

Name: _____

ECON 453
In-Class Exercise 7
October 24, 2023

Please download the file “IC7.gdt”, a gretl data file. This dataset comes from the 2019 American Community Survey and is the same data we used In-Class Exercise 6. The dataset includes individuals that have a bachelor’s degree in economics, accounting, marketing, or finance, work at least 30 hours per week, make at least \$15,000 per year, and are between the ages of 25 and 40. Please open the data file. The dataset contains basic descriptions of each of the variables.

In addition, please download and open the Excel file called “IC7 Prediction Template”. You will find two sheets, one for the Linear Probability Model, and one for the Logit model.

We will follow what we did in In-Class Exercise 6, and use “**ever_married**” as our dependent variable. This variable is 0 if the individual has never been married and 1 if they have been married at some point in their life.

1. Run a linear probability model (OLS regression) using the “Ever married” variable as the dependent and the following regressors: female, age, immig, and nchild.
 - a. Use the LPM prediction template in Excel. Plug in the coefficients from your regression.
 - b. Last time, we were predicting for Janky McMurphy, a 33-year-old female Irish Immigrant. Predict the following probabilities
 - i. The probability Janky has been married if she has 0 children: _____
 - ii. The probability Janky has been married if she has 1 child: _____
 - iii. The probability Janky has been married if she has 2 children: _____
 - iv. The probability Janky has been married if she has 3 children: _____
 - c. Comment briefly on how realistic the estimated marginal effects of having each child are in the linear probability model.
2. Run the same regression as in question 1 but use a binary Logit model instead.
 - a. Use the Logit prediction template in Excel. Plug in the coefficients from your regression.
 - b. Find the mean values for each of the explanatory values and plug them into the “Means” column in the template.
 - c. Find the “marginal effects” of being female and being an immigrant. To do this, use the mean value for each variable, then adjust the dummy variable of interest from 0 to 1.
 - i. Marginal effect of being female: _____
 - ii. Marginal effect of being an immigrant: _____
 - d. Last time, we were predicting for Janky McMurphy, a 33-year-old female Irish Immigrant. Predict the following probabilities
 - i. The probability Janky has been married if she has 0 children: _____
 - ii. The probability Janky has been married if she has 1 child: _____
 - iii. The probability Janky has been married if she has 2 children: _____
 - iv. The probability Janky has been married if she has 3 children: _____

- e. Compare the estimated marginal effects of having each child in the Logit model to those from the linear probability model.
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- 3. Create dummy variables for people that have 1 child in the home, 2 children in the home, and 3 or more children in the home. Run a linear probability model using **"ever_married"** as the dependent variable and the following regressors: female, age, immigrant, and your new children dummies.
 - a. What is the estimated impact on the probability of being married from having the:
 - i. First child: _____
 - ii. Second child: _____
 - iii. Third child: _____
 - 4. Create a simple dummy variable, "kids", that is 1 if the person has any children in the home and 0 if not. Create an interaction term between the female and "kids" variables. Run a linear probability model using **"ever_married"** as the dependent variable and the following regressors: female, age, immigrant, kids, and the interaction term.
 - a. Report the coefficient on the interaction term. What does this tell us, and does this make sense?
 - 5. Run the same regression as in question 4 but use a binary Logit model instead.
 - a. Compare the estimated interaction effect from this model to the one in the LPM in question 4.