



Consumer attitudes to Gigabit broadband - Technical Annex

This annex gives more detail on the modelling process used to estimate the likelihood of consumers taking up Gigabit broadband..

Populus, on behalf of Which? Surveyed UK adults, of whom 1,686 made decisions about their household broadband, online between the 26th and 28th June 2020. The following five questions (table A1) were combined to create the likelihood scale which is used as the dependent variables in model 1, model 2 and tobit model 2 in Table A2.

Table A1: Variables used to create likelihood scale

Question	Description	Answer options [exc DK and NAs]	Reverse scale
Q15	Likelihood of gigabit broadband	Very likely (2.5), Fairly likely (5), Not very likely (7.5), Not at all likely (10).	No
Q9c.	Unlikely to switch to gigabit capable broadband	Strongly agree (10), Tend to agree (8), Neither agree or disagree (6), Tend to disagree (4), Strongly disagree (2).	Yes
Q10b.	Would be willing to pay more than I do now for gigabit capable broadband.	Strongly agree (2), Tend to agree (4), Neither agree or disagree (6), Tend to disagree (8), Strongly disagree (10).	No
Q10e.	I don't understand the benefits of upgrading to gigabit capable broadband.	Strongly agree (10), Tend to agree (8), Neither agree or disagree (6), Tend to disagree (4), Strongly disagree (2).	Yes
Q10f.	The benefits of gigabit capable broadband are not worth any additional cost.	Strongly agree (10), Tend to agree (8), Neither agree or disagree (6), Tend to disagree (4), Strongly disagree (2).	Yes

Numbers in parentheses represent the assigned numeric value.

The variables were standardised to the same scale, ranging between 2 to 10 (values shown in table A1) with a higher number indicating a lower level of likelihood of switching to Gigabit broadband. To check the reliability of combining these responses a Cronbach's alpha test was implemented and a value of 0.82 was found, which is above the threshold value of 0.7.

A mean of the standardised values was calculated for those who responded to at least three of these questions. This left 1,591 observations for the regression analysis sample, because of the removal of observations unweighted data was used in the regressions.

Models 1 and 2 use a linear estimation method. Model 2 is selected as the core model over Model 1; the second model has a lower BIC value and despite having half the degrees of freedom (14 versus 28) the adjusted R² value is very similar (0.303 versus 0.310).

Tobit model 2 is a tobit estimation of model 2 including an upper bound of 10 and a lower bound of 2 for the dependent variable. This is used as a control to model 2.

Logit model is a logit estimation using the same independent variables as model 2 but uses a binary version of Q15 (table A1) as the dependent variable. The dependent variable equals 1 if the individual answered “Very unlikely” or “Not at all likely” to Q15 and “Don’t Know” responses were removed from the regression sample.

Table A2: Likelihood scale regression results

Category	Variable	Model 1	Model 2 (Core)	Tobit model 2	Logit model
Dependent	Dependent variable	Likelihood scale	Likelihood scale	Likelihood scale	Q15
Housing	Rent	0.090 (0.082)			
Housing	Other	0.144 (0.341)			
Gender	Female	0.409*** (0.071)	0.424*** (0.071)	0.436*** (0.072)	0.397*** (0.132)
Household Income	62k or more	-0.154*** (0.139)			
Household Income	Prefer not to answer	0.381*** (0.116)			
Household Income	<28k	0.390*** (0.081)	0.344*** (0.072)	0.351*** (0.073)	0.235* (0.134)
Age Band	25-34	-0.007 (0.187)			
Age Band	35-44	0.023 (0.179)			

Age Band	45-54	0.510*** (0.177)			
Age Band	55-64	0.657*** (0.185)			
Age Band	65+	0.812*** (0.184)			
Age Band	<45yrs		-0.626*** (0.080)	-0.639*** (0.089)	-0.431*** (0.146)
Household Size	Single or couple	0.362** (0.167)	0.442*** (0.164)	0.444*** (0.167)	1.252*** (0.335)
Household Size	Small household	0.308* (0.167)	0.334** (0.165)	0.334** (0.168)	0.781** (0.341)
Urban-rural	Town and Fringe	-0.071 (0.080)			
Urban-rural	Village	-0.013 (0.099)			
Urban-rural	Hamlet/Isolated Dwelling	-0.407* (0.213)			
Nation	Northern Ireland	-0.071 (0.206)			
Nation	Scotland	0.101 (0.128)			
Nation	Wales	-0.154 (0.150)			
Internet Speed	Standard <24Mbps	0.292*** (0.088)	0.292*** (0.087)	0.295*** (0.089)	0.440*** (0.161)
Internet Speed	Ultrafast >100Mbps	-0.138 (0.110)	-0.169 (0.109)	-0.166 (0.111)	-0.461 (0.202)
Internet Speed	Don't Know	0.428*** (0.132)	0.460*** (0.132)	0.474*** (0.135)	0.836*** (0.273)

Meets needs	Tend to disagree	0.598** (0.243)	0.591*** (0.243)	0.577** (0.247)	0.353 (0.512)
Meets needs	Neither agree or disagree	0.990*** (0.232)	0.989*** (0.232)	0.982*** (0.236)	0.632 (0.492)
Meets needs	Tend to agree	1.554*** (0.221)	1.576*** (0.221)	1.566*** (0.225)	1.595*** (0.468)
Meets needs	Strongly agree	2.580*** (0.225)	2.608*** (0.225)	2.635*** (0.229)	2.951*** (0.478)
	Constant	3.906*** (0.297)	4.531*** (0.266)	4.538*** (0.270)	-0.301*** (0.570)
	Observations	1591	1591	1591	1289
	Adjusted R2	0.310	0.303		
	F statistic	28.41***	58.51***		

*p<0.1, ***p<0.05 and ***p<0.01

Note that a higher dependent variable indicates a lower level of likelihood, therefore a positive coefficient indicates lower likelihood of switching to Gigabit broadband and a negative coefficient indicates a higher likelihood.

For Model 1, the base values are as follows

- Owns house' either through mortgage or outright for the housing tenure variable
- Male for the gender variable
- Earns between £28,000 and £62,000 for the household income variable
- Aged between 18-24 for the age variable
- Large household size (five or more people) for the household size variable
- Urban area for the rural-urban variable
- England for the nation variable
- Superfast internet speed equivalent to 24-100Mbps for the internet speed variable
- Strongly disagree with the statement 'The broadband I currently have meets my needs in terms of speed and reliability.'

For the other 3 models, the base values are as follows

- Male for the gender variable
- Earns more than £28,000 or 'prefer not to say' for the household income variable
- Aged above 45 years for the age variable
- Superfast internet speed equivalent to 24-100Mbps for the internet speed variable
- Strongly disagree with the statement 'The broadband I currently have meets my needs in terms of speed and reliability.'

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We tested for co-dependencies, multicollinearity was not found to be a significant concern and including interactions did not improve model fit.

The coefficients on the remaining variables in model 2 are very similar to those in model 1 further showing the insignificance of housing tenure, nations and urban-rural status on likelihood. The coefficients are also very similar between model 2 and the control tobit model 2 suggesting that there are not many individuals at the bounds of the likelihood scale. There are a few differences in significance between the logit model and the other models however all of the coefficients move in the same direction.