save and fixed-term contract effect

Independent variable	Model VI
Constant	*0.26 (0.46)*
Female	0.60* (1.97)
Switching freq(=0)	0.13 (0.33)
Switching freq(=2)	-2.93 (-1.70)

Independent variable	Model VI
Switching freq(=3)	-1.64* (-2.29)
Elec. consumption	0.002* (3.47)
Save	0.20 (0.65)
Fixed-term2	1.17* (2.73)

Source: Electricity Authority

4.126   There is an expectation that the coefficient estimate for the save variable has a positive sign since the regression equation is specified to reflect the customer retention behaviour of the Big 5 retailers in the market. When the save variable is true (equals 1), the expected probability of a consumer switching to another Big 5 retailer should be higher than when the save variable is false (equals 0) and the retailer selected is a Big 5 retailer.

4.127   Note that the results in Table 18 provide evidence that the gender, monthly electricity consumption and fixed-term contract variables are statistically significant. Also, the switching frequency variable is statistically significant when retail customers have switched three or more times in the past two years.

4.128   Table 19 presents the probabilities associated with saves and the fixed-term contracts that retailers use when their customers choose to switch to another retailer. The behaviour intention of retailers is to lure their customers to remain and continue the business relationship.

Table 19: Probabilities of the save and fixed-term contract effect

Decision	Switching frequency	Not saved, no fixed-term contract	Saved, no fixed-term contract	Saved, fixed-term contract
Stayed (B5) Stayed (NB5)	None	0.071 0.007	0.087 0.007	0.279 0.007
Stayed (B5) Stayed (NB5)	Once	0.062 0.007	0.076 0.007	0.244 0.007
Stayed (B5) Stayed (NB5)	Twice	0.012 0.007	0.015 0.007	0.047 0.007
Stayed (B5) Stayed (NB5)	Three or more times	0.003 0.007	0.004 0.007	0.013 0.007

Source: Electricity Authority

4.129   The highest probability recorded in Table 19 for saved retail customers is the event when the retail customer expresses an interest in switching for the first time to another retailer. That probability is 27.9 per cent compared with 24.4 per cent when the customer has switched once in the past two years. As the switching frequency of the customer increases the probability that the

customer stays with the retailer declines to 1.3 per cent in the case of three or more times and the retailer's interest in saving the customer and offering.

4.130 Saving customers is an unattractive customer retention strategy for retailers when the customers targeted have a record of switching to another retailer two or more times in the past two years. Since these consumers have gained experience through switching in the market and they seem more aware of their retail contract terms and conditions, they are likely to reject any fixed-term contract offer by their existing retailer when seeking to switch to another retailer unless the lump-sum credit is quite substantial in exchange for temporarily relinquishing the freedom to switch to other retailers.

4.131 Fixed-term contracts are unpopular among the non-Big 5 retailers who seek to grow their customer base. Understandably, retailers who are seeking entry to the market are unlikely to commit resources to such a customer retention strategy. For non-big 5 retailers, the strategy is unlikely to result in a sustainable business strategy. There are Big 5 retailers who save their customers within the switching process with offers of a reduced tariff and a commitment to a fixed-term contract in an effort to retain their business.

4.132 In the survey, only 180 (30 per cent) retail customers out of 600 were offered fixed-term contracts when another retailer was chosen. Alternatively, if this number of offers of fixed-term contracts is considered only, then 66 per cent of the potential switchers who had never switched in the past two years are locked into a fixed-term contract with their retailer.

4.133 One hundred and nineteen of those retail customers were first-time switchers who had been approached by another company but the counteroffer from their existing retailer resulted in the reversal of the decision to switch to another retailer. One hundred and fifty-five out of the 180 consumers are 45 years or older. Based on these statistics, it is more likely that the Big 5 retailers deploy a retention strategy that targets the age group(s) where significant customer erosion is likely to affect the cost of their delivered retail service and those customers who are first-time switchers. The customer retention strategy involves the offer of a financial counteroffer along with a fixed-term contract.

4.134 Among the survey responses, there are 104 retail customers who started the switching process by using their acquiring retailer to initiate the switch. Those customers were persuaded to stay with the existing retailer when counteroffers were offered. The counteroffers were a matched retail rate, one-time lump-sum credit, another type of financial incentive and fixed rates including a fixed-term contract. This group of retail customers excludes those customers who switched for a brief period to a competing retailer and decided to cancel the switch and return to their previous retailer.

4.135 Retailers may have motives for encouraging their customers to stay when those customers have expressed an interest in switching to another retailer. In some cases, the customer retention strategy may be in response to preserving the minimum quantity for a procurement contract which avoids the breach fee or premium attracted for procuring less than the minimum quantity agreed on for the contract. Alternatively, the behaviour may sometimes be viewed as anti-competitive if it is intended to discourage entry into the retail market (Xevelonakis, 2005).

4.136 Spector (2011) presents analysis that shows the effect of dominant suppliers introducing exclusionary contracts in a competitive market in order to deprive rivals of the minimum commercially viable size of a customer base. This behaviour can result in the rivals' exclusion from the market while the established firm enjoys increased market power. While there is no

evidence that the retailer behaviour has resulted in the exercise of market power, there is one concern in relation to fixed-term contracts.

4.137   None of the survey respondents indicated whether the fixed-term contracts contain fixed or variable rates for the energy supplied except for one consumer. That consumer had decided to switch to another retailer and was saved by the existing retailer who offered the retail customer a lump-sum credit and a fixed rate for the fixed-term contract. It is unclear from the response whether the fixed rate applies to the duration of the contract or a reduced term for the contract.

