

A2 – ECONOMICS (9708)

MACRO

CHAPTER 2

Keynesian Theory of Income & Employment

Topics
Topic 1: Measuring National Income
Topic 2: Keynesians and Monetarists / AD & AS
Topic 3: Circular Flow of Income
Topic 4: Consumption
Topic 5: Investment and accelerator
Topic 6: Keynesian Cross
Topic 7: Keynesian Multiplier
Topic 8: Paradox of Thrift

TOPIC 1: MEASURING NATIONAL INCOME

Lecture 1

Definition | National Income: The total amount of money earned within a country. There are several key concepts in National Income

Concept	Description
1. Gross Domestic Product (GDP)	This shows the value of final goods and services produced by factors of production within a country.
2. Gross National Product (GNP)	This shows the value of final goods and services produced by factors of production owned by a country's citizen, regardless of where in the world this is earned. $\text{GNP} = \text{GDP} + \text{Property Income from Abroad} - \text{Property Payments to Abroad}$ OR $\text{GNP} = \text{GDP} + \text{Net Property Income from Abroad}$
3. Net National Product (NNP)	Out of the income earned in the economy some will be spent replacing the equipment that has depreciated. To measure additional (or new or net) income earned we deduct the amount spent simply on replacement of items. This is also called net income. $\text{NNP} = \text{GNP} - \text{Depreciation}$

1. CALCULATING NATIONAL INCOME

There are THREE methods of calculating national income:

1. Expenditure Method
2. Income Method
3. Output method

$$\text{Output} = \text{Income} = \text{Expenditure}$$

Example: If \$100 worth of goods are produced (Output) this has generated \$100 of income for various factors of production (Income) and will lead to \$100 of spending (Expenditure)

1. Expenditure Method

This method adds up spending in the economy.

$$\text{GDP at Market Price} = C + I + G + (X - M)$$

Note: Imports are deducted because this is the spending on goods and services from abroad. This amount leaves the economy.

C – Consumers Expenditure

I – Investment spending by firms, this includes planned investment in capital and unplanned increase in stock

G – Government Spending

X – Exports

M – Imports

The expenditure method: Market Price to Factor Cost

If spending of different groups in the economy is added up this will show the spending at current market prices. This does not reflect the income earned by the factors of product because:

1. Market Price is too high because of indirect taxes
2. The Market price is too low because of subsidies

$$\text{GDP at market Price} - \text{indirect taxes} + \text{subsidies} = \text{GDP at factor cost}$$

2. Income Method

This approach looks at the flow of economic activities from the income point of view. It can be calculated by:

1. Wages and salaries
2. Interest and Dividends
3. Rent
4. Profits
5. Income of self employed

$$\text{GDP} = \text{Total Domestic Income}$$

Note: Transfer Payments are not added in the national income because these are payments for which no corresponding good or service is produced. Example: Pensions, scholarships, unemployment benefits etc.

3. Output Method

1. This method adds up the value of every firm's output (i.e. the value of the output minus the value of the input). This avoids double counting example counting the value of steel and the value of car which also includes the value of steel.

2. Adds up the output of final goods and services.

GDP Deflator

Real national income is calculated by adjusting national income figures for inflation. The retail price index is not used as it only considers consumer prices, a more complex measure of inflation is used called the GDP Deflator. This converts money GDP to real GDP.

$$\text{Real GDP} = \text{Money GDP} \times \frac{\text{Base Year Index}}{\text{Current Price Index}}$$

TOPIC 2: KEYNESIANS AND MONETARISTS

Keynesians

Keynesians are economists whose ideas and approach are based on the work of John M. Keynes. They believe that if left to the market forces there is no guarantee that the economy will achieve a full employment level of GDP. They think that level of GDP can deviate from full employment by a large amount and for long periods. In such cases they favor government intervention to influence the level of economic activity. If there is high unemployment they argue the government should use a deficit budget (Expansionary Fiscal Policy) to raise the level of spending in the economy. They believe that a government can assess the appropriate amount of extra spending to inject into the economy in such a situation. They believe unemployment should be avoided as a top priority.

Key Points:

1. Government Intervention important for the economy
2. Unemployment should be removed as a top priority
3. Can't reach full employment without government intervention

VS

Monetarists

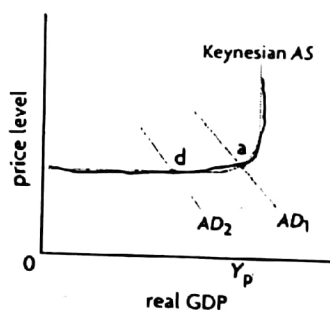
For monetarists the control of inflation is seen as the top priority for a government. This group of economists, the best known is Milton Friedman who argues that inflation is the result of an excessive growth of money supply, so they believe that the main role of the government is to control the money supply. This also believe that to reduce unemployment by increasing government spending will only succeed in raising inflation in the long run. They think that the economy is inherently stable unless disturbed by unpredictable changes in the growth of the money supply.

Key Points:

1. Inflation is the main priority
2. Inelastic Supply
3. No government intervention
4. Money supply is the main cause of inflation

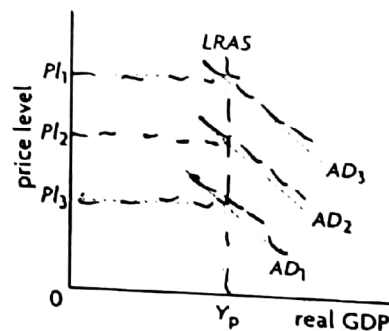
Keynesian view of the Economy

Up to full employment the aggregate supply is horizontal, perfectly elastic. An increase in aggregate demand increases output and not price. Only when full employment is reached then the prices will increase. The government should control the AD to endure the equilibrium occurs at full employment.



