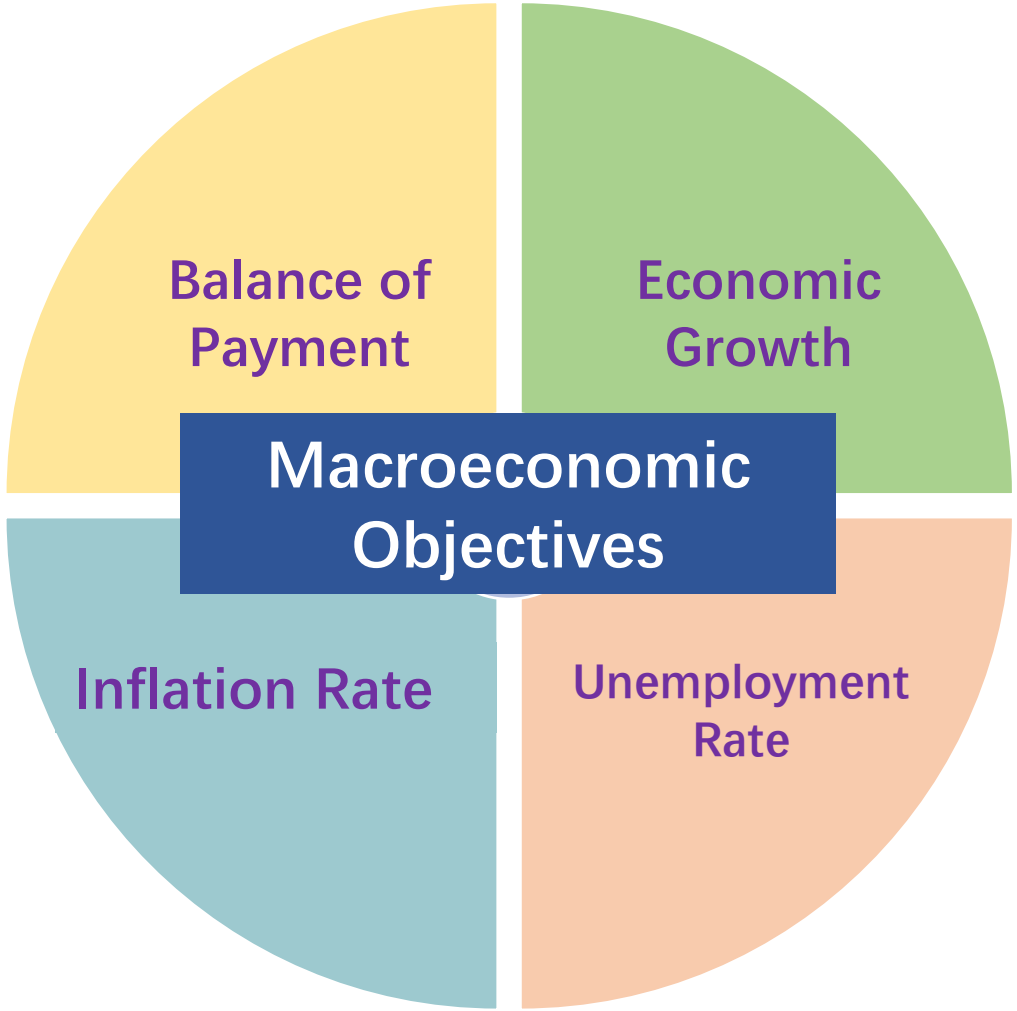

Economic
growth

Macroeconomic objectives

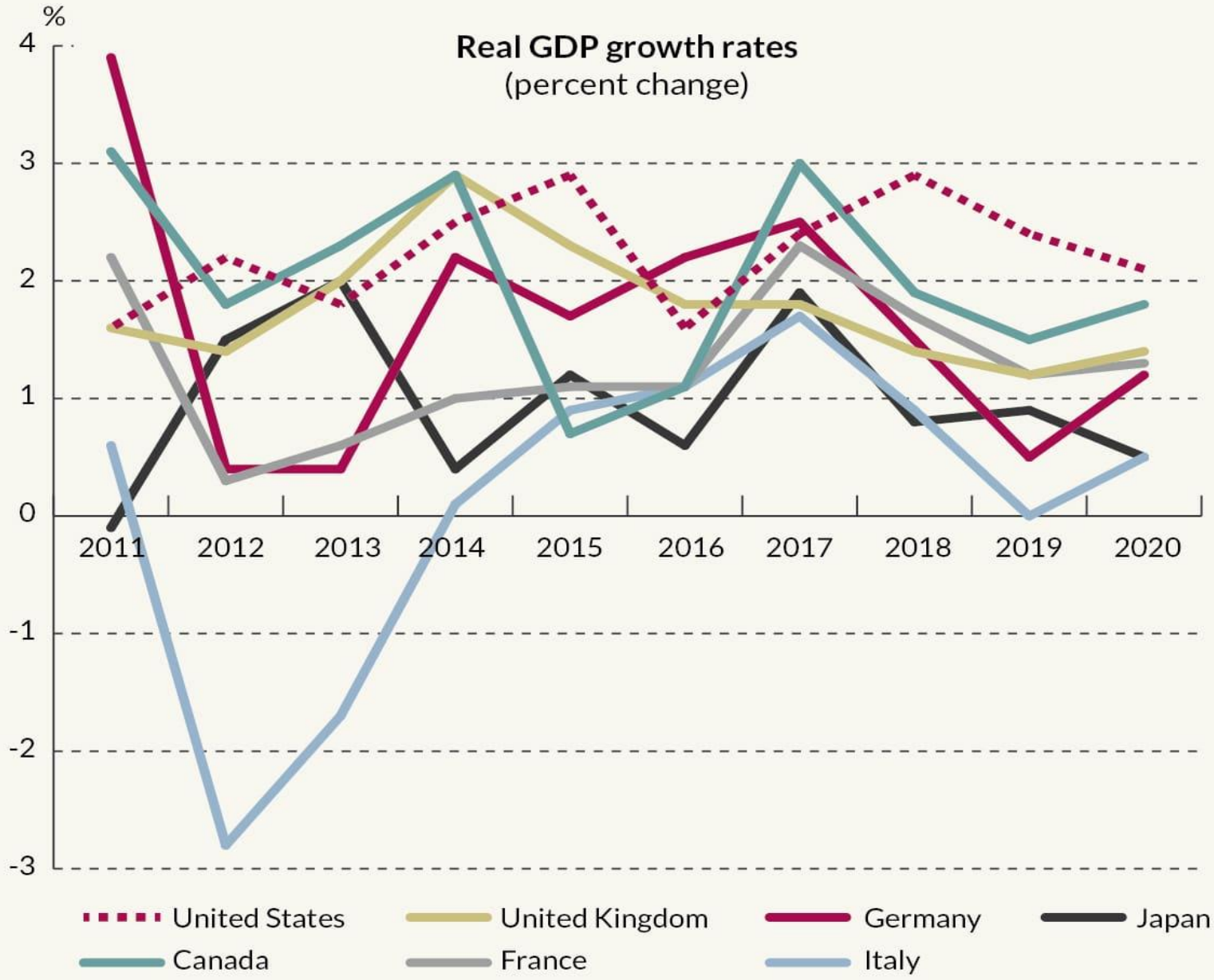
1. A steady rate of increase in national income, that is, **economic growth**
2. A low and sustainable **rate of unemployment** in the economy
3. Low and stable **rate of inflation**, that is, price stability