4.138   Fixed-term contracts pose a greater risk when their rate is variable rather than fixed; and such contracts limit consumers' exercise of retail choice. The fixed rate may be offered for the term of the contract or a shorter period. If retailers are offering fixed-term contracts with variable rates, then consumers must be aware of the risks associated with such retail offerings. The specific risk to consumers is those consumers who are unaware that the contract has a variable rate clause may be unable to cure their exposure to price increases at levels that they are reluctant to accept during the term of the contract.

4.139   Retail customers under contract with their retailers will only be able to switch when their contract expires or if they are prepared to pay the contract breach fee. As a result, fixed-term contracts in the retail market may impede consumer switching temporarily if full disclosure of the tariff conditions to customers does not exist in the retail market. In addition, these contracts can lock consumers into price hazards for which they may be unaware.

4.140   In the survey results, there is one retail customer who committed to a fixed-term contract and was unaware that the contract remained in force until an attempt was made to switch to another retailer. The consumer was trying to avoid the existing retailer's announcement of a price increase. The existing retailer reminded the customer of the contract and offered a lump-sum credit in exchange for the customer's continued business. The size of the lump-sum credit was similar in magnitude as the lump-sum credit offered to other retail customers being saved.

4.141   The Commerce Commission administers the Fair Trading Act which is the mechanism that ensures that consumers are fully informed. We will bring this study to the attention of the Commerce Commission to provide context for any complaints that they receive from electricity consumers about retailer behaviour regarding fixed-term contracts. If complaints about fixed-term contracts occur frequently, then the Authority could consider regulating the information contained in offers along similar lines as the recently released guidelines on price changes.

4.142   Another aspect to the analysis of the retailers' customer retention strategy is the win-back of customers who have switched to other retailers. Analysis was conducted of the effect of the win-back strategy of retailers on their departed customers whose return was won. The focus is to determine whether any material influence exists on the choices that those customers make. The regression equation estimated is:

$$U = [\beta_0 + \beta_1 female + \beta_2 age + \beta_3 winback\,] \qquad\qquad (R7)$$

4.143   This regression was estimated using the full sample. The results appear in Table 20 as **Model VII**. A number of coefficient estimates are statistically significant though the win-back variable is statistically insignificant.

4.144   Based on the positive sign for the win-back variable and the magnitude of the coefficient estimate for those customers who were won-back by a Big 5 retailer, there is indication that the values

1.10 and 0.53 provide evidence that primarily the Big 5 retailers seek to regain lost customers who have switched to other retailers.

4.145   Retailers have been active in attracting customers to reverse their switching decisions after brief periods with other retailers. These returning customers are labelled 'win-backs'. Their re-entry to the customer base of the losing retailer who had lost them temporarily is associated with marketing costs incurred to win-back their continued business.

4.146   In the survey sample, customers who were won-back by their retailers numbered 31 out of 91 consumers. Success with win-backs is more difficult than 'saves' which are customers who have not completely exited the customer base of their existing retailer until the switch is completed.

4.147   Customers who have ended their relationship with a retailer are often hesitant to accept counteroffers pitched by the losing retailer. Typically, customers prefer that the retailer is proactive about offering a discount of the retail tariff without the trigger of the customer's threatened departure. When retailers choose to extend the discount on announced departure of their customer, customers view the behaviour with mistrust which requires investment from both parties to the contractual relationship to restore trust to the business relationship.

Table 20: Coefficient estimates for the win-back strategy effect

Independent variable	Model VII
$Constant_{stb5}$	*3.59* (4.88)*
$Constant_{swnb5}$	*2.16* (2.82)*
$Constant_{swi}$	*3.77* (5.12)*
$Female_{stb5}$	0.45 (1.52)
$Female_{swnb5}$	0.29 (0.89)
$Female_{swb5}$	0.14 (0.48)
$Age45–54_{stb5}$	-1.76* (-2.30)
$Age45–54_{swnb5}$	-1.97* (-2.41)
$Age45–54_{swb5}$	-2.16* (-2.80)
$Age55–64_{stb5}$	-1.75* (-2.30)
$Age55–64_{swnb5}$	-1.53 (-1.91)
$Age55–64_{swib5}$	-2.04* (-2.67)
$Age65–74_{stib5}$	-1.03 (-1.27)
$Age65–74_{swnb5}$	-0.69 (-0.82)
$Age65–74_{swb5}$	-1.20 (-1.48)
$Age75+_{stb5}$	-1.73 (-2.21)
$Age75+_{swnb5}$	-0.98 (-1.20)
$Age75+_{swib5}$	-2.07* (-2.64)
$Win-back2_{stb5}$	0.53 (0.51)
$Win-back2_{swnb5}$	0.28 (0.25)
$Win-back2_{swb5}$	1.10 (1.06)

Source: Electricity Authority

4.148 Table 21 shows the probabilities for the retailer selections made for retail customers who were won-back by their retailer. The table shows that customers who were won-back were very likely to stay with a Big 5 retailer or switch to another Big 5 retailer. It also reveals that retail customers who have selected a non-Big 5 retailer are unlikely to be won-back by the non-Big 5 retailer but may instead be lured to a Big 5 retailer given the higher recorded probabilities for this event in Table 21.

