Queen Mary
University of London

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ECN383 Economics of Inequality ***Duration: 2 hours***

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Answer ALL Questions

You are permitted to bring 20×A4 pages of notes into your examination (i.e. 10 double sided pieces of paper). These can be typed or handwritten and can include graphs and images. They can include material from any source.

Your notes must be stapled together and include your student ID number and the module code on the first page. You must submit your notes at the end of the examination with your answer booklet.

Calculators are permitted in this examination. Please state on your answer book the name and type of machine used. Complete all rough workings in the answer book and cross through any work that is not to be assessed.

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Examiners:
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SECTION A

Questions 1 and 2 are multiple choice questions. There can be more than one correct answer, but there is always at least one correct answer. For each question, justify your choice of answer(s) in 1 or 2 lines.

Question 1 *(Growth Accounting and Misallocation).*

Consider the misallocation model learnt in class, where production takes place according to

$$\pi(e) = \max_{k,l} \left\{ \tau(e) \cdot k^{\alpha} l^{\nu} - wl - Rk \right\},$$

where $\tau(e)$ is some function of actual talent, e. (k, l) are the amounts of capital and labour an entrepreneur chooses to allocate in production, while R is the rental rate of capital and w the wage rate.

Recall that $\tau(e)$ is a tool to measure the degree of misallocation across different entrepreneurs. In light of this, which of the following statements are true?

[15 marks]

1. Since ability is not actually measurable in the data, we can model the degree to which entrepreneurs in operation are actually productive.
2. Since low talent is rewarded and high talent is punished, the extensive margin of measured TFP is low.
3. Since low talent is rewarded and high talent is punished, the extensive margin of measured TFP is high.
4. If we knew the average size of the wedge $\tau(e)$, we would be able to design how to tax and subsidise firms.
5. If we knew the derivative of the wedge $\tau(e)$, we would be able to design how to tax and subsidise firms.
6. Taxes should be designed to reward high $\tau(e)$ firms and penalize low $\tau(e)$ firms.

Question 2 *(Savings and Human Capital).*

Suppose that individuals can either invest in a high-return business, or invest in their own human capital, or both. But they cannot borrow (they face a no-borrowing constraint). Reflecting on the implications of this that we learnt in class, which of the following statements are true?

[15 marks]

1. If there are decreasing returns to human capital investments, we should observe that everyone equates human capital to physical capital returns.
2. If the returns to human capital investments are linear, then it must be that everyone wants to borrow (but are not allowed to).
3. If there are decreasing returns to human capital investments, we should generally observe faster human capital growth than physical capital growth.
4. If the returns to human capital investments are linear, then everyone will either only save, or only invest in human capital.
5. In the presence of borrowing constraints, no one will ever save and everyone will only invest in human capital.

SECTION B

Questions 3 and 4 are numerical questions. Try to show the steps through which you arrive at your answer.

Question 3

Recall that in the double-sided sorting model of firms and managers, managerial compensation of the i-th rank manager, $W(i)$ was determined by

$$W(i) = W_0 + \int_0^i Y_a(a[\tilde{i}], b[\tilde{i}])a'[\tilde{i}]d\tilde{i}.$$

where $a[i]$, $b[i]$ are the quantile functions of managerial ability a and firm productivity b. The c.d.f. of a and b are, respectively,

$$F(a) = a^\alpha, \quad G(b) = b^\beta,$$

and we assume that both $a \in [0, 1]$ and $b \in [0, 1]$, and that $(\alpha, \beta) > 0$. The production function is multiplicative as

$$Y(a, b) = a^\alpha b^\beta.$$

Suppose the outside option is $W_0 = 0$. What is the wage of the top manager?

[10 marks]

Question 4

Suppose that ability persists through generations according to

$$\log a_k = \rho \log a + \epsilon$$

where a_k is the child's ability, a is the parent's ability, and ϵ is an i.i.d. shock. Recall that in the presence of intergenerational borrowing constraints, if children's human capital, h_k, is determined by their own ability, a_k, and their parent's human capital, h, according to

$$\log h_k = \log a_k + \gamma \log h + \text{other stuff},$$

then the IGE (intergenerational elasticity) of earnings was determined as $\frac{\gamma+\rho}{1+\gamma\rho}$.
Now suppose instead, children's human capital is determined by

$$\log h_k = \lambda \log a_k + \nu \log h = \lambda\rho \log a + \nu \log h + \tilde{\epsilon}$$

where $\tilde{\epsilon} \equiv \lambda\epsilon$. What would be the estimated IGE when

$$\rho = 0.2, \quad \nu = 0.07 \quad \text{and} \quad \lambda = 1000?$$

You may round your answer up to 2 decimal places.

[10 marks]

SECTION C

Questions 5 is an essay question. Try to be clear in your argument and how it connects to what we have learnt in class.

Question 5

Suppose that you are appointed the Minister of Education. There are calls from the electorate to promote early childhood education, which has been viewed as lacking and expensive, even before the Covid crisis and cost-of-living crisis. Explain what kind of policy you would consider, especially taking care to explain the following. Discussion of each item will be equally weighted.

1. Should we subsidise early childhood education at all? In light of what we learnt and discussed in class, in which cases would it be desirable not just for children from lower-income families but also for the entire economy on average?
2. What do you expect to happen to the intergenerational mobility of earnings if you were to subsidise low-income/poor children? Why?
3. How would you ensure that the right children get the support they need?
4. Where would you get the funds to subsidise them and why?
5. What would happen to the size of the required budget for such subsidies in the short- and long-runs? Why?

[50 marks]

End of Paper