Macroeconomics - Problem Set #1

Problem 1 - Price indexes

Consider an economy that only produces and consumes traveling bags, sneakers and flights to Italy. Use the data below

	2009	2010
Traveling bag		
Price	$40	$50
Quantity	150	200
Sneakers		
Price	$8	$10
Quantity	200	300
Flights to Italy		
Price	$200	$600
Quantity	10	0

- Using 2009 as the base year, compute the following abstracts for 2007 - nominal GDP, real GDP, GDP deflator and CPI.

- Why do the CPI and GDP deflator give different characterizations of how much prices have risen from 2009 to 2010. Discuss which you would recommend as the more accurate reflection of the cost of living in this particular case, and explain your reasoning.

Problem 2 - Savings and Investment

Consider economy like in Lecture 2, but with consumption depending both on disposable income and **interest rate**, i.e. $C = C(Y - T, r)$. More specifically, we suppose that consumption is an increasing function of $Y - T$, but a decreasing function of r.

$$
\begin{aligned}
Y &= F(\bar{K}, \bar{L}) \\
C &= C(Y - T, r); \quad \frac{\partial C}{\partial (Y - T)} > 0, \frac{\partial C}{\partial r} < 0 \\
I &= I(r); \quad I'(r) < 0 \\
G &= \bar{G}, T = \bar{T}
\end{aligned}
$$

- Define total saving in this economy. What is the relationship between total saving and interest rate? Plot total saving (i.e. supply of funds) against r.

- Plot the investment function in the same graph. Define the equilibrium interest rate.

- Suppose there is an increase in government spending. Analyze what happens to consumption, investment, private saving, public saving, total saving and interest rate.

Problem 3 - Baumol-Tobin model

People typically carry much less cash than the Baumol-Tobin model predicts, and go to the bank more often. Try the following exercise to see whether you can rationalize this finding.

- Suppose your bank account pays you 5 percent interest per year. You spend $100in cash each week. It takes 10 minutes of your time to make a trip to the bank. The opportunity cost of your time (your wage) is $12 per hour. According to the Baumol-Tobin model, how often should you go to the bank, and how much should you withdraw each time? (Be careful about the units of measurement.)

- In addition to the cost of foregone interest, a cost of holding money is that you might be robbed or lose your wallet. How high does the probability of this event need to be to make it rational for you to go to the bank once a week?