Principles of Macroeconomics

Topic 3 Part 1

Aggregate Expenditure and Equilibrium Output (CH 8)

Overview

- In this topic, we will find the **Short-Run macroeconomic equilibrium** of the good and service market.

- In Microeconomics, equilibrium refers to the situation where demand and supply of a good are equal.

- In Macroeconomics, it refers to the situation where aggregate expenditure and aggregate output are equal.

Aggregate Expenditure and Aggregate Output

- **aggregate output** The total quantity of goods and services produced (or supplied) in an economy in a given period.
- We measure aggregate output by the expenditure approach.

- **aggregate income** The total income received by all factors of production in a given period.
- We measure aggregate income by the income approach.

Aggregate Expenditure and Aggregate Output

- We have learnt that the expenditure approach and the income approach give the same number of GDP.
- This is because **the expenditure of someone is the income of another.**
- Therefore, in any given period, **there is an exact equality between aggregate output and aggregate income.**
- For clarity, we will mainly use the term “aggregate output”, but note that the two terms refer to the same thing.
- **We will also use the variable “Y” to denote aggregate output (income).**

Aggregate Expenditure and Aggregate Output

- In our analysis, Output Y refers to the quantities of goods and services produced, expressed in "**real terms**", not the dollars circulating in the economy.
- **We can think of Y as "Real GDP" or "Real Output".**

- In our **short-run** analysis, we will assume the sticky price, i.e. **the price level is constant**, and there is no inflation.
- As a result, real output = nominal output.

Aggregate Expenditure and Aggregate Output

- **aggregate expenditure (AE)** The total amount the economy plans to spend in a given period.
- **AE = C + I + G + (X – M)** for an open economy with govt.
- That is, AE is real output or GDP, calculated from the expenditure approach.

- AE also has other names:
  - Desired Aggregate Expenditure (DAE)
  - Planned Aggregate Expenditure

Aggregate Expenditure and Aggregate Output

- **AE = C + I + G + (X – M)**
- C = Aggregate Consumption Expenditure
- I = Aggregate Investment Expenditure
- G = Aggregate Government Expenditure
- X–M = Aggregate Net Exports

Aggregate Expenditure and Aggregate Output

We can have different versions of AE:

- AE = C + I

  for a closed economy without government

- AE = C + I + G

  for a closed economy with government

- AE = C + I + G + (X – M)

  for an open economy with government

What to do next?

- Later on, we will look at each component of AE
  - AE = C + I + G + (X – M).

- However, as a starting point, **we will assume a close economy without a government**, so AE = C + I.
  - We will start with C and I.

Aggregate Consumption Expenditure

- For this component of AE, there are many theories regarding the consumption of people.
  - **Keynesian Consumption Theory (also called Absolute Income Hypothesis)**
  - Relative Income Hypothesis
  - Permanent Income Hypothesis
  - Life Cycle Hypothesis
- **We will heavily rely on the first theory**. We will briefly talk about the others, though.

