

# The Multiplier

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GCE A-LEVEL & IB ECONOMICS

# Lesson Structure

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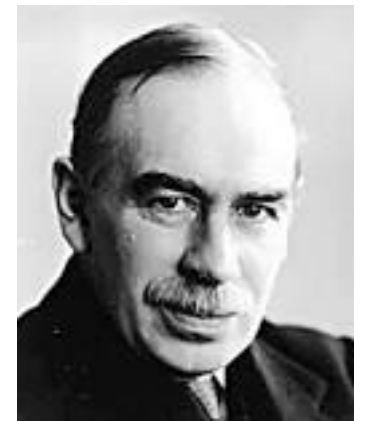
- The Multiplier
- Marginal Propensity to Consume
- Marginal Propensity to Import
- Marginal Propensity to Tax
- Marginal Propensity to Save
- Effects of the Multiplier on the Economy

# The Multiplier Concept

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The multiplier effect states that an injection into the circular flow of income will cause a larger than original increase in aggregate demand (AD), vice versa.

A concept with Keynesian roots, it is often used to support using government spending to control the economy (fiscal policy)



# The Multiplier Concept

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The main reason it works is because spending by an economic agent (e.g. a government / firm) will lead to higher **income** for another (e.g. workers). Because of that, they will then be able to further purchase goods and services.

As a result, when new money enters into the circular flow of income (i.e. an **injection**) will lead to a series of new purchases that increases national income (AD) by a larger amount than what is spent.

Note that the opposite is also true when money is **withdrawn** from the circular flow of income.

# Calculating the Multiplier

If national income increases by \$83 million when the government injects \$50 million on an infrastructure project, what is the value of the multiplier?

Method 1:

The Multiplier (K)

= **Total increase in national income (AD) / initial injection**

= \$83 million / \$50 million

= 1.66



Hence we can see the total effect on national income is 1.66x the initial injection.

# Size of the Multiplier

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But what determines the size of the multiplier?

We can have a better understanding of that by looking at method 2 and 3 of calculating it using marginal propensities.

# Size of the Multiplier

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**Marginal Propensity to Consume (MPC)** is the proportion of spending for one additional unit of income. (i.e. how much one will spend given a \$1 increase in income.)

Example 1: If you spend \$0.9 for every \$1 gained, your MPC is  $0.9/1 = 0.9$ .

Example 2: If your MPC is 0.7, and you earned \$100, you will spend  $100 * 0.7 = \$70$ .

Hence, the **bigger** the MPC, the **bigger** the multiplier effect. MPC is always a number between **0 and 1**.

Method 2 Formula:

$$\textit{The Multiplier (K)} = \frac{1}{1-MPC}$$

# Exam Question Example

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- 2** In 2011, the Bank of England estimated that the marginal propensity to consume for UK households was on average 0.4.

(Source: <http://www.bankofengland.co.uk/publications/Documents/quarterlybulletin/qb110402.pdf>)

- (b) Calculate the value of the multiplier for the UK in 2011. You are advised to show your working.

(2)

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Answer: The Multiplier (K) =  $1/(1-0.4) = 1.66...$

# Size of the Multiplier

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Where does the money go, if it is not spent on local consumption or investment of goods and services?



# Size of the Multiplier

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When money is not retained in the circular flow of income through domestic consumption/investment, it must be leaked out through withdrawals. What are some examples of withdrawals?

What will happen if incomes were taxed? How will that affect the multiplier and the increase in national income?

Discuss with your neighbor.

# Size of the Multiplier

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**Marginal Propensity to Withdraw (MPW)** is the proportion of funds withdrawn from the circular flow, for one additional unit of income.

Withdrawals from the circular flow of income includes **taxes, imports and savings**.

Hence, the **smaller** the MPW, the bigger the multiplier effect.

Method 3 Formula:

# Size of the Multiplier

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MPS is the marginal propensity to **save**. MPT is the marginal propensity to **tax**.  
MPM is the marginal propensity to **import**.

Example 1: If you save \$0.2 for every \$1 gained, your MPS is  $0.2/1 = 0.2$ .

Example 2: If you spend \$40 on imports for every \$100 gained, your MPM is  $40/100 = 0.4$ .

All of these are different types of withdrawals from the circular flow of income.  
Hence,  $MPW = MPS + MPT + MPM$ .

Method 3 Formula:

$$\textit{The Multiplier (K)} = \frac{1}{MPW} = \frac{1}{MPS+MPT+MPM}$$

# Size of the Multiplier

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Let's say 50% of all incomes are saved in an economy, 10% of consumer incomes are spent on imports and the marginal propensity to tax is 0.2.

What will be the multiplier for this economy?

Method 3 Formula:

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Answer: The Multiplier (K) =  $1/(0.5+0.1+0.2) = 1.25$

# Factors that Determine MPW

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## The marginal propensity to save (MPS)

- When interest rates are high, it will increase the MPS. This is because consumption is lower as it becomes more expensive to borrow to consume; and you get more interest from saving.

## The marginal propensity to tax (MPT)

- If tax rates are high then MPT is high. Consumers will be deterred from spending or simply have less disposable income to consume goods and services

## The marginal propensity to import (MPM)

- In the UK, we have very high import spending, meaning we have a high MPM. If we receive increases in disposable income, but this is spent on imported goods, then this would count as a withdrawal or **leakage** from the circular flow of income and national income would not rise as much as anticipated

# Exam Question Example

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(c) Which **one** of the following is a likely cause of an increase in the value of an economy's multiplier?

