

*Partner assignments*

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*Problems*

**Romer's Problem 2.10.**

- In class (and in Romer's Chapter 2) we analyzed the effects of a lump-sum tax that is fully used up (spent) by the government. In that case, the tax had a (negative) wealth effect on the household budget constraint, but no substitution effect because of the lump-sum nature of the tax. In this problem, we analyze the opposite case: the tax is on capital income so it has incentive (substitution) effects, but all the tax revenues are redistributed with the average taxpayer getting back the same amount that she pays, so there is no wealth effect.
- **In addition to your basic answers to each part**, explain the economic intuition surrounding the result. How are people changing their behavior and how is that affecting the aggregate outcome of the model?
- Hints on part (d): Solve the steady-state condition  $\dot{k} = 0$  for  $f(k^*) - c^*$ . For part (ii), do the investors/savers pay taxes based on the tax rate in their home country or in the country in which the capital is located? (The latter.)
- Hint on part (e): Use the criterion of Pareto optimality to evaluate the change in welfare. What is the Pareto-optimal rate of tax/subsidy in which individual decisions lead to optimal social outcomes?

**Romer's Problem 2.11.**

- This problem is much like the temporary change in government spending in class in that there is an expected future change in taxes. There are two sets of curves and two saddle paths: one when the tax is in force and one when it's not. As we discussed in class, these problems should be solved *from end to beginning*: to where does the economy converge after  $t_1$ , where does it need to be at  $t_1$  in order to converge there, where does it need to be at 0 in order to get to that point at  $t_1$ ?

- **Once again, explain the economic intuition of your answers.**

**Romer's Problem 2.17.**

- This problem has very important policy implications; the logic underlying it should be at the core of any discussion of Social Security reform.
- **New part (c):** Explain the economic intuition behind your results for (a) and (b), especially the welfare effects.
- **New part (d):** Public-policy analysts in the United States and many other countries are very concerned about the effects of the aging of the large baby-boom generation on Social Security. Briefly discuss how these issues might be analyzed in the Diamond model. (You don't have to do the analysis, just set up the problem.) What results would you expect based on your answers to parts (a) and (b)? In particular, would you expect the return on capital to be lower or higher for baby-boomers than for "normal" generations?
- **Hint:** *The introduction of Social Security taxes and benefits fundamentally changes the individual's budget constraint, so results like Romer's (2.53) and (2.55) cannot be used as they stand. Conditions for optimal consumption and saving behavior will have to be derived again under the new conditions starting from a revised budget constraint (a revised version of Romer's equation (2.44)) that takes into account these taxes and benefits.*