

ACCELERATION PRINCIPLE

Definition-

An induced consumption leading to an induced investment is known as principle of accelerator.

- When income or consumption increases, investment will increase by a multiple amount.**
- The accelerator is the numerical value of the relation between the increase in investment resulting from an increase in income.**
- The net induced investment will be positive if national income increases**
- induced investment may fall to zero if the national income or output remains constant.**

Working of the Accelerator

To produce a given amount of output, it requires a certain amount of capital.

If Y_t output is required to be produced in current period and v is capital-output ratio i.e. K/Y , the required amount of capital to produce Y_t output will be given by the following equation:

$$K_t = vY_t \quad \dots(1)$$

Where,

K_t stands for the current period stock of capital

Y_t for the level of output or income in current period, and

v for capital-output ratio i.e. K/Y

In the theory of accelerator this capital-output ratio is assumed to be constant.

Working of the Accelerator

If Y_{t-1} output is required to be produced in t-1 period and v is capital-output ratio i.e. K/Y , the required amount of capital to produce Y_{t-1} output will be given by the following equation:

$$K_{t-1} = vY_{t-1} \quad \dots(2)$$

Hence, the increase in the stock of capital in period t is given by the following equation:

$$K_t - K_{t-1} = vY_t - vY_{t-1} \text{ (From equation 1\&2)} \quad \dots(3)$$

Working of the Accelerator

So,

$$I_t = vY_t - vY_{t-1} \quad (K_t - K_{t-1} = I_t) \quad \dots(4)$$

Where,

It is investment in current period.

Equation 3 & 4 reveals that as a result of increase in income in any year t from a previous year $t - 1$, increase in investment will be v times more than the increase in income.

Hence, it is v i.e., capital-output ratio which represents the magnitude of the accelerator.

Working of the Accelerator

It thus follows that investment is a function of change in income.

If Y_t is greater than Y_{t-1} then investment will be positive.

If Y_t is less Y_{t-1} then disinvestment will take place.

And if $Y_t = Y_{t-1}$ the investment will be equal to zero.

Working of the Accelerator

We have made the following assumptions in making this table:

(i) Capital-output ratio remains constant and is equal to 3.

(ii) The depreciation that takes place in the stock of capital is equal to one-fifth of the stock existing in the previous year. Therefore, one-fifth of the stock of capital is to be replaced every year.

Working of the Accelerator

Period	Output (income)	Required Stock of	Capital Replacement	Net Investment	Gross Investment
(1)	(2)	(3)	(4)	(5)	(6)
t - 1	500	1,500	300	0	300
t	510	1,530	300	30	330
t + 1	525	1,575	306	45	351
t + 2	550	1,650	315	75	390
t + 3	575	1,725	330	75	405
t + 4	575	1,725	345	0	345
t + 5	560	1,680	345	-45	300
t + 6	550	1,650	336	-30	306
t + 7	500	1,500	330	-150	180
t + 8	400	1,200	300	-300	0
t + 9	400	1,200	240	0	240

Working of the Accelerator

A glance at columns 2, 5 and 6 will show that with a change in output, investment will increase by a multiple of it. This shows that acceleration principle is a powerful destabilizing force working in the economy.

Limitations of the principle

- **Capital-output ratio may not remain constant.**
- **If there is excess capacity, new investment will not take place.**
- **Change in the demand for the consumer goods should be permanent, otherwise entrepreneurs will not invest in additional capital goods.**
- **Funds should be easily available for induced investment.**
- **No time lag between the demand for the consumer goods and the demand for the capital goods.**