Resources for Teachers

LC Economics

4.1 National income

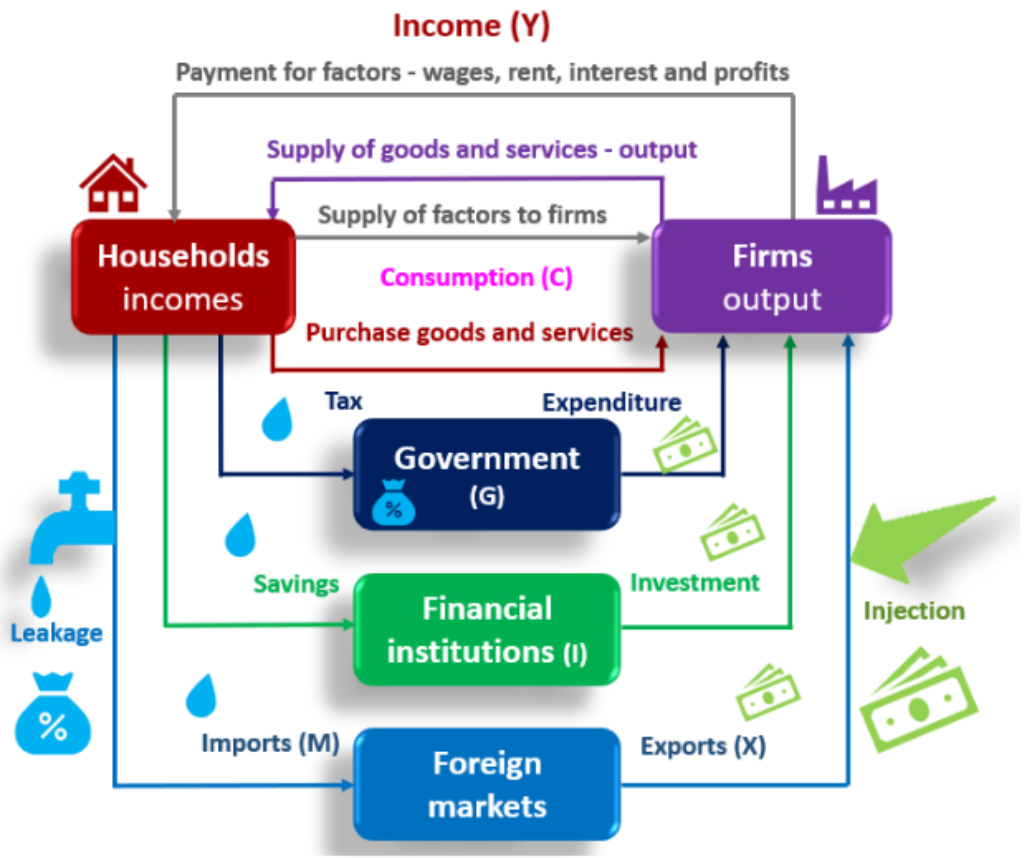
The circular flow and the multiplier

https://www.myleavingcert.ie/

The circular flow of income

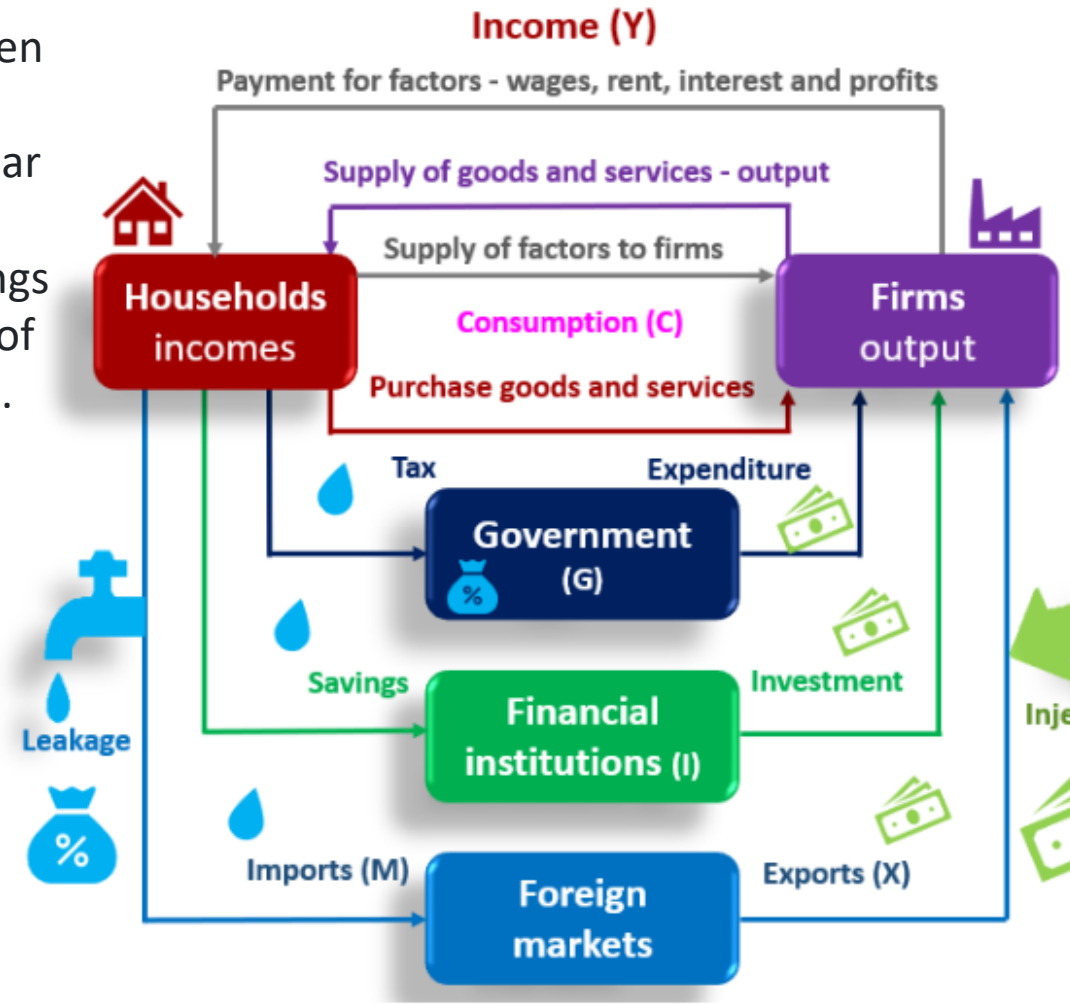
Definition

The circular flow of **income** shows the flow of **goods, services and factors of production** between firms and households.



The circular flow of income

A leakage is when **money is taken out** of the circular flow of income e.g., taxes, savings and the buying of imported goods.

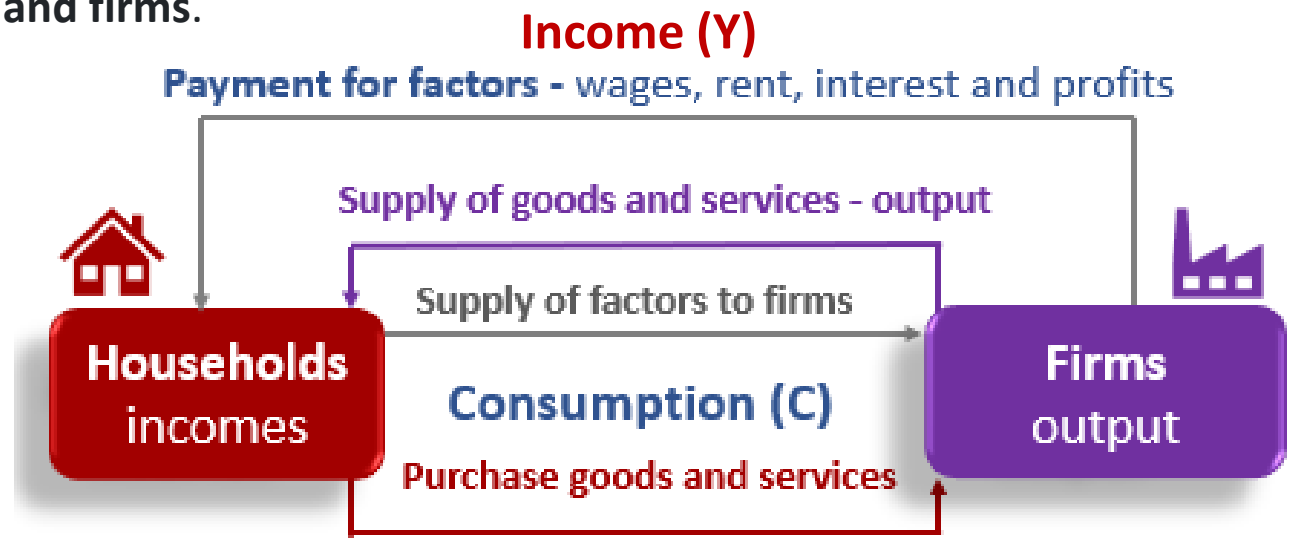


An injection is when **money is added** to the circular flow of income e.g., money from exported goods, borrowing money in order to spend on goods and government spending.

The circular flow of income

Consumption (C)

- **Households** supply the factors of production to firms and receive **income (Y)** in the form of wages, rent, interest payments and profits from enterprise
- They use this income to **purchase goods and services** produced by firms
- **The firms** use the income to **grow and maintain their businesses** and buy more factors of production
- The money goes around in a circular flow, demonstrating **the interdependence between households and firms**.



Leakages and injections

Investment (I)

Households may choose **to save some of their income**, and this removes money from the circular flow and is considered a leakage.

If individuals or businesses **borrow money**, from financial institutions such as banks, then spend or invest it on capital goods, then this acts as an injection to the flow of income.

