In the RPL model, conditional on the individual specific parameters βi and error components εi the probability that individual *i* chooses alternative *j* in a particular choice task *n* is represented as:

|  |  |  |
| --- | --- | --- |
|  |  | ( 2) |
|  |  |  |

Note, choices for bovine and ovine farmers were modelled separately to explore preference heterogeneity between both groups. The unconditional choice probability is the expected value of the logit probability over all possible values of β weighted by the density of β. The marginal probability of choice can be derived from integrating the distribution functions for the random parameters β. The probability of choosing alternative *j* over *N* observed choices is:

|  |  |  |
| --- | --- | --- |
|  |  | ( 3) |
|  |  |  |

Where *f (β|θ)* is the density function for *β* with a mean *b* and covariance *W*. This equation does not have a closed form and so we rely on simulation methods (for details see Train (2009)). Draws of values of are drawn from for r=1,…, R. The probabilities are approximated by drawing the values from the density function and averaged to estimate the simulated probability. Random parameters were estimated using 1000 Halton draws which take into account the heterogeneity of parameter values sampled from the distribution of respondent’s choice (Greiner, 2015; Mariel et al., 2013). A normal distribution is assigned to the all random parameters (accept subsidy) to allow respondents to have either positive or negative marginal utility for the contract attributes (Christie et al., 2015). A triangular distribution was assigned to the subsidy attribute to ensure the parameter does not change sign over its range.

In a CE, the standard approach to calculate respondent WTA is to is to compute . Given the contract attributes were effects coded WTA estimates were calculated from the ratio where *k* is the attribute coefficientand *c* is the cost coefficient as outlined by Bech and Gyrd‐Hansen (2005). Confidence intervals were estimated using the Delta method. Individual specific parameters (Table 2) for individual *i* were dummy coded and interacted with random parameters to determine policy relevant factors influencing contract preferences. Contract probabilities of enrolment were calculated under alternative payment scenarios to determine how probability of uptake varied according to contract attributes and payment rates, following a similar method to Adams et al, (2014). Based on the CE, the probability of an individual *i* choosing a contract alternative *j* is given by:

|  |  |  |
| --- | --- | --- |
|  |  | ( 6) |

whereby alternative specific variables (i.e. contract options) for individual *i* and alternative *j* are given by whilst coefficients are denoted by γ. Case specific variables for individual *i* are given by *xi* whilst coefficients are denoted by β. We estimated the probability of participation for case specific contracts under two scenarios– ‘optimal’ and ‘non-optimal’ contracts. ‘Optimal’ refers to contract attributes (excluding subsidy) that meet the preferences of agents while ‘non-optimal’ contracts do not. This was relative to a non-enrolment option.