

CONSUMPTION AND INVESTMENT FUNCTIONS

INTRODUCTION

In this lesson consumption function and investment function will play a vital role (C+I) there is close correlation between investment and national income.

The multiplier (K) = $\frac{\text{change in Y}}{\text{change in I}}$

K depends on MPC or consumption function is the relationship between consumption expenditure and national income. The unspent income is saving which becomes investment. The accelerator explains the relationship between consumption expenditure and capital expenditure.



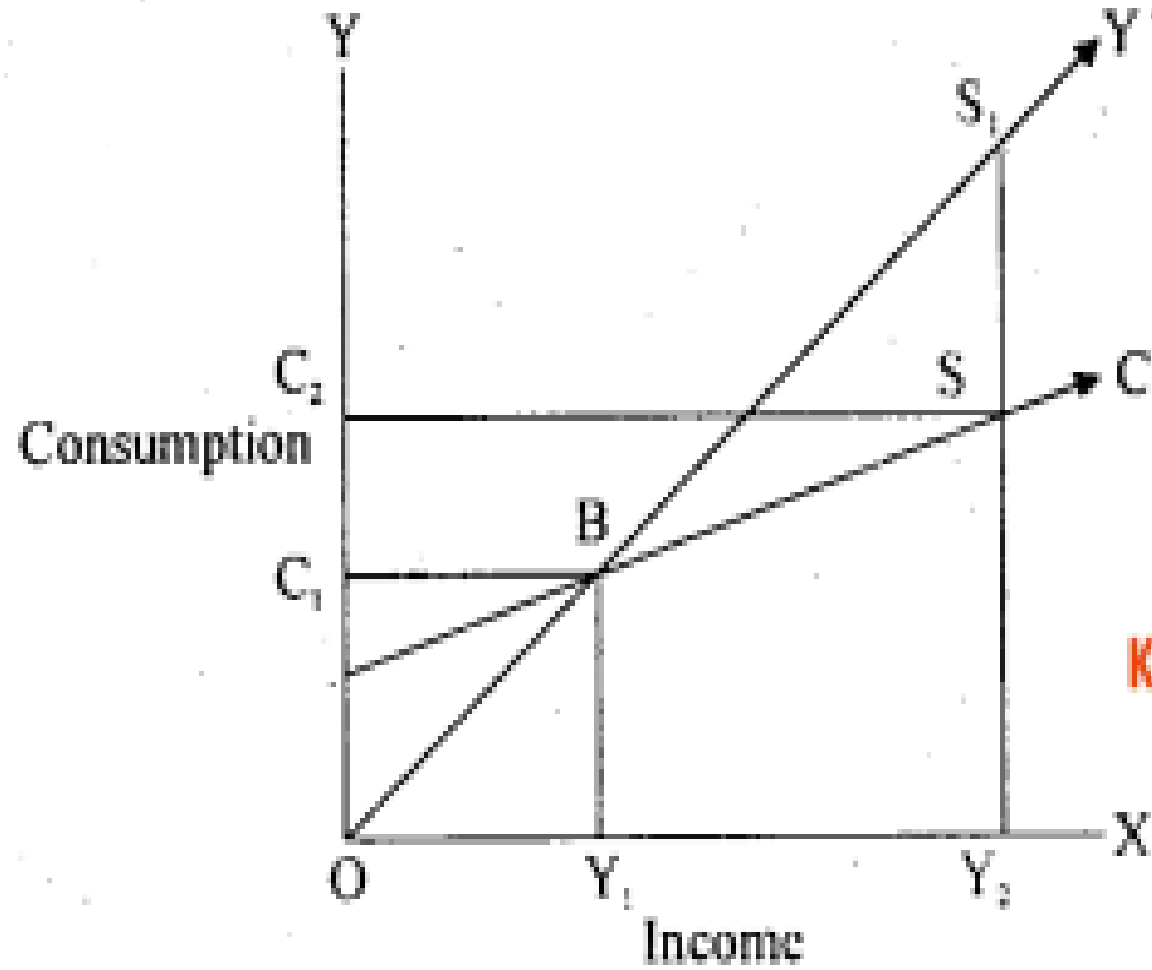
CONSUMPTION FUNCTION MEANING

CONSUMPTION FUNCTION Meaning: The functional relationship between total consumption and gross national income $C=f(Y)$. This relationship is based on the ceteris paribus (other things being same) assumption.



INCOME CONSUMPTION SCHEDULE

Income Y	Consumption C	Saving S
0	20	-20
60	70	-10
120	120	0
180	170	10
240	220	20
300	270	30
360	320	40



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DIAGRAM EXPLANATION

Refer diagram in Pg: 54.

In the diagram, income in X axis consumption in Y axis in 45 degree line Y and C are equal. At the point B there is 0 saving.

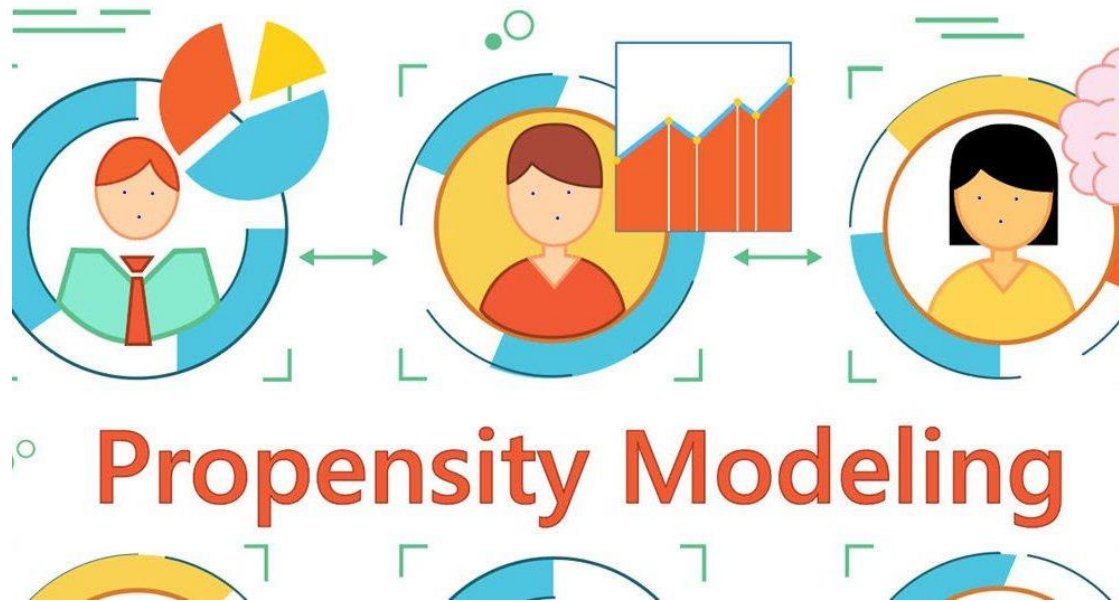
PROPENSITY

1. $APC = c/y$
2. $MPC = \Delta c / \Delta y$
3. $APS = s/y$
4. $MPS = \Delta s / \Delta y$.