Government (G)

The Government **collects tax contributions** from persons, groups or businesses and this reduces (leaks) money from the circular flow of income.

All **government spending injects money** into the flow of income.

Foreign trade (X-M)

When consumers **spend money on imported goods** and services produced outside Ireland, the profits go to the country of origin and is therefore a leakage to the flow of income.

When **Irish goods are bought by foreign countries**, these exports inject income into the circular flow of income within Ireland.

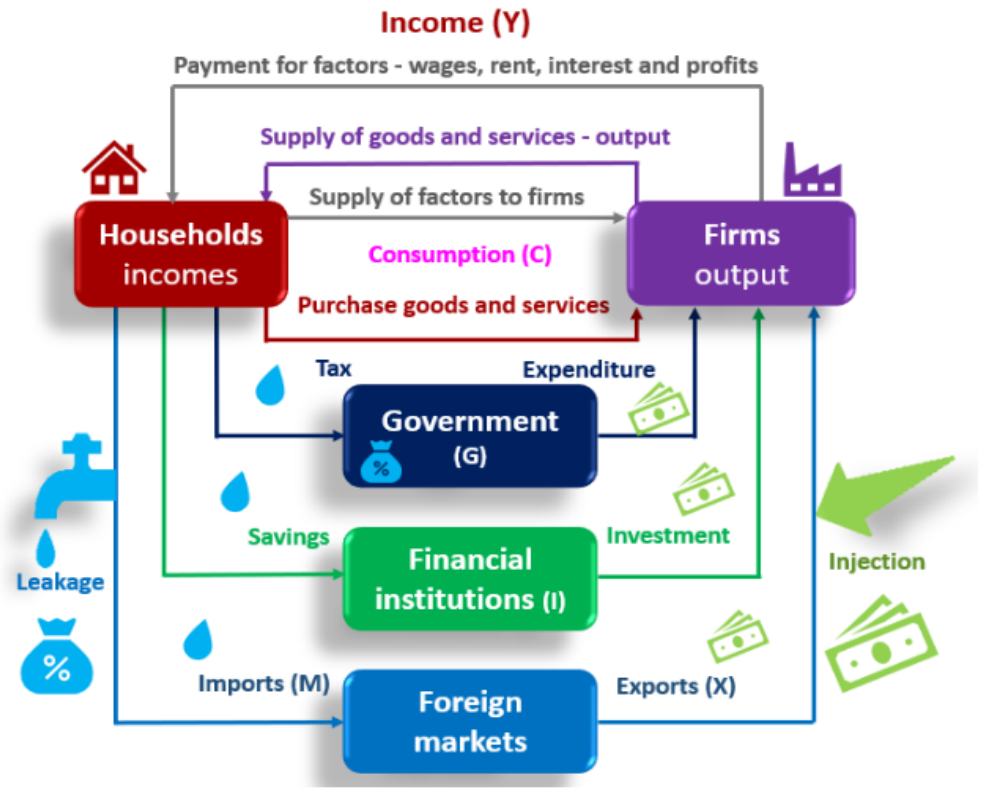
The determinants of national income

The determinants of national income can therefore be expressed as:

Income = **Consumption** + **Investment** + **Government** + **(Exports - Imports)**

or

$$Y = C + I + G + (X-M)$$



The determinants of national income

Task:

The following table shows National Income (Y), Consumption (C), Investment (I), Government Spending (G), Exports (X) and Imports (M) for 2021 and 2022.

	Y	C	I	G	X	M
2021	**€215,000**	**€80,000**	**€55,000**	**?**	**€85,000**	**€70,000**
2022	**?**	**€105,000**	**€60,000**	**€70,000**	**€95,000**	**€75,000**

(i) Calculate the level of **government spending** in 2021.

(ii) Calculate the level of **National Income** in 2022.

$$Y = C + I + G + (X-M)$$

The determinants of national income

	Y	C	I	G	X	M
2021	€215,000	€80,000	€55,000	€65,000	€85,000	€70,000
2022	€255,000	€105,000	€60,000	€70,000	€95,000	€75,000

(i) Calculate the level of government spending in 2021.
(ii) Calculate the level of National Income in 2022.

