Midterm Exam
Macro Economics

Institute for Financial Management & Research (Batch: 2017-19)

November 1, 2017

Maximum Points: 60 **Duration**: 120 minutes

Instructions:

- You need to answer 7 questions in all.
- You can choose between Question 1 and Question 2, and between Question 3 and Question 4.
- All other questions are compulsory.
- Please be brief and precise in your answers. Unnecessarily lengthy answers will attract penalty.
- At no point of this examination you are allowed to ask clarificatory questions. Make reasonable assumption if you have doubts.
- You are allowed to use calculator in the exam.

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1. (4 points) Assume that the banking system has total reserves of ₹100 billion. Assume also that required reserves are 10 percent of checking deposits and that banks hold no excess reserves and households hold no currency.
   (a) (2 points) What is the money multiplier? What is the money supply?
   (b) (2 points) If the RBI now raises required reserves to 20 percent of deposits, what is the change in reserves and the change in the money supply?

Solution:
(a) Money Multiplier $= \frac{1}{\text{Reserve Ratio}}$.
Money Multiplier $= 1/0.1 = 10$.
Money Supply = Total Reserves $*$ Money Multiplier.
Money Supply (in ₹billion) $= 100 * 10 = 1000$

(b) Change in total reserves = 0.
Change in required reserves (in ₹billion) = $(0.2 - 0.1) * 100 = 10$.
Change in New Money Multiplier = $1/0.2 = 5$.
New Money Supply (in ₹billion) = $100 * 5 = 500$.
Change in Money Supply (in ₹billion) = $500 - 1000 = -500$

Or

2. (4 points) The GDP can be broken down into four components- consumption(C), investment (I), government purchases (G), and net exports (NX)- according to: $Y = C + I + G + NX$.

   Identify to which component (C, I, G, or NX) would the following belong:
   a. An Indian laptop purchased by the Maharashtra state government.
   b. An Indian laptop purchased by an Indian consumer.
   c. An Indian laptop purchased by a German consumer.
   d. An Indian laptop purchased by Wipro.

Solution:
a. G.
b. C.
c. NX.
d. I.

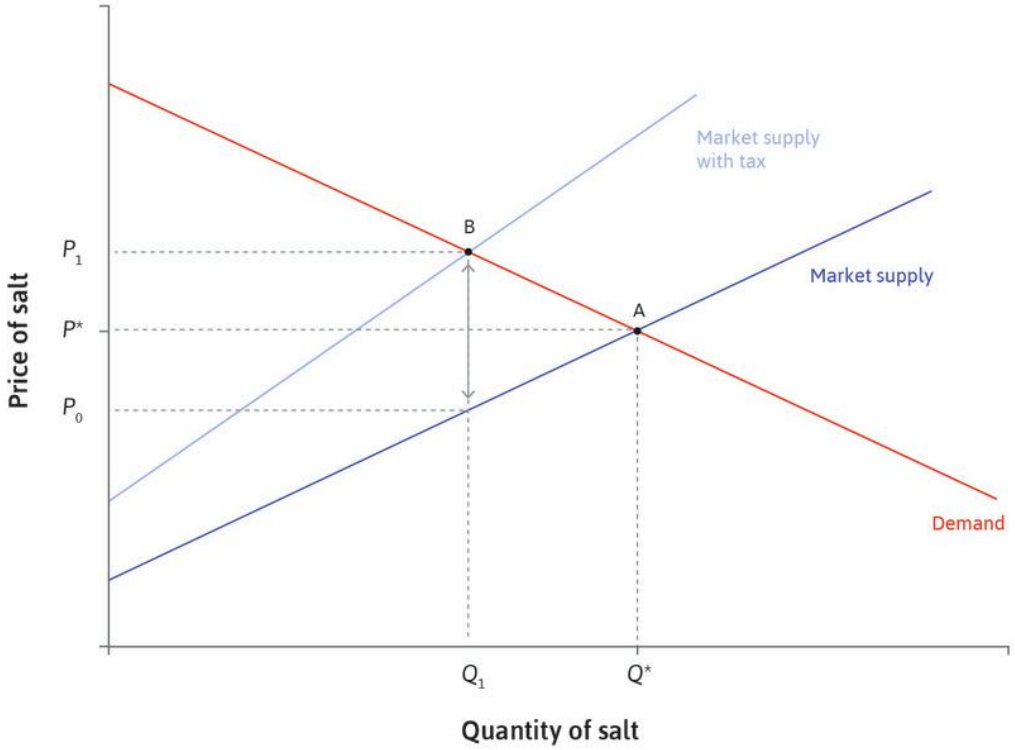
3. (6 points) Please indicate whether each of the following statements is true or false:
   a) GDP accounts for physical goods like iPhones, Fitbit, Plasma TV, but not on services, like haircuts, legal advice, that are produced within an economy for a given period of time.
   b) GDP is a measure of both income and expenditure.
   c) GDP includes the value of both new iPhones purchased from Apple stores and used iPhones purchased on OLX by consumers within an economy during a given period of time.

