Name:
Student No.:

SPP/Econ 556
Macroeconomics
Midterm Exam No. 1

February 17, 1999

Answer all questions, on these sheets in the spaces or blanks provided. In questions where it is appropriate, **show your work**, if you want partial credit for an incorrect answer. Point values of the questions are shown; there are a total of 94 points possible.

1. (20 points)

   a. For each of the following transactions and events, indicate whether or not it contributed to one or more of the U.S. macroeconomic variables C, I, G, X, or IM, and if so, which one or ones. Record your answer(s) by writing either "none" or x=±yyy in the space provided, where x=C,I,G,X,or IM and yyy is the dollar amount. Assume that all take place in the same year.

   The City of Ann Arbor pays an SPP summer intern $2500 for a summer's work. _____

   The intern uses $1500 to pay rent. _____

   The intern uses $100 to buy two textbooks, published in England, from a British online bookseller. _____

   The intern uses $5000 to pay tuition. _____

   The intern borrows $4000 in a student loan from the federal government. _____

   At the end of the summer, the intern buys a $200 round-trip ticket to Mexico from American Airlines. _____

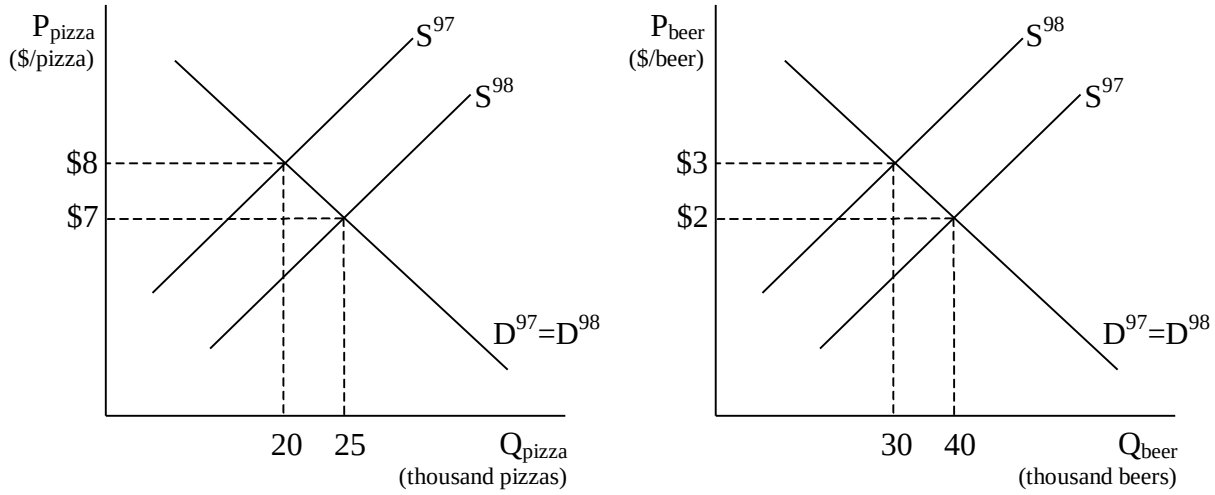
   In Mexico the intern spends 3200 pesos at a Mexican-owned hotel. The peso is worth $0.10. _____

   Meanwhile, back in Ann Arbor, the intern's landlord spends $7600 repairing the intern's apartment, damaged by fire when the intern left the coffeemaker on during the trip to Mexico. _____

b. Calculate the total contribution of the above transactions to U.S. Gross Domestic Product.

c. By how much would U.S. GDP have been different if the intern had chosen not to take a vacation and had instead spent the time in the apartment watching the coffeemaker?

2. (14 points) The graphs below show supply and demand *per day* for two goods, beer and pizza, which are the only goods consumed by Ann Arbor's population of 20,000 consumers. Market equilibria are shown for both 1997 and 1998, between which both prices and quantities changed as shown.



a. What was Ann Arbor's nominal GDP for the *year* of 1997 and also for 1998?

b. Calculate the CPI for 1998, using 1997 as a base year and the 1997 quantities consumed as the basket of goods.

c. Calculate the Ann Arbor GDP deflator for 1998 using 1997 as base year, assuming that beer and pizza were the only things produced in Ann Arbor during these years.