Answer

(i) Y = C + I + G + (X-M)

215 = 80 + 55 + G + 85 -70

215 - 80 - 55 - 15 = G

G = 65

Answer

(ii) Y = C + I + G + (X-M)

Y = 105 + 60 +70 + 95 -75

Y = 255

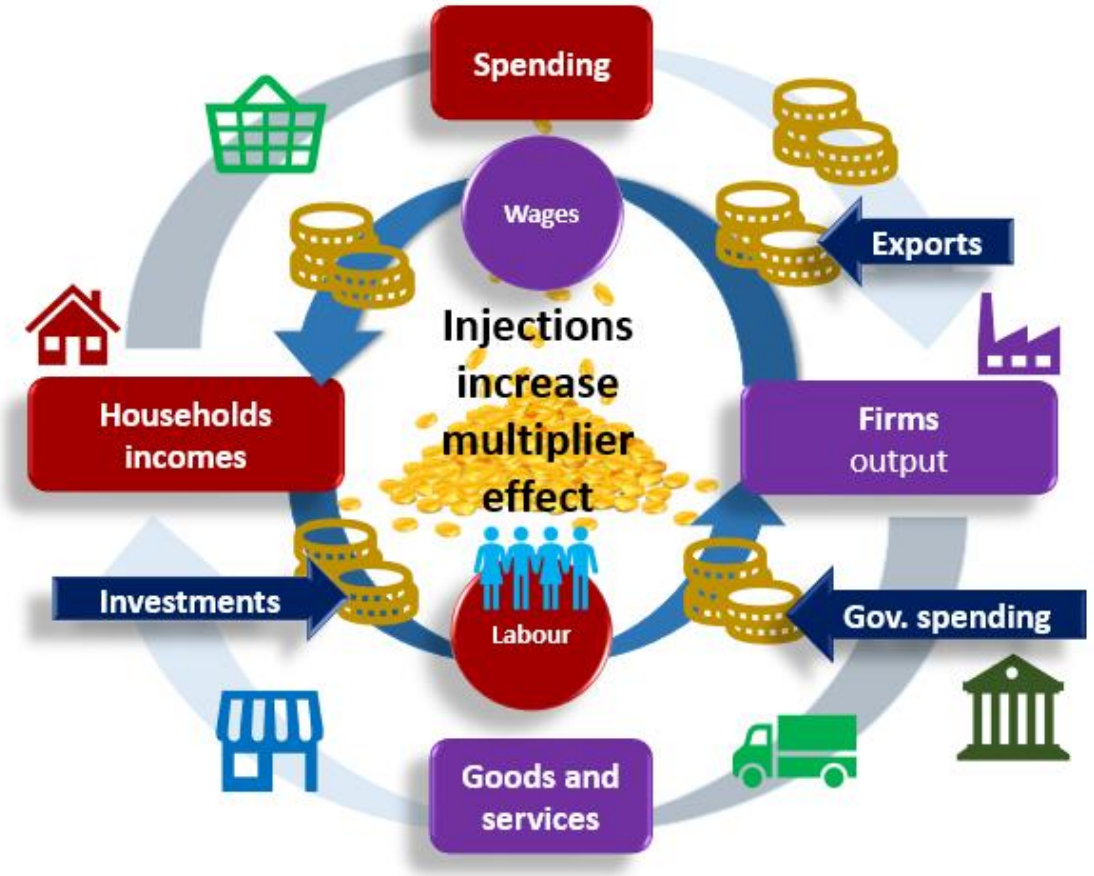
The multiplier

Definition

The multiplier shows the relationship between an **injection of money into the economy** and the resulting **total increase in national income**.

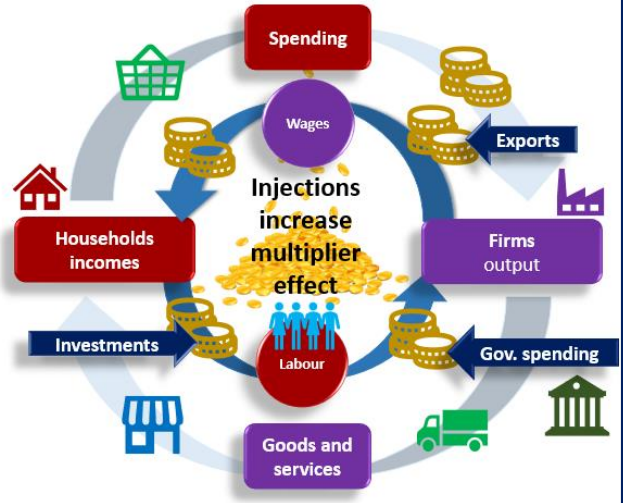
The multiplier effect

The injections of **money from investments, exports and government spending** have a multiplier effect and increase the national income.



Examples of the multiplier effect

An **injection of €100m by the Government**, to increase public sector wages, could increase national income by much more than the initial outlay of €100m. With the extra income from higher salaries, workers will spend it on goods and services, therefore boosting output and income in other parts of the economy. This would lead to a further injection into the national income and lead to an increase in GDP.



Investing €300m into a new house building project would benefit not only the construction industry, but many associated businesses such as architects, building suppliers, haulage and catering companies. This extra demand and output is a multiplier effect and increases the flow of factor incomes e.g., wages and profits, which in turn increases spending. This multiplier effect increases the circular flow of income and national GDP.

Injections increase the multiplier effect

The multiplier (K)

The **Multiplier (K)** shows the relationship between the **change in real GDP** after an injection of spending.
In the example below, if a government increases spending by **€1 billion** and this causes real GDP to increase by a total of **€1.5 billion**, then the multiplier effect would have a **value of 1.5**.

