

Empirical Project, Eco 311
Professor Jing Li

The project is due at the beginning of the final exam.

Project Description

This empirical project is intended to test your ability to conduct an empirical analysis and convey the results using everyday writing accessible to a non-specialist audience. You will be asked to write a letter to your family in which you interpret and explain the results of an empirical analysis assuming your family members know nothing about econometrics.

This project is 10% of your total course grade. Late submissions are unacceptable. Attached to your body of work should be an appendix of R commands and results. Your letter should be less than five single-spaced pages, and the appendix is not subject to the page limitation. The letter should use standard font and margin. In essence, a good project is expected to accomplish the following three goals:

- 1) The content should be presented clearly so that your non-specialist audience can follow and understand it.
- 2) Your argument should convince your audience (in this case, me!)
- 3) The method you use should be econometrically or statistically sound.

Topic: Using Econometrics to Aid in Choosing Schools for Your Sister

You have a young sister who will graduate in high school in next spring. Since you are the only person in your family that understands econometrics/statistics, they hope you can use expert knowledge to narrow down the list of colleges/universities that your sister will apply for. What makes your job challenging is the fact that different family members have different priorities. In other words, they define “good schools” using different criteria.

(A) The main concern of your sister is the difficulty level of getting accepted by a school. She understands that it is hard to get admitted by a school that is selective, but she is not sure how to measure selectiveness. Somebody tells her that maybe private schools are more selective than public schools, and she hopes you can provide statistical evidence for that argument. If what she hears turns out to be true, maybe she will apply for public schools only.

(B) Your mother is very cost-conscious, and she is primarily concerned with the monetary cost of college education. She would like to pay a high tuition only if it is justified by high quality. For example, she understands that a low student-teacher ratio may signal for high quality, and she is curious whether there are other signals for high quality. She also understands improving quality (such as lowering the student-teacher ratio) entails raising tuition. Your mother would be very happy if you can present her some sort of quality-adjusted cost or quality-weighted tuition, based on which she can hunt for “bargain schools” for your sister. The school “with best value”, according to your mother, should be the one that charges tuition less than that implied by its quality.

(C) Your dad is an engineer, and he loves his job. So he hopes your sister can become an engineer as well. In terms of school choices, you dad hopes your sister can go to a school where the students on average have good math skill, which is needed by an engineer. For whatever reason, your dad would prefer your sister goes to a school outside Ohio. Your dad would like to see a list of five schools that (i) are outside Ohio, and (ii) put highest premium on the math skill.

Your job is to write a letter with three subsections. In each section you need to explain in detail to each family member how you use econometrics or statistics to address their concerns. In particular, you need to show them how the empirical results are linked to their questions. You need to convey your results so that a non-specialist audience can understand. Thus my suggestion is that in the letter you need to try to minimize using jargons such as p-value and residual. Nevertheless, I hope to see how you take care of those econometric issues in the appendix of R commands and results.

The data you will use for this project is called School data, which is posted on my webpage. The data contains 717 colleges and universities in US. The variables and explanations are in Table 1 below:

Table 1: Variable Descriptions

school	Name of a college or university
state	The state in which the school is located
private	=1 for a public school; =2 for a private school
mathsat	The average SAT math score of newly enrolled students
verbalsat	The average SAT verbal score of newly enrolled students
applications	The number of applications received by a school
acceptance	The number of accepted applications
newenrolled	The number of students newly enrolled
fulltimeunder	The number of full-time undergraduate students
parttimeunder	The number of part-time undergraduate students
instatuition	The in-state tuition
outofstatetuition	The out-of-state tuition
phdfal	The percentage point of faculties who hold doctoral degrees
stufalratio	The student-faculty ratio

Table 2: Tentative Rubric

Criteria	Exceed	Meet	Fail
Is your letter well organized? Is the material ordered in a way that is logical, clear and easy to follow?			
Does the letter show high quality of econometric reasoning? Are econometric methods properly chosen and implemented? Are the statistical evidences adequate?			
Do you explain the results so that a non-specialist can understand?			
Is your letter free of grammatical or spelling problems?			
Are the paragraphs and sentences cohesive? Is the writing good?			

The rubric above is suggestive. It shows you roughly what I am looking at in your letter.

You can seek help from me, but not from your classmates. For instance, you can ask me for clarification if you think some part of this project is unclear. You need to convince me that what you do makes econometric sense, and are relevant to the concerns raised by your family numbers. There are possibly multiple ways of conducting the empirical analysis. Please discuss fully if different approaches produce different answers. Ultimately, the success of this project depends crucially on the care and effort you put into it.

If you would like a feedback on a draft of your writing, please visit the Howe Writing Initiative in FSB 3064. Appointments can be made online at www.miamioh.edu/hwi. They can only help your writing, not econometrics!