

14.02 Principles of Macroeconomics

Problem Set #2, Questions

Posted: Thursday, February 21, 2002

Due Date: Thursday, February 28, 2002

Please remember to write your TA's name and section time on the front page of your problem set.

Part I: True, False Questions. Decide whether each statement is true or false and justify your answer with a short argument. (5 points each, 35 points total)

1. The real output per capita is one of the best measures of the standard of living.
2. An increase in the personal savings rate reduces aggregate demand, so it is unambiguously bad for short and long-term growth.
3. The regression line obtained using OLS is chosen to minimize the size of the estimated coefficient.
4. A t-statistic close to zero indicates that we cannot be 95% sure that the true coefficient is different from zero.
5. Cross-sectional data show that relatively high growth countries have had a relatively highly educated labor force.
6. A regression of Y on X with a high R^2 indicates that X is caused by Y.
7. Other factors equal, a 1% increase in a nation's investment in physical capital, produces a 1% increase in potential output.

Part II. National Accounts. (5 points each, 40 points total)

There are an orange farm and an orange juice company in a country called Orangeland. Orangelanders live only on orange juice. In 1992, the orange farm produced 10 oranges, and sold them to the orange juice company at \$1 each. The orange juice company produced 3 bottles of orange juice, and sold them all at a unit price of \$10 plus 10% indirect tax collected by government (so the price paid was actually \$11). The orange farm paid total wages of \$6. The orange juice company paid total wages of \$10. The orange juice company also had to pay \$4 to replace the orange juice extractor that was not working properly due to its use during 1992 (depreciation). Both companies retained 50% of their profits and paid the rest of it as dividends to the households. After receiving their wage income and their dividends, the households paid a 10% direct tax on their total income to the government. The government bought one orange juice bottle. (Notice that the firms are not paying any direct taxes on their retained profits)

1. Compute the GNP of Orangeland using the value added approach or the final goods approach.
2. What is NNP? What is National Income?
3. What is the total income of the government?
4. What is government budget deficit (or surplus)?
5. What is the disposable income (income available for consumption) of the households?

In 1993, the price of all the goods (the oranges and the orange juice bottles) went up by 10%.

6. Would you say that the economy experience a real economic expansion between 1992 and 1993? Explain.
7. What was the nominal GNP in 1993? What is the inflation rate?
8. What was the real GNP in 1993 measured at 1992 prices?

Part III : Econometrics and Aggregation (5 points each, 25 points total):

An economist used data on savings (S) and disposable income (Y) over many years of a given individual (Mister X). He applied an appropriate econometric procedure to estimate the following savings equation:

$$S_t = \alpha + \beta Y_t + \text{residual}$$

1. Interpret β . What is the range of values should you expect for β ?
2. The regression yielded the following estimates: $\alpha = -5$, $\beta = 0.3$. Suppose that for one of the observations in the sample, $Y_t = 100$ and $S_t = 10$. What is the estimated (fitted) value for that observation? What is the estimated residual?
3. If the t-statistic for β was 1.023, what can you say about the effect of disposable income on consumption?
4. Derive the consumption function of Mister X (forget about the residual).
5. Suppose that there are 100 individuals in the economy. All individuals have the same consumption function as Mister X but have different disposable incomes. What is the aggregate consumption function?. Aggregate disposable income is 8,000. What will be your "estimate" of aggregate consumption? If there is no government expending, no imports, and no exports, how big is investment in this economy?