The Keynesian Theory of Consumption

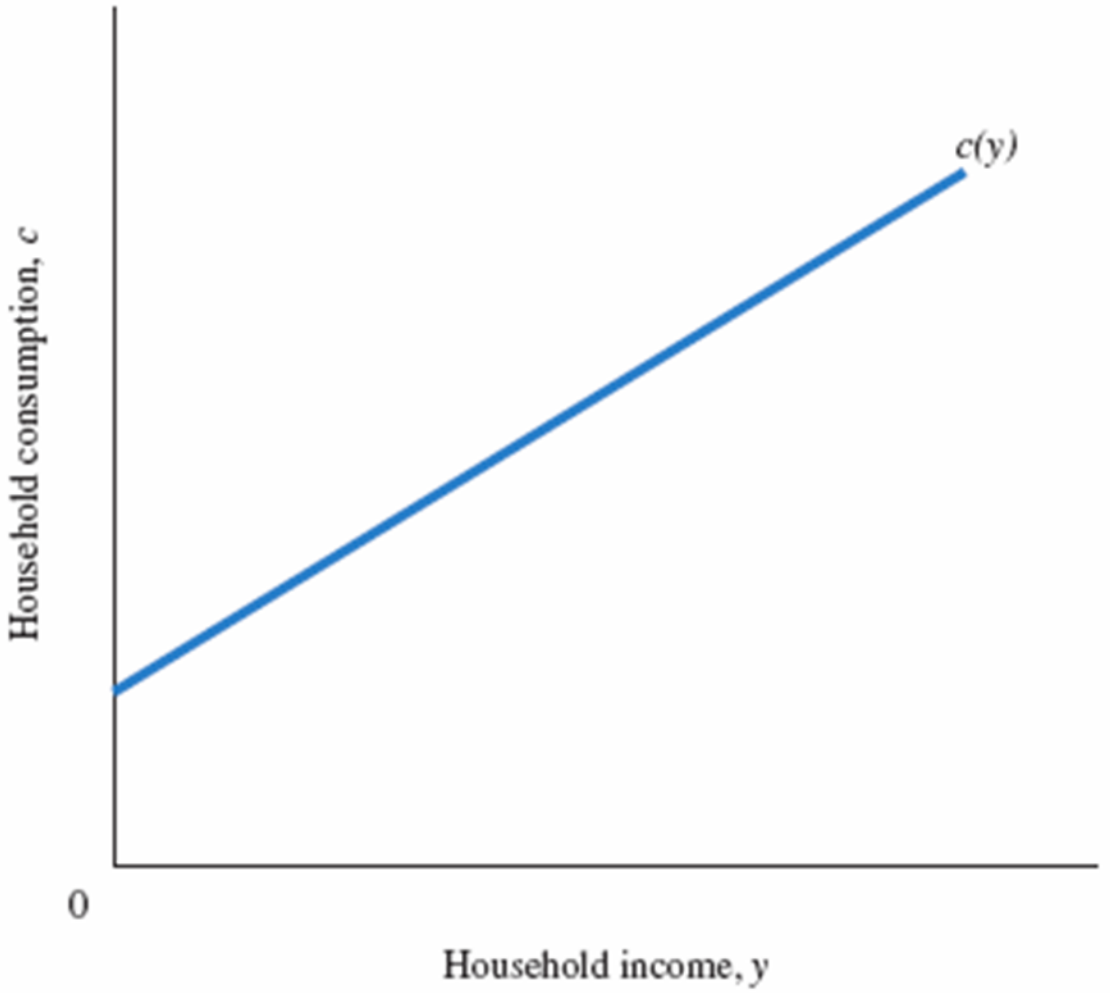
- In Keynes's *The General Theory of Employment, Interest, and Money*, current income played the key role in determining consumption levels in the economy.

- That is, consumption is determined by income.

- **consumption function** The relationship between consumption and income.

A Consumption Function for a Household

A consumption function for an individual household shows the level of consumption at each level of household income.



The Keynesian Theory of Consumption

"The fundamental psychological law, …, is that men are disposed, as a rule and on average, to increase their consumption as their incomes increase, but not by as much as the increase in their income."

- To reflect this view, we have drawn the consumption function with a slope of less than 1.
- That is, **when income increases by 1 unit, consumption will increase by less than 1 unit.**

The Keynesian Theory of Consumption

- We can use the following equation to describe a straight-line consumption curve:

$$C = a + bY$$

Where

a denotes **autonomous consumption**

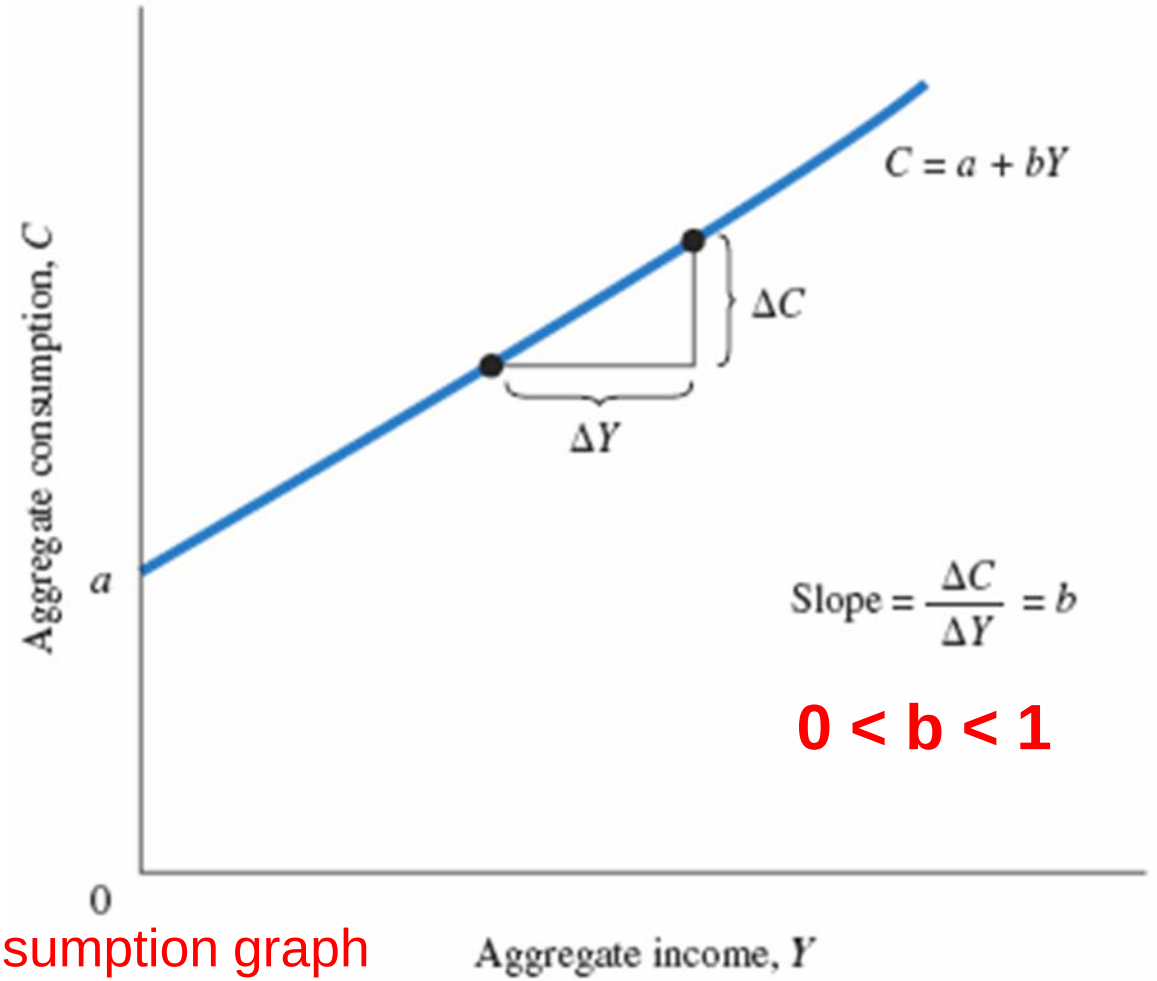
b denotes **marginal propensity to consume**

- Notice that there is no “Tax” here because we are currently assuming an economy without government.

An Aggregate Consumption Function

The aggregate consumption function shows the level of aggregate consumption at each level of aggregate income.

