

14.05 Midterm II

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You have 75mins. You must answer all questions. No books or notes are allowed.

GOOD LUCK!

Short Questions. (60% of the grade; I recommend you allocate about half your time.)

Answer any FOUR (4) of the following five questions, providing a brief explanation for each of your answers. (If you answer all five questions, you get a bonus!)

(i) How does a tax on *capital* income affect aggregate saving and growth? How does a tax on *labor* income affect aggregate saving and growth?

(ii) “Recessions are painful. Therefore, welfare necessarily improves with policies that stabilize the economy against aggregate fluctuations.” True or false?

(iii) During the last year or so, the US has been experiencing a “jobless recovery”: GDP, consumption, and labor productivity have been increasing, while employment and unemployment have stayed roughly constant. Is this behavior consistent with the neoclassical, equilibrium business cycle model?

(iv) “If firms and workers suffered from price misperceptions, labor productivity would be countercyclical irrespectively of whether the business cycle is driven by technology shocks or by monetary shocks.” True or false?

(v) Suppose that we need to expand government spending this year, in order to finance a war. Should we do so by increasing income and corporate taxation and balancing the budget, or should we instead run a deficit and transfer the largest part of the tax burden to the future?

[TURN PAGE FOR SECOND QUESTION]

Analytical Question. (40% of the grade)

Consider an economy that lasts for only two periods, $t \in \{0, 1\}$. The economy is populated by a representative, price-taking household and a benevolent government. Income (GDP) and government spending are exogenously given and constant over time: $y_t = \bar{y}$ and $g_t = \bar{g}$, for $t \in \{0, 1\}$.

The household preferences are given by

$$\mathcal{U} = c_0 + \beta c_1,$$

where $\beta \in (0, 1)$ is the discount factor and c_t is the period- t consumption. The household's budget constraints are given by the following:

$$c_0 + a = \bar{y} - T_0$$

$$c_1 = (1 + R)a + \bar{y} - T_1,$$

where a are the savings of the household during the first period, R is the interest rate, and T_t are the lump-sum taxes levied by the government at time t . The household is choosing c_0 and c_1 so as to maximize its life-time utility \mathcal{U} subject to its own budget constraints (taking income, taxes, and the interest rate as exogenous)

The government starts with no initial debt. Its budget constraints are therefore as follows:

$$\bar{g} = T_0 + b$$

$$\bar{g} + (1 + R)b = T_1,$$

where b is the level of debt issued in the first period (and paid off in the second period). The government is free to choose any triplet (T_0, T_1, b) subject to the above constraints. Finally, the interest rate R adjusts in equilibrium so that $a = b$ (i.e., household saving equals government borrowing).

(i) Starting from a status quo of balanced budget ($T_0 = \bar{g}, T_1 = \bar{g}, b = 0$), the government contemplates the following policy change: running a deficit in the first period ($T_0 < \bar{g}$), accumulating debt ($b > 0$), and paying off this debt with a surplus in the second period ($T_1 > \bar{g}$). How is this policy change going to affect the household's consumption and saving? How is it going to affect the equilibrium interest rate? (Provide both an intuitive answer and a formal proof.)

(ii) Suppose the government chooses T_0, T_1 and b so as to maximize welfare \mathcal{U} . Is there a unique triplet (T_0, T_1, b) that attains the maximum?

(iii) Consider now the following modification: consumers dislike paying taxes, in the sense that their preferences are now represented by

$$\mathcal{U} = [c_0 - \Lambda(T_0)] + \beta [c_1 - \Lambda(T_1)]$$

where Λ is a strictly increasing and convex function. How does this affect your answer to part (ii)? Is it optimal to balance the budget?

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