4.149 The survey results reveal that retail customers who are won-back are infrequently locked-in to a fixed-term contract possibly because of the assumed awareness among such customers about contractual hazards.

4.150 Strategically targeting customers for retention may prove costly on occasions as Xevelonakis (2005) and Jones and Sasser, Jr. (1995) point out. Xevelonakis (2005) mentions in his research that a Cooper & Lybrand study shows that acquiring new customers can be five times more costly than the cost of keeping existing customers. Xevelonakis (2005) even states that the cost can reach up to 25 times more than the cost of retaining existing customers.

4.151 In November 2014, the Electricity Authority decided to introduce an amendment to Part 11 of the Electricity Industry Participation Code 2010 (the Code) to allow gaining retailers to opt-in for save protection. The amendment prohibits the losing retailer from initiating contact to offer inducements to any of its customers who are acquired by another retailer, if the gaining retailer has chosen save protection.

Table 21: Probabilities of the win-back effect

Age and effect	Stayed (B5)	Stayed (NB5)	Switched (B5)	Switched (NB5)
<45 years Win-back	0.13	0.002	0.23	0.022
No win-back	0.08	0.002	0.08	0.017
45–54 years Win-back	0.022	0.002	0.23	0.003
No win-back	0.013	0.002	0.08	0.002
55–64 years Win-back	0.023	0.002	0.026	0.005
No win-back	0.013	0.002	0.009	0.004
65–74 years Win-back	0.046	0.002	0.030	0.011
No win-back	0.027	0.002	0.010	0.008
>=75 years Win-back	0.023	0.002	0.069	0.008
No win-back	0.013	0.002	0.023	0.006

Source: Electricity Authority

4.152 The period of duration for save protection extends the length of the period taken to complete the switch. The losing retailer can offer an inducement to the customer prior to entering the switching process and after the switch is complete. The other exception is if the customer initiates contact with the losing retailer prior to completion of the switch. The amendment includes a reciprocity clause that prohibits a retailer who has opted-in for save protection from carrying out saves itself, unless the customer initiates contact with the gaining retailer.

4.153 The Code amendment should discipline retailer behaviour in the market as retailers deploy their customer retention strategies going forward and continue to build their customer base.

4.154 The remaining effects that this analysis explores are the switching process, the ease of switching to another retailer and consumers' perception of their retailers.

Effect of the switching process and the ease of switching

4.155 The way households accomplish switching in the retail market was another effect analysed in this study. Interest exists in knowing whether this effect influences the retail customers' choice of a retailer. The regression equation estimated for this effect is:

$$Z = [\beta_0 + \beta_1 gender + \beta_2 age + \beta_3 switching\ process] \qquad (R8)$$

4.156 This equation uses only the group of potential switchers to model the switching process. The switching process was structured to reflect whether or not the retail customers used the retailer to initiate the switch. Results for this model appear as **Model VIII** in Table 22.

4.157 The switching process variable is statistically insignificant though the age variables are significant. Its value of 0.49 and the positive sign that it has is indication that retail customers are willing to be approached by retailers about switching, particularly those customers whose age occurs in the under 45 years age group. The other age groups for consumers whose age is 45 years and above seem less willing to have the new retailer initiate their switching to another retailer given the negative coefficient estimates. These older consumers are more willing to accept the counteroffer of their existing retailer. This sub-sample contains evidence that many of its members had agreed to switch to another retailer and while the new retailer was processing their switching decision, the retail customer chose to cancel the switch.

Table 22: Coefficient estimates for the switching process effect

Independent variable	Model VIII
Constant	*3.51* (4.03)*
Age45–54	-1.72* (-2.22)
Age55–64	-1.73* (-2.26)
Age65–74	-1.24 (-1.54)
Age75+	-1.76* (-2.23)
Switching frequency(=0)	-0.015 (0.04)
Switching frequency(=2)	-1.41* (-2.04)

Independent variable	Model VIII
Switching frequency(>=3)	-2.03 (-1.37)
Switching process2	0.49 (1.27)

Source: Electricity Authority

4.158 Another aspect of the results is, as the retail customers' switching frequency increases, there is less reliance on the new retailer initiating interest in switching to another retailer. This outcome may signal that with frequent switching retail customers become more proactive about searching for deals rather than waiting to be approached by the retailers. The searches may eventually result in the consumer making the decision to switch to another retailer.

4.159 Based on the responses received in the survey, there are 353 potential switchers who got their retailer to initiate their switching decision but those switches were never completed for various reasons. An additional 177 households had a conversation with a competing supplier about possibly switching though the customer never switched.

4.160 The latter group of retail customers was unmotivated to switch when financial inducements were offered by their existing retailer to sway their decision to stay. Approximately 90 per cent of the retail customers who had started to switch their retailer changed their decision due to the counteroffer their existing retailer made.

4.161 This outcome reinforces the idea that, when retailers who face the imminent loss of customers and choose to adjust their tariff offerings favourably for their customers who wish to depart, their customers are discouraged from switching to another retailer. Typical offers from the existing retailers are a discount on the tariff or a lump-sum credit.

