Appendix B - Vote transfer methodology

Best for Britain's analysis measured the similarity between the demographic profiles of the Don't Knows and each party's voters by calculating the Kullback-Leibler divergence between the two distributions. K-L divergence is a statistic that measures how different one distribution is from another, with the discrete version of the statistic given by

$D = \sum_{x \in X} P(x) log(\frac{P(x)}{Q(x)})$, where P(x) is the share of Don't Knows in demographic bin x (out of |X| possible bins, e.g. age 18-24, 25-34, etc.), and Q(x) is the share of the given party's voters in demographic bin x. We calculate D for each party separately in England, Scotland, and Wales, and transform them to reflect relative rather than absolute differences in distribution: $D(x)_{new} = \frac{D(x)}{\sum_{x \in X} D(x)}$, with D(x) the K-L divergence for party x. Because a higher value of D corresponds to a distribution further from that of the Don't Knows, we reorder the set of Ds by party so that the party with the most similar demographic profile is given the highest value of D. We then distribute the Don't Know vote share to each party by the following partition: $s(x) = \frac{D(x)p(x)}{\sum_{x \in X} D(x)p(x)}$, with D(x) the re-ordered relative K-L divergence for party x, and p(x) party x's vote share in that country.