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1    /*************************************************************
     ***********
2    Project:    ECON 613 Stata Short Tutorial
3    Created by: Weijia Qiu
4    Created:    2019/04/15
5    *************************************************************
     **********/
6
7
8    clear all
9    set more off, perm
10   set scrollbufsize 2000000
11   capture log close
12   log using  "/Users/huangguo/Desktop/613/session 2.smcl", replace
13
14   //HW1
15   //Exercise 1
16   set obs 10000
17   set seed 100
18   generate x1=runiform(0,1)
19   generate x2=rgamma(3,2)
20   generate x3=rbinomial(10000,0.3)
21   generate eps=rnormal(2,1)
22   generate Y=0.5+1.2*x1-0.9*x2+0.1*x3+eps
23   egen mean_Y=mean(Y)
24   generate ydum=0
25   replace ydum=1 if Y>mean_Y & Y!=0
26   //Exercise 2
27   //Question 1
28   correlate Y x1
29   // Conclusion: the correlation is 0.047, which is far different
     from 1.2
30   //Question 2 and Question 3 (Calculate standard errors by using
     OLS formula)
31   regress ydum x1 x2 x3
32   // Question 3 (Calculate standrad errors by using bootstrap)
33   bootstrap, reps(49) seed(100): regress ydum x1 x2 x3
34   bootstrap, reps(499) seed(100): regress ydum x1 x2 x3
35   //Exercise 3
36   mlexp ( ydum*lnnormal({b1}*x1 + {b2}*x2 + {b3}*x3+{b0}) + (1-ydum)*
     lnnormal(-({b1}*x1 + {b2}*x2 + {b3}*x3+ {b0})) )
37   ///Exercise 4
38   regress ydum x1 x2 x3
39   //Interpretation: All the coefficients in the linear regression
     model are significant,
40   mlogit ydum x1 x2 x3
41   //Interpretation: All the coefficients in the linear regression
     model are significant,
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42    probit ydum x1 x2 x3
43    //Interpretation: All the coefficients in the linear regression
      model are significant,
44    //Comparision: The coefficients in the probit model and logit
      model are very close except their intercepts. The signs of the
      coefficients are respectively the same in all these three models.
45    //Exercise 5
46    probit ydum x1 x2 x3
47    margins, dydx(*) vce(delta)
48    mlogit ydum x1 x2 x3
49    margins, dydx(*) vce(delta)
50
51
52
53
54    /// HW3
55    //Exercise 1
56    //Q1
57    clear
58    insheet using/Users/huangguo/Desktop/613/hw3/product.csv
59    sort hhid
60    save data1,replace
61    clear
62    insheet using/Users/huangguo/Desktop/613/hw3/demos.csv
63    save data2,replace
64    sort hhid
65    merge 1:m hhid using data1.dta
66    gen n = 4470
67    gen v2 = _n
68    summarize phse_stk ppk_tub ppk_stk pgen_stk pfl_tub phse_stk
      ppk_tub ppk_stk pgen_stk pfl_tub
69    tab choice
70    tab choice income
71
72    //Q2
73    //Use conditional logit model
74    rename (ppk_stk pbb_stk pfl_stk phse_stk pgen_stk pimp_stk pss_tub
      ppk_tub pfl_tub phse_tub)(c1 c2 c3 c4 c5 c6 c7 c8 c9 c10)
75    reshape long c,i(v2) j(price)
76    gen dum = cond(price == choice,1,0)
77    asclogit dum c,case(v2) alternatives(price)
78    est sto c_logit
79    estat mfx
80    //Interpretation Q2.3: Because beta is negative, which indicates
      that the higher the price it is, the less 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.
81    //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.

82 //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.

83

84 //Q3&4

85 asclogit d, case(v2) alternatives(price) casevar(income)

86 est sto m_logit

87 estat mfx

88

89 //Q5

90 asmixlogit dum, random(c) casevar(income) alternatives(price) case(v2)

91 estimate store haha

92 drop if choice == 10

93 drop if price == 10

94 asmixlogit dum, random(c) casevar(income) alternative(price) case(v2)

95 estimate store hahapartial

96 hausman hahapartial haha, alleqs constant

97 //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

98

99

100 //HW4

101 clear

102 insheet using /Users/huangguo/Desktop/613/hw4/Koop-Tobias.csv,names

103 //convert data into panel data

104 xtset personid timetrnd

105 bysort personid: gen t = _n

106 //Represent the panel dimension of wages for 5 randomly selected individuals

107 tabulate timetrnd logwage if personid == 3

108 tabulate timetrnd logwage if personid == 13

109 tabulate timetrnd logwage if personid == 133

110 tabulate timetrnd logwage if personid == 1133

111 tabulate timetrnd logwage if personid == 1333

112

113 //Q 2

114 //Random effect model

115 xtreg logwage educ potexper, re

116

117 //Q 3

```
118  //Fixed effect model
119  //Between Estimator
120  xtreg logwage educ potexper,be
121  //Within Estimator
122  xtreg logwage educ potexper,fe
123  //First time difference estimator
124  xtset personid t
125  xtdes
126  gen logwage_D = D.logwage
127  gen educ_D = D.educ
128  gen potexper_D = D.potexper
129  xtreg logwage_D educ_D potexper_D, fe
130  //Q4
131  mlexp (ln(normalden(logwage, {b0} + {b1}*educ+ {b2}*potexper, {
     sigma})))
132  //Q4.3
133  //The standard errors in the previous model are wrong because of
     some auto-correlation issues in the model.
134  //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
135  //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.
136
137  log close
138
139
```