Table 23: Probabilities of the switching process effect

Age and effect	Stayed (B5)	Stayed (NB5)
<45 years Supplier initiated Not supplier initiated	0.239 0.146	0.007 0.007
45–54 years Supplier initiated Not supplier initiated	0.043 0.026	0.007 0.007
55–64 years Supplier initiated Not supplier initiated	0.166 0.102	0.007 0.007
65–74 years Supplier initiated Not supplier initiated	0.069 0.042	0.007 0.007

Age and effect	Stayed (B5)	Stayed (NB5)
75 years+		
Supplier initiated	0.056	0.007
Not supplier initiated	0.034	0.007

Source: Electricity Authority

4.162   Watson et al. (2002) refer to the door-to-door marketing that retailers use in the solicitation of consumers to switch from their existing retailer. These marketing campaigns required consumers to engage in instantaneous decision-making with which many consumers seem uncomfortable. This marketing tactic is viewed as an aggressive approach to customer acquisition since it disallows decision postponement and risks the potential alienation of consumers from engaging in switching activity. The approach also detracts from customers' engagement in information gathering when an instantaneous decision is required.

4.163   In the United Kingdom, such marketing was met with great criticism and in New Zealand some retail customers have expressed disinterest in such marketing approaches. Unlike the United Kingdom, New Zealand has a 10-day cooling off period that allows the retail customer to search for information and unwind their switching decision. This consumer protection clause is much better than an outright ban on door-to-door marketing which the United Kingdom introduced.

4.164   The other aspect of the switching process that was analysed is the ease of switching which was measured using a Likert scale that ranged from very easy to very difficult to determine if it influences the retailer selection of consumers. The equation estimated is:

$$Z = [\beta_0 + \beta_1 female + \beta_2 age + \beta_3 sfreq + \beta_4 ease\ of\ switching] \qquad (R9)$$

This regression uses only the 600 switchers in the sample and the binary logit model. This model is estimated using the ordinary least squares technique. The results for this regression appear in Table 24 as **Model IX** and the probabilities appear in Table 25.

Table 24: Coefficient estimates for the ease of switching effect

Independent variable	Model IX
Constant	*1.559** (5.04)
Female	-0.12 (-0.65)
Age45–54	-0.15 (-0.43)
Age55–64	-0.47 (-1.50)
Age65–74	-0.47 (-1.51)
Age75+	-1.01* (-3.24)
Switching Frequency(=0)	-0.05 (-0.19)

Independent variable	Model IX
Switching Frequency(=2)	0.47 (1.63)
Switching Frequency(=3)	0.75 (0.95)
Ease of switching2	-0.06 (-0.30)

Source: Electricity Authority

4.165   Only retail customers younger than 45 years share the view that switching is easy. All the other age groups do not have a similar opinion of the ease with which they can switch to another retailer. As the age of the retail customers increases, there is a less than favourable opinion about the ease of switching. In fact, retail customers who are 75 years and older are the least likely to express a positive opinion of the ease of switching given their coefficient estimate is negative 1.01. Even the ease of switching variable has a negative coefficient which indicates a less than favourable opinion exists about the ease of switching.

4.166   The probabilities show that retail customers within each age group are indifferent between whether switching to another retailer is easy, an indication that how easy it is to switch to another retailer does not exert significant influence on the selection of a retailer.

Table 25: Probability of the ease of switching effect

Age and effect	Switched (B5)	Switched (NB5)
<45 years		
Very easy	0.125	0.0396
Not very easy	0.132	0.0396
45–54 years		
Very easy	0.107	0.0396
Not very easy	0.112	0.0396
55–64 years		
Very easy	0.093	0.0396
Not very easy	0.097	0.0396
65–74 years		
Very easy	0.093	0.0396
Not very easy	0.097	0.0396
>=75 years		
Very easy	0.071	0.0396
Not very easy	0.073	0.0396

Source: Electricity Authority

4.167   Exactly where the challenges are within the switching process is key to refining the experience retail customers have when contemplating the switch to another retailer. Possibly the inclusion of an education variable may assist in sorting consumers and how best to fulfil their needs within the switching process.

4.168   The final effect analysed in relation to the selection of a retailer is the retail customers' perception of their retailer.

Consumers' perceptions of retailers

4.169   Retail customers have enjoyed a sedentary relationship with their existing retailer with whom they have enjoyed a long relationship. As a result, their loyalty to the existing retailer may be underestimated. New entrants who intend to interrupt the relationship must be sensitive to the needs of the customers being attracted to their customer base if successful acquisition is the desired outcome of the acquiring retailer (Xevelonakis, 2005).

4.170   In an effort to understand the connection between the perceptions retail customers have of their retailers and the choices that these customers make, a number of perception attributes were modelled: value for money; satisfaction; trustworthiness; service quality; being well-established; and reliability and security. The questions posed to the survey respondents targeted whether the attributes apply a lot to their selected retailer.

4.171   Retail customers were asked to rate their retailer using a 6-point Likert scale for each attribute which ranged from *applies a lot* to *not applicable* for five of the six attributes. The remaining attribute, satisfaction, was rated from *very satisfied* to *dissatisfied* or *not satisfied at all*.

4.172   There were 43 retail customers not satisfied with their retailer but only 11 of those retail customers chose to exercise their choice to switch the retailer. Nine of those retail customers changed from an incumbent retailer due to the offer of a cheaper deal from the acquiring retailer. Seven of the nine retail customers were acquired by another Big 5 retailer, with the remaining two customers distributed between two non-Big 5 retailers to the retail market. Thirty-two retail customers decided to remain with their existing retailer despite dissatisfaction with the retailer. Four of the 32 retail customers actively sought other opportunities for service delivery by approaching other retailers. Twenty-four of the remaining 28 retail customers were actively approached by other retailers but decided not to switch to another retailer.