$$MPC + MPS = 1$$

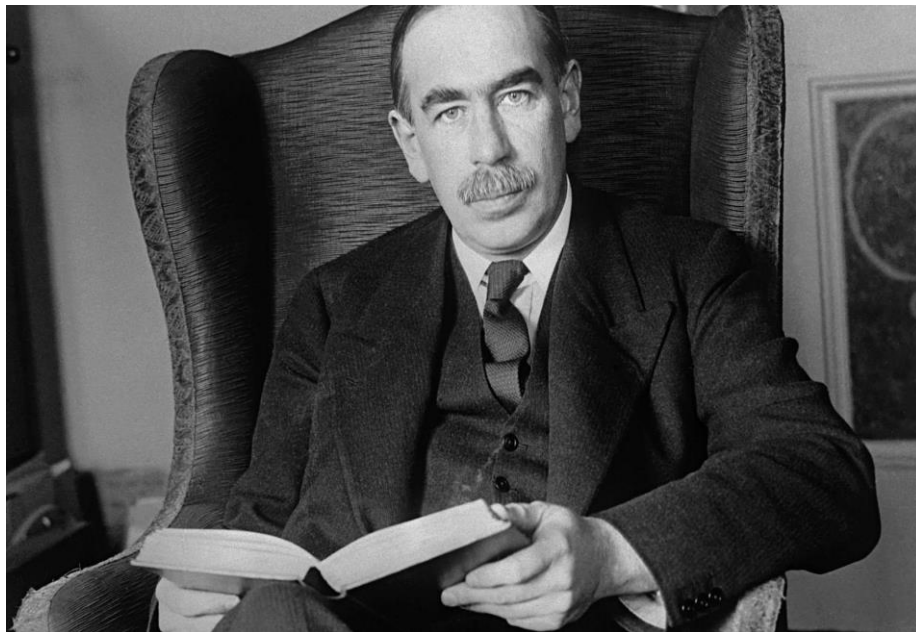
APC is expressed in percentage and MPC in fraction.

Refer Table on page no: 56.



KEYNES'S PSYCHOLOGICAL LAW OF CONSUMPTION

According to Keynes the psychology of the people is that when income increases consumption also increases but increase in income is not as much as increase in consumption.



CETERIS!

All things being equal

PARIBUS!

ASSUMPTION

1. Ceteris paribus (other variables- taste, habit, population etc do not change) C depends on only.
2. Existence of normal conditions. If there is an extraordinary conditions like war, hyperinflation etc this law will not operate.
3. Existence of Laissez-faire capitalist economy (people should be free to spend their income, no government intervention).

Propositions of the law:

When income increases, consumption expenditure also increases but by a smaller amount.

TABLE FOR THREE PROPOSITION OF LAW

Income Y	Consumption C	Savings $S = Y - C$
120	120	0
180	170	10
240	220	20

TABLE EXPLANATION

► Proposition: (1)

Income increases ₹60 crores, consumption increases ₹50 crores.

► Proposition: (2)

Income increases ₹60 crores. This is divided between consumption (₹50 crores) and saving (₹10 crores).

► Proposition: (3)

As income increases consumption as well as saving increases. Refer diagram pg no: 57.

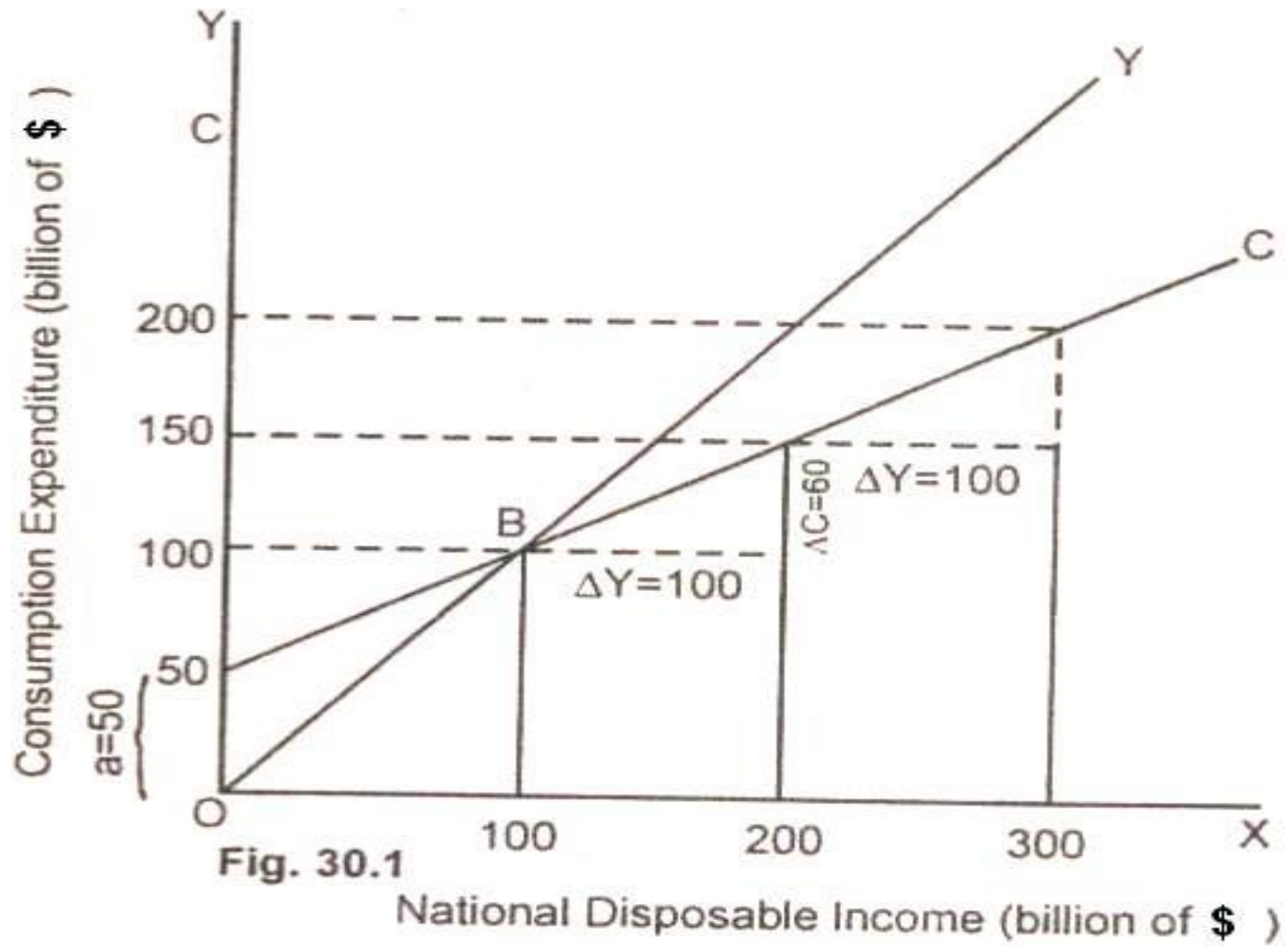
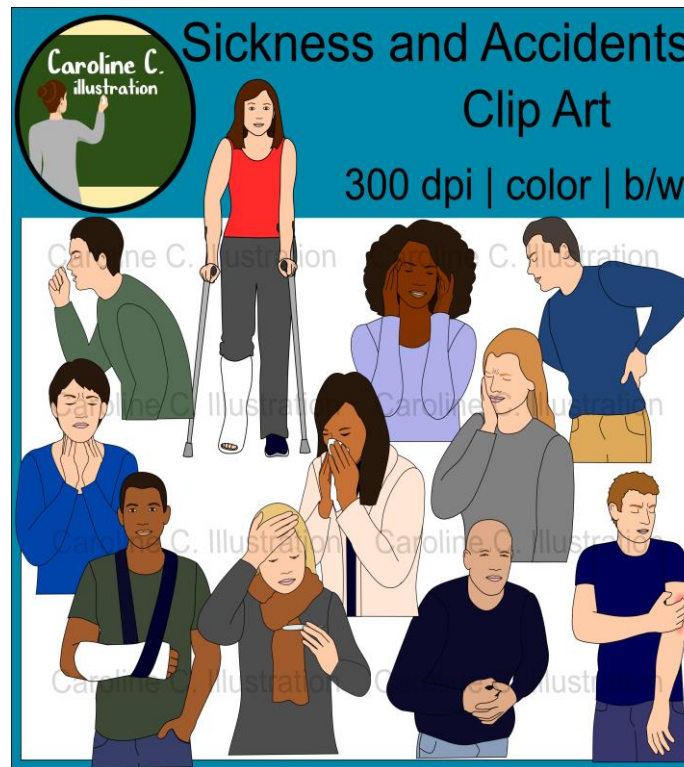


