

Homework 18: ECO220Y - SOLUTIONS

Problems:

- (1) It is possible for (a), (c), and (f). For (c), simply take the natural log of both sides. For (f), simply take the square root of both sides.
- (2) Term will be endogenous because it is correlated with the error: all other factors that affect a student's final examination performance. Some factors that are included in this error are: effort, motivation, study habits, class attendance, student's attitude toward studying, number of other final examinations close to same time, and health on the day of the final examination. Aside from the last two factors, the others will affect BOTH the final examination mark AND the term mark. If we have a regression with an endogenous variable like this one, we cannot say that increasing a student's term marks with OTHER THINGS EQUAL will cause a higher mark on the final examination. The only way for term marks to be exogenous is if grades were completely arbitrary: every student gets a random grade. If that were the case, the $term_i$ would be independent of the error as required and Assumption #5 would be met.
- (3) There is no reason to believe that any of the six assumptions are violated in this case. Height should be exogenous because there is no expected correlation between a student's height and effort, motivation, study habits, statistical ability, class attendance, student's attitude toward studying, number of other final examinations close to same time, health on the day of the final examination, or anything else that tends to affect a student's performance on the final examination. Hence there is no violation of Assumption #5. For the other assumptions (#1 - #4, and #6) there is no logical reason to believe that there would be a violation of those either. Because we would not believe there to be a relationship between heights and marks, we would expect beta to be 0. Of course if we actually estimated this model the estimate of beta would be a small negative number or a small positive number: in expectation it is zero.
- (4) Ask TA on tutorial or office/help hours.