

# Economics: Economic Growth

**Economic growth** is measured annual percentage change real GDP.

**Rule of 70 (72):** Gives the approximate estimate of number of years it takes to double the GDP at any given GDP growth rate. In theory 72 is more accurate number.

$$\text{Number of years to double} = \frac{70}{\text{Annual GDP growth rate}}$$

**Economic growth:** Amount of inputs used to produce amount of output for each input.

The factors of production are

- **Land:** Natural resources for production
- **Capital Goods:** Raw material used in production
- **Labor:** Both Physical and intellectual
- **Entrepreneurial Ability:** Risk takers for economic profit.

Suitable incentive system is the most important **precondition** for economic growth.

Three institutions are critical to develop incentives are **markets, property rights, and monetary exchange.**

Labor productivity is quantified as real GDP per labor hour. The growth rate in labor productivity decomposed into two factors:

- Growth in **Physical capital** per labor hour
- Growth in **Technology**

The **Productivity curve** is the one result from when labor productivity (real GDP per labor hour) is plotted against capital per labor hour at any given state of technology.

Two important properties of productivity curve are:

*Growth in capital per labor hour causes movement along productivity curve.  
Growth in technology causes productivity curve to shift upwards.*

**Law of diminishing** returns also applies to productivity curves, that is, as more capital is increased at any given technology level the growth real GDP per labor hour gets smaller and smaller.

**One third rule:** At any given level of technology, for every one percent increase in capital results in one third of one percent growth real GDP per labor hour.

The productivity growth has two components, one is attributable to capital per labor hour and other is attributable to technology (shift in productivity curve).

This one third law also applies here. If the real GDP per labor hour growth is 10 percent and increase capital per labor hour is 9 percent, then the contribution from capital per labor hour to real GDP growth is 3 percent and rest of the 7 percent attributable to technology.

Key methods to increase economic growth are:

**Increase in savings:** Capital accumulation, Tax savings

**Increase in basic R &D:** Technological advance for public good

**Increase in International Trade:** Gains from specialization, comparative advantages.

**Improvements in quality of education:** Increase educational standards.

**Classic Growth Theory:**

States growth in real GDP is not permanent. When real GDP rises above sustenance level population growth occurs and GDP per person is reverted back to sustenance level.

**Neoclassical Growth Theory:**

States without technological advancements there is no growth in GDP. Technology leads to increased savings and investments causes' capital per labor hour to increase. This growth continues until real rate of returns declines to all the way to "Target rate of return" and stalls. Neoclassical growth theory is independent of population growth.

**New Growth Theory:**

This theory has two properties: Discoveries are result of choices, and discoveries lead to profits, competition eliminates profits.

Rate of discoveries are based on the need and incentives for discoveries. Competition threatens profits, and profits motivate discoveries. It is a perpetual motion economy.

Two assumptions:

Discoveries are public goods and law of diminishing return does not apply to knowledge capital.