4.173   The specific regression equation for the perceptions effect is:

$$U = \begin{bmatrix} \beta_0 + \beta_1 female + \beta_2 age + \beta_3 value\ for\ money + \\ \beta_4 satisfaction + \beta_5 trustworthy + \beta_6 service\ quality + \\ + \beta_7 established + \beta_8 reliability \end{bmatrix} \quad (R10)$$

4.174   To model the above equation, the 6-point Likert scale used for the perception attributes was recoded as two levels. The highest positive rating on a perception is placed in one group and all other ratings form the second group consistent with the management literature.

4.175   Keaveney (1995), Xevelonakis (2005), Zeithaml (2000) and Jones and Sasser, Jr. (1995) show that less than very satisfied customers are potential departures from a company's client base. The discussion presented in the works of these authors has contributed to the segmentation employed for the perception variables presented in this study.

4.176 The results for the regression appear in Table 26 as **Model X**. The significant variables are all age groups except the 65 years to 75 years old customers who seemed non-committal in expressing their perceptions of their retailers. Those retail customers aged 75 years and above who switched to another retailer did not have statistically significant coefficient estimates at the 5 per cent level of significance.

Table 26:   Coefficient estimates for perceptions of the retailer

Independent variable	Model X	Independent variable	Model X
Constant$_{stb5}$ Constant$_{swnb5}$ Constant$_{swi}$	3.32* (4.37) 2.39* (3.03) 3.84* (5.06)	Value for money2$_{stb5}$ Value for money2$_{swnb5}$ Value for money2$_{swb5}$	-0.25 (-0.60) 1.42* (3.15) 0.92* (2.20)
Female$_{stb5}$ Female$_{swnb5}$ Female$_{swb5}$	0.46 (1.52) 0.24 (0.71) 0.09 (0.30)	Satisfaction2$_{stb5}$ Satisfaction2$_{swnb5}$ Satisfaction2$_{swb5}$	-0.23 (-0.59) -0.33 (-0.77) -0.29 (-0.73)
Age45–54$_{stb5}$ Age45–54$_{swnb5}$ Age45–54$_{swb5}$	-1.76* (-2.27) -2.04* (-2.48) -2.17* (-2.79)	Trustworthy2$_{stb5}$ Trustworthy2$_{swnb5}$ Trustworthy2$_{swb5}$	0.11 (0.25) 0.10 (0.20) -0.22 (-0.50)
Age55–64$_{stb5}$ Age55–64$_{swnb5}$ Age55–64$_{swb5}$	-1.80* (-2.01) -1.62* (-2.01) -2.14* (-2.78)	Service quality2$_{stb5}$ Service quality2$_{swnb5}$ Service quality2$_{swb5}$	-0.51 (-1.20) -0.19 (-0.41) -0.61 (-1.41)
Age65–74$_{stb5}$ Age65–74$_{swnb5}$ Age65–74$_{swb5i}$	-1.18 (-1.44) -0.68 (-0.79) -1.29 (-1.57)	Established2$_{stb5}$ Established2$_{swnb5}$ Established2$_{swb5}$	1.65* (4.28) -0.09 (-0.22) 1.32* (3.39)
Age75+$_{stb5}$ Age75+$_{swnb5}$ Age75+$_{swb5}$	-1.74* (-2.20) -0.93 (-1.13) -0.24 (-0.59)	Secure2$_{stb5}$ Secure2$_{swnb5}$ Secure2$_{swb5}$	-0.22 (-0.49) -1.16* (-2.30) -0.80 (-1.74)

Source: Electricity Authority

4.177 The value for money attribute for retail customers who switched to another retailer has positive and statistically significant coefficient estimates, 1.42 and 0.92. As a result, there is evidence that retail customers who are value seekers are very likely to switch to other retailers when their anticipated savings are greater than the cost of gathering information and switching.

4.178 Retail customers who stayed with a Big 5 retailer seem unlikely value seekers unless they express an unexpected desire to switch and their retailer chooses to offer them a tariff discount in exchange for their continued business. The coefficient estimate for these consumers is -0.25.

4.179 For the satisfaction attribute, retail customers who stayed with a Big 5 retailer are more likely to be very satisfied (-0.23) with their existing retailer relative to those retail customers who switched to a non-Big 5 retailer (-0.33) or even those customers who chose to switch to another Big 5

retailer. Based on these estimated values, the Big 5 retailers can expect to hear the voices of displeasure from their customers when the service provided does not result in high levels of satisfaction. There are retail customers who are more inclined to switch to another retailer rather than voice their displeasure since time is money lost which value seekers wish to minimise. Such retail customers often select another Big 5 retailer.

4.180 Retail customers do not view the satisfaction attribute as important to their selection of a retailer which is an unusual outcome, since Xevelonakis (2005), Keaveney (1995), Jones and Sasser, Jr. (1995) and Colgate et al. (2007) share the opinion that customers who are not very satisfied must be viewed as likely candidates to switch their provider. Jones and Sasser, Jr. (1995) and Walsh et al. (2005) do acknowledge that customers less than satisfied may remain until a suitable replacement can be located or the customer has reached his tolerance threshold for dissatisfaction.

4.181 Trustworthiness is another attribute examined. The trustworthiness of retailers is not statistically significant to the choice of a retailer at the 5 per cent significance level for all retail customers. There are positive coefficient estimates for retail customers who choose to stay with a Big 5 retailer and those retail customers who switched to a non-Big 5 retailer, 0.11 and 0.10, respectively. These estimates show that the trustworthiness of their retailers is important to the business relationship.

