

ECON 2273 Practice Final

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Instructions

1. This exam lasts **two hours**.
2. Pay attention to time. Point values roughly indicate appropriate time allocations. I will end the exam promptly.
3. Write your answers on the exam itself.
4. The answers to mathematical questions should be boxed or clearly labeled.
5. I will grade down for extraneous, rambling, or incorrect information.

Some potentially useful formulae:

$$\frac{1}{2N^2\mu} \sum_{j=1}^N \sum_{k=1}^N |y_j - y_k|$$

$$\frac{1}{N} \sum_{i=1}^N 1(y_i < y_p)$$

$$\frac{1}{Ny_p} \sum_{i=1}^N (y_p - y_i) 1(y_i < y_p)$$

1 True/False (explain)

For each statement write in your answer book whether the question is true or false. If the statement is false you must explain *briefly* why it is false to get full credit (one to two sentences). A statement is false if any part of it is false.

1. Child labor bans are necessarily self-enforcing since families don't want to send their children to work.

2. One reason big banks do not enter poor, rural markets is that the fixed cost of lending cannot be easily recovered from the small loans the poor demand.

3. AIDS does not affect growth much because it attacks the least productive in a society.

4. Around the world, most poor households engage in only one productive activity to earn their income.

5. In their article “Wealthier is Healthier,” Pritchett and Summers conclude that health improvements largely cause increases in income.

2 Questions

1. **Nutrition and inequality.** (12 points) The following table is taken directly from Fogel (1994). Note that the deciles are to the far left. The First Decile refers to the bottom 0-10% of the population, the Second Decile to those from 10-20% and so on. The “Cumulative percentage” column shows the cumulative percentage of calories consumed by that decile and lower.

TABLE 2—A COMPARISON OF THE PROBABLE FRENCH AND ENGLISH DISTRIBUTIONS OF THE DAILY CONSUMPTION OF KILOGRAM CALORIES PER CONSUMING UNIT TOWARD THE END OF THE 18th CENTURY

Decile	France, circa 1785		England, circa 1790	
	Daily kcal consumption	Cumulative percentage	Daily kcal consumption	Cumulative percentage
Highest	3,672	100	4,329	100
Ninth	2,981	84	3,514	84
Eighth	2,676	71	3,155	71
Seventh	2,457	59	2,897	59
Sixth	2,276	48	2,684	48
Fifth	2,114	38	2,492	38
Fourth	1,958	29	2,309	29
Third	1,798	21	2,120	21
Second	1,614	13	1,903	13
First	1,310	6	1,545	6
\bar{X} :	2,290		2,700	
s/\bar{X} :	0.3		0.3	

- (a) India sets its poverty line based on the income necessary to get 2,200 kilo calories a day. Based on this poverty line, what is the Head Count Ratio for France in 1785 and England in 1790.

- (b) If India has a poverty rate of 40% today, based solely on the poverty rate is it better off than England around 1790? How does it compare to 1785 France?
- (c) If the new United States wanted to relieve all poverty in England in 1790, how many kilo calories would that require (assume that England had a population of 10 million)? You do not have to actually calculate the number but it should be clear that you could with a calculator.
- (d) If X is your answer to the previous question, what is the Poverty Gap Index (in terms of X).
- (e) Draw the Lorenz curve for England in 1790.

(f) How would you calculate the Gini coefficient from your curve?

(g) Construct a nutritional poverty trap model that explains why nutrition may be a good way to construct a poverty line. Your chart should have nutrition consumed this year on the x-axis and nutrition produced for next year on the y-axis, and 2200 kilo calories should be what separates those who are “trapped” in nutrition poverty and those who have escaped. Label the stable equilibria and the poverty line. According to your chart will the French in the fifth decile consume more or less in the next year? Label the point that your chart predicts they will consume in the long run with “Long Run.”

2. **Child labor** (14 points)

- (a) In the space below, construct a model of the demand and supply of labor which allows for two equilibria: one with child labor and one without.
- (b) In your model, suppose the population starts out with no child labor, but an earthquake destroys all of the schools, and so there is no longer an opportunity cost of child labor. Draw the new supply curve on your graph and label the new equilibrium. Will it persist even once the schools are rebuilt?
- (c) Now suppose instead that the earthquake destroys factories, reducing the demand for labor substantially and permanently. Label the new equilibrium. Will it persist even once the schools are rebuilt?
- (d) In (b) and (c), will a ban on child labor improve welfare once the schools are rebuilt?

3. **Credit.** (18 points) A borrower with an investment idea and a lender are considering whether to borrow and lend a loan of size L . The borrower's investment pays off with probability p and she will pay back the loan plus interest for a total of $(1 + i)L$, otherwise she pays back nothing.

(a) The lender's cost of funds is r so making the loan costs $(1 + r)L$ to the lender. What are the lender's expected profits from making the loan?

(b) What is the minimum interest rate the lender is willing to make the loan?

(c) The borrower has an opportunity cost A of taking the loan and making the risky investment. If the borrower takes the loan she loses A . With probability p the investment pays off, she gets a total return R and pays back the loan $(1 + i)L$ to the lender. If the investment does not pay off she pays back nothing, gets nothing, and she still gives up A . What are the borrower's expected profits from taking a loan?

(d) What is the maximum interest rate the borrower is willing to take the loan?

(e) What condition determines whether the borrower and lender can agree on an interest rate in which they both want to make the loan?