Monetarists view of the economy (Classical)

Aggregate supply is vertical. Any increase in AD increases the price level but not output and employment. To increase output and employment supply side policies are needed to shift AS to the right.

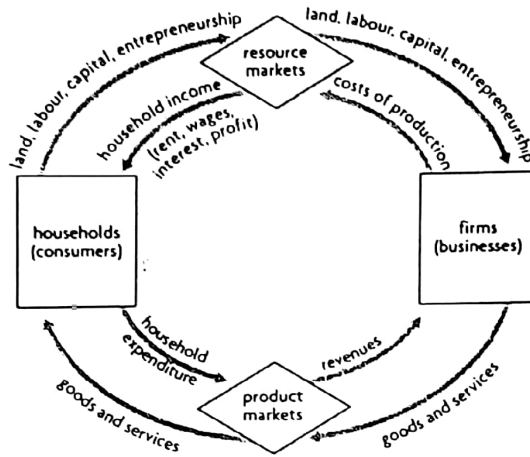


TOPIC 3: CIRCULAR FLOW OF INCOME

1. Simple Circular flow of Income Model

Definition: The circular flow of income shows that in any given time period (say a year), the value of output produced in an economy is equal to the total income generated in producing that output, which is equal to the expenditures made to purchase that output.

Example: The income in an economy is \$100. This means that \$100 of output is produced and in a simple circular flow model this all bought by households who earn \$100 and spend \$100.



2. Injections and Withdrawals

Injections (J) Increases AD	Withdrawals (W) Reduces AD
<p>Definition: These represent spending on final goods and services in addition to consumers spending. Injection increase AD. Planned injections represent spending in addition to that of the households in the economy. Example: Government firms, overseas buyers. Hence injection would equal to investments + government spending + exports.</p>	<p>Definition: These represent a leakage from the economy. They represent income which is earned by households but which is not spent on final goods and services. Withdrawals reduce the AD. Planned withdrawals represent the income which households have earned which they do not want to spend within the economy. This could be because they want to save it (S), they have to pay taxes (T) or they want to spend it on imports (M).</p>
$J = I + G + X$	$W = S + T + M$

3. Adding Injection and Withdrawals to the circular flow

In reality, households may not want to spend all of the \$100 in the economy, they may withdraw \$40 and only want to spend \$60. In this case the level of demand in the economy is too low, \$100 is produced but only \$60 is demanded. Equilibrium will be restored provided the other groups (Firms, Government and overseas buyers) want to buy up to \$40 of output that the households do not want. i.e. provided the planned injections = withdrawals there will be an equilibrium

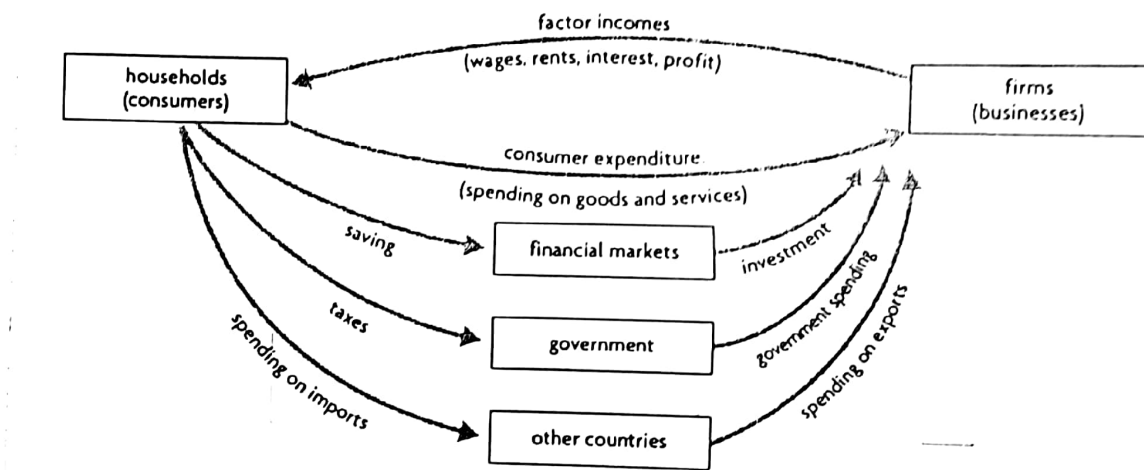
Equilibrium | $J = W$ & $Y = AD$

— If other groups only want to buy \$30 of goods, there will still be \$10 leftover. AD is too low. Because the planned injection did not compensate for the planned withdrawals demand is too low. i.e. if planned injections are less than planned withdrawals, then the AD is too low.

$J < W \rightarrow Y > AD$

— If the other groups wanted to buy \$50, demand would have been too high because there was only \$40 goods left over, i.e. if planned injections are greater than planned withdrawals, then AD is too high.

$J > W \rightarrow Y < AD$



4. National Income Equilibrium

Definition: This is a situation where there is no further tendency to change National Income. It is a state of an economy where withdrawals are equal to injections into the circular flow of income. In a 2-Sector economy there are only households and firms and no govt. and international trade.

Lecture 1

TOPIC 4: CONSUMPTION

Lecture 2

Definition: The level of consumption in the economy is the planned level of spending on final goods and services by households. It is a major element of aggregate demand.

