Problem Set 1 (Answers)
14.02 Principles of Macroeconomics
2/19/97

1.) If imports exceed exports, then there will be a trade deficit. (i.e. US consumers spend on goods and services produced by the rest of the world more than the rest of the world spend on US produced goods and services) Therefore, C+I+G may equal 105% of GDP while C+I+G+X-M equal 100% of GDP.

2.) (a) Yes, the market value of the sweater will be counted toward to GDP at its sale price.

(b) Yes, this should be counted under service. Unfortunately, it is rarely reported since it is an informal type of income.

(c) No. The value of an Apple computer had been already counted in GDP when it was first produced and purchased, and thus, like any purchase of used products, the purchase of used computer will be excluded from GDP this period (to avoid double counting). For the purchase of Russian caviar, since it is imported from Russia (and not product produced in US) we would not count it in US GDP. Of course, during the process of distributing the caviar to the consumers, US firms may create some value added to the consumption of caviar (e.g. packaging, advertising etc.) Thus, the portion of the price paid by consumers incurred as a result of these services will be counted in US GDP.

(d) No, this transaction will not be counted in US GDP because raw oatmeal is an intermediate input. While the value of oatmeal cookie, a final product, will be counted.

3.) (a)

1995 Nominal GDP = (1,200*$1) + (5,000*$.50) + (600*$2) = $4,900

1996 Nominal GDP = (800*$1.50) + (4,000*$.75) + (400*$3)= $5,400

1995 Real GDP (in 1995 dollars)= 1995 Nominal GDP = $4,900

1996 Real GDP (in 1995 dollars)= (800*$1) + (4,000*$.50) + (400*$2) = $3,600

1995 Real GDP (in 1996 dollars)= (1,200*$1.50) + (5,000*$.75) + (600*$3)= $7,350

1996 Real GDP (in 1996 dollars)= 1996 Nominal GDP = $5,400

1995 GDP deflator (in 1995 dollars)=1995 Nominal GDP/1995 Real GDP (in 95 dollars)=$4,900/$4,900 = 1

1996 GDP deflator (in 1995 dollars)= 1996 Nominal GDP/1996 Real GDP (in 95 dollars)=$5,400/$3,600 = 1.5

1995 GDP deflator (in 1996 dollars)=$4,900/$7,350= .667

1996 GDP deflator (in 1996 dollars)=$5,400/$5,400= 1

(b) The inflation rate between 1995 to 1996 using 1995 as a base year = (1.5-1)/1= 50 %

(c) The inflation rate between 1995 to 1996 using 1996 as a base year = $(1-.667)/.667 \sim 50\%$

Note: it is coincidence that inflation rates are equal in these two cases. Usually, when you use different base years, the rate of inflation will differ as well.

(d) If increase in wages does not accompany increase in general price level of goods and service by the same proportion, then the standard of living (real wage) will decline. Besides, inflation will usually associate with redistribution of income (e.g. debtor/creditor, old/young, etc.). It also creates price distortion among various resources, which leads to inefficient allocation and use of resources in the economy. High inflation hinders investment due to higher uncertainty. In some of hyperinflation episodes, the domestic currency may lose its value so rapidly that no one will be willing to hold it, and thus becomes worthless.

4.) (a) According to the question, we would consider widgetizer as part of nonresidential investment (i.e. purchase of capital goods by firms). Therefore, it will not be part of the fixed basket of goods consumed by urban consumers which is the base for consumer price index measurement. Therefore, increase in its price will not affect CPI directly. On the other hand, GDP deflator, which measures the average price change of goods purchased not only by consumers (C) but also by firms(I) and government (G), should increase as a result of increase in the price of widgetizer, capital good used heavily by firms.

(b) During 1978-1979, the price of imported oil to the US went up substantially. Given that the US is a net oil importer, and the fact that oil is a major component of a basket of goods and services consumed by consumers (through transportation expenditures, for example), this increase in oil price caused a significant increase in CPI relative to GDP deflator which measures the price of products produced in the US.

5.) (a) Uncertain

To calculate the unemployment rate, we need to know the number of the labor force. In this case, labor force cannot be precisely determined, however. For those who are over 16 and not working, we can either classify them as "unemployed" which is part of labor force if they are still looking for job, or as "out of labor force" which is not part of labor force if they are not looking for job. Since we are not provided with this information, we cannot calculate the unemployment rate. Note, given the limited information we have, the rate may vary anywhere from 0% to 23.8%.

(b) In this case, labor force = 160 + 40 = 200. Thus, unemployment rate = 40/200 = 20 %.

(c) The major factor that has contributed to the increase of the labor force participation rate in the US are increase in percentage of women joining the workforce. Other possible answer is increase in percentage of minority joining

the workforce due to lower discriminatory practices in the hiring and promoting decision.

(d) The answer will depend on whether most of people on the welfare are looking for jobs or not. If they are, then they are already counted as in the labor force. Therefore, changing the welfare law will have little impact on the participation rate. On the other hand, if most of those on welfare are not actively looking for jobs,(and thus considered to be out of the labor force), then cutting short the period anyone allowed to be on welfare will force them to rejoin the labor force. This should lead to a higher participation rate.

6.) Total government expenditures consist of two main components. First, government spending on goods and services (G) which is counted under GDP. The second component are government transfers (e.g. welfare, social security, medicare, etc.) and interest payment on government debt. We do not count these items under GDP because they are not purchases of goods and services, but rather represent transfers of income from some taxpayers to others or foreigners. Make sure you know which meaning of the term government spending you are using. Note that increase of government transfers does not lead to increase in GDP, while increase in G does.

7.) Both real and nominal GDP have steadily increased (for the most part) since the 1960s although the latter series has exhibited steeper movement. The increase in real GDP is due to increase in final goods production while the increase in nominal GDP can be attributed to increase in both final goods production and prices. Given that the US has experienced a steady increase in price level over time, the slope of nominal GDP series will be steeper than real GDP. For the example in the book, we use 1987 as the base year (noting that both curves intersect in 1987) If we were to change the base year to 1976, then the two curves would cross in 1976 since in 1976, the nominal GDP would be equal to real GDP. However, change in the base year will not affect nominal GDP series at all.