Homework 5: Ordered Response Models

Due Date:

Exercise 1: Interpretation

Use the same data set as last week – nes92.dta – which is a small subset of the 1992 National Election Study (cleaned up). The file should be reasonably self-documenting but you can also look at the codebook (nes92_codebook.pdf).

1. Drop the Perot voters. Estimate the following model using probit, ordered probit, logit and ordered logit:

$$\begin{aligned} clinton_i^* = \beta_0 &+ \beta_1 DistancetoClinton + \beta_2 DistancetoBush + \beta_3 Economyworse \\ &+ \beta_4 Education + \beta_5 Union + \beta_6 Income + \beta_7 Black + \epsilon \end{aligned} \quad (1)$$

   Put the results in a table like the one below. What is the relationship between probit and ordered probit, and between logit and ordered logit?

Table 1: The Determinants of Presidential Vote Choice in 1992

Dependent Variable: ClintonVote (1 if Clinton, 0 if Bush)

Regressor	Probit	Ordered Probit	Logit	Ordered Logit
DistancetoClinton				
DistancetoBush				
EconomyWorse				
Education				
Union				
Income				
Black				
Constant				
τ_1				
Log likelihood				
Observations				

* $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$ (two-tailed)
(Standard errors are given in parentheses)

2. Now clear the data from STATA and reload nes92.dta so that we now regain the Perot voters. $v2$ is a measure of Bush Approval. Rename the variable 'bushapproval'. This variable goes from 0 = Strongly Disapprove, 1 = Disapprove, 2 = Approve, and 3 = Strongly Approve. Label the values as above in STATA. Now type 'tabulate bushapproval'. You will now see the number of responses in each category.

3. Now estimate the following model using OLS, ordered probit and ordered logit.

$$\begin{aligned} BushApproval_i^* = \beta_0 &+ \beta_1 Economyworse + \beta_2 Education + \beta_3 Union \\ &+ \beta_4 Income + \beta_5 Black + \epsilon \end{aligned} \tag{2}$$

Put the results in a table like the one shown below:

Table 2: The Determinants of Bush Approval

Dependent Variable: The Determinants of Bush Approval
(0 Strongly Disapprove 3 Strongly Approve)

Regressor	OLS	Ordered Probit	Ordered Logit
EconomyWorse			
Education			
Union			
Income			
Black			
Constant			
τ_1			
τ_2			
τ_3			
Log likelihood			
Observations			

* $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$ (two-tailed)
(Standard errors are given in parentheses)

4. Using the results from the ordered probit model, manually (in STATA) test that the threshold parameters are statistically different from each other i.e. test that τ_1 is different from τ_2 and that τ_2 is different from τ_3. How do you interpret the threshold parameters?

5. By hand (in STATA) fill in the table shown below with the following guidelines.

- Scenario 1: Respondent is white, Education=15 years, Income=$30,000, Union=0, EconomyWorse=3
- Scenario 2: Respondent is white, Education=15 years, Income=$30,000, Union=1, EconomyWorse=3
- Difference: Change in probability between Scenario 1 and Scenario 2 i.e changing Union from 0 to 1.
- Marginal Effect (Income): This is the marginal effect of income in scenario 1.

Table 3: Predicted Probabilities, Marginal Effects, First Differences

	Strongly Disapprove	Disapprove	Approve	Strongly Approve
Predicted Probability (Scenario 1)				
Predicted Probability (Scenario 2)				
Difference				
Marginal Effect (Income) (Scenario 1)				

Scenario 1: Union=0; Scenario 2: Union=1
Education=15 years, Income=$30,000, Union=0, EconomyWorse=3
(95% Confidence Interval in parentheses)