

INSTRUCTIONS:

1. Answer **ONLY** the specified number of questions from the options provided in each section. Do not answer more than the required number of questions. Each section takes one hour.
2. Your answers must be on the paper provided. No more than one answer per page. Do not answer two questions on the same sheet of paper.
3. If you use more than one sheet of paper for a question, write "Page 1 of 2" and "Page 2 of 2."
4. Write **ONLY** on one side of each sheet. Use only pen. Answers in pencil will be disqualified.
5. Write ----- **END** ----- at the end of each answer.
6. Write your exam identification number in the upper right-hand corner of each sheet of paper.
7. Write the question number in the upper right-hand corner of each sheet of paper.

Section 3: Econometrics—Answer One Question.

3A. (Econ 203A) The California Standardized Testing and Reporting (STAR) dataset contains data on test performance, school characteristics and student demographic backgrounds. The data used here are from all 420 K-6 districts in California with data available for 2008 and 2009.

TESTSCR: avg test score (= (read_scr+math_scr)/2);
STR: student teacher ratio (enrl_tot/TEACHERS);
EL_PCT: percent of English Learners;

Regression Results

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Dependent variable:

	TESTSCR		
	(1)	(2)	(3)

STR	-1.72** (0.50)	-0.69* (0.27)	-1.02** (0.37)
%EL_PCT		-0.411 (0.306)	
%Eligible for Free lunch			-0.709** 0.091
District		16.53**	
Income(log)		(3.15)	
Constant	739.6 (8.6)	682.4 (11.5)	744.0 (21.3)

Observations	420	420	420
R2	0.054	0.163	0.090
Adjusted R2	0.047	0.158	0.085
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- a) Report the estimated regression model in **specification (1)** in equation format. Test the hypothesis that higher student to teacher ratio leads lower test scores.
- b) Interpret the coefficient on STR in **specification (1)**. If STR falls from 17 to 16, in **specification (1)**, how is TESTSCR expected to change?
- c) What do you make of the substantial increase in Adjusted-R² from **specification (1)** to **specification (2)**? Interpret the value of the Adjusted-R² from column **specification (2)**.
- d) Which one of the three specifications do you prefer and why?

- e) Explain why the coefficient on Student to teacher ratio in **specification (2)** is higher than the one in **specification (1)**. Justify your answer. *Hint: District Income (log) and English learners (%) are part of the error term in column 1.*
- f) Interpret the coefficient on District Income (log) in **specification 2**. Is it statistically significant?
- g) Under specific conditions, OLS is BLUE. What does the acronym BLUE stand for, and what does it tell us about OLS as an estimator?
- h) What is the definition of a biased estimator?

(over)