

PROBLEM SET 3 WITH ANSWERS

Q.1

Use the following information to fill in the blanks in the table. The economy is a closed economy without a government. Planned investment spending is determined autonomously. All figures are in billions of TL. Assume that the value of the MPC does not change as real GDP changes.

Real GDP	Consumption	Planned Investment	Aggregate Planned Expenditures
0		400	
1000	2000	400	
2000	2800		
3000			
4000	4400		
5000	5200		
6000			
7000			
8000			
9000			

Real GDP	Consumption	Planned Investment	Aggregate Planned Expenditures
0	1200	400	1600
1000	2000	400	2400
2000	2800	400	3200
3000	3600	400	4000
4000	4400	400	4800
5000	5200	400	5600
6000	6000	400	6400

7000	6800	400	7200
8000	7600	400	8000
9000	8400	400	8800

- i) Calculate the MPC and MPS.

$$MPC = \frac{\Delta C}{\Delta Y} = \frac{2800 - 2000}{2000 - 1000} = 0.8$$

$$MPS = 1 - MPC = 0.2$$

- ii) Determine the equilibrium level of income for this economy.

$$\text{In equilibrium, } Y = AE \text{ (8000 = 8000)}$$

$$AE = C + I = 7600 + 400 = 8000$$

- iii) If real GDP is 5000, is unplanned inventory investment positive or negative? How producers will respond?

***Unplanned Investment* = $Y - AE = 5000 - 5600 = -600$ Since producers have unplanned decrease in their inventories, they will produce more. Thus, we expect an increase in the level of output.**

- iv) If real GDP is 9000, is unplanned inventory investment positive or negative? How producers will respond?

***Unplanned Investment* = $Y - AE = 9000 - 8800 = 200$ Since producers have unplanned increase in their inventories, they will produce less. Thus, we expect a decrease in the level of output.**

Q.2

In the Keynesian cross, assume that the consumption function is given by

$$C = 200 + 0.75(Y - T)$$

Planned investment is 100; government purchases and taxes are both 100.

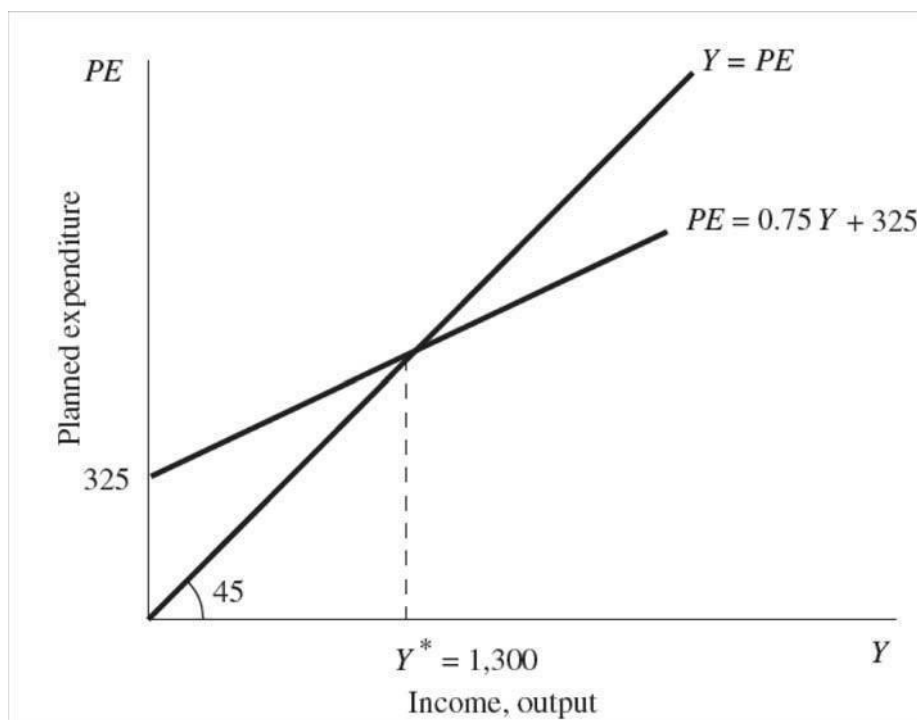
- a. Graph planned expenditure as a function of income.
- b. What is the equilibrium level of income?
- c. If government purchases increase to 125, what is the new equilibrium income?
- d. What level of government purchases is needed to achieve an income of 1,600?