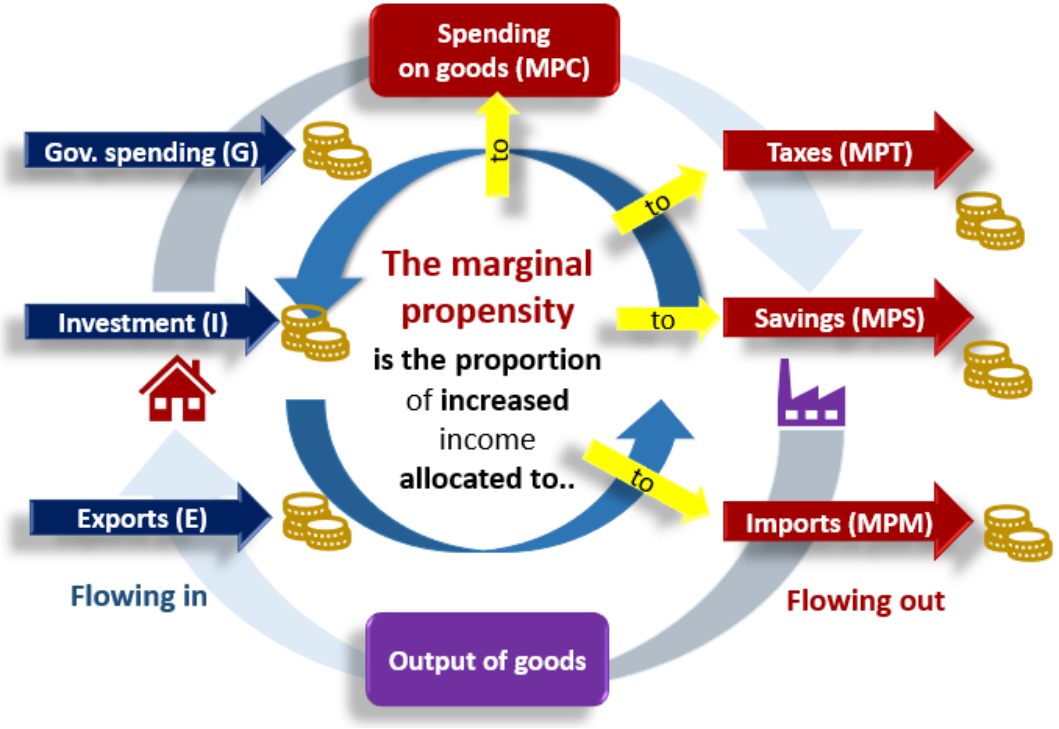
$$\text{Multiplier (K)} = \frac{\text{Change in real GDP (Y)}}{\text{Change in injections}}$$

$$\text{Multiplier (K)} = \frac{\text{If GDP increases by €1.5 billion (Y)}}{\text{If there is an injection of €1 billion}}$$

$$\text{Multiplier (K)} = 1.5$$

Marginal Propensity and the size of the multiplier

The **size of the multiplier** will be affected by a household's **spending decisions**.
The decision to spend, is known as the **marginal propensity to consume** and the decision to save, is known as the **marginal propensity to save**.



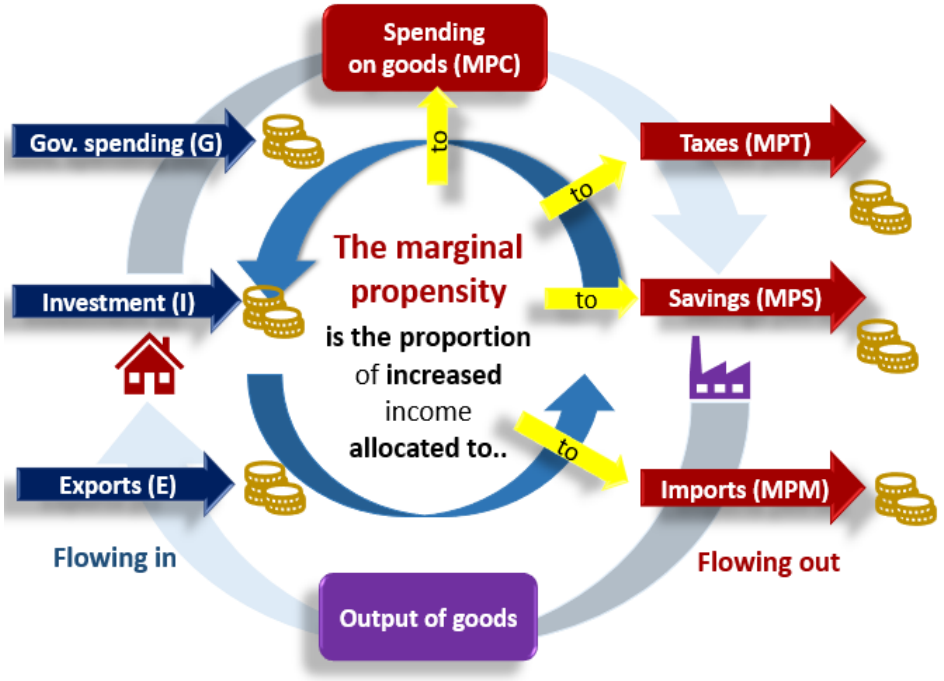
The marginal propensity
is the proportion of **increased** income **allocated** to spending, saving, as well as buying imported goods and paying taxes.

