

HOMEWORK 6. Due Wednesday March 10.

1. A consumer lives for 3 periods and expects to earn 100\$, 200\$, and 300\$ in period 1, 2, and 3 respectively. The consumer has a quadratic utility function and is—in period 1—allowed to freely borrow and lend at an interest rate that equals his or her rate of time preference. The consumer is not allowed to borrow or lend in period 2. Let  $C_i$  be the consumption of the representative consumer in period  $i$ . Is  $C_1 = E(C_2)$  and is  $C_2 = E(C_3)$ ?

[NOTE: This question was on the 2004 make-up core exam. Since I stress the Euler equation and the PIH so much in this class, I did not give partial points for incorrect answers.]

2. Let

$$x_t = \alpha_0 + u_t + 0.5 * u_{t-1} ,$$

where  $u_t$  is white noise.

If  $\alpha_0 = 3$ ,  $u_{-1}=0$ , and  $x_0 = 4$ , what is  $E_0(x_1)$ ,  $E_0(x_2)$ ,  $E_0(x_3)$ , and  $E_0(x_4)$ ?

3. Given the AR(1) process

$$x_t = 3 + 2 * x_{t-1} + u_t$$

a) If  $x_0 = 6$ , what is  $E_0(x_1)$ ,  $E_0(x_2)$ ,  $E_0(x_3)$ , and  $E_0(x_4)$ ?

a) If  $x_0 = 10$ , what is  $E_0(x_1)$ ,  $E_0(x_2)$ ,  $E_0(x_3)$ , and  $E_0(x_4)$ ?

4. Assume that

$$\Delta x_t = 3 + .8 * \Delta x_{t-1} + u_t$$

and that  $x_0=100$ , and  $\Delta x_0 = 10$ .

Find  $E_0(x_1)$ ,  $E_0(x_2)$ ,  $E_0(x_3)$ , and  $E_0(x_4)$ .