(1)

- A** An increase in the marginal propensity to save
- B** An increase in the basic rate of income tax in the economy
- C** A decrease in the marginal propensity to import
- D** A decrease in investment in the economy

Answer

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Answer

**C**

# Multiplier – Chain of Reasoning

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Scenario: The government spends (injects) £1bn to improve London's infrastructure by building the Elizabeth Line

The increase in government spending is an injection in the circular flow of income

As a result, aggregate demand will increase by a larger amount than from the initial effects of higher government spending, leading to significant economic growth

This causes an increase in income/profits of railway firms and workers

To build the railroad, the £1bn will be used to employ railroad construction firms and workers for their services

They will then spend their income/profits to purchase other goods and services, increasing consumption in the economy via the multiplier effect

Can you put this in order and explain how the multiplier works to your neighbour?

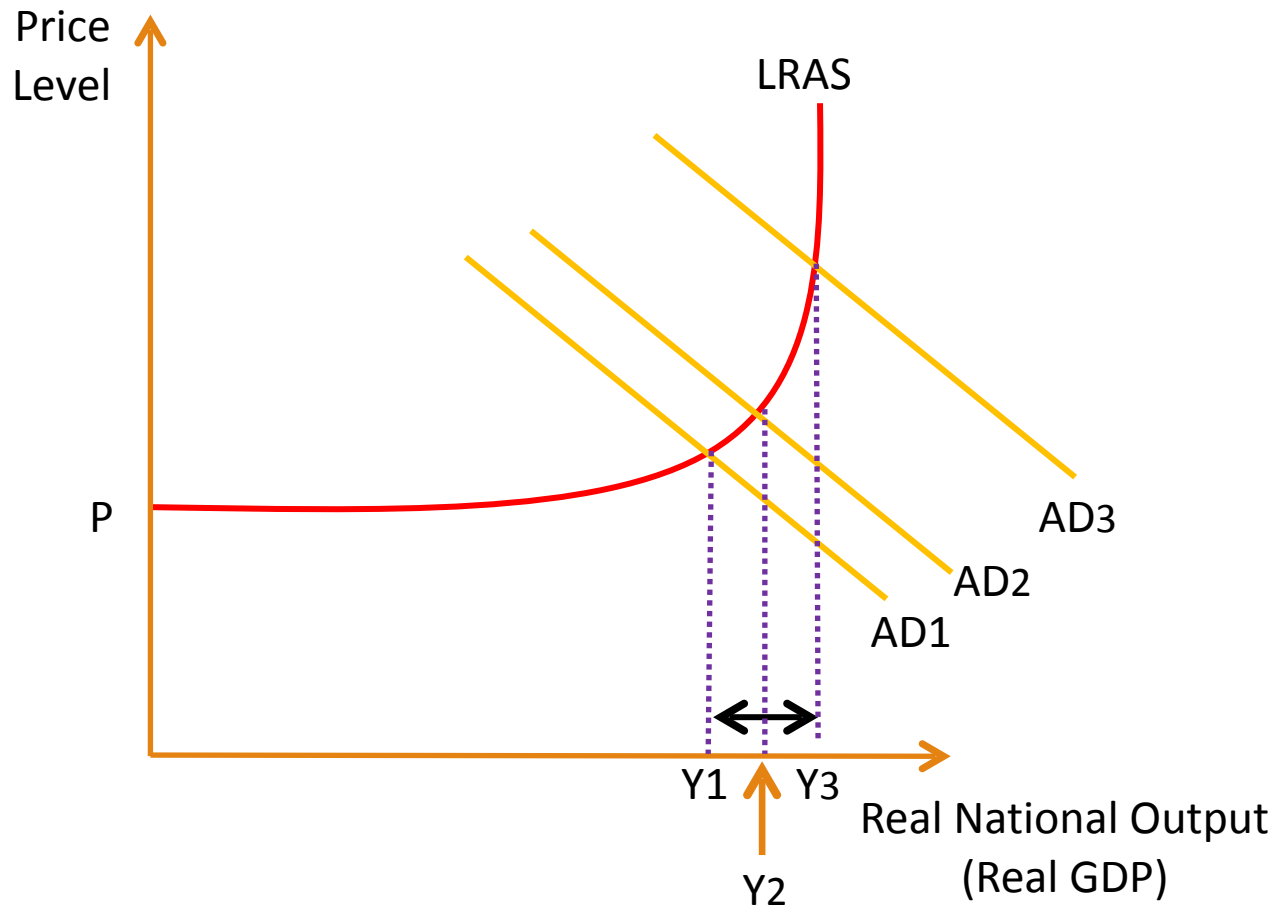
# Multiplier – Chain of Reasoning

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Scenario: The government spends (injects) £1bn to improve London's infrastructure by building the Elizabeth Line

1. The increase in government spending is an injection in the circular flow of income
2. To build the railroad, the £1bn will be used to employ railroad construction firms and workers for their services
3. This causes an increase in income/profits of railway firms and workers
4. They will then spend their income/profits to purchase other goods and services, increasing consumption in the economy via the multiplier effect
5. As a result, aggregate demand will increase by a larger amount than from the initial effects of higher government spending, leading to significant economic growth

# Multiplier – Effects on the Economy



Let's assume an economy is below full employment at Y1. The government looks to increase employment by increasing government spending (G) on healthcare. This increases AD from AD to AD1, and output from Y1 to Y2.

The multiplier effect will then cause AD to increase beyond the initial injection, when healthcare workers use their income to consume other goods/services. This shifts aggregate demand from AD2 to AD3, increasing national output from Y2 to Y3.

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