Marginal propensities

Marginal propensities show the **proportion of extra income** allocated to particular activities, such as spending on goods and services, spending on imported goods or by household savings and taxes.

They are divided into:

- **MPC** - The Marginal Propensity to **Consume**
- **MPS** - The Marginal Propensity to **Save**
- **MPM** - The Marginal Propensity to **Import**
- **MPT** - The Marginal Propensity to pay **Tax**.



Marginal Propensity to Consume - MPC

The marginal propensity to **consume** is the proportion of an **increase in income** that is spent on **goods and services**.
The larger the MPC, the larger the multiplier effect will be since that money keeps circulating inside the economy. When income is received, people **spend most of it** and **save part of it**.

Income (Y) = Consumption (C) + Savings (S)

Savings (S) = Income (Y) - Consumption (C)

$$\text{MPC} = \frac{\text{Change in consumption}}{\text{Change in income}}$$

The MPC is greater than 0 but less than 1.

Marginal Propensities to save, import and tax

Marginal Propensity to Save - MPS

The marginal propensity to **save** is the proportion of an increase in income that **goes into savings**. This is a leakage out of the circular flow. What is not consumed is saved.

$$\textbf{MPS} = 1 - \text{MPC}$$

Marginal Propensity to Import - MPM

The marginal propensity to **import** is the proportion of an increase in income **spent on imported goods** or services, which is a leakage out of the circular flow of income.

$$\textbf{MPM} = \frac{\text{Change in imports}}{\text{Change in income}}$$

Marginal Propensity to Tax - MPT

The marginal propensity to **tax** is the proportion of an increase in income that is **paid in tax** to the Government. This is a leakage out of the circular flow of income.

$$\textbf{MPT} = \frac{\text{Change in tax}}{\text{Change in income}}$$

Calculating marginal propensities

Task:

Using the following data calculate the **marginal propensity to import** (MPM).

	Y	C	I	G	X	M
2021	**€215,000**	**€80,000**	**€55,000**	**€65,000**	**€85,000**	**€70,000**
2022	**€255,000**	**€105,000**	**€60,000**	**€70,000**	**€95,000**	**€75,000**

$$\textbf{MPM} = \frac{\text{Change in imports}}{\text{Change in income}}$$

Calculating marginal propensities

Task:

Using the following data calculate the **marginal propensity to import** (MPM).

	Y	C	I	G	X	M
2021	**€215,000**	**€80,000**	**€55,000**	**€65,000**	**€85,000**	**€70,000**
2022	**€255,000**	**€105,000**	**€60,000**	**€70,000**	**€95,000**	**€75,000**

Answer:

$$\text{MPM} = \frac{\text{Change in imports}}{\text{Change in income}} = \frac{75{,}000 - 70{,}000}{255{,}000 - 215{,}000} = \frac{5{,}000}{40{,}000} = 0.125$$

Calculating the value of the multiplier

There are a number of scenarios where extra income can be spent:

- **In a closed economy, with no government** - extra income is allocated to **savings**
- **In an open economy, with no government** - extra income is allocated to **savings and imports**
- **In an open economy, with a government** - extra income is allocated to **savings, imports and tax**.

closed economy, no government

$$\frac{1}{1\text{-MPC}} \text{ or } \frac{1}{\text{MPS}}$$

Extra on savings

open economy, no government

$$\frac{1}{\text{MPS} + \text{MPM}}$$

Savings and imports

open economy, with government

$$\frac{1}{\text{MPS} + \text{MPM} + \text{MPT}}$$

Savings, imports and tax

Calculating the value of the multiplier

Task:

In an open economy, with a government extra income is allocated in the table below:

Marginal propensity to consume **MPC**	**0.6**
Marginal propensity to consume **MPM**	**0.2**
Marginal propensity to consume **MPT**	**0.2**

(i) Calculate the **value of the multiplier** and explain the economic meaning of the figure calculated.

$$\frac{1}{MPS + MPM + MPT}$$

Calculating the multiplier effect

Marginal propensity to consume **MPC**	**0.6**
Marginal propensity to consume **MPM**	**0.2**
Marginal propensity to consume **MPT**	**0.2**

Answer

The value of the multiplier in this open economy is:

$$\frac{1}{(1\text{-MPC}) + \text{MPM} + \text{MPT}} \qquad \frac{1}{\text{MPS} + \text{MPM} + \text{MPT}}$$

$$\frac{1}{(1\text{-}0.6) + 0.2 + 0.2} = 1.25 \qquad \frac{1}{0.4 + 0.2 + 0.2} = 1.25$$

Any injection into the circular flow of income will have a **1.25 times larger effect** on national income than the initial injection.