1. Keynesian Consumption Function

Definition: According to Keynes the level of national income is a major determinant of consumer spending. Shown by the following equation

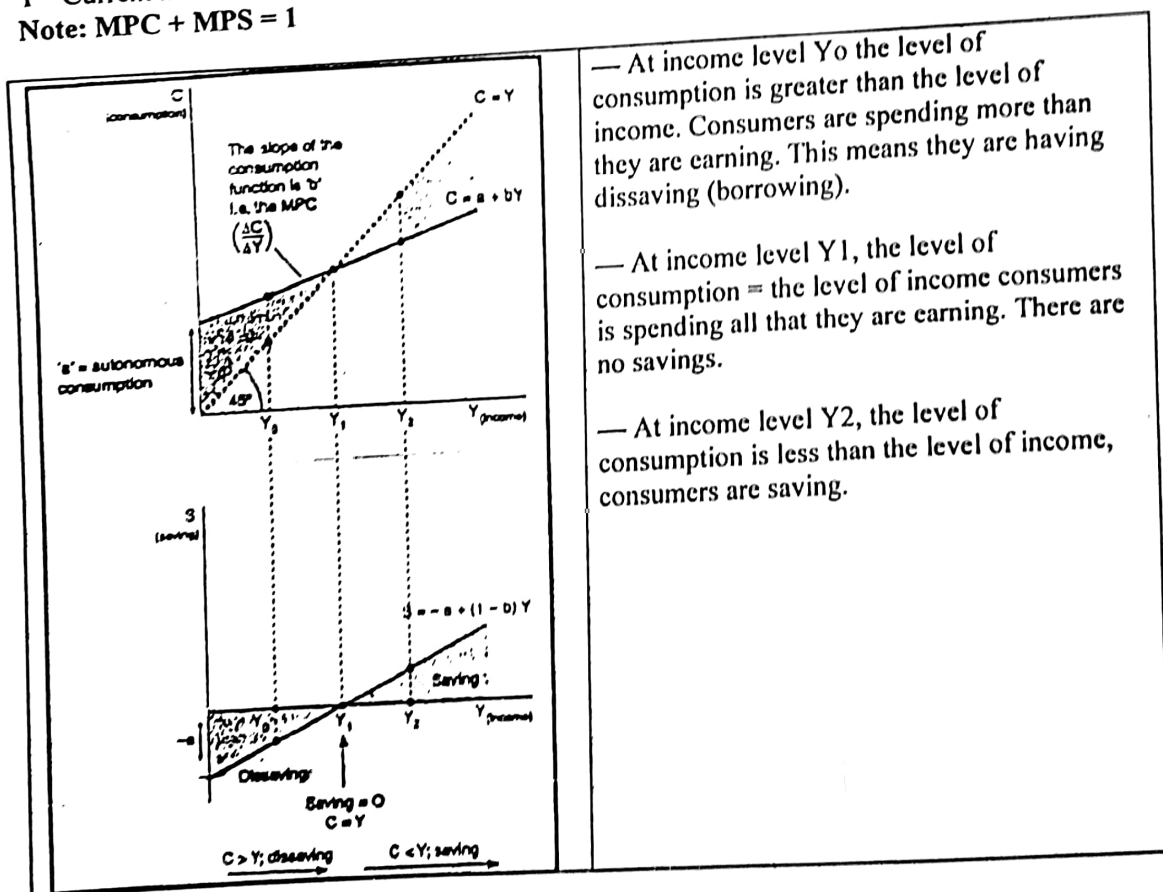
$$C = a + bY$$

a = Autonomous spending. This represents spending which the household would do even if income was zero.

b = the marginal propensity to consume. This is the extra spending out of each extra dollar and is given by the equation. This is the gradient of the consumption function

$$MPC = \frac{\text{Change in Consumption}}{\text{Change in Income}} = \frac{\Delta C}{\Delta Y}$$

Y = Current income level
 Note: $MPC + MPS = 1$



— At income level Y_0 the level of consumption is greater than the level of income. Consumers are spending more than they are earning. This means they are having dissaving (borrowing).

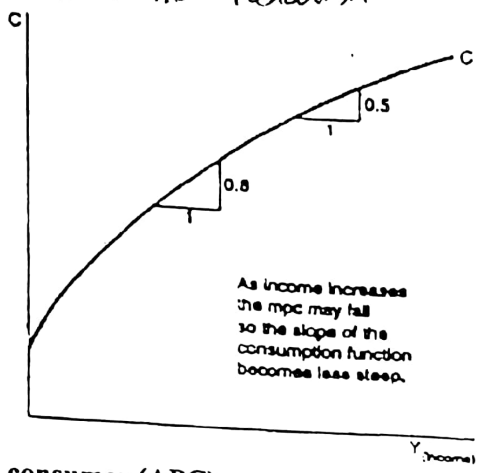
— At income level Y_1 , the level of consumption = the level of income consumers are spending all that they are earning. There are no savings.

— At income level Y_2 , the level of consumption is less than the level of income, consumers are saving.

The size of the MPC depends on the following factors

Factors	Description
1. Level of income	As the income of the consumer goes up we assume that the consumer tends to consume the same amount. However in reality as the consumers earn more their MPC declines
2. Interest rates	Higher interest rates may increase the amount saved out of each extra pound and reduce the MPC. Higher the interest rate lower the MPC
3. Expectations	If the prices will increase in the future the MPC might increase today
4. Taxation	Higher the tax rates less would be spent.