a. Total planned expenditure is $P E = C(Y - T) + I + G$

Plugging in the consumption function and the values for investment I, government purchases G, and taxes T given in this question, total planned expenditure P E is:

$$P E = 200 + 0.75(Y - 100) + 100 + 100 = 0.75Y + 325$$

Graphically,



- b. To find the equilibrium level of income, combine the planned-expenditure equation derived in part (a) with the equilibrium condition $Y = P E$: $Y = 0.75Y + 325$
- $$\Leftrightarrow Y = 1300.$$
- c. If government purchases increase to 125, then the planned expenditure changes to $P E = 0.75Y + 350$. Equilibrium income increases to $Y = 1,400$. Therefore, an increase in government purchases of 25 (i.e. $125 - 100 = 25$) increases income by 100. This is what we expect to find, because the formula for the government purchases multiplier is $1/(1 - MPC)$, the MPC (marginal propensity to consume) is 0.75, and the government-purchases multiplier therefore has a numerical value of 4.
- d. An income level of 1,600 represents an increase in 300 over the original level of income. The government-purchases multiplier is $1/(1 - MPC)$ the MPC in this example equals 0.75, so the government-purchases multiplier is 4. This means that government purchases must increase by $300/4 = 75$ (to a level of 175) for income to increase by 300.

Q.3. $C = 500 + (0.5)Y_D$ (C = Consumption, Y_D =Disposable income)

$I = 100$ (I =Investment)

$T = 80$ (T =Taxes)

$G = 200$ (G =Government expenditures)

(AE = Aggregate expenditures)

a) Solve for the equilibrium level of income. (Find equilibrium levels of Y , AE , C , and Y_D .)

Aggregate Expenditures: $AE = C + I + G$

Equilibrium condition: $Y = AE$

So, $Y = C + I + G$

Remember, $Y_D = Y - T$ (Y_D = disposable income)

Substituting in: $Y = 500 + (0.5)(Y - 80) + 100 + 200$

$$Y = (0.5)Y + 760$$

$Y = 1520$ (equilibrium output/income)

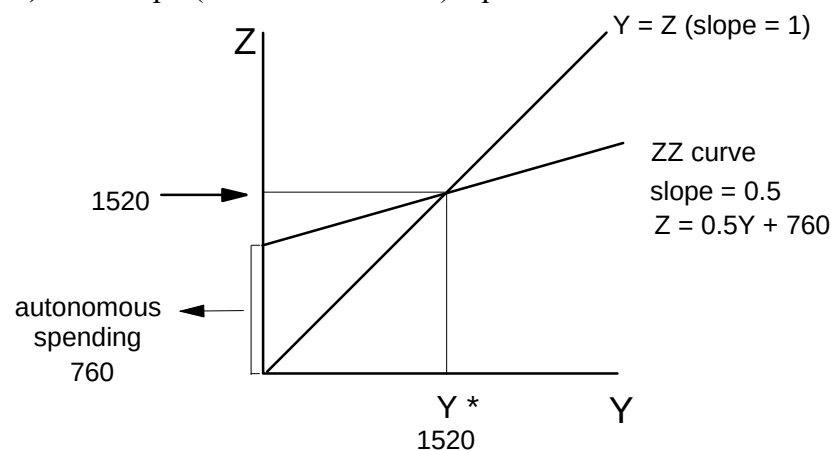
$Y_D = 1520 - 80 = 1440$ (disposable income)

$C = 500 + (0.5)(1440)$

$C = 1220$ (equilibrium consumption)

$AE = 1220 + 100 + 200 = 1520$ (total expenditures)

b) Graph (with correct labels) equilibrium Y and AE .



c) Solve for private saving and public saving (public saving is the difference between government income and expenditures).

Private Saving : $S = Y_D - C = 1440 - 1220 = 220$

Public Saving : $(T - G) = (80 - 200) = -120$ (Budget Deficit)

d) What is the value of marginal propensity to consume (mpc)? What does it mean?

mpc = marginal propensity to consume gives the effect of an additional dollar of disposable income on consumption. For example, if $mpc = c_1 = 0.3$, this means that \$0.30 of an additional \$1 of disposable income will be consumed, and \$0.70 will be saved.

In this problem, $mpc = c_1 = 0.5$. For every \$1 additional disposable income increase, \$0.50 will be consumed.

e) Find the multiplier and autonomous spending. Explain what they mean.

