**HW 5\_ECON613**

Weijia Qiu (0830479)

Hw1

Q1

A screenshot of a cell phone

Description automatically generated

Q2

A screenshot of a cell phone

Description automatically generated

Bootstrap 49

A screenshot of a cell phone

Description automatically generated

Boot strap499

A screenshot of a cell phone

Description automatically generated

Q3

A screenshot of text

Description automatically generated

Q4:

A screenshot of a cell phone

Description automatically generated

A screenshot of text

Description automatically generated

A screenshot of text

Description automatically generated

Q5:

Marginal effect (delta method) (probit model)

A screenshot of a cell phone

Description automatically generated

Marginal effect (delta method) (mlogit model)

A screenshot of a cell phone

Description automatically generated

Hw3

Q1

A screenshot of a cell phone

Description automatically generated

A screenshot of a cell phone

Description automatically generated

A screenshot of a cell phone

Description automatically generated

A screenshot of a cell phone

Description automatically generated

Q2:

Iteration 0: log likelihood = -7559.2014

Iteration 1: log likelihood = -7465.2594

Iteration 2: log likelihood = -7464.9321

Iteration 3: log likelihood = -7464.9321

Alternative-specific conditional logit Number of obs = 44,700

Case variable: v2 Number of cases = 4470

Alternative variable: price Alts per case: min = 10

avg = 10.0

max = 10

Wald chi2(1) = 1458.85

Log likelihood = -7464.9321 Prob > chi2 = 0.0000

------------------------------------------------------------------------------

dum | Coef. Std. Err. z P>|z| [95% Conf. Interval]

-------------+----------------------------------------------------------------

price |

c | -6.656579 .1742793 -38.19 0.000 -6.99816 -6.314998

-------------+----------------------------------------------------------------

1 | (base alternative)

-------------+----------------------------------------------------------------

2 |

\_cons | -.9543068 .0500462 -19.07 0.000 -1.052396 -.856218

-------------+----------------------------------------------------------------

3 |

\_cons | 1.296968 .1086515 11.94 0.000 1.084015 1.509921

-------------+----------------------------------------------------------------

4 |

\_cons | -1.717332 .0541582 -31.71 0.000 -1.82348 -1.611184

-------------+----------------------------------------------------------------

5 |

\_cons | -2.904005 .0714605 -40.64 0.000 -3.044065 -2.763945

-------------+----------------------------------------------------------------

6 |

\_cons | -1.515311 .1262303 -12.00 0.000 -1.762718 -1.267904

-------------+----------------------------------------------------------------

7 |

\_cons | .2517684 .079164 3.18 0.001 .0966098 .406927

-------------+----------------------------------------------------------------

8 |

\_cons | 1.464868 .1180467 12.41 0.000 1.233501 1.696236

-------------+----------------------------------------------------------------

9 |

\_cons | 2.357505 .133774 17.62 0.000 2.095313 2.619697

-------------+----------------------------------------------------------------

10 |

\_cons | -3.896594 .177419 -21.96 0.000 -4.244328 -3.548859

Marginal effect(Q4: partial)

A close up of text on a white background

Description automatically generated

A close up of text on a white background

Description automatically generated

A close up of text on a white background

Description automatically generated

A close up of text on a white background

Description automatically generated

A close up of text on a white background

Description automatically generated

Interpretation Q3.2.3: Because beta is negative, which indicates that the higher the price it is, theess utility that an individual will have by choosing the product, and the less likely it is that an individual is going to choose the product.

alfa1, alfa3, alfa4, alfa5,alfa9 are all negative, which indicates that compared with the product 1 ( PPk\_Stk), product 2,4,5,6,10 ( PBB\_Stk, PHse\_Stk,PGen\_Stk,PImp\_Stk,PHse\_Tub) are less preferred and thus are less likely to be chosen given the same price.alfa2, alfa6,alfa7, alfa8, are all positive, which indicates that compare with the product 1 (PPk\_Stk), product 3,7,8,9 (PFl\_Stk,PSS\_Tub,PPk\_Tub,PFl\_Tub) are more preferred and thus they are more likely to be chosen given the same price.

A screenshot of a cell phone

Description automatically generated

A screenshot of a cell phone

Description automatically generated

Marginal effect (Q4 partial)

A screenshot of a cell phone

Description automatically generated

A screenshot of a social media post

Description automatically generated

A screenshot of a cell phone

Description automatically generated

Q5:

A screenshot of a cell phone

Description automatically generated

A screenshot of a cell phone

Description automatically generated

IIA test:

A screenshot of a cell phone

Description automatically generated

A screenshot of a cell phone

Description automatically generated

Conclusion: The result of hausman test shows that we can hardly reject IIA. The reason might be that the sample of the product 10 is too small to show any significant difference if we remove its observations

Hw4

Q1:

A screenshot of a social media post

Description automatically generated

A screenshot of a cell phone

Description automatically generated

A screenshot of a cell phone

Description automatically generated

A screenshot of a cell phone

Description automatically generated

A screenshot of a cell phone

Description automatically generated

A screenshot of a cell phone

Description automatically generated

Q2:

A screenshot of text

Description automatically generated

Q3:

Between Estimator

A screenshot of a cell phone

Description automatically generated

Within Estimator

A screenshot of text

Description automatically generated

First Difference Model

A screenshot of a cell phone

Description automatically generated

Q4:

A screenshot of a cell phone

Description automatically generated

Q4.3

The standard errors in the previous model are wrong because of some auto-correlation issues in the model.

In this case, the standard errors we calculated in the previous model by using ols method can hardly get the robust standard error of coefficients

Alternative approach: We can use robust ols method to get the adjusted standard errors of coefficients.We can also use gls to get robust standard errors of coefficients.