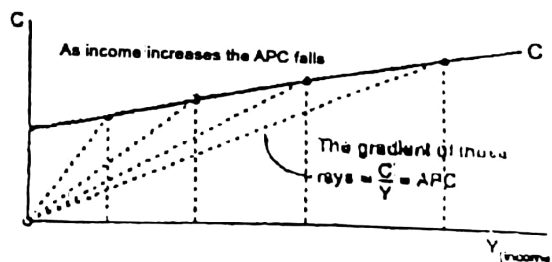
2 sector: no taxation



The average propensity to consumer (APC)

Definition: The average propensity to consume shows the amount consumed on average out of each pound earned.

$$APC = \frac{C}{Y}$$



On the diagram the APC is shown by the gradient of rays from the origin to each point on the consumption function. The APC falls with higher levels of income because which income is low the level of consumption is relatively high because of autonomous element of consumption. As income levels increase, the autonomous level of consumption becomes less significant.

If there is no autonomous element of consumption the $APC = MPC$

Income (Y)	Consumption (C) $C=10+0.8Y$	Average Propensity to consume (APC)
0	10	Infinity
10	18	1.8
20	26	1.3
30	34	1.133
50	50	1
100	90	0.9
500	410	0.82
1000	810	0.81

Note: If autonomous consumption of (10) wasn't there the MPC would be equal to APC.

Other factors influencing consumption apart from current income

Factors	Description
1. Relative Income	If the consumption patterns of a consumer are fixed to high income standards it will take time for the consumer to fall back to low standards because the household has become accustomed to the higher levels of spending and many of their peers are still spending at the same income level.
2. Expectation	If the consumers expect that their income will go up in the future they are likely going to increase consumption now. Even if their income has not gone up yet. If consumers expect prices to increase they will buy goods now and not in the future.
3. Interest rate and credit	If interest rates are low there is less incentive to save and consumers are more likely to spend. If credit is readily available, borrowing, and spending may increase.
4. Wealth	If consumers wealth increases, spending may be high even if their income is low.
5. Distribution of Income	If income is redistributed and taken from high income groups and given to low income groups, consumption is likely to rise. This is because the low income groups tend to spend more out of each dollar.

Lecture 2

TOPIC 5: INVESTMENT AND ACCELERATOR

ecture 3

Definition: This refers to spending by firms. It has **TWO** elements:

1. The purchase of new capital such as equipment and factories
2. An increase in stock levels

Gross Investment vs. Net Investment

Definition | Gross Investment: This is the total level of investment.

Definition | Net Investment: It is the increase in the capital stock minus some investment simply replaces capital which has worn out (i.e. depreciation). *Investment left after previous assets have been disposed*

$$\text{Net Investment} = \text{Gross Investment} - \text{Depreciation}$$

Autonomous Investment vs. Induced investment

Definition | Autonomous investment: This is unrelated to the level of national income

Definition | Induced investment: This is the investment which is related to changes in the level of national income.

Real vs. Money Investment

Definition | Real Investment: It is the investment in capital goods. Example: Factories, equipment, machinery

Definition | Money Investment: This is investment (savings) in 'paper'. Example: Shares, bonds, securities.

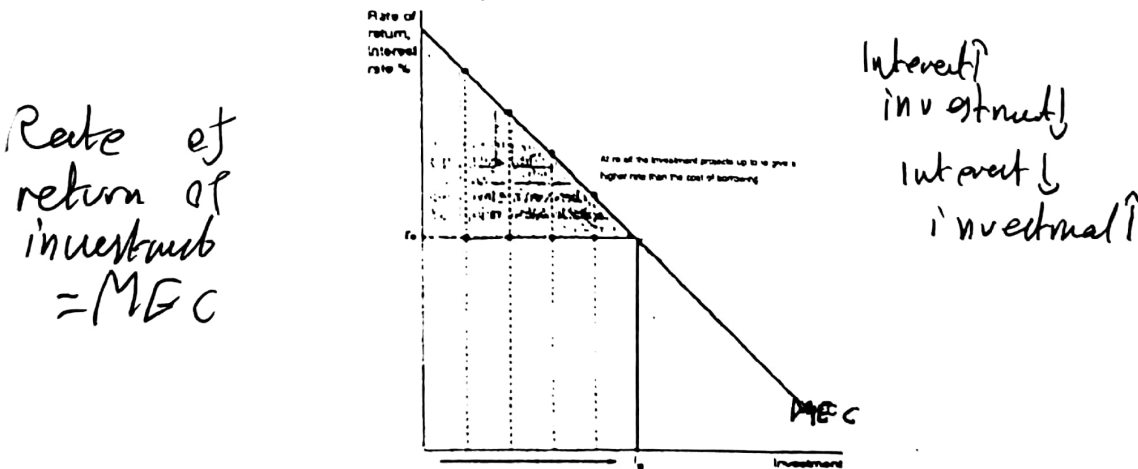
The level of investment depends on

- (a) Availability of Finance
- (b) Interest Rates
- (c) The expected rates if return from investment

The expected return from investment depends on for example:

1. The initial cost
2. Expected costs
3. Expected Revenues
4. Expected Productivity

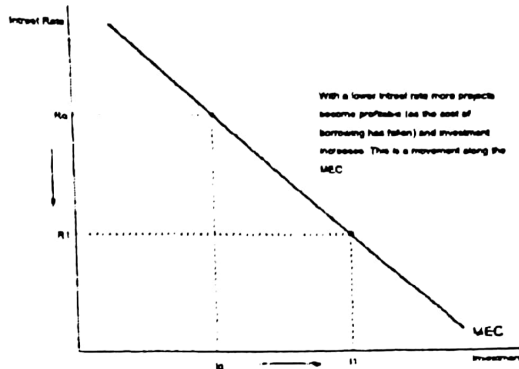
If the expected rate of return is greater than cost of borrowing (i.e. interest rate) the firm will invest. If the expected rate of return is less than the cost of borrowing the will not invest. The Marginal efficiency of Capital (MEC) shows the rate of return on each additional unit of capital.