Equilibrium $\rightarrow Y = C + I + G$

$Y = [c_0 + c_1 Y - c_1 T] + I + G$

$Y = [1/1 - c_1][c_0 + I + G - c_1 T]$

Multiplier $\rightarrow [1/1 - c_1] = (1/1 - 0.5) = 2$

Autonomous Spending $\rightarrow [c_0 + I + G - c_1 T] = 760$

Autonomous spending is the part of demand for goods that does not depend on output.

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Autonomous spending is the part of demand for goods that does not depend on output. The multiplier tells us how much equilibrium output will change for a given change in autonomous spending. For example, if investment increases by 500, then the equilibrium output will rise by 1,000 ($500 * 2$)

Q.4

Suppose that there are five families in a society with incomes \$8000, \$12000, \$20000, \$40000 and \$80000. Construct a Lorenz curve for this five-family society.

Poorest quantile only consists of one family earning \$8000. Percentage of total income = $8000/160000 = 5\%$

The richest quantile consists the highest income family earning \$80000. This is $80000/160000 = 50\%$ of total income

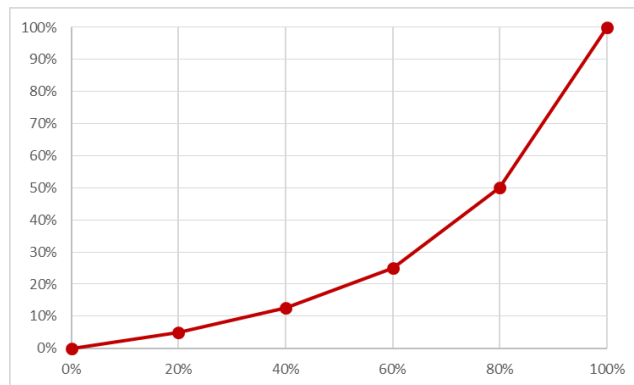
Second quantile: $12000/160000 = 7.5\%$

Third quantile = $20000/160000 = 12.5\%$

Fourth quantile = $40000/160000 = 25\%$

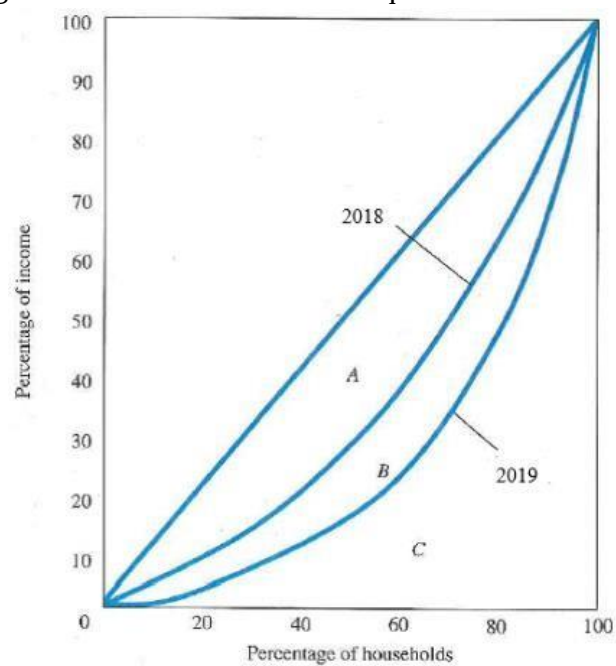
The Lorenz curve plots the percentage of total income against the cumulative percentage of total families:

Households	Percentage of Income
0%	0%
20%	5%
40%	12.5%
60%	25%
80%	50%
100%	100%



Q.5

Refer to the following Lorenz Curve to answer the questions.



- i) Explain whether the distribution of income was more equal in 2018 or 2019. The more the Lorenz curve away from the line of perfect equality, the greater will be the income inequality. Lorenz curve for 2018 is more close to the line of perfect equality so the income distribution more equal in 2018.
- ii) If area A=1900 and area B=300. What is the value of area C? what is the value of Gini coefficient for 2018 and 2019?