DIAGRAM EXPLANATION

- ❖ Income is measured horizontally and consumption and saving measured vertically.
- ❖ C is the consumption function curve.
- ❖ 45 degree line is $C = Y$
- ❖ **Proposition: (1)-** When Y increases from 120 to 180 C increases from 120 to 170 (increase in C is less than increase in Y) 10 is saved.
- ❖ **Proposition: (2)-** When Y increases to 180 and 240 C increases by 170 and 220 and S increases by 10 and 20.
- ❖ **Proposition: (3)-** Increase in income leads to increase in C and S. The saving gap is between C curve and 45 degree line.

DETERMINANTS OF CONSUMPTION FUNCTION

J.M. Keynes has divided this into two. Subjective factors and Objective factors.



A) SUBJECTIVE FACTORS

- ▶ It is related to psychological feelings
- ▶ Eight motives of individuals:
 - ▶ 1.The motive of precaution:(accidents and sickness)
 - ▶ 2.The motive of foresight:(for future needs- old age)
 - ▶ 3.The motive of calculation:(to enjoy their interest and appreciation)
 - ▶ 4.The motive of improvement:
 - ▶ 5.The motive of financial independence
 - ▶ 6.The motive of enterprice
 - ▶ 7.The motive of pride
 - ▶ 8.The motive of avarice(greediness)

Four motive of govt, firm, business corporation etc:

- 1.The motive of enterprice: (making investment without debt)
- 2.The motive of liquidity:(holding liquid for emergency)
- 3.The motive of improvement:(increasing income)
- 4.The motive for financial freedom:(for paying debt, for depreciation)

According to Keynes consumption function remains same in short period.

B) OBJECTIVE FACTORS

These factors can change in the long run.

1. **INCOME DISTRIBUTION:** If there is large disparity between rich and poor, consumption is low. If there is equal distribution of income, consumption is high. This view is mentioned by V. K. R. V. Rao.
2. **PRICE LEVEL:** When price falls, real income goes up, people consume more and propensity to save also more.
3. **WAGE LEVEL:** Consumption expenditure increases with the rise in wages. Similar is the effect with regard to windfall gains.
4. **INTEREST RATE:** Interest increases means saving increases and consumption decreases.

5. **FISCAL POLICY:** When government reduces the tax the disposable income rises and the propensity to consume of community increases. The progressive tax favours for poor.

6. **CONSUMER CREDIT:** Easy instalments encourage consumer durables like automobiles, fridge etc.

7. **DEMOGRAPHIC FACTORS:** The larger the size of the family, the grater is the consumption. Eg: Children of college education stage spend more than those of primary education.

8. **DUESENBERRY HYPOTESIS:**

a) The individuals continue to spend the same amount on consumption even though the current income is reduced.

b) Consumption is influenced by demonstration effect. Eg: the poor people want to imitate the consumption pattern of rich.

9. **WINDFALL GAINS OR LOSSES:** Unexpected changes in the stock market shift the consumption function upward or downward.

INVESTMENT FUNCTION

- ▶ The investment function means functional and inverse relationship between rate of interest and investment.
- ▶ $I=f(r)$
- ▶ Investment means purchase of stocks, shares, debentures, bonds and equity etc.
- ▶ Types of investment:
- ▶ **1. Autonomous investment:** (This curve is horizontal, welfare motivated)
- ▶ Autonomous investment means independent of economic activity. (Income inelastic)
- ▶ **2. Induced investment:** (profit motivated)
- ▶ Induced investment means expenditure on fixed asset and stock.
- ▶ National income and induced investment is positive. (Income inelastic)
- ▶ (Diagram and distinguish refer book)

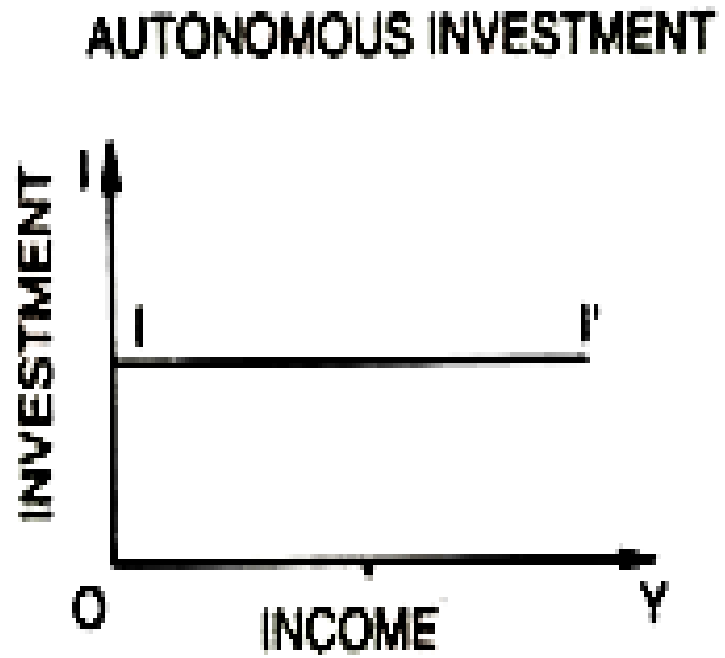
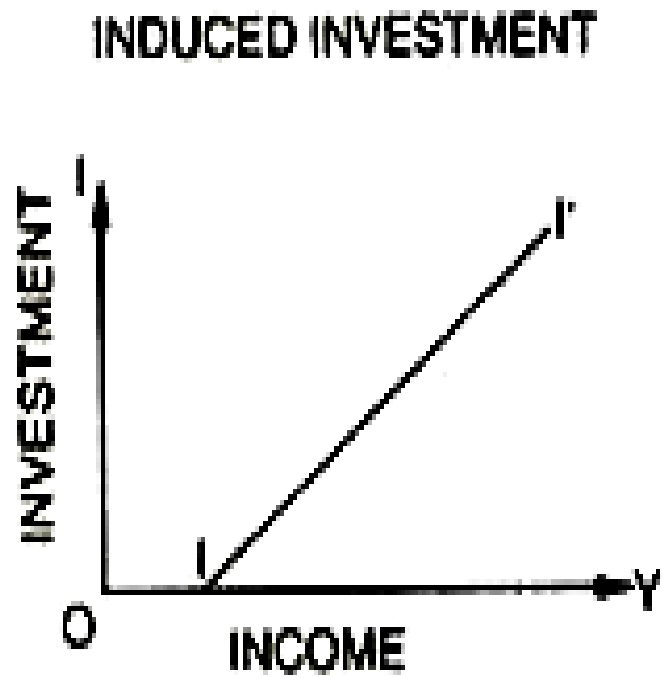