4.182 As a result, profitability of the retailer with this group of decision-makers is linked to the extent of trust that develops between the transacting parties. For households that switched to another incumbent retailer, there is little expectation that the retailer must be trustworthy, which may be interpreted that their decision to switch their retailer can be viewed as a disloyal act for which no expectation of trustworthiness should be expected in return on entry into a new business relationship. Both parties to the relationship must commit to building trust over time.

4.183 The reliability and security attribute is important for consumers who stay with the Big 5 retailers though least important among consumers served by non-Big 5 retailers. For those consumers who stayed with their Big 5 retailer their coefficient estimate is -0.22 and for those consumers who switched to a non-Big 5 retailer the estimate is -0.80. Both estimates are not significant and do not significantly influence the selection of a retailer among these consumers. Consumers who switched to a non-Big 5 retailer have a coefficient estimate of -1.16 with the negative sign which indicates that this attribute is very unlikely to significantly influence the selection of a retailer.

4.184 Retail customers are aware that reliability and security are service quality indicators that govern all suppliers of services in the electricity industry and if service quality information is not presented in a manner that shows a direct link between the retailer and their service experience then the information will be disregarded in their choice of a retailer. If such information can be communicated about retailers then consumers who develop knowledge in distinguishing the differences in reliability and security among retailers will be more discerning in the selection of a retailer.

4.185 Many retail customers have long-established relationships with their retailers. There is an expectation that retail customers who choose to stay with the Big 5 retailer will value their retailer being well-established very highly. Similarly, this attribute will be highly appreciated among retail customers who have switched to other Big 5 retailers. The coefficient estimates are consistent with these expectations given their positive sign and the higher values, 1.65 and 1.32 respectively, relative to those retail customers who switched to a non-Big 5 retailer, -0.09. Many

retail customers are reluctant to forego long-established relationships to start the building of a new relationship hence the significance of the positive coefficient estimates at the 5 per cent significance level. Older consumers are unlikely to switch since the value placed on the relationship with their existing retailer is very high.

4.186   In the applied research work of Colgate et al. (2007) which examined the reasons why stayers remain with their service provider, some respondents of the survey stated that switching takes too much time and effort in establishing a new relationship. The study shares a number of other reasons for stayers who choose to stay. This study is one of a few studies that examine stayers rather than the significant focus that switchers have received in the past.

4.187   New entrants to the retail market who have no known reputation or local presence and a distant relationship with their customers must be prepared to overcome the challenges of establishing new business relationships and their lack of physical presence within the local community. These non-Big 5 retailers must demonstrate their commitment to the satisfaction of their customers' needs if success in customer acquisition, market entry, service and continued presence in the industry are expected achievements.

5   Policy implications

5.1   The Authority has a statutory objective to promote competition in, reliable supply by and the efficient operation of the electricity industry for the long-term benefit of consumers. The sample studied for this review of the switching experiences of residential consumers in New Zealand has provided insights into a number of policy-relevant questions. Those insights relate to consumer motivations for switching to another retailer, consumer information gathering on the possibilities of switching to another retailer and the customer retention strategies of retailers.

5.2   There is evidence from the sample that consumers are motivated to switch to other retailers whether the length of their relationship with the new retailer is short-lived or long enough until the next opportunity for switching is discovered. This consumer behaviour contributes to the development of robust competition in the retail market.

5.3   Consumers are engaged in searching for opportunities to switch to other retailers. They demonstrate effort in using the consumer information tools provided in the retail market. Information gathering occurs among consumers in all age groups though there are consumers aged between 45 years and 55 years who seem less inclined to gather information on the possibilities of switching to other retailers. It is possible that the communication channels used in targeting some consumer segments can be improved to support better information gathering.

5.4   The sample provides evidence that fixed-term contracts are predominantly used by retailers when their customers seek to switch to another retailer for the first time. The Authority will bring the results of this study to the attention of the Commerce Commission to provide context for any Fair Trading Act complaints that are received on these contracts.

5.5   Typically, the existing retailer is willing to make a counteroffer that includes a fixed-term contract to those customers who seek to switch to another retailer. The evidence from the sample is unclear whether the contract has a fixed rate for the duration of the contract or a reduced term of the contract.

5.6 There are contractual provisions of which consumers may be unaware such as whether the rate for their energy purchases is variable for the term of the contract or there is a period shorter than the contract term for which the rate is fixed. In addition, consumer lack of awareness of the contract breach fee after the original contract expires increases their vulnerability of being caught unaware that the payment of a breach fee is necessary for access to switching opportunities that have been located in the market. Another aspect of the contracts is whether an opt-out clause exists at the time of contract expiration which affords the consumer an opportunity to self-select its continuance or discontinuance.

5.7 In the event that this customer retention strategy is a source of frequent consumer complaints, the Authority could consider regulating the information contained in the tariff offers along similar lines as the recently released guidelines on price changes.

6 Conclusions

6.1 Consumers' motivations for switching to another retailer or staying with their existing retailer differ. The sample studied provides statistical evidence that retail customers are not only motivated to switch based on the financial incentives retailers offer when they contact retail customers or the retail customers' disgruntlement with the service quality their retailer delivers.

6.2 Instead, consumers seek out possibilities for switching through their discovery of consumer information on *What's My Number* and *Powerswitch* that indicates that there are potential savings from switching to another retailer. These consumers may choose to leave their existing retailer and establish a new business relationship with another retailer.