Depending on the triangle formula:

$$A + B + C = \frac{100 * 100}{2} = 5000$$

$$1900 + 300 + C = 5000$$

$$C = 2800$$

As we know;

$$\text{Gini coefficient for 2018} = \frac{A}{A + B + C} = \frac{1900}{5000} = 0.38$$

$$\text{Gini coefficient for 2019} = \frac{A + B}{A + B + C} = \frac{2200}{5000} = 0.44$$

Q.6

Define wealth and income. Why is it important to distinguish between the two? When you compare wealth inequality with income inequality in the USA and Turkey, which one is more unequal?

Wealth is the value of the things individuals own less the value of what they owe. It is a stock concept representing the value of assets such as houses, buildings and machines.

Income is payments received plus or minus changes in value in a person's assets in a specified time period. It's a flow concept.

Wealth distribution is more unequal. Check the figure 18-5 in your textbook (p.399). Actually in US, 40% of population has no wealth. According to World Inequality Database, Turkey is in similar situation. The top 1 percent own around 37% of total wealth. On the other hand, 50% of the population has less than 3% wealth.

MULTIPLE CHOICE QUESTION

Q.1. Macroeconomic equilibrium occurs when

- a) **aggregate expenditure = GDP.**
- b) aggregate expenditure = $C + I + G + \text{net transfers}$.
- c) aggregate income = planned inventories.
- d) aggregate expenditure = planned inventories

Q.2. If aggregate expenditure is less than GDP, how will the economy reach macroeconomic equilibrium?

- a) Inventories will decline, and GDP and employment will decline.
- b) **Inventories will rise, and GDP and employment will decline.**
- c) Inventories will decline, and GDP and employment will rise.
- d) Inventories will rise, and GDP and employment will rise.

Q.3. Consumption function is $C = 200 + 0.8 Y$. The saving function is:

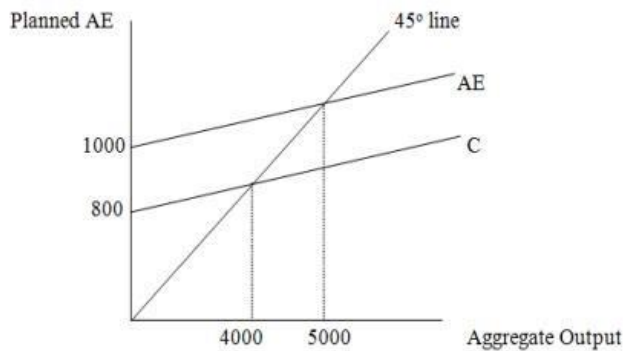
- a) $S = 200 - 0.2 Y$; where 200 is autonomous saving and -0.2 is marginal propensity to save.
- b) $S = -200 - 0.2 Y$; where -200 is marginal propensity to save and -0.2 is autonomous saving.
- c) $S = -200 + 0.2 Y$; where -200 is dissaving and 0.2 is (1- marginal propensity to save).
- d) **$S = -200 + 0.2 Y$; where -200 is dissaving and 0.2 is (1- marginal propensity to consume).**

Q.4. If Mike's income is reduced to zero after he loses his job, his consumption will be _____ and his saving will be _____.

- a) less than zero; less than zero.
- b) less than zero; greater than zero.
- c) greater than zero; greater than zero.
- d) **greater than zero; less than zero.**

Q.5. If the slope of AE function became steeper, MPC is _____ and the multiplier is _____.

- a) larger ; smaller b) smaller ; larger c) **larger ; larger** d) smaller ; smaller



The figure above belongs to a close economy without government. Use the figure to answer questions; 6-10

Q.6. The level of investment in this economy is;

- a) 1000 b) 800 c) 600 **d) 200**

Q.7. The slope of AE function is _____ which is equal to _____ in this case.

- a) MPC ; 0.2 b) MPC ; 0.5 c) **MPC ; 0.8** d) MPS ; 0.8

Q.8. The multiplier has a value of;

- a) 10 **b) 5** c) 1.25 d) 0.8

Q.9. If planned investment increases by 100, equilibrium level of output will ____ by _____. In equilibrium saving will be equal to _____.

- a) decrease ; 100 ; 50 **b) increase ; 500 ; 300** c) decrease ; 500 ; 300 d) increase ; 200 ; 500

Q.10. When output level is 4000, unplanned inventories will ____ by _____.