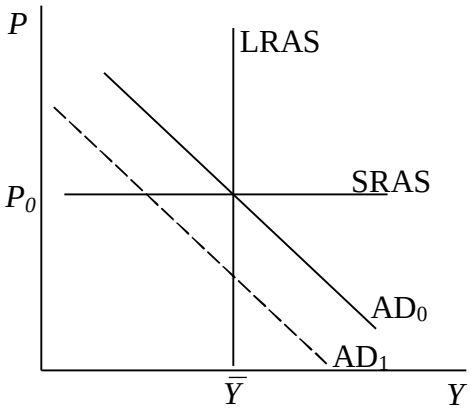
d. How do the rates of inflation from 1997 to 1998 compare when measured by these two different means? Why do they differ in this way?

e. Suppose that the "true" rate of inflation were taken to be simply halfway between (i.e., the arithmetic average of) the two rates gotten from the CPI and the GDP Deflator. In this example, how would the error from using only the CPI as the official rate of inflation compare to error that was found by the Boskin Commission to be present in the United States CPI? Would Dean Baker, who criticized the Commission findings, believe that the example here is more correct or less correct than the Boskin Commission findings?

f. Name and briefly explain one source of error in the real-world CPI that is *not* included in the example here.

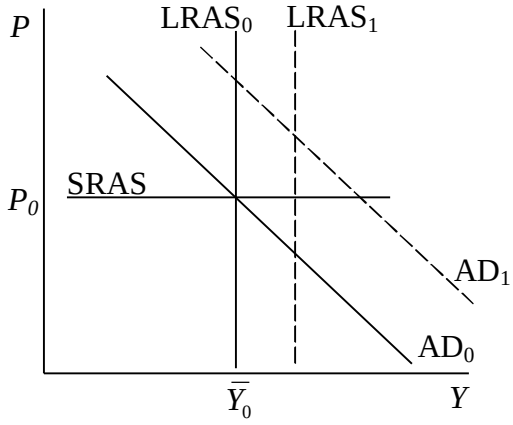
3. (14 points)

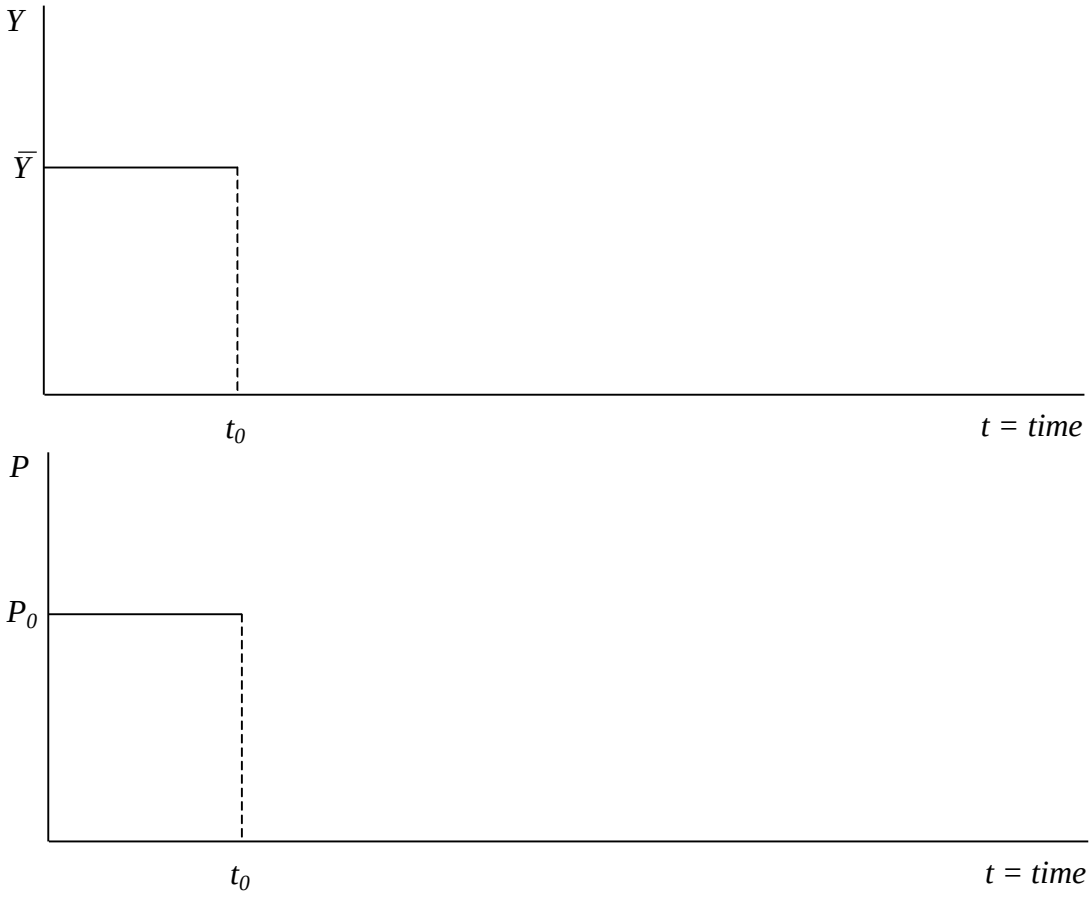
a. Trace the effects, initially and over time, of a permanent *leftward* shift of the Aggregate Demand Curve, occurring at time t_0, as shown in the figure at the right. Record your answer *both* by showing the path followed by Y and P together in the Aggregate Supply and Demand diagram at the right, and also by drawing the paths over time that are followed by Y and P separately in the graphs below.



