

1 An Optimal Policy Problem

The economy consists of a unit measure of identical households who choose how much to work each day, which we denote by h . Each unit of labor produces 1 unit of output. There is a single government which chooses a tax rate on labor τ and uses the proceeds to provide government services g . We will assume that the government's policy choice of τ and g can only depend on the aggregate amount of household hours \bar{h} and not on the distribution of these hours among the households and in particular not on the hours choice of an individual household. The payoff to a household is given by

$$u((1 - \tau)h) - v(h) + n(g).$$

For reasons that will become clear later, it will help to assume that

$$u(c) = \frac{c^{1-\gamma} - 1}{1 - \gamma}$$
$$v(h) = \frac{1}{\alpha} h^\alpha, \text{ with } \alpha > 1.$$

The timing is such that the households choose h first, and then the government chooses τ and g . The objective function of the government is to maximize the representative household's payoff.

A) Assume that this was a one-shot game in which there was only one day. Define an appropriate notion of an equilibrium and characterize it. Please explain how your equilibrium definition takes account of our restriction that the government's policy choice only depends upon \bar{h} . Henceforth we will describe it as the no-commitment (static) equilibrium.

B) Explain how you would alter the game if you wanted to think about a commitment outcome. Then characterize such an outcome and explain why it is different from the no-commitment equilibrium in (A). In characterizing the commitment outcome please treat it as a standard Ramsey problem and solve it using the primal approach in which you characterize the solution using allocation variables only. Then use your results to discuss how the commitment solution in (B) differs from the noncommitment solution in (A). Does the commitment equilibrium attain the first-best?

C) Now assume that the model had an infinite number of periods (or days). Explain why the commitment outcome may now be achievable if the discount rate of the government is sufficiently close to one. Construct the condition that would need to be satisfied to support this outcome. Be careful to explain your logic.

D) Now assume that the government could change hands with probability π , and that a government only cared about what happened so long as it was in power. For simplicity assume that there is a complete new government that takes over each time. How would this affect your ability to support the commitment outcome (be sure to explain your answer in terms of your condition).