Solution:
a) False.
b) True.
c) False.

Or

4. (6 points) Figure 1 shows the demand and supply curves for salt, and the shift in the supply curve due to the implementation of a 30% tax on the price of salt?

Figure 1



(a) (4 points) Calculate the government tax revenue.

(b) (2 points) What is the price that consumers pay and the one that producers receive?

Solution:
a. Government's tax revenue: $(P_1 - P_0) * Q_1$.
b. Price that consumers pay: P_1. Price that producers receive: P_0.

5. (10 points) One day, Melissa's restaurant *How Sweet It Is* collects ₹10,000 for ice-cream, desserts and coffee. Over this day, her equipment depreciates in value by ₹1,000. Of the remaining ₹9,000, Melissa sends 20% to the government as GST, takes home ₹5,200 in wages, and retains ₹2,000 in her business to add new equipment in the future. From the ₹5,200 that Melissa takes home, she pays 20% in income taxes. Based on this information, compute Melissa's contribution to the following measures of income.
   a) Gross domestic product
   b) Net national product
   c) National income
   d) Personal income
   e) Disposable personal income

Solution:
a) Gross domestic product = ₹10,000.
b) Net national product = ₹10,000 - ₹1,000 = ₹9,000.
c) National income = ₹10,000 - ₹1,000 = ₹9,000.
d) Personal income = ₹5,200.
e) Disposable personal income = ₹5,200 - 0.2*₹5,200 = ₹4,160.

6. (10 points) Refer to Table 1 and answer the following questions.

Table 1

Year	Price of Milk	Quantity of Milk	Price of Honey	Quantity of Honey
2015	₹50	100	₹100	50
2016	₹50	200	₹100	100
2017	₹100	200	₹200	100

   (a) (4 points) Compute nominal GDP, real GDP, and the GDP deflator for each year, using 2015 as the base year.
   (b) (4 points) Compute the percentage change in nominal GDP, real GDP, and the GDP deflator in 2016 and 2017 from the preceding year.
   (c) (2 points) Did economic well-being rise more in 2016 or 2017? Explain.

Solution:
(a)
Nominal GDP:
2015: 5,000 + 5,000 = 10,000

2016: 10,000 + 10,000 = 20,000
2017: 20,000 + 20,000 = 40,000
Real GDP:
2015: 5,000 + 5,000 = 10,000
2016: 10,000 + 10,000 = 20,000
2017: 10,000 + 10,000 = 20,000
GDP Deflator:
2015: 100
2016: (Nominal GDP/Real GDP) $*$ 100 = $(20,000/20,000) * 100 = 100$
2017: $(40,000/20,000) * 100 = 2 * 100 = 200$
(b)
Percentage Change in Nominal GDP:
2016: 100%
2017: 100%
Percentage Change in Real GDP:
2016: 100%
2017: 0%
Percentage Change in GDP Deflator:
2016: 0%
2017: 100%
(c) In 2017, we observe inflationary effects whereas in 2016, there is no inflation. If at all a comment can be made about economic well-being, it can be said that 2016 was a better year than 2017.