- a) decrease ; 1000 b) increase ; 800 **c) decrease ; 200** d) increase ; 200

Q.11. According to the “paradox of thrift”, as individuals increase their saving,

- a) income in the economy increases because there is more Money available for firms to invest
 b) income in the economy increases because interest rates will fall and the economy will expand
 c) income in the economy will remain constant because the change in consumption equals the change in saving.
d) income in the economy will fall because the decreased consumption that results from increased saving causes the economy to contract

Q.12. If the marginal propensity to save is 0.25, then a \$10,000 decrease in disposable income will

- a) increase consumption by \$7,500.
- b) increase consumption by \$2,500.
- c) **decrease consumption by \$7,500.**
- d) decrease consumption by \$2,500.

Q.13. If $C = 2000 + .9YD$, what increase in government spending must occur for equilibrium output to increase by 1000?

- a) 250
- b) 500
- c) **100**
- d) 1000

Q.14. An economy is assumed to be closed when:

- a) $S=I$
- b) $G=T=0$
- c) $G=T$
- d) **None of the above**

Q.15. Suppose the marginal propensity to consume equals .8 (i.e., $c_1 = .8$). Given this information, which of the following events will cause the largest increase in output?

- a) T decreases by 200
- b) **G increases by 200**
- c) I increases by 150
- d) both A and B

Q.16. Which of the following is a concern of fiscal policy?

- a) Policies concerning unemployment compensation, Social Security benefits, welfare payments, and veterans' benefits to households
- b) Policies concerning taxes
- c) Policies concerning government purchases of goods and services
- d) **All of the above**

Refer to the information provided in Table 1 below to answer the questions that follow.

All Numbers are in \$ Billion				
Output (Income)	Consumption Spending	Net Taxes	Investment Spending	Government Spending
200	100	100	200	100
400	300	100	200	100
600	400	100	200	100
800	500	100	200	100
1,000	600	100	200	100

Q.17. Refer to Table 1. At an output level of \$400 billion, disposable income equals _____ billion.

- a) \$400
- b) \$300**
- c) \$200
- d) \$100

Q.18. Refer to Table 1. The equilibrium level of output is _____ billion.

- a) \$600
- b) \$800**
- c) \$700
- d) \$1000

Q.19. The government spending multiplier shows:

- a) The ratio of the change in government spending to a change in autonomous planned investment
- b) The ratio of the change in equilibrium output to an initial change in government spending**
- c) The amount by which government spending changes with changes in the level of output
- d) How government spending is one of those variables that does not change in response to changes in the economy

Q.20. The tax multiplier is:

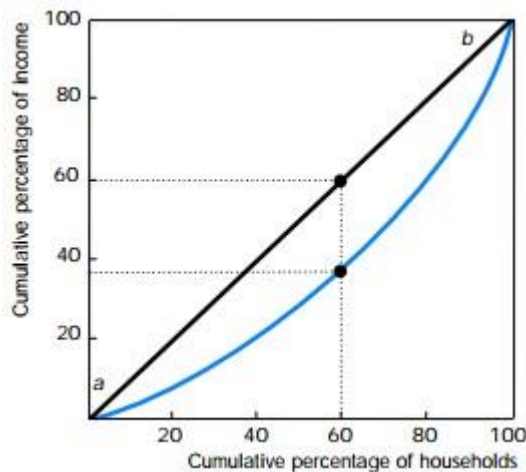
- a) The ratio of a change in the equilibrium level of output to a change in taxes
- b) A negative multiplier
- c) Not the same as the multiplier for a change in government spending

d) **All of the above**

Q.21. If firms are more optimistic that future profits will rise and remain strong for the next few years, then

- a) investment spending will fall.
- b) **investment spending will rise.**
- c) investment spending will remain unaffected.
- d) investment spending will rise and then fall

Answer the following questions according to the curve below



Q.22. The straight line labeled ab is the

- a) Lorenz curve.
- b) **line of equality.**
- c) line of poverty.
- d) line of distribution

Q.23. The poorest 60 percent of households have what percent of the nation's total income.

- a) **About 37 percent**
- b) About 60 percent
- c) About 63 percent
- d) Precisely 100 percent

Q.24. The Lorenz curve is a representation of

- a) a perfectly equal distribution of income
- b) a perfectly equal distribution of wealth

- c) **the percentage of total income earned by each quintile of the population**
- d) the percentage of poor people in a country

Q.25. The farther away a Lorenz curve for income is from the line of equality, the

- a) more equally wealth is distributed.
- b) more equally income is distributed.
- c) **less equally income is distributed.**
- d) None of the above.