1. Movement along the investment schedule | Change in Interest Rate

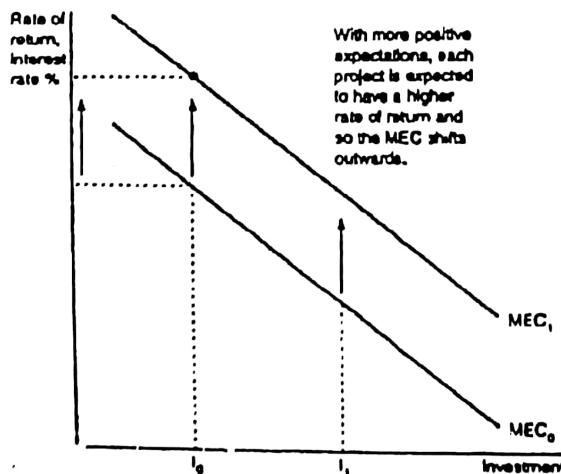
— With an increase in interest rates invest is likely to fall. This is because it is more expensive to borrow and there are now fewer projects which have a higher rate of return than the cost of borrowing.

— With a fall in interest rates there are more projects which have a higher return than the cost of borrowing and investment should increase.



2. Shifts in the investment Schedule | Other Factors

Factors	Description
1. Expectation	If expectation become more positive, e.g. the firm is more confident about the state of the economy and the level of demand for their product, then each project will be expected to have a higher rate of return; the MEC will shift outwards.
2. Technology	This can increase productivity and make the projects more profitable
3. Taxes	Lower the taxes, greater the retained profits for the companies which they can use to increase investments.
4. Fall in purchase price of capital goods	Lower the price of capital goods this would increase the expected rate of return for the investor.



TOPIC 5: INVESTMENT AND ACCELERATOR

Lecture 3

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1. The purchase of new capital such as equipment and factories
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Investment left after previous assets have been disposed

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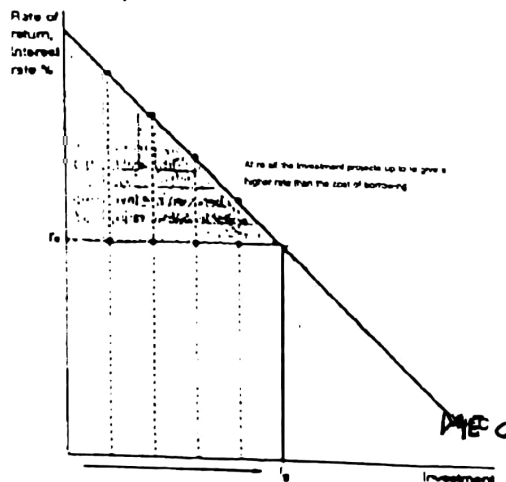
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Rate of return of investment = MEC

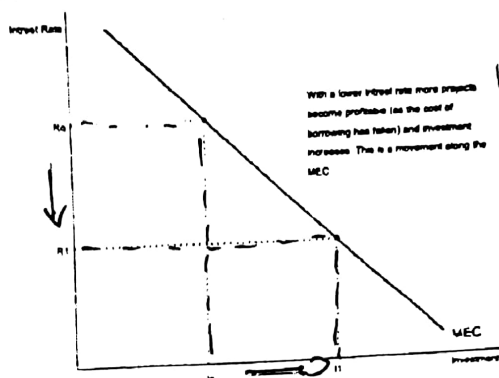


*Interest ↓ investment ↓
Interest ↓ investment ↑*

1. Movement along the investment schedule | Change in Interest Rate

— With an increase in interest rates invest is likely to fall. This is because it is more expensive to borrow and there are now fewer projects which have a higher rate of return than the cost of borrowing.

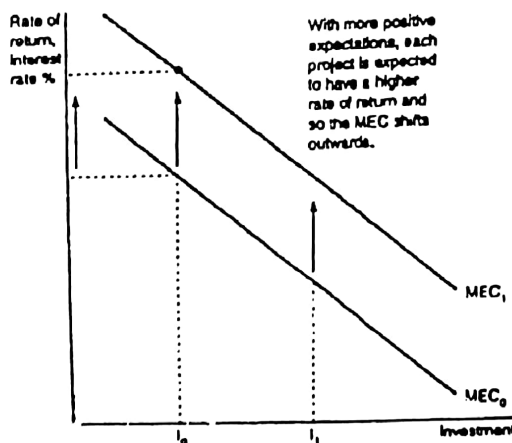
— With a fall in interest rates there are more projects which have a higher return than the cost of borrowing and investment should increase.



With a ↓ interest rate more projects become profitable (as the borrowing rises) and investment ↑. Movement along the MEC

2. Shifts in the investment Schedule | Other Factors

Factors	Description
1. Expectation	If expectation become more positive, e.g. the firm is more confident about the state of the economy and the level of demand for their product, then each project will be expected to have a higher rate of return; the MEC will shift outwards.
2. Technology	This can increase productivity and make the projects more profitable
3. Taxes	Lower the taxes, greater the retained profits for the companies which they can use to increase investments.
4. Fall in purchase price of capital goods	Lower the price of capital goods this would increase the expected rate of return for the investor.