Fig. 18.1

AUTONOMOUS INVESTMENT	INDUCED INVESTMENT
Independent	Planned
Income Inelastic	Income Elastic
Welfare Motive	Profit Motive

DETERMINANT OF INVESTMENT

1. Rate of interest
2. Level of uncertainty
3. Political environment
4. Population
5. Stock of capital goods
6. Necessity of new product
7. Income of investors
8. Inventions and Innovations
9. Consumer demand
10. Policy of state
11. Availability of capital
12. Liquid asset of the investors



Keynes said that *Business expectation

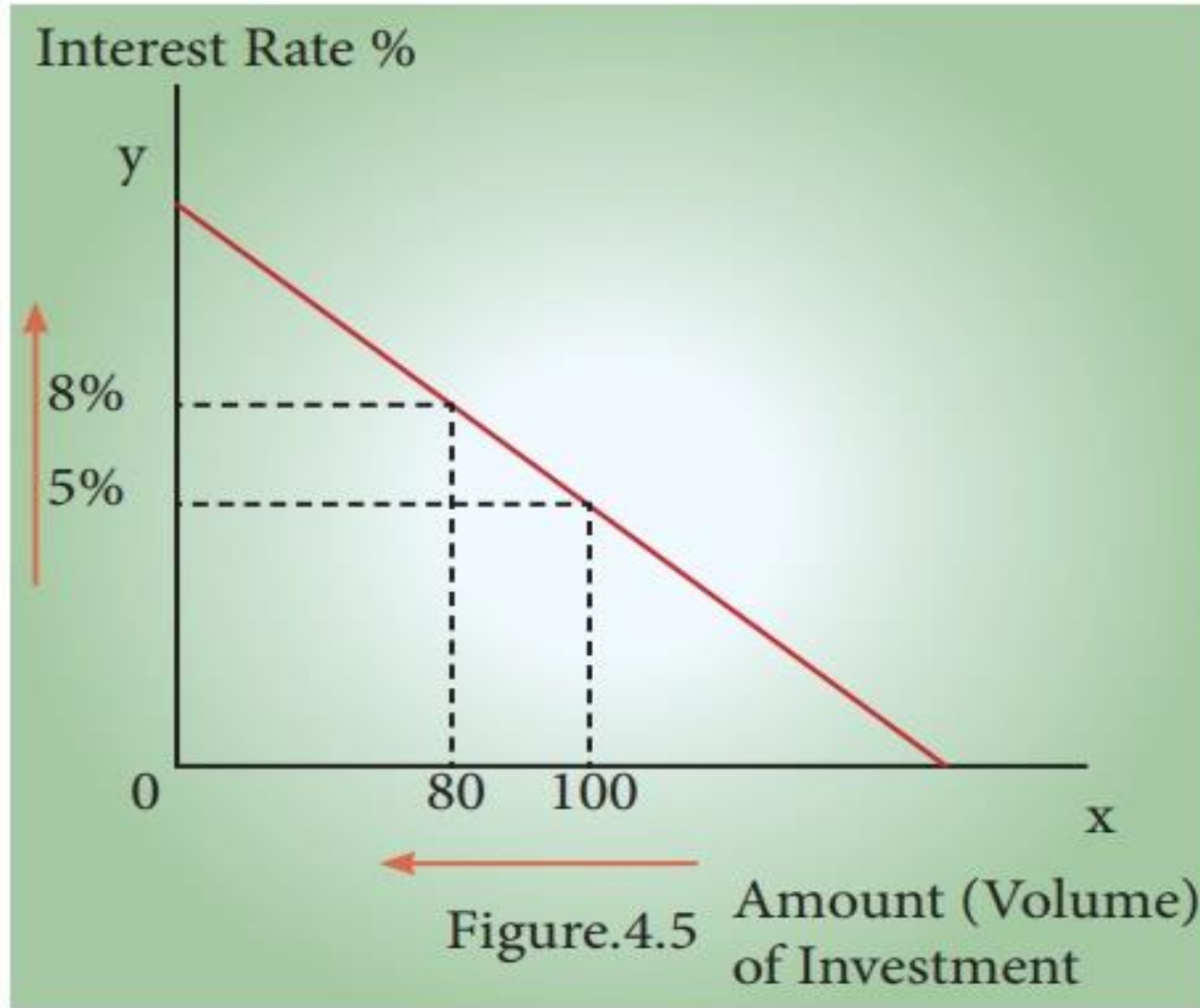
*Profit are important for deciding investment. And also he said MEC and Rate of interest determine investment.

If MEC (expected rate of return) is more than interest , it is benefit for the producers to do business.



RELATIONSHIP BETWEEN INTEREST AND INVESTMENT

- ▶ Higher interest reduces investment. i.e., cost of borrowing is more.
- ▶ (Refer diagram page no.62)
- ▶ If interest rises from 5% to 8% Investment falls from ₹100 cr to ₹ 80 cr.
- ▶ 1. With higher interest rate, it is more expensive to borrow money from the bank.
- ▶ 2. Saving money in the bank gives higher return.



MARGINAL EFFICIENCY OF CAPITAL

- ▶ MEC introduced by J.M. Keynes in 1936.
- ▶ MEC is the expected profitability of an additional capital asset.
- ▶ The value of expected income stream equal to the cost of capital.
- ▶ MEC depends on two factors 1. prospective yield from capital asset 2. Supply price of capital asset.



FACTORS AFFECTING MEC

A) Short-Run Factors

1. Demand for the product:

If the entrepreneur expect a fall in demand for goods and rise in cost , investment will decrease.

2. Liquid assets:

If the entrepreneurs hold large volume of working capital, MEC will be more.

3. Sudden change in income:

If the business community gets windfall profit or tax concession, MEC will go up.

3. Current rate of investment:

If in a particular industry, much investment has already taken place and the rate of investment currently going on in that industry is also very large, then the marginal efficiency of capital will be low.

4. Waves of optimism and pessimism:

If the businessmen are optimistic about future, the MEC will be likely to be high.



B) Long-Run Factors

1. Rate of growth of population:

Rapid rise in the growth of population will increase the marginal efficiency of capital and a slowing down in its rate of growth will discourage investment and thus reduce marginal efficiency of capital.

2. Technological progress:

Inventions and technological improvements

Encourage investment in various projects and increase marginal efficiency of capital.

3. Monetary and fiscal policies:

Lead greater profit so MEC is likely to be high.

4. **Political environment:**

Political stability, smooth administration maintenance of law and order help to improve MEC.

5. **Resource availability:**

Cheap and abundant supply of natural resources efficient labour and stock of capital enhance the MEC.



