

ECON 326: The Economics of Developing Countries

Midterm Exam

80 minutes

Please do not open the exam until you are instructed to do so. Write your name on this page and every additional book that you use. The entire exam is worth 75 points, with point values assigned as a roughly suggested amount of time spent on each question. None of the answers are intended to require more than 3-5 sentences, with many requiring no more than a sentence or two. You do not need to write in complete sentences as long as the idea is clear (e.g. bullet points are sufficient).

Read each question carefully and be sure to answer each part.

1 Literature Review (34 points)

1.1 Poverty Traps (6 points)

Fafchamps et al. (2013) randomly provided cash and in-kind grants to male- and female-owned microenterprises in Ghana. In the table below, the dependent variable is real monthly profits, and the relevant independent variables are listed. The omitted group is the control group. For each variable in (i)-(iii), answer whether the effect on profits for men and women pooled was (statistically) positive, negative, or zero, then provide the intuition as to why this was the case.

Dependent variable: Real monthly profits

Cash Treatment

In-kind Treatment

Cash Treatment * Lack of Self-control

In-kind Treatment * Lack of Self-control

(i) (2 pts) In-kind Treatment

(ii) (2 pts) Cash Treatment * Lack of Self-control

(iii) (2 pts) In-kind Treatment * Lack of Self-control

1.2 Fundamental Causes of Development (7 points)

Acemoglu, Johnson, and Robinson (2001) on “Colonial Origins” aims to measure the effect of institutions on economic growth using an instrumental variable (IV) method to address possible endogeneity.

- (a) (2 pts) Provide one potential source of endogeneity and the direction of the bias that this would generate.
- (b) (2 pts) What IV does AJR (2001) use? What does the relevance assumption mean in this context, and what is the channel by which AJR argue that the instrument is relevant?
- (c) (3 pts) Sachs (2001) argues that geography is the key determinant of economic development. Describe one of the main channels through which Sachs argues geography affects development, and discuss how Acemoglu, Johnson, and Robinson (2002) (about the reversal of fortune) argues against it.

1.3 Health (6 points)

- (a) (2 pts) Explain one positive and one negative effect of charging higher prices for health products in developing countries.
- (b) (4 pts) Ashraf et al. (2010) and Cohen and Dupas (2010) run similar experiments that test the effects of price differences on Clorin (a water purification solution) and insecticide treated bednets, respectively. What do they find regarding your effects listed in (a)? If either effect differs across the two papers, provide one potential explanation as to why.

1.4 Education (7 points)

Duflo et al. (2011) evaluates classroom tracking, or placing students of similar ability within the same classroom.

- (a) (1 pt) What is meant by direct vs. indirect peer effects?

(b) (2 pts) What are their findings about the effect of tracking on test scores for above- and below-median students?

(c) (4 pts) In the table below, the dependent variable is the title for each column, and both the independent and dependent variables are measured in standard deviations. How does the table provide evidence of both direct and indirect peer effects? Include reasoning for the different magnitudes across the pre-test score distribution in columns (4) - (6) in your explanation.

TABLE 4—PEER QUALITY: EXOGENOUS VARIATION IN PEER QUALITY (NONTRACKING SCHOOLS ONLY)

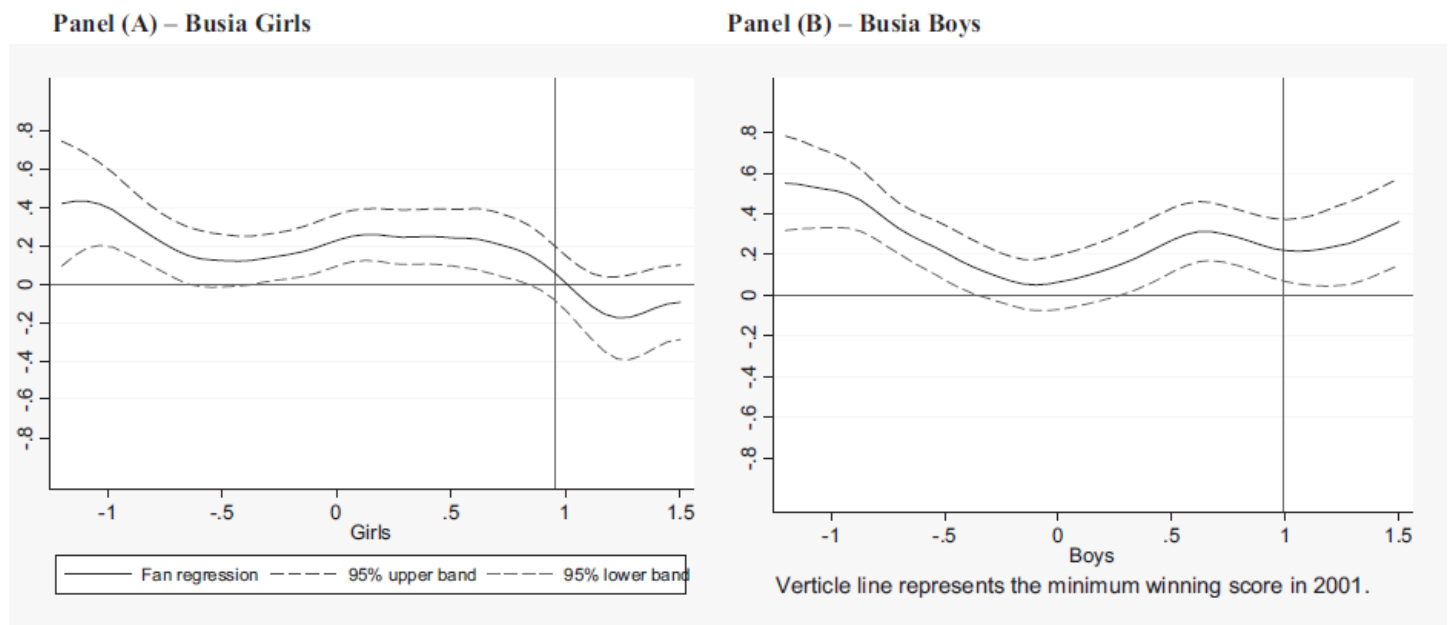
	All			25th–75th percentiles only	Bottom 25th percentiles	Top 25th percentiles only
	Total score (1)	Math score (2)	Lit score (3)	Total score (4)	Total score (5)	Total score (6)
<i>Panel A. Reduced form</i>						
Average baseline score of classmates ^a	0.346 (0.150)**	0.323 (0.160)**	0.293 (0.131)**	−0.052 (0.227)	0.505 (0.199)**	0.893 (0.330)***
Observations	2,188	2,188	2,188	2,188	2,188	2,188

