

Time Allowed: 1.5 hours.

Answer **FIVE** questions out of **SEVEN** questions.

Read carefully the instructions on the answer book provided and make sure that the particulars required are entered on each answer book. If you answer more questions than are required and do not indicate which answers should be ignored, we will mark the requisite number of answers in the order in which they appear in the answer book(s): answers beyond that number will not be considered.

1. This question is based on the model by Ghatak and Jiang. There is a continuum of mass equal to one of dynasties. In each generation t , a dynasty comprises one individual. This individual is born with wealth a_t and maximizes utility function $u(c, b) = c^{1-s}b^s$, where c is consumption and b is the bequest left to the next generation (i.e., $a_{t+1} = b_t$). There are three occupations: subsistence (which pays u), worker (which pays w_t) and entrepreneur (which generates revenues R but requires paying a fixed cost equal to 1 and hiring a worker at wage w_t). Assume $R > 1 + 2u$. Denote with $G_t(a)$ the cumulative distribution of wealth at time t . Assume the interest rate on deposits and loans is exogenous and equal to zero.
- (a) Interpret the assumption $R > 1 + 2u$. **(4 marks)**
 - (b) Suppose the credit market is perfect and everybody can borrow and lend at the exogenous interest rate. What is the equilibrium wage? **(4 marks)**
 - (c) Suppose now that there is no credit market at all. That is, only people with initial wealth larger than 1 can become entrepreneurs. What is the equilibrium wage? **(4 marks)**
 - (d) What are the bequests left as a function of current assets? **(4 marks)**
 - (e) Suppose at time zero $G(1) < 1 - G(1)$. Can you derive the long run distribution of income? **(4 marks)**
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2. Consider recent evaluations of microfinance programs as reviewed in the paper by Banerjee et al. studied in Lectures 4 and 5.
- (a) Carefully explain (writing down the appropriate regression) the empirical strategy in the evaluation conducted by Banerjee et al. in Hyderabad, India. In particular, what was the level of randomization? **(4 marks)**
 - (b) Carefully explain (writing down the appropriate regression) the empirical strategy in the evaluation conducted by Karlan and Zinman in the Philippines. Provide an intuition for their design with the help of a graph. **(4 marks)**
 - (c) Carefully compare the two strategies: do you expect differences in take-up rates? **(4 marks)**
 - (d) With the help of a diagram (or, if you prefer, equations) describe how current consumption responds to the availability of loans. **(4 marks)**
 - (e) Suppose you were asked to evaluate a micro-credit program and you could choose whether to replicate the Banerjee et al design or the Karlan and Zinman design. Which one would you pick, and why? Carefully describe which local average treatment effect (LATE) your chosen experimental design identifies and how it relates to the purpose of the evaluation. **(4 marks)**
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3. Imagine you want to estimate the production function of microenterprises. Assume also, for simplicity, that you are willing to make the assumption that output is well approximated by a Cobb-Douglas function, i.e., $Y = \exp(\theta)L^\alpha K^\beta M^\gamma$, where L is labour, K is capital and Z is a bundle of other inputs. Suppose you have data on Y , L , K and Z for many microenterprises.
- (a) Suppose you decide to estimate the production function using an OLS (Ordinary Least Squares) model. Write down the exact equation for the model. Suppose the model is correct, what is the interpretation of the estimated constant? **(4 marks)**
 - (b) Under which assumptions does the OLS model give you correct estimates of the parameters α , β and γ ? Are these assumptions plausible? **(4 marks)**
 - (c) Your dataset includes information over the prices (wages, interest rates and input prices) paid by these firms. Under which assumptions can information on prices be used to estimate the production function? Do you think these assumptions are plausible, particularly in developing countries? Explain. **(4 marks)**
 - (d) Suppose you can run an experiment in which you randomly allocate K across the small firms. Can you now estimate the production function? Why? **(4 marks)**
 - (e) Would your answer to (d) differ if you suspected many firms in your dataset to be capital constrained? **(4 marks)**
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4. A well-functioning capital market allocates capital to its most productive use.

- (a) Formally, what does that mean? Explain your definition of a well-functioning capital market. **(4 marks)**
 - (b) Suppose you get data on loans, interest rates and repayments from a particular market. Suppose you observe very different nominal interest rates on those loans. Is that enough to conclude that this credit market does not work efficiently? Why? **(4 marks)**
 - (c) Based on the definition you have provided in point a), which kind of evidence needs to be gathered in order to assess whether a particular market is well functioning? **(4 marks)**
 - (d) Suppose you find evidence that, for some borrowers, the marginal product of capital is larger than the interest rate. Can you conclude the borrower is credit constrained? Why? **(4 marks)**
 - (e) Can you write down a simple model illustrating your answer above? **(4 marks)**
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5. This question is based on the paper "The Colonial Origins of Comparative Development".

