



Assignment IV

Question I

Suppose the economy has in it only two people. A and B, listed in the table below. Assume that the interest rate is five percent. Finish the table for the three periods.

	C1	C2	C3	PV(C)	Y1	Y2	Y3	PV(Y)	b0	b1	b2	b3
Person A	105	110	80	282.32	100	100	100	285.94	0	-5	-15.2	-4
Person B	95	90	120	289.56	100	100	100	285.94	0	5	15.2	4
Aggregate Economy	200	200	200	571.88	200	200	200	571.88	0	0	0	0

If the interest rate rises to ten percent, how much did the aggregate economy's present value of consumption fall? How much was the fall in aggregate present value of income?

	C1	C2	C3	PV(C)	Y1	Y2	Y3	PV(Y)	b0	b1	b2	b3
Person A	105	110	80	271.11	100	100	100	273.55	0	-5	-15.5	-3
Person B	95	90	120	275.99	100	100	100	273.55	0	5	15.5	3
Aggregate Economy	200	200	200	547.10	200	200	200	547.10	0	0	0	0

Question II

A Simple Transaction Model for the Demand of Money.

Consider the following model of money demand. An individual consumes C dollars worth of goods every month. Bank deposits earn interest at a monthly rate of r . We assume that the individual consumes (and therefore spends the money) at an even rate throughout the month. Each time a withdrawal is made the individual incurs a *real* cost equal to ϕ . His optimization problem is to select N , the number of evenly spaced withdrawals from the bank during the month, that minimize his total (monthly) costs.

- a) Do you think the above description of an individual's optimization problem is very realistic? Is the model missing any *significant* aspect of reality? Explain.
- b) Set up the individual's optimization problem and solve it. For simplicity, treat N as a continuous variable. You will find that the optimal N satisfies what is called the "square root rule".
- c) It actually doesn't make much sense for N to be a continuous variable. So, suppose now that N is constrained to be an integer. Also, suppose that $C = \$1000$, $r = 1\%$, and $\phi = \$4$. What is the optimal value of N now?

Question III

(Chapter 3)

- a) If income is unchanged, how much must current consumption be lowered in order to increase next period's consumption by 1 if the interest rate equals:
 - a. 5 percent
 - b. 10 percent.

SOLUTION

- a) Consumption must be reduced by 0.95
- b) Consumption must be reduced by 0.91

(Chapter 4)

- b) If an individual exchanges interest-bearing assets for money 26 times a year, what is the period between exchanges?

SOLUTION **1/26 a year, about 2 weeks.**

- c) If another person exchanges interest-bearing securities for money every 1/12 of a year, what is the frequency of exchange per year?

SOLUTION **12 times a year**