EC 205 Macroeconomics I

Fall 2023

Problem Session 1 Solutions

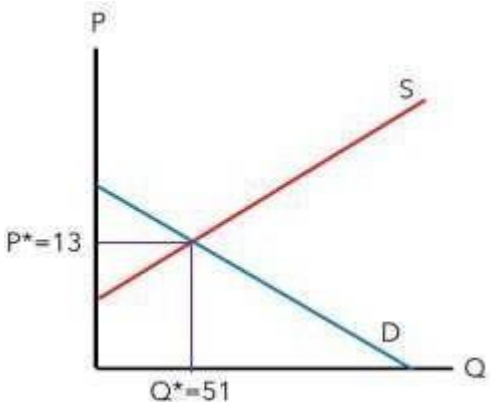
Q1

a) D (Y, P) = 10+5Y-3P >> D(16,P) = 90 – 3P

S (P, P_{lemons}) = 20+3P-2P_{lemons} >> S(P, 4) = 12 + 3P

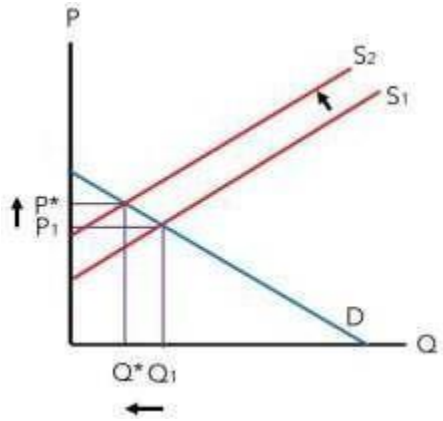
90 – 3P = 12 + 3P

P* = 13, Q* = 51



b) Increase in the input price will shift the Supply curve leftwards.

Equilibrium price will increase, on the other hand, quantity will decrease.



c) Initial Demand

P* = 13, Q* = 5

New Demand (Y_{new}=\$32, P_{lemons}= \$12)

D(P,Y) = 10 + 5x32 – 3P

S(P,Ps) = 20 + 3P – 2x12

170 – 3P = 3P – 4

P* = 29, Q* = 83

Q2

Flow variables refer to variables that are measured over a period or per unit of time. Stock variables, on the other hand, mean those variables that are measured at a point in time.

a. population >>>>> **stock**

b. CO2 in atmosphere >>>>> **stock**

c. water pouring in >>>>> **flow**

d. Total money supply >>>>> **stock**

e. Number of persons employed >>>>> **stock**

f. Gross profit >>>>> **flow**

g. Unemployment rate >>>>> **stock**

Q3

a. Nominal GDP (2018) => $8x400 + $12x300 + $10x150 = $8300

Nominal GDP (2019) => $9x500 + $15x400 + $12x200 = $12900

Nominal GDP (2020) => $14x550 + $16x500 + $10x225 = $17950

b. Real GDP (2018) => $8x400 + $12x300 + $10x150 = $8300

Real GDP (2019) => $8x500 + $12x400 + $10x200 = $10800

Real GDP (2020) => $8x550 + $12x500 + $10x225 = $12650

c. GDP Deflator Formula = (Nominal GDP/Real GDP) ×100

GDP Deflator (2018) = ($8300/$8300) x100 = 100

GDP Deflator (2019) = ($12900/$10800) x100 = 119.44

GDP Deflator (2020) = ($17950/$12650) x100 = 141.90

d. Inflation (t+1) = (GDP Deflator (t+1) – GDP Deflator (t)) / GDP Deflator (t)

Inflation (2019) = (119.44 – 100) / 100 = 19.44%

Inflation (2020) = (141.90 – 119.44) / 119.44 = 18.80%

e. CPI = 100 × (Cost of basket in that month / Cost of basket in base period)

   Consumer Basket = 10 Cherries, 15 Berries, 8 Melons

   Cost of the Consumer Basket (2018) = ($8x10 + $12 x 15 + $10 x 8) = $340

   Cost of the Consumer Basket (2019) = ($9x10 + $15 x 15 + $12 x 8) = $411

   Cost of the Consumer Basket (2020) = ($14x10 + $16 x 15 + $10 x 8) = $460

   Inflation (2019) => ($411-340) / 340 = 20.88%

   Inflation (2020) => ($460-411) / 411 = 11.92%

f. The first difference is that the GDP deflator measures the prices of all goods and services produced, whereas the CPI measures the prices of only the goods and services bought by consumers. Thus, an increase in the price of goods bought by firms or the government will show up in the GDP deflator but not in the CPI.

   The second difference is that the GDP deflator includes only those goods produced domestically. Imported goods are not part of GDP and do not show up in the GDP deflator. For example, an increase in the price of Toyota made in Japan and sold in the U.K. affects the CPI, because the Toyota is bought by consumers in the U.K., but it does not affect the GDP deflator.

   The third difference concerns how the two measures aggregate the many prices in the economy. The CPI assigns fixed weights to the prices of different goods, whereas the GDP deflator assigns changing weights.

Q4

a) No, **second-hand items**, such as **used cars**, are ***not included*** in the GDP calculations

b) No, it is just an input. GDP is the total value of the final goods.

c) It depends, if it is not a paid job then we will not count it in GDP.

d) Yes, it is counted. It is a paid service.

e) No, since it is produced in the previous year. It is not included.

f) Not counted in French GDP, but it is included in Turkish GDP.

g) Investment spending increases by the price of the computer, and so does GDP.

h) Exports (and net exports) increase by the price of the computer, and so does GDP.

i) Government spending increases by the price of the computer, and so does GDP.

j) Consumption spending increases by the price of the computer, and so does GDP.

k) Consumption spending increases by the price of the computer, but imports also increase by the price of the computer, so that net exports decrease by the price of the computer and there will be no net change in GDP. (A computer produced abroad would not change GDP.)

Q5

GDP is a useful indicator of a nation's economic performance, and it is the most commonly used measure of well-being. However, it has some important limitations, including:

- The exclusion of non-market transactions
- The failure to account for or represent the degree of income inequality in society
- The failure to indicate whether the nation's rate of growth is sustainable or not
- The failure to account for the costs imposed on human health and the environment of negative externalities arising from the production or consumption of the nation's output
- Treating the replacement of depreciated capital, the same as the creation of new capital

Q6

Labor Force = Employed + Unemployed

Size of the Labor Force equals 118.4 million.

Labor Force Participation Rate = Labor Force / Population

LFPR = 118.4 / 159.9 = 74.04%

Unemployment Rate = Unemployed / Labor Force

Unemployment Rate equals to 13.6%. (16.1/118.4)