b.

b. Repeat part (a) for the combination of shifts shown at the right. That is, assume that at time t_0 the Aggregate Demand Curve shifts to the right from AD_0 to AD_1 ***and*** that, also at time t_0 or shortly thereafter, the Long Run Aggregate Supply Curve also shifts to the right from $LRAS_0$ to $LRAS_1$. Again, show the paths followed by Y and P over time, both in the AD-AS diagram at the right, and in the graphs over time below.



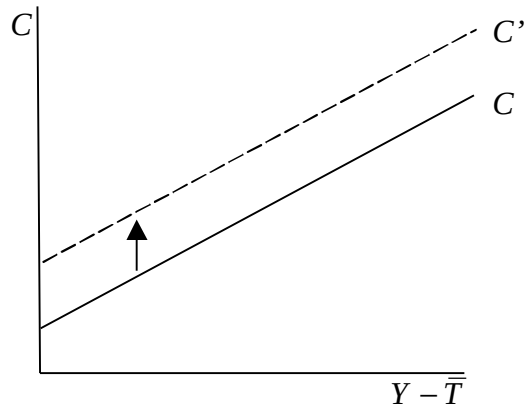


c. Can you think of a single change in one of the components of GDP that might cause the combined shift of AD and LRAS curves shown above?

4. (10 points) In the model of Mankiw's Chapter 3, what is the effect of an upward shift in the consumption function on the five endogenous variables: *Y*, *W*, *r*, *C* and *I*? That is, consider the model whose components are:

Production Function:	$Y = F(\bar{K}, \bar{L})$	(1)
Wage:	$W = MPL = F_L(\bar{K}, \bar{L})$	(2)
Consumption:	$C = C(Y - \bar{T})$	(3)
Investment:	$I = I(r)$	(4)
Goods Market Equilibrium:	$Y = C + I + \bar{G}$	(5)

Suppose now that the consumption function shifts upward as in the figure at the right. Determine the direction of the effect of this change on each of the variables below, recording your answer as +, –, 0, or ?, where the question mark means that the effect is theoretically ambiguous.



Y: Income _____

W: Real Wage _____

r: Real Interest Rate _____

C: Consumption _____

I: Investment _____

5. (16 points) In the Solow Growth Model, without technological progress but with (positive) population growth, identify the following statements as either true or false:

There is an upper bound on the size of total GDP. _____

Savings equals investment only in the steady state. _____

Per capita income is determined completely by the capital-labor ratio. _____

An increase in the savings propensity causes a temporary increase in the rate of growth of total GDP. _____

An increase in the population growth rate causes an eventual increase in the rate of growth of total GDP. _____

In steady-state growth, per capita consumption grows at a constant rate equal to the population growth rate. _____

A fall in the rate of depreciation causes an eventual increase in per capita consumption. _____

If the marginal product of capital is less than the rate of depreciation, then a fall in savings can raise per capita consumption in both the short run and the long run. _____

6. (10 points) In the context of the Solow Growth Model, suppose that an economy starts in steady-state growth with a rate of population growth equal to 3% and a rate of capital depreciation equal to 4%. If these rates now change simultaneously and permanently to 1% for population growth and 6% for depreciation, what if anything will happen subsequently to
    - The level of per capita income
    - The growth rate of total GDP
    - The growth rate of the capital stock
    - The growth rate of the capital-labor ratio
    - The level of per capita consumption

7. (10 points) Recent news items reported first that U.S. growth of GDP was strong in the 4th quarter of 1998, and then also that "productivity" increased faster in that same quarter than it has on average over the last 25 years. Answer the following questions, and provide a brief explanation of your answers:

   a. What component of U.S. GDP was most responsible for the strong growth in late 1998?

   b. Are the causes of the productivity increase the same as, or different from, the cause of GDP growth?

   c. Does strong growth of GDP, for the reasons observed in late 1998, reduce or increase unemployment?

   d. Does strong growth of productivity, for the reasons observed in late 1998, reduce or increase unemployment?

   e. Do these two events together (ignoring other things that might have other implications) suggest that unemployment in the U.S. will rise, fall, or stay the same during the coming