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EC 533 Labour Economics

Problem Set 2

1. **(Signaling):** In this problem, you are asked to work through a model that combines signaling with productive aspects of schooling. There are two types of agents: "high" and "low" ability. Education (e) is continuous and observed, but individual ability (and output) is not. The labor productivity for the "low" type is $y_l(e) = \alpha_1$ and the cost of education is $c_l(e) = \frac{3}{2}e^2$. For the "high" type, output and education costs are $y_h(e) = \alpha_1 + \alpha_2 e$ and $c_h(e) = e^2$, respectively.

   (a) Solve for the most efficient separating equilibrium of the signaling game.

   (b) Show that the high type does not have an incentive to deviate from your proposed equilibrium strategy.

   (c) Does the high type's investment in education differ from what would have obtained in the perfect-information case? Why or why not?

   (d) Suppose now that $c_l(e) = 10e^2$. Does the high type's investment in education differ from what would have obtained in the perfect-information case? Why or why not?

   (e) Suppose again that $c_l(e) = \frac{3}{2}e^2$ and furthermore suppose that there is a compulsory schooling requirement of $\underline{e}$. Characterize the most efficient separating equilibrium. Does the high type invest in education more or less in this case than in (a)? Explain why.

   (f) Characterize the equilibrium if $y_l(e) = y_h(e) = \alpha_1 + \alpha_2 e$; $c_l = \frac{3}{2}e^2$; and $c_h = e^2$. Why does the equilibrium differ from the one in (a)?

   (g) Does a separating equilibrium exist when $y_l(e) = \alpha_0 + \alpha_2 e$; $y_h(e) = \alpha_1 + \alpha_2 e$; $c_l = c_h = e^2$ with $\alpha_0 < \alpha_1$?

   (h) Compute the observed return to schooling in part (a).