

**Macroeconomics**  
**Problem Set 2**

1. *Social Security.* Consider the Overlapping Generations Model Economy as seen in class. In addition, there is government that runs a Social Security System. Write the household's decision problem, and obtain the First Order Conditions and the Euler Equation.
2. *Social Security.* Consider the Overlapping Generations Model Economy as seen in class. In addition, there is government that runs a Social Security System. Show that the saving rate can be written as:

$$\bar{s}_{ss} = 1 - \frac{\frac{1+\theta}{2+\theta}}{(1 - \tau_s)} \quad (1)$$

3. *Social Security.* Consider the Overlapping Generations Model Economy as seen in class. In addition, there is government that runs a Social Security System. Show that capital stock per worker can be written as

$$k_{t+1} = \frac{\bar{s}_{ss}(1 - \tau_s)w_t}{(1 + n)} \quad (2)$$

4. *Individual Retirement Accounts.* Consider the Overlapping Generations Model Economy as seen in class. In addition, there are individual retirement accounts. Specifically, this system sets a contribution rate  $\tau_{ira}$  on labor earnings at period  $t$ , and delivers a private pension  $b_{t+1} = (1 + r_{t+1})\tau_{ira}w_t$  at period  $t + 1$  to all retirees.
  - a) Write the household's constraints for periods  $t$  and  $t + 1$ .
  - b) Write the household's maximization problem and obtain the Euler equation.
  - c) Write the pension fund's budget constraint.
  - d) Show that the total capital is equal to the amount obtained under the Non Social Security case.