

## Macroeconomics B

### Problem set 8

*This problem set will be collected at the beginning of the next class and marked. If you cannot make it to class you are advised to hand your solutions in before the deadline. No solution will be accepted after the deadline.*

1. Question 9.5 in Romer. Note: rather than working with the model in section 9.2-9.5 in Romer use the one described by equations (1)-(4) in the lecture notes. Note that part (b) of the question refers to a proportional tax on firms' profits.
2. The firm's maximization problem takes the same form as in question 1.  $K$  and  $q$  are initially at their steady state values. Suppose the government announces at time  $t_0$  that it will introduce a permanent investment tax credit at some future date  $T > t_0$ . An investment tax credit is equivalent to the tax on investment in part c) of question 9.5 in Romer but with  $\gamma < 0$ . (a) Derive the path for  $K$ ,  $q$  and  $I$  from the time of the announcement onwards; (b) (This is difficult but try it) Now assume that at time  $T$ , due an unexpected change in the government, the investment tax credit is not introduced. Derive the path for  $K$ ,  $q$  and  $I$  from the time of the announcement onwards. (Hint: at time  $T$  there is a new unexpected event. Does any variable jump? If yes, which one? What is the optimal path from time  $T$  onwards?)