- (a) What is the main challenge in establishing a causal relationship between institutions and development? How can the challenge be overcome within the methodological framework of regression analysis? **(4 marks)**
 - (b) How do Acemoglu, Johnson and Robinson overcome the problem? Explain the four logical steps in their argument and write down the corresponding equations for the empirical analysis. **(4 marks)**
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(Question 5 continued)

(c) The following is one of the key tables in the paper. (4 marks total)

TABLE 4—IV REGRESSIONS OF LOG GDP PER CAPITA

	Base sample (1)	Base sample (2)	Base sample without Neo-Europes (3)	Base sample without Neo-Europes (4)	Base sample without Africa (5)	Base sample without Africa (6)	Base sample with continent dummies (7)	Base sample with continent dummies (8)	Base sample, dependent variable is log output per worker (9)
Panel A: Two-Stage Least Squares									
Average protection against expropriation risk 1985–1995	0.94 (0.16)	1.00 (0.22)	1.28 (0.36)	1.21 (0.35)	0.58 (0.10)	0.58 (0.12)	0.98 (0.30)	1.10 (0.46)	0.98 (0.17)
Latitude		−0.65 (1.34)		0.94 (1.46)		0.04 (0.84)		−1.20 (1.8)	
Asia dummy							−0.92 (0.40)	−1.10 (0.52)	
Africa dummy							−0.46 (0.36)	−0.44 (0.42)	
“Other” continent dummy							−0.94 (0.85)	−0.99 (1.0)	
Panel B: First Stage for Average Protection Against Expropriation Risk in 1985–1995									
Log European settler mortality	−0.61 (0.13)	−0.51 (0.14)	−0.39 (0.13)	−0.39 (0.14)	−1.20 (0.22)	−1.10 (0.24)	−0.43 (0.17)	−0.34 (0.18)	−0.63 (0.13)
Latitude		2.00 (1.34)		−0.11 (1.50)		0.99 (1.43)		2.00 (1.40)	
Asia dummy							0.33 (0.49)	0.47 (0.50)	
Africa dummy							−0.27 (0.41)	−0.26 (0.41)	
“Other” continent dummy							1.24 (0.84)	1.1 (0.84)	
R ²	0.27	0.30	0.13	0.13	0.47	0.47	0.30	0.33	0.28
Panel C: Ordinary Least Squares									
Average protection against expropriation risk 1985–1995	0.52 (0.06)	0.47 (0.06)	0.49 (0.08)	0.47 (0.07)	0.48 (0.07)	0.47 (0.07)	0.42 (0.06)	0.40 (0.06)	0.46 (0.06)
Number of observations	64	64	60	60	37	37	64	64	61

Focusing on the 1st column alone, briefly answer the following questions:

- Does the first stage regression prove that the IV strategy is valid? Why?
- Is the correlation between the measure of institutions and the error term in the OLS regression negative or positive?
- What does that mean, in practice?

(d) In your opinion, is the solution proposed by Acemoglu, Johnson and Robinson a good one? (4 marks)

(e) In subsequent work, Acemoglu and Johnson distinguish between two key aspects of institutions: helping with contract enforcement and protecting property rights. How do they untangle which aspect of institutions is most relevant for long run development? What do they find? How do you interpret their results? (4 marks)

6. This question is based on the Mita paper.

- (a) The paper uses a geographic discontinuity design. Before discussing the paper, briefly explain (writing down an equation) the main idea behind RDD. **(4 marks)**
 - (b) In general, what are the main threats to the validity of an RDD? Describe the evidence you would provide to support the validity of an RDD. **(4 marks)**
 - (c) Describe the main strategy employed in the Mita paper. What is the main threat to such a strategy? **(4 marks)**
 - (d) What are the broader implications of the Mita paper for our understanding of the long run relationship between inequality and development? Compare her findings with the Engelmann-Sokoloff hypothesis. **(4 marks)**
 - (e) The Mita paper provides evidence that institutional differences have persistent effects. How does this type of finding affect the way you think about the scope for international aid and advice to improve conditions in developing countries? **(4 marks)**
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7. This question is about the role of State Capacity and the work by Besley and Persson.

- (a) Write down a simple two period model of investment in state capacity, intended as state's ability to raise taxes, by a government along the lines of Besley and Persson's baseline model. Briefly discuss the main determinants of investment in state capacity. **(4 marks)**
 - (b) Besides ability to tax, what is the other key dimension of state capacity in Besley and Persson's model? How does this additional dimension interact with the state's ability to raise taxes? Which kind of evidence would you provide? **(4 marks)**
 - (c) In the empirical part of their analysis, Besley and Persson set out to test the empirical predictions of their model. What are the main determinants of state capacity they identify? How concerned are you that some of these determinants are endogenous to state capacity? **(4 marks)**
 - (d) Do you think the state capacity framework is relevant to understand Africa's long run performance? Discuss how the framework applies to the continent before as well as after colonization. **(4 marks)**
 - (e) Finally, briefly discuss how the framework can be applied to the study of civil conflict. **(4 marks)**
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