Economics 102 - Spring 2010
Homework #4
(Due Wednesday, April 7th in lecture)

Directions: The homework will be collected in a box before the lecture. Please place
your name, TA name and section number on top of the homework (legibly). Make sure
you write your name as it appears on your ID so that you can receive the correct grade.
Please remember the section number for the section **you are registered in,** because you
will need that number when you submit exams and homework. Late homework will not
be accepted so make plans ahead of time. Good luck!

Problem 1.

Consider the following labor market for some economy: labor demand is given by
$w = 170 - 3L$ whereas supply of labor is characterized by the equation $w = 30 + L$. In this
setting w and L are the nominal wage rate per week and the number of hours worked per
week, respectively.
  (a) Suppose we have full employment, what is the equilibrium level of L and w?
  (b) Assume that the aggregate production function is $Y = 5K^{0.5}L^{0.5}$ where K is
      physical capital. Additionally suppose this economy possesses an endowment of
      capital, $K_0 = 100$, and furthermore assume this economy always produces at full
      capacity. What is the full employment output for this economy? (Y is real GDP, K
      is capital, and L is labor.)
  (c) What is the labor productivity if the economy produces the full employment level
      of output?
  (d) Suppose now, that the government implements a minimum wage rate of $70 per
      week.
      (d.1) Given this information, what is the number of unemployed in this economy?
      (d.2) Given this information, what is the new level of output for this economy and
            the new level of labor productivity?
      (d.3) From your answers in parts (d.1 and d.2), discuss whether or not the
            government minimum wage policy makes workers better off or not?
  (e) Go back to the initial situation (no minimum wage imposed by the government).
      Suppose the amount of available physical capital increases to K=125. Suppose
      there is no change in labor demand and labor supply. Given this change in capital,
      what is the full employment level of output and what is labor productivity? How
      does an increase in the capital stock affect output and labor productivity?

Problem 2.

For each of the following situations use a graph of both the labor market and a graph of
the aggregate production function to analyze the situation (these vertically stacked graphs
were presented in class). Provide a clear explanation and be sure to identify the effects on

the level of employment, the wage rate, the output level and the level of labor productivity.

    (a) The average education level has increased. Assume that this change does not alter either the labor demand or the labor supply curves.
    (b) The level of capital in the economy changes while the demand and supply of labor is unaffected.
    (c) An immigration wave takes place (i.e. the labor force increases).

Problem 3.

Complete the following table. The production function is given by $Y = 10K^{0.5}L^{0.5}$ where capital is fixed at the level $K=100$. *APL* stands for *average productivity of labor* while *MPL* stands for *marginal productivity of labor* ($\Delta Y / \Delta L$).

Table 1

Output	Capital	Labor		
Y	K	L	APL	MPL
	100	0	-	-
100.0	100	1		100.0
141.4	100	2	70.7	41.4
	100	3		
	100	4		
	100	5		

Problem 4.

Consider the following economy:

The business sector has an investment function: r = 25 – I/2000
The household sector has a saving function: r = - (1/2) + S_P /4000

Also, by definition, we have the following equations:

$$Y = C + I + G + X - IM$$
$$S_P = Y - C - T + TR$$
$$S_G = T - TR - G$$
$$KI = IM - X$$

where
C = Consumption
I = Investment
G = Government spending
X = Export
IM = Import
r = real interest rate in percentage tem.

S_P = Private Saving
S_G = Government Saving
T = Tax
TR = Government Transfers
KI = Capital Inflow

Answer the following questions.

(a) Write an equation for National Saving (NS), and indicate all the components in NS. (Note: National Saving equals the sum of private saving and government saving).

(b) In equilibrium, we know that investment equals national saving plus capital inflows. Using the equations above, provide a proof about the identity.

(c) Consider a country whose economy is a closed economy. Furthermore, assume initially that government saving in this economy is zero. Use the information above to find (1) the equilibrium interest rate, (2) the equilibrium level of investment, (3) the equilibrium level of private saving and (4) the equilibrium level of national saving.

(d) Suppose in this closed economy the government decides to increase its spending so that it will have a budget deficit of 12,000 (i.e., $S_G = -12,000$). Find (1) the equilibrium interest rate, (2) the equilibrium level of investment, (3) the equilibrium level of private saving and (4) the equilibrium level of national saving.

(e) How does the government's decision to increase its government spending affect the equilibrium level of investment, the equilibrium level of private saving, and the real interest rate?

(f) Suppose this country continues to have a budget deficit of 12,000. Suppose the government decides to trade with other countries and its capital inflows are equal to $6000 (i.e., $KI = 6,000$). Find (1) the equilibrium interest rate, (2) the equilibrium level of investment, (3) the equilibrium level of private saving and (4) the equilibrium level of national saving.

(g) How does this capital inflow affect the equilibrium level of investment, the equilibrium level of private saving, and the real interest rate in this open economy?

Problem 5.

Use the market for loanable funds to answer the following questions:

(a) Suppose that the government wants to reduce the size of its surplus to zero by increasing its spending. Use a graph of the loanable funds market to explain what happens to private savings, equilibrium level of investment, and equilibrium interest rate.

(b) Assume the budget balance is zero. Suppose that at any given interest rate, consumers decide to save less. Use a graph of the loanable funds market to explain what happens to the equilibrium level of investment and equilibrium interest rate.

(c) Assume the budget balance is zero. Suppose that at any given interest rate, businesses become very pessimistic about the future profitability of investment. Use a graph of the loanable funds market to explain what happens to private savings and the equilibrium interest rate.

(d) Suppose the equilibrium level of investment is exactly equal to the depreciation of the economy's capital each year. Holding everything else constant, the

government decides to decrease its level of spending. Suppose this decrease in government spending has no effect on the equilibrium level of employment. What is the effect of this decrease in government spending on output and capital productivity (output per unit of capital)?