The upward slope indicates that higher levels of income lead to higher levels of consumption spending.



a = Y-intercept of the consumption graph
b = slope of the consumption graph

The Keynesian Theory of Consumption

$$C = a + bY$$

- **a or autonomous consumption** The expenditures that consumers must make even when they have no income.
  - That is, C = a when Y = 0.
- **b or marginal propensity to consume (MPC)** The fraction of a change in income that is consumed, or spent.
  - For example, MPC = 0.5 means that when income increases by 100, consumption increases by 50.

$$\text{marginal propensity to consume} \equiv \text{slope of consumption function} \equiv \frac{\Delta C}{\Delta Y}$$

The Keynesian Theory of Consumption

- **In a close economy without government**, people do not pay tax, and they do not import goods from abroad.
- Their income is therefore allocated between saving and consumption: Y = C + S.
- **aggregate saving (*S*)** The part of aggregate income that is not consumed.

$$S \equiv Y - C$$

- ≡ means that this equation is an identity, and thus is always true by definition.

The Keynesian Theory of Consumption

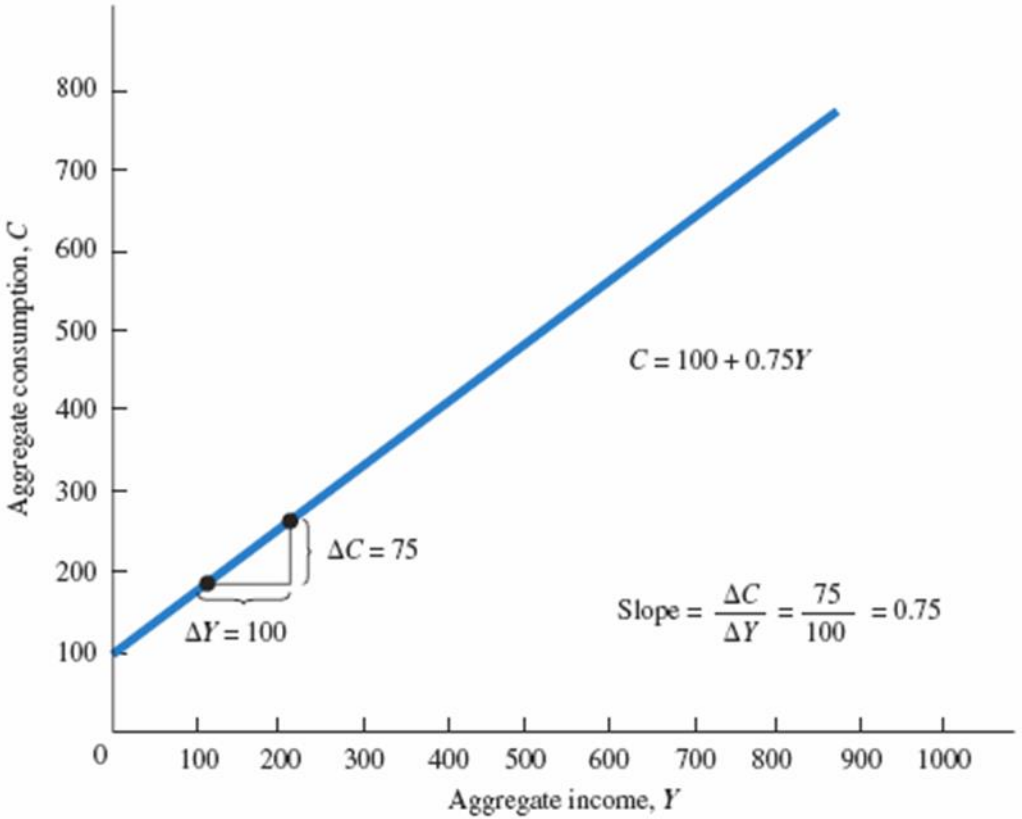
- **marginal propensity to save (*MPS*)** That fraction of a change in income that is saved.

$$MPC + MPS \equiv 1$$

- *MPC* is the fraction of an increase in income that is consumed.
- *MPS* is the fraction of an increase in income that is saved.