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MARGINAL EFFICIENCY OF INVESTMENT

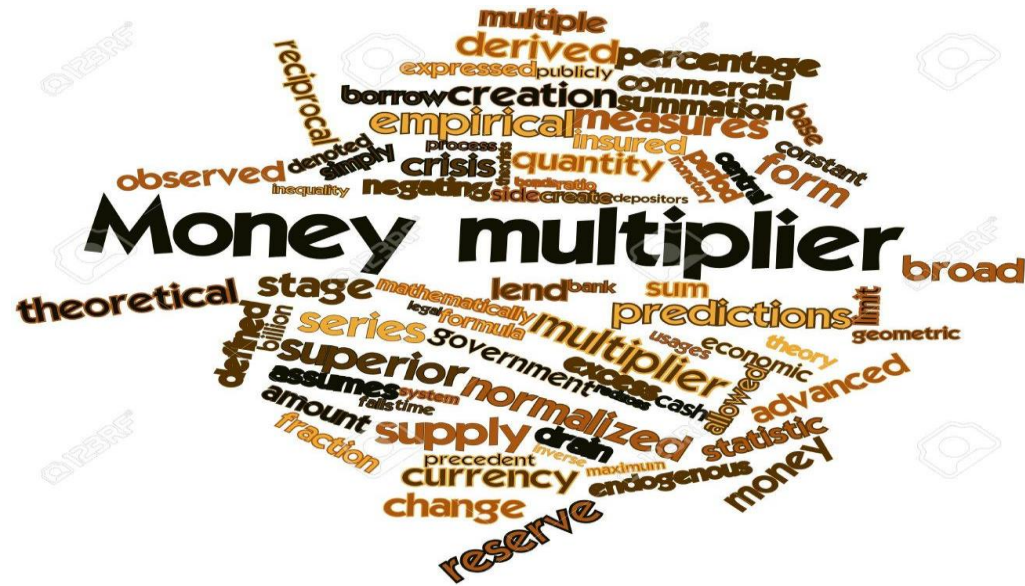
MEI is the expected rate of return of investment. When cost of borrowing is high, businesses are less motivated to borrow money and make investment on different projects because high cost of borrowing reduces profit margin of the business firms;

Difference between MEC and MEI, REFER PG: 64.



MULTIPLIER

- *Employment multiplier developed by RF. Khan.
- *Investment multiplier redefined by J.M. Keynes.
- *Multiplier is the ratio of change in national income to change in investment.
- * $K = \Delta Y / \Delta I$



ASSUMPTIONS OF MULTIPLIER

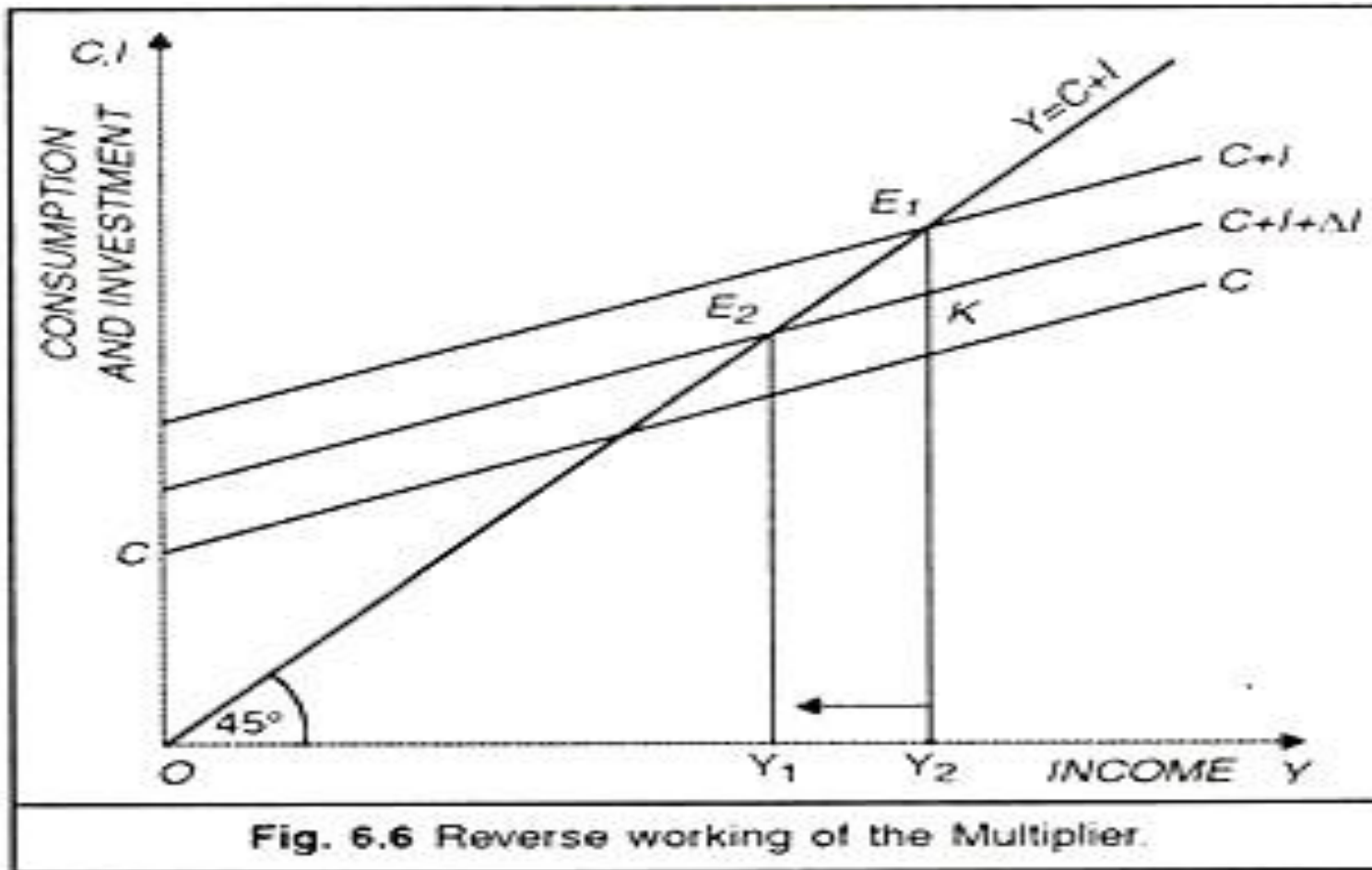
- 1) There is change in autonomous investment.
- 2) There is no induced investment.
- 3) The MPC is constant.
- 4) Consumption is a function of current income.
- 5) There is no time lag in multiplier process.
- 6) Consumer goods are available in effective demand.
- 7) Closed economy.
- 8) No change in price.
- 9) Less than full employment level.



MPC AND MULTIPLIER

- ▶ MPC refers to relationship between change in consumption (C) and change in income (Y).
 $MPC = \Delta C / \Delta Y$.
- ▶ The value of multiplier depends on MPC.
- ▶ Multiplier (K) = $1 / 1 - MPC$ or $1 / MPS$.
- ▶ $MPC + MPS = 1$.
- ▶ Multiplier is inversely related to MPS and directly related with MPC.
- ▶ If MPC is 0.75 MPS is 0.25 and K is 4.