1.5 Health and Education Relationship (7 points)

Miguel and Kremer (2004) produce a “non-experimental” decomposition of the total treatment effect of de-worming on treated schools into the direct effect on treated students and the spillover on untreated students. What does it mean to be “non-experimental?” Summarize the strategy used to identify the effects. *This may be longer than 3-5 sentences, but not too much longer!*

2 Kremer et al. (2009) and Methods (23 points)

The Kremer et al. (2009) paper analyzes the effects of offering a merit scholarship program to the top 15% of Kenyan girls in two districts based on exam scores. They first randomize into control and treatment groups within each district, then compare exam scores between control and treatment. Use the plot below to answer parts (a) and (b).



- (a) (3 pts) The vertical line represents the cutoff for the top 15%. In a few sentences, explain what is interesting or perhaps unexpected about the plots, and provide one potential explanation for this pattern based on the education literature.
- (b) (3 pts) Use your answer from above to answer this question. One of the districts had significant attrition for girls, mostly coming from the upper part of the pretest distribution. Assuming that district had similar effects to the figure, are OLS estimates of the overall treatment effect for girls an overestimate or underestimate of the true effect? Explain.

Suppose the government of Kenya conducts a similar experiment as in Kremer et al. (2009), except that students scoring at or above an 80 on a writing exam are offered admission to an accelerated-learning (AL) classroom. We are interested in the effect of AL classrooms on post-graduation incomes. We have data on individual exam score (S_i), individual AL enrollment ($D_i = 1$ if enrolled), and logged individual income (Y_i), and we consider individuals within 5 points of the cutoff to be “similar.”

- (c) (1pt) Write an expression for T_i , a dummy for whether the individual is offered AL admission, in terms of the data available.

For parts (d) and (e), assume perfect compliance ($T_i = D_i$).

- (d) (3 pts) Draw a hypothetical figure that depicts Y_i vs. S_i . Indicate the size of the treatment effect on the figure, and label this as TE . Is this effect an ATE, ITT, ATT, or LATE? Explain.

- (e) (4 pts) Suppose you learn that after this writing exam, students who finished just below the cutoff received free additional tutoring from the government. Discuss why this would invalidate the RDD strategy. Is TE you estimated from part (d) an over- or underestimate of the true effect of the AL class? Explain in one sentence.

For the remaining sections, assume there is imperfect compliance ($T_i \neq D_i$): not every student offered admission to the AL classroom takes it up.

- (f) (5 pts) Suppose the figure you drew in (c) now depicts the relationship between Y_i and S_i with imperfect compliance. Is TE now an ATE, ITT, or ATT? Explain. Is the LATE larger or smaller than TE ?

- (g) (4 pts) Suppose you learn that the distribution of scores is manipulated around the score of 80: students with richer, well-connected parents are graded systematically easier, so that their scores tend to be above 80. Discuss why this would invalidate the RDD strategy. Is TE an over- or underestimate of the true treatment effect of the AL class?

3 Poverty Trap Models and Evidence (18 points)

For each of the following, draw a graph with k on the x-axis and curves for production, savings, and depreciation and population growth (no need to label them) that produce the corresponding poverty trap using a modified Solow Model framework. On each graph, draw arrows denoting the direction of convergence on the x-axis and label all steady states (e.g. k_1^* , k_2^* , etc.). Then, provide one reason that justifies the difference between each model and the standard Solow Model.

The equations for the **standard** Solow Model are:

$$y = Ak^\alpha$$

$$\text{where } 0 < \alpha < 1$$

$$\Delta k = sy - (\delta + n)k$$

$$\text{where } \Delta \text{ denotes the change in each period}$$

(a) (4 pts) “Big Push” poverty trap

(b) (5 pts) A “demographic” poverty trap, in which population growth rate is n_1 below capital level k_{cutoff} and n_2 above k_{cutoff} , where $n_1 > n_2$ (not seen in class).

(c) (4 pts) Describe two potential ways that a country can escape the poverty traps drawn above. Choose one of the graphs (be sure to clearly label) and show how each of these ways would change the graph to eliminate the trap(s).

(d) (5 pts) Balboni et al. study the existence of individual-level poverty traps. Part of their experiment randomizes 6,000 extremely poor households to receive a \$500 transfer of productive assets. Draw a graph with the treatment group's productive assets in year $t + 1$ on the y-axis vs. their productive assets (plus transfer) in year t on the x-axis. Then, add the 45-degree line, and draw a curve that emulates their findings on average productive asset dynamics. Briefly describe how this graph suggests the existence of a poverty trap or a lack thereof.