Calculating the increase in national income

The increase in national income is calculated by **multiplying** the **initial injection** of income into the economy by the resulting multiplier effect.

Multiplier effect x initial injection

closed economy, no government

$$\frac{1}{1\text{-MPC}} \text{ or } \frac{1}{\text{MPS}} \text{ x initial injection}$$

open economy, no government

$$\frac{1}{\text{MPS} + \text{MPM}} \text{ x initial injection}$$

open economy, with government

$$\frac{1}{\text{MPS} + \text{MPM} + \text{MPT}} \text{ x initial injection}$$

Calculating the increase in national income

Task:

If the Government injects €400m into the economy for building projects, calculate the effect it will have on the National Income.

Marginal propensity to consume **MPC**	**0.6**
Marginal propensity to consume **MPM**	**0.2**
Marginal propensity to consume **MPT**	**0.2**
Injection into the economy for building projects	**€400m**

$$\frac{1}{MPS + MPM + MPT} \times \text{injection}$$

Calculating the increase in national income

Answer

The increase in NI is:

Marginal propensity to consume **MPC**	**0.6**
Marginal propensity to consume **MPM**	**0.2**
Marginal propensity to consume **MPT**	**0.2**
Injection into the economy for building projects	**€400m**

$$\frac{1}{\text{MPS + MPM +MPT}} \times \text{injection}$$

$$\frac{1}{0.4 + 0.2 + 0.2} \times €400m$$

$$= 1.25 \times €400m$$

$$= €500m$$

Factors effecting the value of the multiplier

Positive factors

- **Low taxes** - more income available for consumer spending
- **Low level of imported goods** - marginal propensity to import is low. The income generated by goods and services is largely staying in the country and not going abroad
- **High consumer spending** - marginal propensity to consume is high
- **Spare capacity** - the economy is able to receive injections of capital investment in order to build new infrastructure e.g., roads, transport, housing etc.

Negative factors

- **Inflation** - reduces the purchasing power of money and causes price rises, which in turn reduces consumer spending
- **High interest rates** - increase the cost of borrowing and reduces the amount of loans taken out. This favours saving rather than spending
- **No spare capacity** - there is not enough capacity in the country to deliver big infrastructure projects and skills and expertise may have to be sort abroad.

Exam Questions – 2020 Q8

(b) The following table shows National Income (Y), Consumption (C), Investment (I), Government Spending (G), Exports (X) and Imports (M) for 2018 and 2019.

	Y	C	I	G	X	M
2018	€200,000	€70,000	€50,000	?	€80,000	€60,000
2019	?	€105,000	€55,000	€65,000	€90,000	€65,000

Use this data to answer the following: (Show all your workings in your answer book.)

(i) Calculate the level of government spending in 2018.
(ii) Calculate the level of National Income in 2019.
(iii) Define marginal propensity to import (MPM).
(iv) Calculate the marginal propensity to import (MPM).
(v) Calculate the value of the multiplier **and** explain the economic meaning of the figure calculated.

[30]

Answer – 2020 Q8b (i) and (ii)

(b)

	Y	C	I	G	X	M
2018	€200,000	€70,000	€50,000	**60,000**	€80,000	€60,000
2019	**€250,000**	€105,000	€55,000	€65,000	€90,000	€65,000

(i) Calculate the level of government spending in 2018.

- 200,000 = 70,000 + 50,000 + G + 80,000 – 60,000
- 200,000 – 70,000 – 50,000 – 80,000 + 60,000 = G
- G = 60,000

5

(ii) Calculate the level of National Income in 2019.

- Y = 105,000 + 55,000 + 65,000 + 90,000 – 65,000
- Y = 250,000

5

Y = C + I + G + (X-M)

Answer – 2020 Q8b (iii) and (iv)

(iii) Define Marginal Propensity to Import (MPM). **5**

The marginal propensity to import is the proportion of each extra unit of income received which is spent on imported goods and services.

(iv) Calculate the Marginal Propensity to Import (MPM). **5**

$$\frac{\text{Change in imports}}{\text{Change in income}} = \frac{65{,}000 - 60{,}000}{250{,}000 - 200{,}000} = \frac{5{,}000}{50{,}000} = 0.1$$

	Y	C	I	G	X	M
2018	€200,000	€70,000	€50,000	**60,000**	€80,000	€60,000
2019	**€250,000**	€105,000	€55,000	€65,000	€90,000	€65,000

Answer – 2020 Q8b (v)

(v) Calculate the multiplier. Explain the economic meaning of the value calculated.

$$\frac{\text{Change in consumption}}{\text{Change in income}} = \frac{105{,}000 - 70{,}000}{250{,}000 - 200{,}000} = \frac{35{,}000}{50{,}000} = 0.7$$

MPS = 1 – 0.7 = 0.3

$\frac{1}{(1\text{-MPC}) + \text{MPM}}$	$\frac{1}{\text{MPS} + \text{MPM}}$
$\frac{1}{(1\text{-}0.7) + 0.1}$	$\frac{1}{0.3 + 0.1}$
Multiplier = 2.5	Multiplier = 2.5

5

This figure means that any injection into the economy (circular flow of income) will have a 2.5 times greater effect on national income than the size of the initial injection.