MPC AND MULTIPLIER DIAGRAM



FUNCTIONING OF MULTIPLIER TABLE

MPC	MPS	K
0.00	1.00	1
0.10	0.90	1.11
0.50	0.50	2.00
0.75	0.25	4.00
0.90	0.10	10.00
1.00	0.00	α

EQUATIONS

$$C=100+0.8Y$$

$$Y=C+I \quad Y=100+0.8Y+100 \quad \text{ie } I=100$$

$$Y-0.8Y=200$$

$$0.2Y=200 \quad Y=1000$$

$$C=100 + 0.8(1000)$$

$$C=900$$

$$Y=C+I, \quad Y=C+S$$

$$I=Y-C, \quad S=Y-C$$

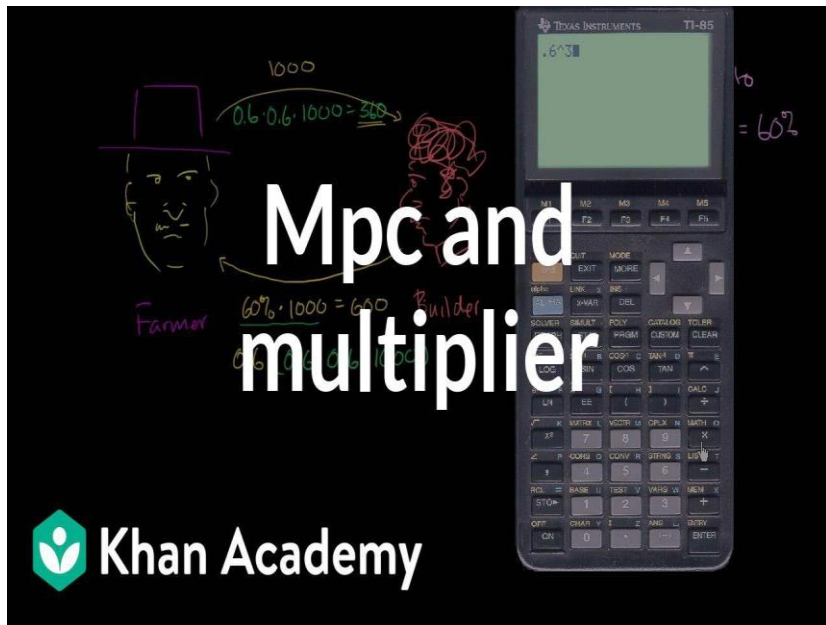
$$\text{So, } I=S \quad (I=110=S)$$

If I raised to 100 to 110 (increased by 10)

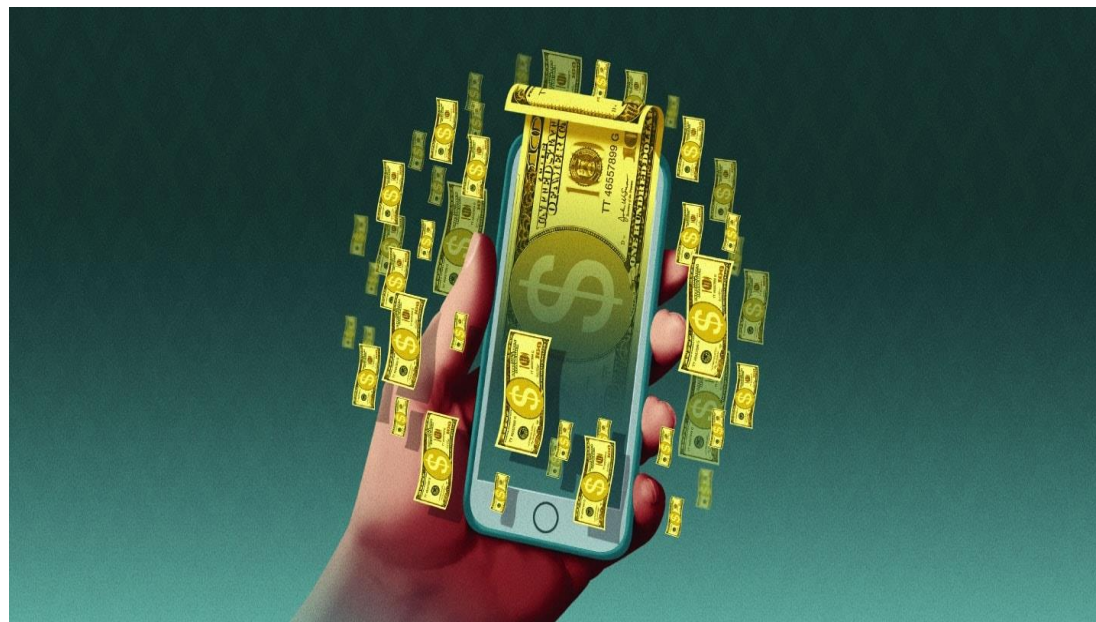
$Y=1050, C=940$ (Y Increased from 1000 to 1050, C increased from 900 to 940)

DIAGRAM EXPLANATION

- ▶ 45 degree line is $Y=C+S$
- ▶ MPC is 0.8 ($C=100+0.8y$)
- ▶ The aggregate demand curve is $C+I$ which intersects 45 degree line at point E
- ▶ Original national income is 500 ($C=100+0.8Y$) ($C=100+0.8(500)$) c
- ▶ $C=500$
- ▶ When I is 100, $Y=1000$, $C=900$, $S=100$
- ▶ New aggregate demand curve is $C+I'=100+0.8Y+100+10$
- ▶ $Y=210/0.2$
- ▶ $Y=1050$, $S=110=I$
- ▶ Working of Multiplier, refer Pg: 66 and 67.



A video thumbnail from Khan Academy. It features a black background with a calculator on the right and handwritten notes on the left. The notes include a drawing of a man's face, the text "Farmer" and "Builder", and calculations: 1000 , $0.6 \cdot 0.6 \cdot 1000 = 360$, $60\% \cdot 1000 = 600$, and $0.6 \cdot 0.6 \cdot 1000 = 360$. The calculator screen shows $.6 \cdot 1000 = 600$. The text "Mpc and multiplier" is written in large white letters. The Khan Academy logo is in the bottom left corner.



CLASSIFICATION OF MULTIPLIER

Static Multiplier

Static multiplier is otherwise known as simultaneous multiplier, timeless multiplier, and logical multiplier. Under static multiplier the change in investment and the resulting change in income are simultaneous. There is no time lag.

Dynamic multiplier

Dynamic multiplier is also known as 'sequence multiplier'. In real life, income level does not increase instantly with investment. In fact, there is a time lag.

LEAKAGES OF MULTIPLIER

The multiplier assumes that those who earn income are likely to spend for consumption. Such expenses are known as leakages.

▶ **PAYMENT TOWARDS PAST DEBTS:**

MPC is reduced and as a result the value of multiplier is cut.

▶ **PURCHASE OF EXISTING WEALTH** like land, building etc. after consumption stream multiplier is affected.



▶ **IMPORT OF GOODS AND SERVICES:**

Imports reduce the value of multiplier.

▶ **NON AVAILABILITY OF CONSUMER GOODS:**

Inflation is likely to rise. This reduces the consumption expenditure and thereby multiplier value.