1. ACCELERATOR

Definition: This shows the relationship between net investment and rate of change in national output. The accelerator assumes a constant capital to output ratio, Example: \$2 of capital has to be purchased to be able to increase output by \$1. This makes the capital to output ratio 2:1.

$$\text{Accelerator} = \frac{\Delta I}{\Delta Y}$$

Desired Output Level	Desired Capital Level	Change in Output	Level of Net Investment
200	400	-	-
220	400	+20	+40
250	500	+30	+60
300	600	+50	+100
400	800	+100	+200
600	1200	+200	+400
700	1400	+100	+200

Assume [Capital : Output ratio = 2:1]		
If output increases by an increasing (accelerating) amount, firms will have to buy more machines each period. Net Investment ↑	If output increases by a constant amount each period, firm will have to buy the same number of machines and factories. Net Investment = Constant	If output increases but by less than the year before firm will not need to buy as many machines and factories. Net Investments ↓

Limitation of the accelerator model

Limitation	Description
1. Stocks	Firms often have stocks so if the output increase they can meet this without having to produce more. They may not need net investment.
2. Inelastic Supply	The capital goods industry which produces the capital goods may not be able to increase supply. Example: Even if firms want to buy more machines they may not be able to because they might be at full capacity.
3. Technology	With the increase in technology the same number of machines might become more efficient and the need for more investment is not required.
4. AD increase is long term	Firms need to be certain that the demand will last in the long-run and is not a temporary increase; otherwise firms would be reluctant to invest. They may try to meet demand by using overtime for the short period.

All injections are assumed to be autonomous

TOPIC 6: KEYNESIAN CROSS

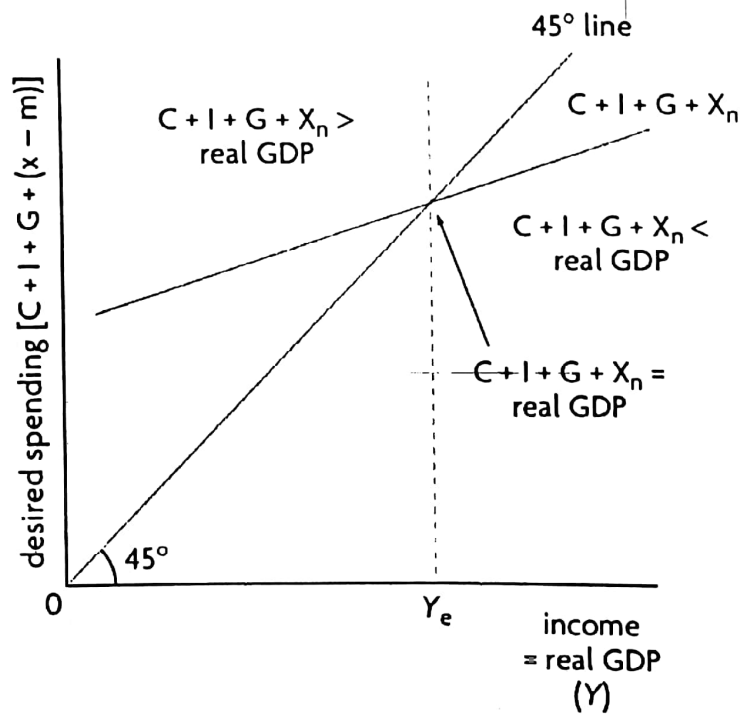
Definition: The Keynesian cross diagram (or 45-degree line diagram), a desired total spending (or aggregate expenditure, or "aggregate demand") curve is drawn as a rising line since consumers will have a larger demand with a rise in disposable income, which increases with total national output.

The 45-degree line shows all the combinations of points where the values of two axes are equal. In this case the 45-degree line shows all points at which the level of aggregate demand (AD) equals the level of output and income (Y), i.e. all the possible points of equilibrium where $AD=Y$. i.e. Aggregate demand = output.

The economy will always move towards this point. If the Aggregate demand is greater than the output there is an incentive for firms to produce more. If aggregate demand is less than the output, there is an incentive for firms to produce less.

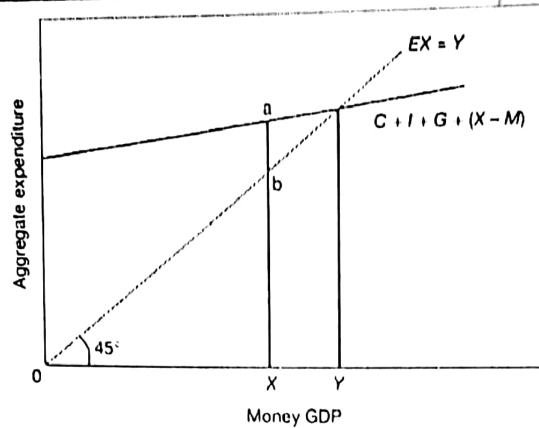
$AD > Output \rightarrow$ Firms produce more
 $AD < Output \rightarrow$ Firms produce less

Note: The Aggregate demand schedule: $AD = C + I + G + (X-M)$
 Note: The slope of the AD depends on the marginal propensity to consume (MPC).



