

## THE KEYNESIAN MODEL: TWO SECTOR NATIONAL MODEL AND EQUILIBRIUM INCOME

Model assumptions for 2 sector:

1. Stable price level (no inflation) -> all nominal values are actually real values
2. Economy does not operate on full-employment level nor full-capital level (there's enough labor and capital supply)
3. The economy does not take part in international trade (there's no export or import) and there's no government sector

In this model, we try to establish the equilibrium of the economy. As usually, the equilibrium means that the supply equals to the demand but in this case we consider the supply being given by the level of product (Y) and the demand being given by the level of aggregate expenditure (AE). Therefore, the economy is in the state of equilibrium when:

$$Y_{(E)} = AE$$

In a simple two-sector economy aggregate expenditure (AE) consists of only two components:

- (i) aggregate demand for consumer goods (C),
- (ii) aggregate demand for investment goods (I).

$$AE = C + I$$

While investment in this model is considered to be autonomous (does not change with level of disposable income  $Y_D$ ), the consumption can and does change with the level of disposable income  $Y_D$ . That's why we speak about consumption function given as:

$$C = C_a + c \cdot Y_D$$



$$AE = C_a + c \cdot Y_D + I$$



Thus for the equilibrium:

$$Y_{(E)} = C_a + c \cdot Y_D + I$$

Consumption is not the only option for households how to use their disposable income ( $Y_D$ ). They can decide to save their money instead of spending it all. Remember that savings are not part of aggregate expenditure but due to their relationships with consumption and income we can speak about the saving function as follows:

$$S = S_a + s \cdot Y_D$$

Since disposable income can be used on consumption and savings then:  $Y_D = C + S$

How big share of disposable income is used on consumption and how big share is being saved is matter of so called marginal propensity to consume (MPC or c) and marginal propensity to save (MPS or s). If 60% (0.6) of households' income is spent on consumption, then remaining 40% (0.4) is used on savings. Thus:

$$c + s = 1$$

- a) If  $Y > AE$ : The product in the economy is higher than the expenditure of firms and households which means that the economy produced more than the subjects bought and hence, there are unplanned inventories in the economy ( $UI > 0$ ).
- b) If  $Y < AE$ : The product in the economy is lower than the expenditure of firms and households which means that the economy produced less than the subjects bought and hence, the unplanned inventories from previous years are decreasing ( $IU < 0$ ).
- c) If economy is in equilibrium and  $Y = AE$ , no unplanned inventories are made nor used ( $IU = 0$ ).



**Other useful formulas for the topic:**

**Multiplier formula:**  $\alpha = 1/(1 - c)$

**Autonomous Expenditure formula:**  $A = Ca + I$

**Change in the equilibrium product:**  $\Delta Y_E = \alpha * \Delta A$



**QUESTIONS AND PROBLEMS:**

**Problem 1:** Think about the relationship between the people’s income, their consumption and savings. Add the proper abbreviations and equations to these terms, then fill in the table the values of savings, MPC and MPS:

Income level	Consumption	Saving	MPC (c)	MPS (s)
0	500			
1 000	1 250			
2 000	2 000			
3 000	2 750			
6 000	5 000			
10 000	8 000			

**Problem 2:** Assume that an economy’s consumption function is specified by the equation  $C = 500 + 0.80Y$ :

Y	C	S	Sa	s
4 000				
5 000				
6 000				

**Problem 3:** In two sector economy, the autonomous consumption is equal to 1 200 USD, the subjects have tendency to save up 32% of their income, investments of all firms is equal to 1 050 USD.

- a) Find out the value of MPC.
- b) If the economy is in equilibrium, find out the value of product.
- c) Find out the value of consumption and saving in the state of equilibrium from b).
- d) Find out the value of consumption and saving if the income is equal to 2 500 USD.
- e) Using the multiplier  $\alpha$  find out what will happen if investments decrease by 250 USD.

**Problem 4: In two sector economy, the consumption function is  $C = 800 + 0.55Y_D$ . You know that when the economy is in the equilibrium then  $Y_E = 1\,200$  USD.**

- Whats is the level of investment in this economy?
- Define the saving function.
- What's the value of the multiplier?
- What's the new level of  $Y_E$  when investment decreases by 50 USD?



### Test yourself:

**Find the value of the multiplier  $\alpha$  when:**

- MPC is 0.2 \_\_\_\_\_
- MPC is 0.5 \_\_\_\_\_
- MPC is 0.8 \_\_\_\_\_

**In the Keynesian model, equilibrium aggregate output is determined by:**

- aggregate demand
- consumption function
- the national demand for labor
- the price level

**Keynes believed that an economy may attain equilibrium level of output:**

- only at the full-employment level of output
- below the full-employment level of output
- only if prices were inflexible
- a) and c) above

**According to Keynes, consumption expenditure is determined by:**

- the level of interest rates
- extent of government taxes and subsidies
- disposable income
- autonomous investment expenditure

**The marginal propensity to consume (MPC) can be defined as:**

- (a) a change in spending due to a change in income
- (b) a change in income that is saved after consumption
- (c) part of income that is spent on consumption.
- (d) part of income that is not saved

**If the consumption function is expressed as  $C = C_a + c \cdot Y$  then  $c$  represents:**

- (a) autonomous consumer expenditure when income is zero
- (b) the marginal propensity to consume
- (c) the expenditure multiplier when consumption is increased
- (d) part of disposable income

**If the consumption function is  $C = 20 + 0.5Y_D$ , then an increase in disposable income by 100 will result in an increase in consumer expenditure by:**

- (a) 25
- (b) 70
- (c) 50
- (d) 100

**In the Keynesian cross diagram, the point at which the aggregate demand function crosses the 45 degree line indicates the:**

- (a) level of full employment income
- (b) less than full employment level of income
- (c) equilibrium level of income which may or may not be full employment level of income
- (d) autonomous level of income which may not be full employment level of income