6.3 Thaler et al. (2010) offer the suggestion that choice architecture when structured to promote rational consumer decision-making can result in the choices that are consistent with expectations. The structure requires that effective nudges are incorporated. Similarly, in communicating information on switching in the retail market, targeting consumer segments is important given the various communication channels available.

6.4 Aligning communication channels to the communication access challenges of the consumer segments makes information more accessible to consumers and may encourage more consumers to engage in information gathering on the opportunities for switching their retailer.

6.5 *What's My Number* and *Powerswitch* have provided consumer information support in locating opportunities for switching to another retailer. There is evidence that consumers aged between 45 years and 54 years may not be as engaged in information gathering as other age groups. The Authority may wish to consider adjustments to the targeting of *What's My Number* funding to support better consumer engagement in information gathering.

6.6 There are consumers who are steadfast in staying with their existing retailer despite their search for opportunities for switching either because the savings are inadequate to justify their switch to another retailer or other reasons that remain unknown. Not all consumers will switch but with critical mass in consumer switching, opportunities will arise for other consumers to enjoy the benefits of more robust competition among retailers.

6.7 The sample studied provides evidence that switching more than two times within two years is unpopular among residential consumers except for a few consumers whose ages lie in the under 45 years age group. Results also show that consumers in adult households are more likely to be

frequent switchers than consumers whose households include children. Very often the selected retailer is a Big 5 retailer.

6.8   Consumers whose annual household income is below $70,000 are more inclined to switch to other retailers who most often are the Big 5 retailers. In contrast, consumers in households with incomes higher than $70,000 often choose to stay with their existing retailer who most often is a Big 5 retailer.

6.9   There is strong evidence in the sample that consumers in all occupational categories often choose to stay with their existing retailer.

6.10   Retailer perceptions are not statistically significant among consumers in selecting a retailer. Exceptions to this outcome are the consumers who seek value for money when switching to other retailers and the consumers who choose to stay with the Big 5 retailer who prefer a retailer who is well-established. The latter type of consumer is very challenging to attract when non-Big 5 retailers seek to build their customer base.

6.11   Offering innovative services and products that are not provided by the Big 5 retailers is a typical strategy for attracting new customers. Examples of such service innovations are emerging in the retail market. Flick has ventured into the offer of a spot contract for the retail purchase of electricity. This service offering is attractive to consumers who welcome self-insurance in the retail market.

6.12   Another service offering is Globug's pre-payment tariff which allows consumers to proactively manage their expenditure on electricity. Save A Watt is another service innovation that has emerged for offering consumer advice on energy efficiency solutions that improve the consumption of electricity. Currently, the service is available to industrial and commercial customers. This service should be offered to residential consumers by Save A Watt or another provider capable of delivering similar energy efficiency advice to residential consumers.

Appendix A   Regression model variables

A.1   The definitions of all variables used in the regressions appear in the table below.

Table 27: Definitions of all variables used in the regressions

Variable	Definition
sti	= 1 if the consumer stays with a Big 5 retailer, 0 otherwise
stni	= 1 if the consumer stays with a non-Big 5 retailer, 0 otherwise
swi	= 1 if the respondent switches to a Big 5 retailer, 0 otherwise
swni	= 1 if the respondent switches to a non-Big 5 retailer, 0 otherwise
gender	= 1 if the consumer is a female, 0 otherwise
age	age1 = 1 if the age of the consumer is less than 45 years old, 0 otherwise
	age2 = 1 if the age of the consumer occurs between 45 and 54 years old, 0 otherwise
	age3 = 1 if the age of the consumer occurs between 55 and 64 years old, 0 otherwise
	age4 = 1 if the age of the consumer occurs between 65 and 74 years old, 0 otherwise
	age5 = 1 if the age of the consumer is 75 years or more, 0 otherwise
switching frequency	sfreq1 = 1 if the consumer switched to another retailer once in the past two years, 0 otherwise
	sfreq2 = 1 if the consumer switched to another retailer twice in the past two years, 0 otherwise
	sfreq3 = 1 if the consumer switched to another retailer three or more times in the past two years, 0 otherwise
	sfreq4 = 1 if the consumer never switched to another retailer in the past two years, 0 otherwise
child	child1 = 1 if the consumer's household has no members less than 18 years, 0 otherwise
	child2 = 1 if the consumer's household has one or two members less than 18 years, 0 otherwise
	child3 = 1 if the consumer's household has three or more members less than 18 years, 0 otherwise
adult	adult1 = 1 if the consumer's household has one member whose age is greater than or equal to 18 years, 0 otherwise
	adult2 = 1 if the consumer's household has two members whose ages are greater than or equal to 18 years, 0 otherwise
	adult3 = 1 if the consumer's household has three or more members whose ages are greater than or equal to 18 years, 0 otherwise