▶ **FULL EMPLOYMENT SITUATION:**

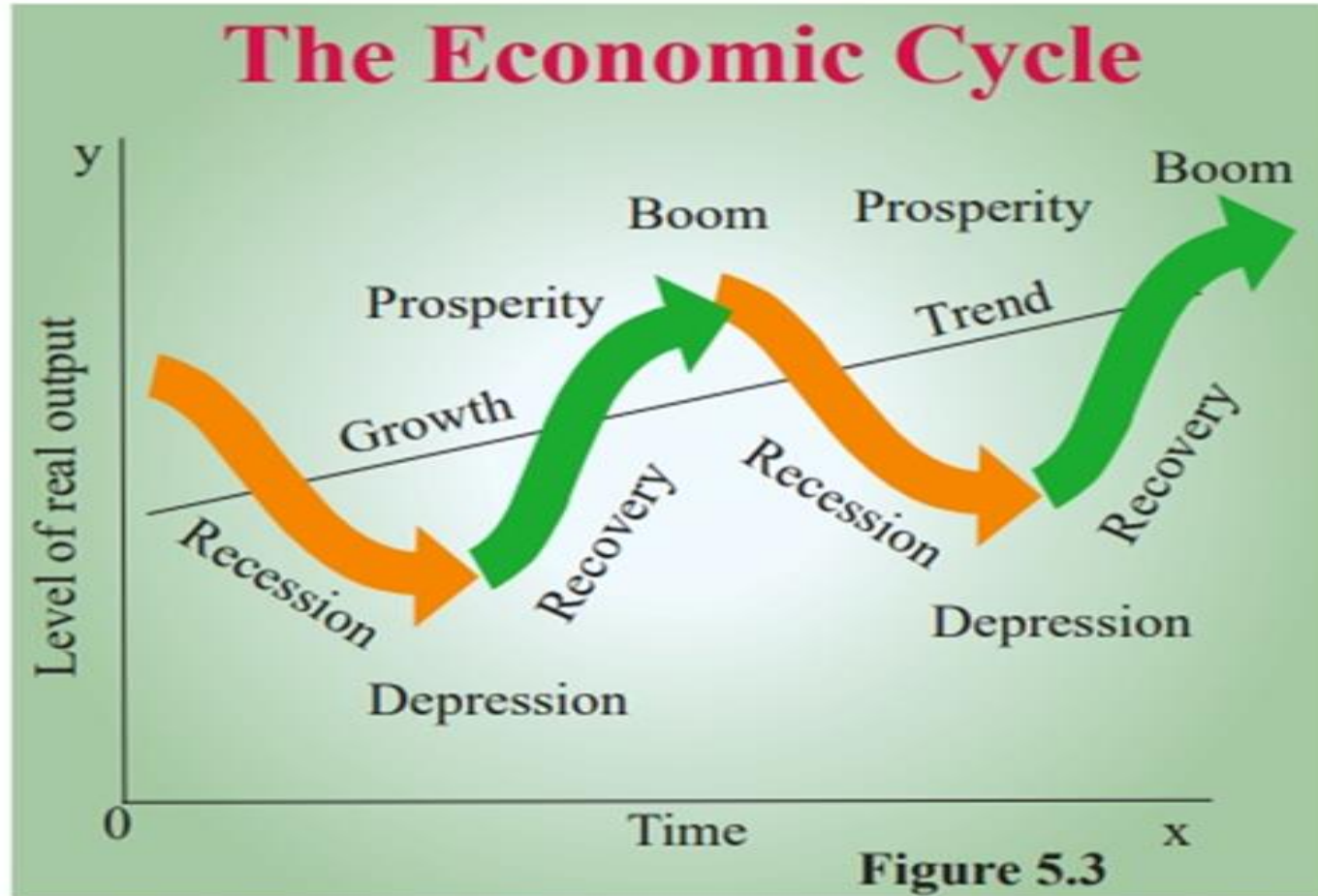
Under conditions of full employment, resources are fully employed. So, additional investment will lead to inflation.



USES OF MULTIPLIER

- *Multiplier highlights the importance of investment in income and employment theory.
- *The process throws light on the different stages of trade cycle.
- *it also helps in bringing the equality between **S** and **I**.
- *It helps in formulating Government policies.
- *It helps to reduce unemployment and achieve full employment.

TRADE CYCLE



KINDS OF MULTIPLIER

- 1) Tax multiplier
- 2) Employment multiplier
- 3) Foreign Trade multiplier
- 4) Investment multiplier



ACCELERATOR PRINCIPLE

- ▶ The origin of accelerator principle traced back in the writings of Aftalion (1909), Hawtrey (1913)

And Bickerdike (1914).

- ▶ The simple accelerator model was made by

J.M. Clark in 1917.

- ▶ It was further developed by Hicks, Samuelson and Herrod.

- ▶ **Meaning:** Accelerator is the relationship between an increase in consumption and increase in investment. Accelerator (β) = $\Delta I / \Delta C$.