The Aggregate Consumption Function Derived from the Equation $C = 100 + 0.75Y$

Aggregate Income, Y	Aggregate Consumption, C
0	100
80	160
100	175
200	250
400	400
600	550
800	700
1,000	850

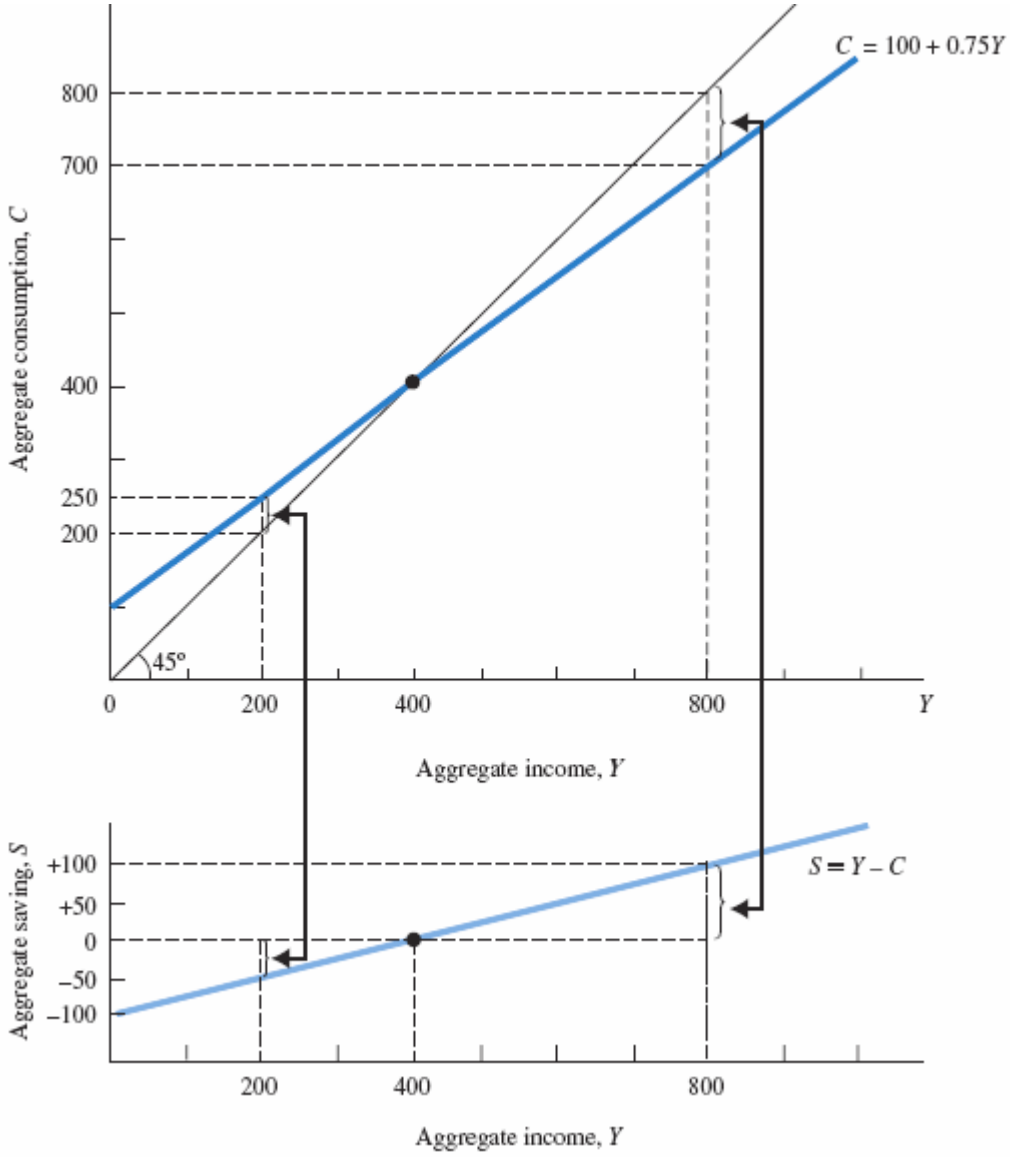


In this simple consumption function, consumption is 100 at an income of zero.
As income rises, so does consumption.
For every 100 increase in income, consumption rises by 75.
The slope of the line is 0.75.

