

Homework #8***** Due Thursday, May 2nd at the beginning of lecture (9:30 a.m.)*****

You will have lab problems and written problems for this assignment.

You will be using the data set `loan_edited.dta` located at Beachboard to do the Lab Problems. Please work on the STATA code during lab so you can ask questions of the lab instructor. For the lab problems, I want you to submit your log file and your **typed** answers in complete sentences. Do not submit your `do` file.

The answers to the written problems are to be neatly written out or typed. The answers to anything that asks you to explain should also be in complete sentences.

Please submit everything in one package in the order assigned in this homework.

Lab Problems

L1. The dataset `loan_edited.dta` contains loan application data. The dataset describes each variable used in this question. This question looks at the determinants of loan approval. Create a `do` file `loan.do` and a log file `loan.log` for this problem. Submit the log file with your answers. Label each part of this assignment using comments, so `/*part a*/` should be before part a) and so on...

- a. Use OLS regression to estimate the following model.
 - i. Dependent variable: `approve`, this indicates the person had their loan approved; explanatory variables are `hrat` `loanprc` `unem_ind` `male` `married` `dep` `school` `cosign` `chist` `bankrupt` `mortlatel` `mortlate2` `high_vacancy` `white`
- b. Use `logit` to estimate the following model.
 - i. Dependent variable: `approve`, this indicates the person had their loan approved; explanatory variables are `hrat` `loanprc` `unem_ind` `male` `married` `dep` `school` `cosign` `chist` `bankrupt` `mortlatel` `mortlate2` `high_vacancy` `white`
- c. Estimate the marginal effects of each variable using the mean value of all dependent variables using `margins` and `atmeans`.
- d. Estimate the marginal effects of each variable as the average of the marginal effects using `margins`.
- e. Since `male` is a discrete dummy variable, use `margins` and `male = (0 1)` to get the marginal effects.
- f. Use `probit` to estimate the following model.
 - i. Dependent variable: `approve`, this indicates the person had their loan approved; explanatory variables are `hrat` `loanprc` `unem_ind` `male` `married` `dep` `school` `cosign` `chist` `bankrupt` `mortlatel` `mortlate2` `high_vacancy` `white`

- g. Estimate the marginal effects from using probit of each variable as the average of the marginal effects using margins.

Questions

Q1. Use the results from L1 to answer this question.

- a. Assuming you don't have any violations of OLS, interpret the coefficient on "white" from the regression you ran in L1, part a).
- b. Use the following values and the coefficients from L1, part a). What is the estimated probability? Hint: Only use statistically significant coefficients with p-values less than 0.10.
- | | | | | | | | |
|----|---------|---------|-----------|-----------|--------|----------|--------------|
| a. | married | dep | bankrupt | hrat | cosign | unem_ind | high_vacancy |
| | school | | | | | | |
| b. | 1 | 1 | 0 | 22.54 | 0 | 3.2 | 1 |
| | 1 | | | | | | |
| c. | male | approve | mortlate1 | mortlate2 | chist | loanprc | white |
| d. | 1 | 0 | 0 | 0 | 1 | 0.8 | 1 |
- c. What is a potential problem with using the model you estimated in L1, part a)?
- d. Use your results from the model you estimated in L1, part b). Does there appear to be a positive or negative impact on the probability of getting a loan from being white relative to being black?
- e. Use your marginal results from L1, part c). Interpret the marginal effect for the variable white.
- f. Use your marginal results from L1, part d). Interpret the marginal effect for the variable white.
- g. Are the marginal results from parts e) and f) above the same? Explain why there might be a difference, even if it is small.
- h. Use your results from L1, part e). Calculate the difference between the two estimates. This is the marginal difference between being white and being nonwhite. Compare your answer to your answer in part g).
- i. Use your results from the model you estimated in L1, part f). Does there appear to be a positive or negative impact on the probability of getting a loan from being white relative to being black?
- j. Multiply the coefficient from L1 part f) on white by 1.81. How does this compare to the coefficient on white in L1 part b)? Explain.

- k.** Use your results from L1, part g). Interpret the marginal effect for the variable `white`.
- l.** Compare the marginal effect for the variable `white` as discussed in this question in parts f) and l).
- m.** Based on these results, does there appear to be a racial bias in terms of who gets loans approved?