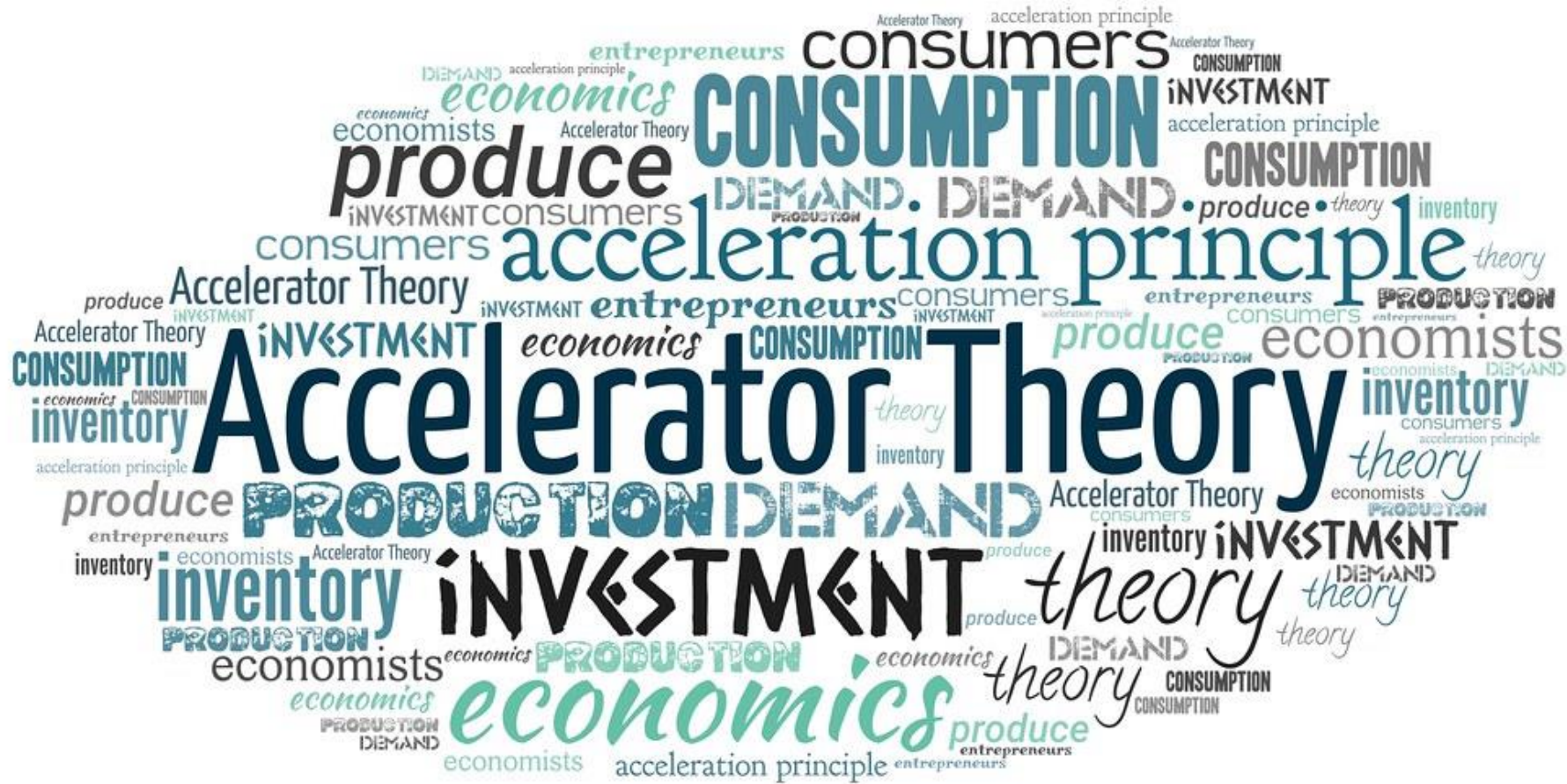
- ▶ **Definition:**

The accelerator coefficient is the ratio between induced investment and an initial change in consumption.

ASSUMPTION

- *Absence of excess capacity.
- *Constant capital output ratio.
- *Increase in demand is assumed to be permanent.
- *Supply of funds and other inputs is quiet elastic.
- *Capital goods are perfectly divisible.





OPERATION OF THE ACCELERATION PRINCIPLE

- ▶ Let us suppose that in order to produce 1000 consumer goods, 100 machines are required also suppose that working life of a machine is 10 years. Every year 10 machines have to be replaced.
- ▶ Suppose demand for consumer goods raises by 10 %.
- ▶ So increase in demand for 10 more machines needed. Total demand for machines is 20.
- ▶ It may be noted here a 10 % increase in demand for consumer goods.
- ▶ We can conclude even a mild change in demand for consumer goods will lead to wide change in investment.

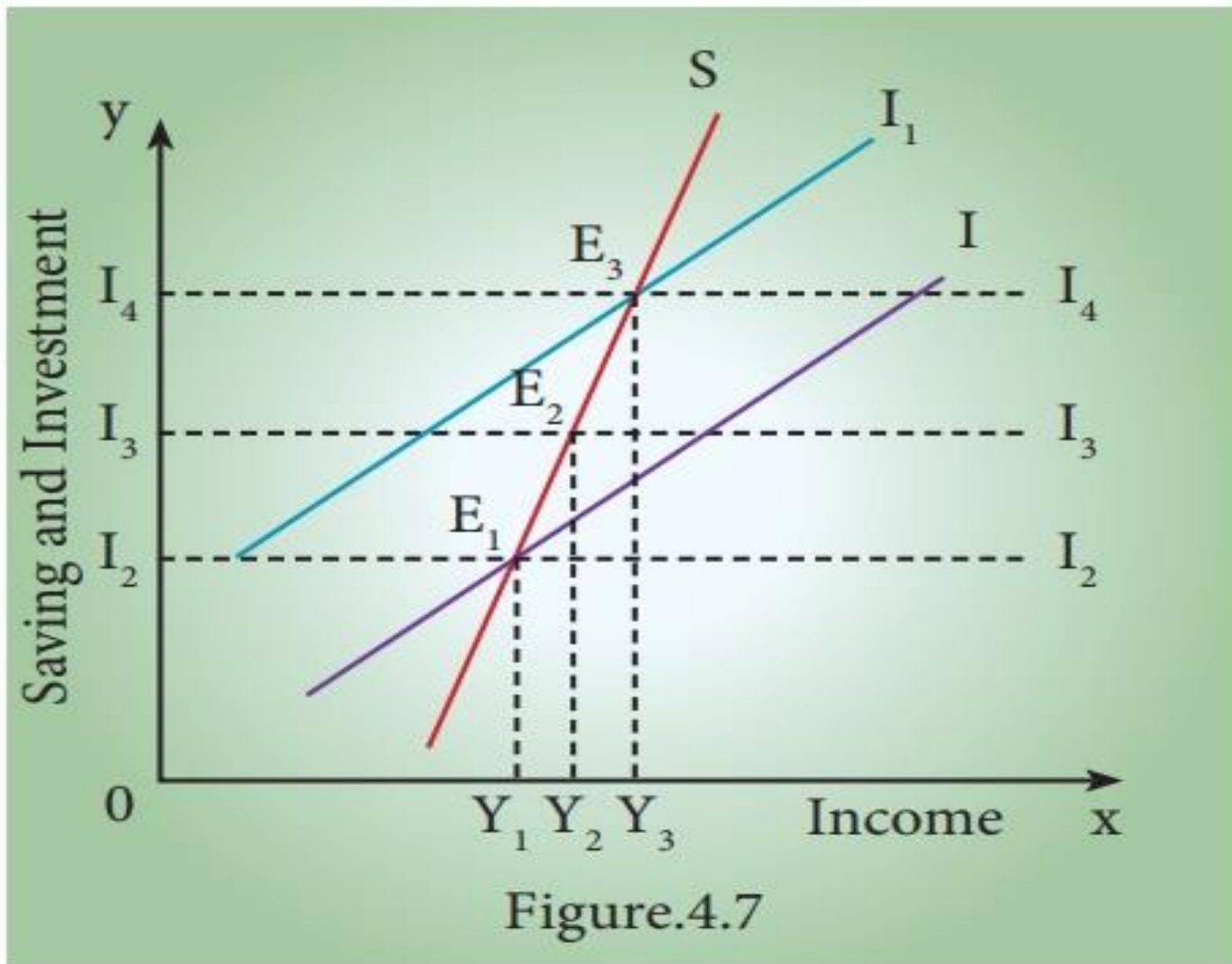


DIAGRAM EXPLANATION

*SS is saving curve, II is investment curve.

*At point E₁ the economy is in equilibrium with

*OY₁ income, saving and investment are equal at OI₂.

*Now investment is increased from OI₂ to OI₄, this
Increases income from OY₁ to OY₃ and equilibrium is E₃.

*I₂ I₄ and I₂ I₃ is exogenous. Increase in income by Y₁ Y₃

Due to multiplier effect.

*Induced investment is I₂ I₄.

*Increase in income by Y₁ Y₂ is due to multiplier effect and
increase in income by Y₂ Y₃ is due to accelerator effect.



LIMITATIONS

- 1) The assumption of constant capital-output ratio is unrealistic.
- 2) Resources are available only before full employment.
- 3) Excess capacity in capital goods industries is assumed.
- 4) Accelerator will work only if the increased demand is permanent.
- 5) Accelerator will work only when credit is available easily.
- 6) If there is excess capacity the accelerator will not work.

SUPER MULTIPLIER



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Super Multiplier:

Hicks has combined the k and β mathematically and given as super multiplier it is worked out by combining both induced consumption and induced investment.

Leverage effect:

The combined effect of the multiplier and the accelerator is called the leverage effect.



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