5

	Y	C	I	G	X	M
2018	€200,000	€70,000	€50,000	**60,000**	€80,000	€60,000
2019	**€250,000**	€105,000	€55,000	€65,000	€90,000	€65,000

Exam Questions – 2021 Q15c (i)

(c) **(i)** Explain the term **multiplier**.

Answer – 2021 Q15c

(i) Explain the term **Multiplier.** The multiplier effect means that any injection into the circular flow of income leads to a more than proportionate increase in National Income e.g. an initial injection of €100m will lead to a €200m increase in the size of National Income if the multiplier is 2.	**8**

Exam Questions – 2021 Q15c (ii)

(ii) Assume that MPM is 0.25 and MPC is 0.65 and MPT is 0.10.
Calculate the multiplier. Show all your workings

Workings:
Answer:

Answer – 2021 Q15c (ii)

(ii) Assume that MPM is 0.25 and MPC is 0.65 and MPT is 0.10.
Calculate the multiplier. Show all your workings

8

$$\frac{1}{(1\text{-MPC}) + \text{MPM} + \text{MPT}}$$

$$\frac{1}{(1 - 0.65) + 0.25 + 0.10}$$

Multiplier = 1.43

MPS = 1 – 0.65 = 0.35

$$\frac{1}{\text{MPS} + \text{MPM} + \text{MPT}}$$

$$\frac{1}{0.35 + 0.25 + 0.10}$$

Multiplier = 1.43

Exam Questions – 2021 Q15c (iii)

(iii) Discuss two possible **negative** multiplier effects of large corporations such as Google withdrawing from their rental property contracts in Dublin city during 2020.

1.
2.

Exam Questions – 2021 Q15c (iii)

(iii) Discuss two possible **negative** multiplier effects of large corporations such as Google withdrawing from their rental property contracts in Dublin city during 2020.

14
(2 @ 7)
(3 + 4)

Lost rents
The owners of the property won't receive rent. This reduces their income and spending power - which will have a negative multiplier effect into the economy

Reduced demand for goods and services
Businesses in the area won't benefit from the custom of Google's employees anymore, this will mean less revenue for, and less expenditure from these businesses. Employment in these businesses will fall.

Reduced demand for public transport
Employees won't need to use transport, public and private, to get to the premises and so incomes are lost for transport companies with a possible reduction in employment.

Effect on government finances
With lost rents; reduced spending and a reduction in business activity taxation revenue to the government will fall which may be compensated for by increased government expenditure. Effect on multiplier depends will depend on the extent of increased government expenditure to outweigh the reduction in government revenues.

[30]

Answer – 2021 Q15c

(c) **(i)** Explain the term **Multiplier.** **8**

The multiplier effect means that any injection into the circular flow of income leads to a more than proportionate increase in National Income e.g. an initial injection of €100m will lead to a €200m increase in the size of National Income if the multiplier is 2.

(ii) Assume that MPM is 0.25 and MPC is 0.65 and MPT is 0.10.
Calculate the multiplier. Show all your workings **8**

$$\frac{1}{(1\text{-MPC}) + \text{MPM} + \text{MPT}}$$

$$\frac{1}{(1- 0.65) + 0.25 + 0.10}$$

Multiplier = 1.43

MPS = 1 – 0.65 = 0.35

$$\frac{1}{\text{MPS} + \text{MPM} + \text{MPT}}$$

$$\frac{1}{0.35 + 0.25 + 0.10}$$

Multiplier = 1.43

What is ‘Myleavingcert’?

https://www.myleavingcert.ie/

Myleavingcert is a series of flexible, high quality on-line resources, aimed at helping students improve their grades and fill in knowledge gaps.

What is included?

- ✓ **Key facts** in each topic to help students check knowledge and identify gaps
- ✓ **Important definitions** highlighted in every section
- ✓ **Detailed revision notes** organised by topic
- ✓ **Original diagrams** aimed to clarify topics and promote understanding
- ✓ **Audio files** to make revision more flexible
- ✓ **Quizzes** provided at the end of each topic aimed at improving retention
- ✓ All available **exam questions** included by topic, helping to focus the study.

Benefits for students

Students **have all the information** they need in one place.
'Myleavingcert' allows access to information at any time of the day or night on any device.
Our priority is to support, motivate and encourage students to be in control of their learning.

myleavingcert.ie

www.myleavingcert.ie