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14.771 Development Economics: Microeconomic Issues and Policy Models
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14.771 Final Exam
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Instructions. Please answer both questions each in a different booklet, identifying clearly the number of the question on top of the booklet. The exam is 1.5 hour in duration.

1. Consider a setting where there is one buyer firm that faces a large population of potential suppliers. In every period, the firm buys at most one unit every period and will buy from one supplier. Time is discrete but infinite.

There are two types of goods: good quality, worth G to the buyer and bad quality, worth B to him. Assume that $G > 0 > B$, i.e. if the buyer knows he would get bad quality he would rather not buy. There are three types of suppliers: an good type that always supplies good quality, a bad type who always supplies low quality and an opportunist type that can choose to supply either high quality or low quality depending on the incentives. The cost of supplying high quality for the opportunist type is $C > 0$, while supplying the low quality is costless. Let the fraction of the three types of suppliers be α (good), β (opportunist) and γ (bad). Finally assume that the buyer is infinitely-lived, while the suppliers "die" in each period with probability λ . When the supplier dies, the buyer has to switch suppliers. Other than as a result of this risk of dying, there is no discounting of the future. Suppliers are also born every period exactly in the same proportion so that the population stays fixed.

- (a) Suppose first that the buyer can commit to a price policy and a buying policy as a function of the supplier's age (i.e. the number of periods he has been in the business) and the quality he has supplied in the past. Describe the optimal price and buying policies from the buyer's point of view.
 - (b) Next assume that the buyer cannot commit to policies. In other words they would like to announce the optimal policy and stick to it but they are tempted and cannot resist temptation if it pays. Assume that sellers do not condition their behavior on the buyer's past history. What would be the buyer's optimal price and buying policy?
 - (c) What would change if the sellers could condition their selling policy on the buyer's past history?
 - (d) Suppose you observe that new sellers are paid a lower price. Would that convincingly establish the importance of reputation? Could you suggest a natural experiment or a field experiment that would nail the fact that there are reputation effects.
2. This question refers to spillovers to education.

- (a) Cite and briefly discuss several reasons why other people's education may affect my wages (positively or negatively).
- (b) The standard regression to measure whether there is an impact of other's education on my wage (see for example Rauch (1993)) is as follows:

$$y_{ijt} = \alpha + \beta S_{ijt} + \gamma \overline{S}_{jt} + \epsilon_{ij}, \quad (1)$$

where i is the individual, j is the relevant region, t is the year, y_{ijt} and S_{ijt} are respectively the log wages and the years of education of individual i in region j , and \overline{S}_{jt} is the average education in the region in that year. Panel B in Table 2 gives the results for the US (from Acemoglu and Angrist). The regression also include state and year fixed effects. What would these results suggest if we took them at face value?

- (c) Angrist and Acemoglu discuss two sources of problems with this regression:
 - 1. There may be omitted variables correlated with \overline{S}_{jt} . Give examples, and explain the likely impact on the estimate.

2. $\overline{S_{jt}}$ is the average of the S_{ijt} in a state and year. Argue that it is likely to create additional problems
- (d) Given these two concerns, how many instruments do we need to properly estimate equation 1? What types of instruments would work? Alternatively, if we are interested only in estimating γ , what properties should the instrument have?
 - (e) The INPRES policy generates potential instrument. Recall that children aged 12 or more in 1974 did not directly benefit from the policy, since they were too old to complete primary school when the school when the first schools were built. What is likely to happen to average education in the labor market around them as the younger people start graduating from these schools? What is the assumption which is necessary for this to be true?
 - (f) To estimate the impact of average education on the wage of the older workers using this strategy, what data set(s) do you need? Would a 1995 cross section (the one we used for estimating the returns to education be sufficient)?
 - (g) Armed with this data, explain what your strategy would be. Be as specific as you can. In particular write down you reduced form equation, your first stage, and your second stage. Discuss the assumptions you need to make, and potential specification checks for these assumptions.
 - (h) Other than estimating the effect of education on average wage, could you use this strategy and the same data to measure the effect on other important parameters, which would help us understand better the model of this economy?
 - (i) The results of this exercise suggest that average education in the labor market seems to have negative (and fairly large) impact on others. Use the knowledge you gathered from the rest of the course to expand a bit on the explanations you gave in (a.). Why is this happening? Whis is this somewhat surprising? How can we explain it?