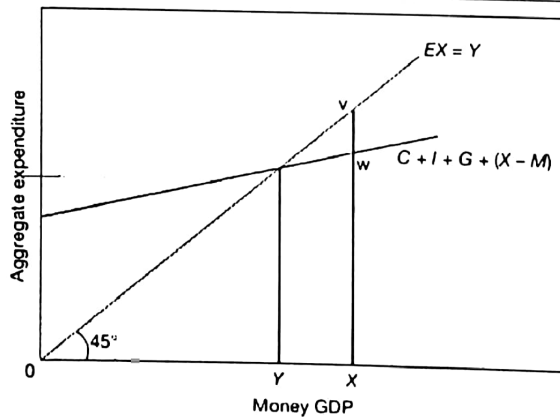
1. INFALTIONARY AND DEFLATIONARY GAP

Inflationary Gap



In the short run, and Keynesians argue also possibly in the long run, an economy may not achieve full employment. An inflationary gap will occur if **aggregate expenditure exceeds the potential output of the economy**. In such a situation, not all demand can be met, as there are not enough resources to do so. As a result the excess demand drives up the price level. The diagram above shows that an economy is in equilibrium at a GDP of Y, which is above the level of output, X, that could be achieved with the full employment of resources. The distance a-b represents the inflationary gap. A government may seek to reduce an inflationary gap by cutting its own spending and/or raising taxation in order to reduce aggregate expenditure. This reduction in government spending moving the economy back to the full employment level.

Deflationary Gap



The equilibrium level of GDP may also be below the full employment level, In this case there is said to be a deflationary gap. The diagram above shows that the lack of aggregate expenditure results in an equilibrium level of GDP of Y, below the full employment level of X. There is a deflationary gap of v-w. The Keynesian solution to a deflationary gap is increased government spending financed by borrowing. An increase in government spending eliminating a deflationary gap.

Lecture 3

TOPIC 7: KEYNESIAN MULTIPLIER (K)

Definition: The multiplier shows how an increase in planned injections into the economy leads to a larger increase in output and income. This is because the initial injection sets off rounds of spending. It is based on the idea that 'one person's spending is another person's income'.

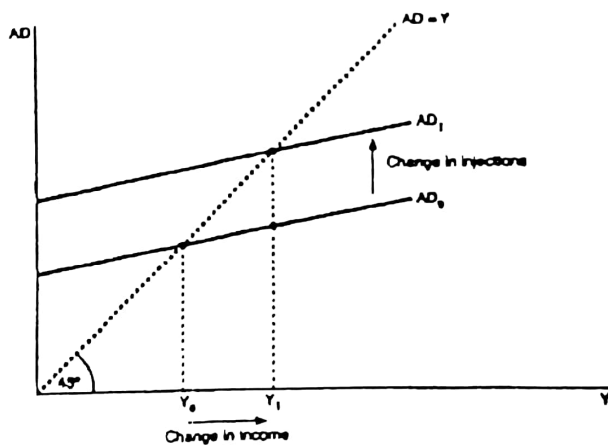
J ↑ Y ↑

Example: Imagine the government spend \$100m on building a road. This \$100m is paid to a building contractor who will spend some of this on buying equipment, materials, paying for laor, paying overheads, payout out to shareholders. Let's assume it spends \$80m and saves the rest. The various groups that have received this money now go and spend some of this \$80m. The shareholders might buy a holiday, the employees pay for their food, the suppliers pay their employees and buy their materials. If the \$80m, \$64m may be spent and this then becomes income for another set of people who again go and spend some of it.

— The initial \$100m creates a series of successive smaller increases in spending throughout the economy. Example from the case above \$100m + \$80m + \$64m...

$$\text{Multiplier} = \frac{\text{Change in Income}}{\text{Change in Injections}}$$

Note: the initial injection has multiplied effect on the economy. The size of the multiplier will depend on how much is spent on each stage. i.e. the marginal propensity to consume (MPC). The more that is spent at each stage (i.e. Larger the MPC), the bigger the overall effect.



$$MPC + MPS = 1$$

$$MPS = 1 - MPC$$

$$\frac{1}{MPS}$$

3 sectors

$$MPS + MPC + MPT = 1$$

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

4 sectors

$$MPS + MPC + MPT + MPE = 1$$

1. Size of the multiplier

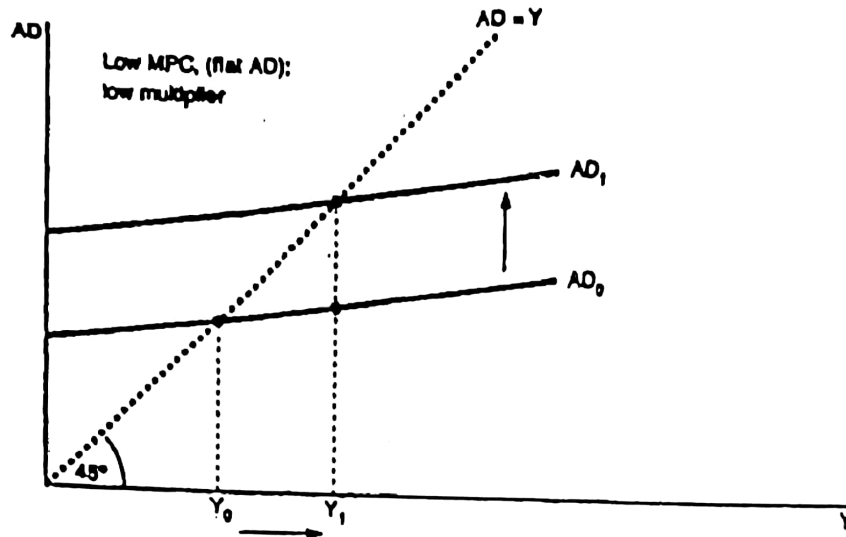
The size of the multiplier is calculated using the formulae:

$$K = \frac{\Delta Y}{\Delta I} = \frac{1}{1 - MPC}$$

Example: If the MPC is 0.5 the multiplier would be 2. If the MPC is 0.9 the multiplier would be 10.

