

Midterm Exam

Directions: Answer all questions - each question is worth 20 points. For full credit, you must provide complete explanations for your answers.

1. According to C. Romer, business cycles in the post-war era are both similar and different than in the pre-war era. Explain.
2. According to M. Goodfriend, “Monetary policy has come of age in the 20th century in the sense that monetary economists and central bankers have come to terms with the past - lessons have been learned and principles have been applied successfully.” This statement seems particularly relevant for the conduct of monetary policy in the 1970’s - explain why this is so and provide examples of the lessons and principles that were learned from this episode.
3. In his critique of economic policy analysis, Lucas derived the following demand curve for capital (i.e. investment) in a hypothetical industry:

$$\begin{aligned} & k_t(1 - \delta) + i_t && (1) \\ = & \frac{1}{\lambda} E_t(a_{t+1}) - \frac{b}{\lambda^2} \left[\frac{r_t}{1 - \theta_t} + \delta \right] + \frac{b}{\lambda^2} \left[\frac{\psi_t(1 + r_t) - E_t(\psi_{t+1})(1 - \delta)}{(1 - \theta_t)} \right] \end{aligned}$$

where r_t denotes the current one-period interest rate, θ_t is the current tax rate on profits, ψ_t is the investment tax credit. Answer the following:

- a. Explain why the factors on the right-hand side of eq.(1) affect investment demand.
- b. What two properties were used to derive this investment demand function.
- c. Lucas criticized Hall and Jorgenson’s analysis of the 1962 tax credit - where did they go wrong?

4. Bob and Jerry have identical incomes in every year during their lifetimes (and this is known with certainty) and both have just graduated from college. Bob, however, currently consumes much more than Jerry. Based on our model of consumption behavior, why is this so?

5. The government of Finlandia is faced with the Ramsey problem of choosing a sequence of excise taxes so that the utility of its citizens is maximized. It uses this revenue to pay for a war in the first period of the economy. The government knows that households' optimal consumption is given by:

$$c_t^* = \frac{\sum_{t=0}^{\infty} \frac{Y_t}{(1+r)^t}}{1 + \tau_t} \quad (2)$$

Y_t denotes income and it is assumed that $Y_t = 1$ in every period. The government has expenditures of $G_0 = 1$ in the very first period (this is the war expenditures) and nothing thereafter; that is, $G_t = 0$ for $t \geq 1$. Given this environment, answer the following:

a. Find the optimal excise tax, τ^* . (Hint: Use the conditions that the tax smoothing hypothesis implies taxes are constant, $\tau_t = \tau^*$, and the government's intertemporal budget constraint implies that the present discounted value of tax revenues (given by $c_t \tau_t$ in every period) equals the present discounted value of government expenditures. You do not have to solve for the indirect utility function.)

b. Find the implied path of government debt. Does this satisfy the transversality condition?