Deriving the Saving Function from the Consumption Function

Y − Aggregate Income	C Aggregate Consumption	= S Aggregate Saving
0	100	−100
80	160	−80
100	175	−75
200	250	−50
400	400	0
600	550	50
800	700	100
1,000	850	150

Because $S \equiv Y - C$, it is easy to derive the saving function from the consumption function. A 45° line drawn from the origin can be used as a convenient tool to compare consumption and income graphically. At $Y = 200$, consumption is 250. The 45° line shows us that consumption is larger than income by 50. Thus, $S \equiv Y - C = -50$. At Y = 800, consumption is less than income by 100. Thus, $S = 100$ when $Y = 800$.



Other Determinants of Consumption

- Based on Keynesian Theory, consumption depends on income.
- In practice, the decisions of households about how much to consume in a given period are also affected by:
  - Their wealth
  - The interest rate
  - Their expectations of the future
- This leads to other theories of consumption.

Consumption Theories

So far…we have studied the consumption theory of Keynes, which is also known as “Absolute Income Hypothesis”.

- Absolute Income Hypothesis: real consumption (i.e. adjusted for inflation) is a function of real income, and as income rises, consumption will also rise but not necessarily at the same rate (i.e. $0 < MPC < 1$).

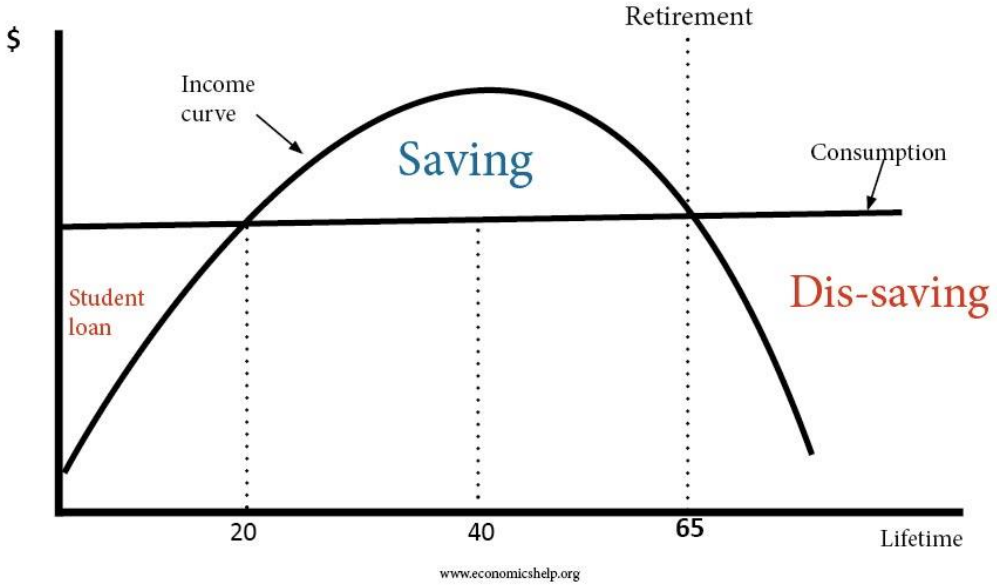
Consumption Theories

- Relative Income Hypothesis (by James Duesenberry): an individual's consumption is dictated by his income in relation to others, i.e. people care about their social status.

Example: a typical person is happier if he or she got a $100 weekly wage rise and others only got $50 than receiving a $150 increase while everybody else received the same $150 increase.

Consumption Theories

- Life-Cycle Hypothesis (by Franco Modigliani): individuals plan their consumption and savings behavior over their life-cycle, and they intend to smooth their consumption over their lifetimes.



Consumption Theories

- Permanent Income Hypothesis (by Milton Friedman): a person's consumption is determined not just by their current income but also by their expected income in future years—their “permanent income”, changes of which will lead to changes in consumption patterns.