Variable	Definition
occupation	occupation 1 = 1 if the consumer is unemployed, student, beneficiary, homemaker and mother, labourer and undisclosed, 0 otherwise
	occupation 2 = 1 if the consumer is a salesperson, personal or community service worker, clerical or administrative worker, self-employed, machinery operator, driver, technician or trades worker or professional, 0 otherwise
	occupation 3 = 1 if the consumer is a retiree, 0 otherwise
	occupation 4 = 1 if the consumer is a manager, 0 otherwise
residence	residence 1 = 1 if the consumer lived at the address five years or less, 0 otherwise
	residence 2 = 1 if the consumer lived at the address six to 10 years, 0 otherwise
	residence 3 = 1 if the consumer lived at the address more than 10 years, 0 otherwise
fixed-term	= 1 if the consumer is on a fixed-term contract, 0 otherwise
win-back	win-back = 1 if the consumer was offered a financial incentive/credit, 0 otherwise
household income (HHInc)	HHInc 1 = 1 if the consumer's annual household income is less than $30,000, 0 otherwise
	HHInc 2 = 1 if the consumer's annual household income is between $30,000 and $50,000, 0 otherwise
	HHInc 3 = 1 if the consumer's annual household income is between $50,000 and $70,000, 0 otherwise
	HHInc 4 = 1 if the consumer's annual household income is between $70,000 and $100,000, 0 otherwise
	HHInc 5 = 1 if the consumer's annual household income is $100,000 and above, 0 otherwise
save	save = 1 if the consumer was offered an inducement within the switching process, 0 otherwise
switching process (swp)	= 1 if the acquiring retailer started the switch process for the consumer, 0 otherwise
ease of switching (swease)	swease2 = 1 if very easy, 0 otherwise
reason for switching (rfs)	rfs1 = 1 if the consumer was offered no inducement to switch to another retailer, 0 otherwise
	rfs2 = 1 if the consumer is unhappy with the retailer's service, 0 otherwise
	rfs3 = 1 if the consumer was offered a financial inducement to switch another retailer, 0 otherwise
What's My Number (*WMN*)	= 1 if the consumer consulted the *What's My Number* website, 0 otherwise

Variable	Definition
Powerswitch (*PWRSW*)	= 1 if the consumer consulted the *Powerswitch* website, 0 otherwise
electricity consumption	The consumer's average monthly electricity consumption (kilowatt hours)
electricity expenditure	The consumer's average monthly electricity expenditure (dollars)
satisfaction (satisfy)	satisfy2 = 1 if the consumer is very satisfied with the retailer, 0 otherwise
trustworthy (trust)	trust2 = 1 if the consumer believes trust applies a lot to the retailer, 0 otherwise
value for money	value for money2 = 1 if the consumer believes value for money applies a lot to the retailer, 0 otherwise
service quality (service)	service2 = 1 if the consumer believes service quality applies a lot to the retailer, 0 otherwise
well-established (established)	established2 = 1 if the consumer believes the retailer is well-established, 0 otherwise
reliable and secure (secure)	secure2 = 1 if the consumer believes the retailer is reliable and secure, 0 otherwise

Source: Electricity Authority

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References

1. Caldwell, John; Lisa Wood; Andy Zetlan; Eric Blume (2013). Customer Engagement – What will it take to change customers into active energy managers – and keep them as customers at the same time? Electric Perspectives, January/February, pp.30–38.

2. Colgate, Mark; Vicky Thuy-Uyen Tong; Christina Kwai-Choi Lee; John U. Farley (2007). Back From the Brink: Why Customers Stay, Journal of Service Research, February, Volume 9, Number 3, pp.211–228.

3. French, Tom; Laura LaBerge; Paul Magill (2012). Five 'No Regrets' for Superior Customer Engagement, McKinsey Quarterly, July.

4. Henderson, Joan; Eddie McGoldrick; Rodney McAdam (2003). A Critical Review of e-service in Northern Ireland Electricity, Managing Service Quality, Volume 13, Number 6, pp.463–470.

5. Jones, T.; W.E. Sasser, Jr. (1995). Why Satisfied Customers Defect, Harvard Business Review, November–December, pp.2–13.

6. Keaveney, Susan M. (1995). Customer Switching Behavior in Service Industries: An Exploratory Study, Journal of Marketing, April, Volume 59, Number 2, pp.71–82.

7. Spector, David (2011). Exclusive Contracts and Demand Foreclosure, Rand Journal of Economics, Volume 42, Number 4, pp.619–638.

8. Thaler, R.; C.R. Sunstein; J.P. Balz (2010). Choice Architecture, SSRN Working Paper, April 2.

9. Walsh, Gianfranco; Markus Groth; Klaus-Peter Wiedmann (2005). An Examination of Consumers' Motives to Switch Energy Suppliers, Journal of Marketing Management, Volume 21, pp.421–440.

10. Watson, Anna; Howard Viney; Patrick Schomaker (2002). Consumer Attitudes to Utility Products, Marketing Intelligence & Planning, Volume 20, Number 7, pp.394–404.

11. Xevelonakis, Evangelos (2005). Developing Retention Strategies Based on Consumer Profitability in Telecommunications: An Empirical Study, Journal of Database Marketing & Customer Strategy Management, April, Volume 12, Number 3, pp.226–242.

12. Yang, Y. (2014). Understanding Household Switching Behavior in the Retail Electricity Market, Energy Policy, Issue 69, pp.406–414.

13. Zeithaml, Valarie A. (2000). Service Quality, Profitability and the Economic Worth of Customers: What we Know and What we Need to Learn, Academy of Marketing Science Journal, Volume 28, Number 1, pp.67–85.

Glossary of abbreviations and terms

Authority	Electricity Authority
Code	Electricity Industry Participation Code 2010
Contact	Contact Energy Limited
Genesis	Genesis Power Limited (trading as Genesis Energy)
ICP	Installation control point
Mercury	Mercury Energy Limited
Meridian	Meridian Energy Limited
MNL	Multinomial Logistic or Logit
MRP	Mighty River Power Limited
Trustpower	Trustpower Limited