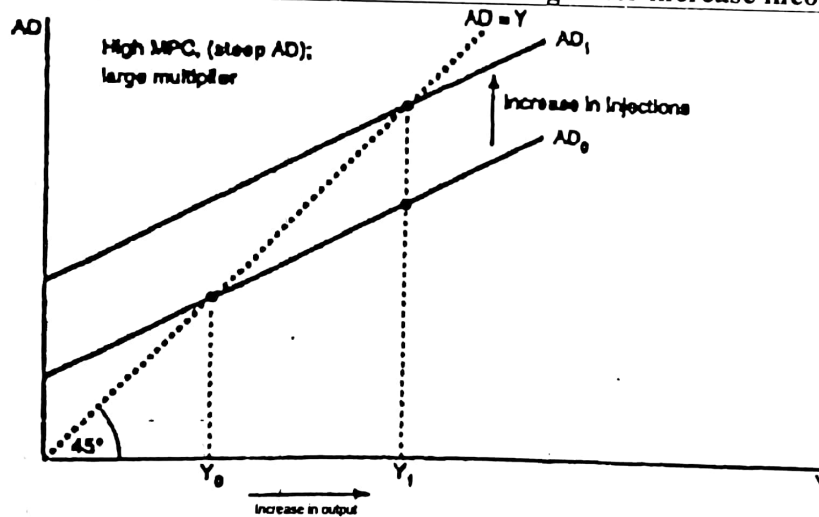
Lecture 5

Low MPC – The Multiplier will have a small increase in income



— If the multiplier is 2, this means that any injection will have twice the effect on income. Example: If the government spends \$100m this will lead to an increase of \$200m in the national income.

High MPC – The Multiplier will have a greater increase income



— If the multiplier is 10, this means that any injection into the economy will have a 10times the effect on national income. IF the government spends \$100m this will lead to an increase of \$1000m overall.

Two Sector, Three Sector and Four Sector Economy

Sector	Description
1. TWO-Sector Economy	<p>In a two-sector economy (Households and firms) there is only one withdrawal (savings) and one injection (investment). Investment is drawn as a straight line on the diagram because it is assumed to be autonomous of income. Investment tends to be related to interest rates and expectations about the future level of income rather than the present income level. A two-sector economy is also known as a closed economy (that does not engage in international trade and is without a government sector).</p> <p>In such an economy the multiplier can be found by the formulae:</p> $K = \frac{1}{1-MPC} = \frac{1}{MPS}$ <p>This is because in this model the income can either be spent or saved.</p>
2. THREE-Sector Economy	<p>In a three sector economy there are (Households, Firms and the Government). The government is an extra injection government spending (G) and an extra withdrawal tax (T). The government spending is drawn as a straight line this is because (G) is autonomous and depends on the government policy not the level of income. The government may or may not spend more in a boom or recession, we cannot definitely say. This is also known as a closed economy but with a government sector.</p> <p>In such an economy the multiplier can be found by the formulae:</p> $K = \frac{1}{1-MPC} = \frac{1}{MPS+MPT}$
4. FOUR-Sector Economy	<p>In a four sector economy there are (Households, Firms and the Government and a foreign trade sector). This is the most realistic model as it includes all four possible sectors and is an open economy. This adds another injection into the economy exports (X) and another withdrawal imports (M). This is called an open economy.</p> <p>In such an economy the multiplier can be found by the formulae:</p> $K = \frac{1}{1-MPC} = \frac{1}{MPS+MPT+MPM}$

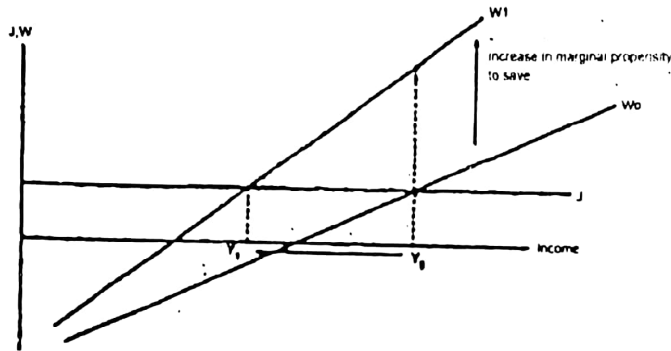
All injections autonomous and parallel upward are considered to be will shift the AE

TOPIC 8: PARADOX OF THRIFT

Definition: If households try to save more of their income, they may end up saving exactly the same amount of money as before. This is because if they save more of their money, this reduces the level of demand in the economy, which leads to a downward multiplier and a fall in the level of income. Although they save a greater proportion of their income BUT since income has fallen total savings in an economy will be the same total amount (or less), because for equilibrium savings must equal investments which is unchanged.

Long
run
1/3 saved
over a
long
time period

Savings ↑ MPS ↑ MPC ↓ → Pivotal upward shift in the withdrawal function



Yo. Households save more, increasing planned withdrawals. Aggregate demand falls and the output and income of the economy falls to a new equilibrium at Y1. Withdrawals (W) are now equal to injections (J). Note: Households are saving a higher proportion of a lower income.

Lecture 4

Desired
increase
in
national
income

$$= k \times \text{new multiplier}$$

$$= 100 = 1.25 \times x$$