7. (10 points) A small nation of 10 people loves Instagram and Snapchat. All they produce and consume are iPhones and Pizzas in the following amounts:

Table 2

	iPhone		Pizza	
Year	Quantity	Price	Quantity	Price
2016	10	$ 40	30	$ 10
2017	12	$ 60	50	$ 12

(a) (4 points) Use the consumer price index to compute the percentage change in the overall price level. Use 2016 as the base year, and fix the basket at 1 iPhone and 3 Pizzas.

(b) (4 points) Use the GDP deflator to compute the percentage change in the overall price level. Use 2016 as the base year.

(c) (2 points) Is the inflation rate in 2017 the same using the two methods? Explain why or why not.

Solution:
a) Cost of consumption basket (2016) = 1*40 + 3*10 = $ 70.
Cost of consumption basket (2017) = 1*60 + 3*12 = $ 96.
$CPI = ((96 - 70)/70) * 100 = 37.1\%$
b) In order to calculate GDP deflator, we need nominal and real GDPs for 2017.
Nominal GDP (2017) = 12*60 + 50*12 = $ 1320.
Real GDP (2017) = 12*40 + 50*10 = $ 980.
Deflator = (Nominal GDP/Real GDP)*100 = 134.69
Inflation = Deflator - 100 = 34.69%.
c) No, because the CPI is based on a fixed basket whereas deflator accounts for all goods and services.

8. (10 points) According to the Census of India 2011, of all adult Indians, 145,993,000 were employed, 7,381,000 were unemployed, and 79,436,000 were not in the labour force. Use this information to calculate:

   (a) (2 points) the adult population

   (b) (2 points) the labour force

   (c) (3 points) the labour-force participation rate

   (d) (3 points) the unemployment rate

Solution:
a) the adult population: 23,28,10,000.
b) the labour force: 15,33,74,000.
c) the labour force participation rate: 65.88%.
d) the unemployment rate: 4.81%.

9. (10 points) Suppose that this year's money supply is ₹500 billion, nominal GDP is ₹10 trillion, and real GDP is ₹5 trillion.

   (a) (4 points) What is the price level? What is the velocity of money?

   (b) (2 points) Suppose that velocity is constant and the economy's output of goods and services rises by 5 percent each year. What will happen to nominal GDP and the price level next year if the RBI keeps the money supply constant?

   (c) (2 points) What money supply should the RBI set next year if it wants to keep the price level stable?

(d) (2 points) What money supply should the RBI set next year if it wants inflation of 2 percent?

Solution:
a) Price Level = Nominal GDP/Real GDP = 10/5 = 2. Velocity = PY/M = 10000/500 = 20.
b) $MV = PY$. M stays the same, V remains the same, Y increases. Therefore, the price level must fall.
$500 * 20 = (5,000 + (5,000 * 0.05)) * P$
$10,000 = (5,000 + 250) * P$
$P = 10,000/5,250$
$P = 1.9$
Price Level = Nominal GDP/Real GDP
1.9 = Nominal GDP/5.25
Nominal GDP = ₹1.9*5.25 = ₹10 trillion.
c) Velocity is assumed to be constant. Growth rate is assumed to be 5%. Price level is fixed at 2.
M*20 = 2*(₹5.25 trillion)
M = ₹525 billion
d) Money growth + Velocity growth = Inflation + Real GDP Growth.
Assume real growth rate to be 5%. Velocity growth rate is assumed to be zero.
Therefore, Money growth = Inflation + Real GDP Growth Rate.
Money growth = 2% + 5% = 7%.
Money supply = ₹500 billion + 0.07*₹500 billion.
Money supply = ₹535 billion.