4. **balance of payment**

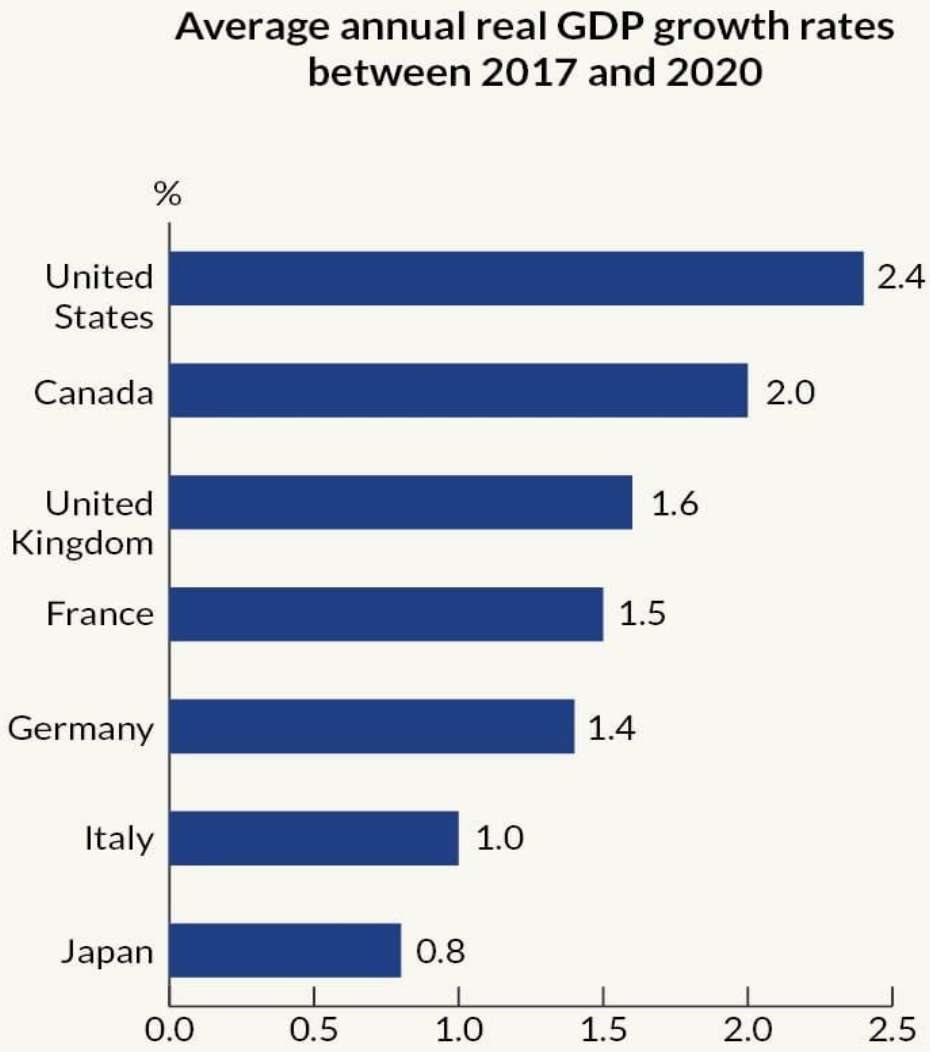


→ Economic growth might be the most important objective of government.

→ It also helps to achieve the other two objectives of low unemployment and low and stable inflation

FIGURE 1: **Real Growth in GDP for the G7**

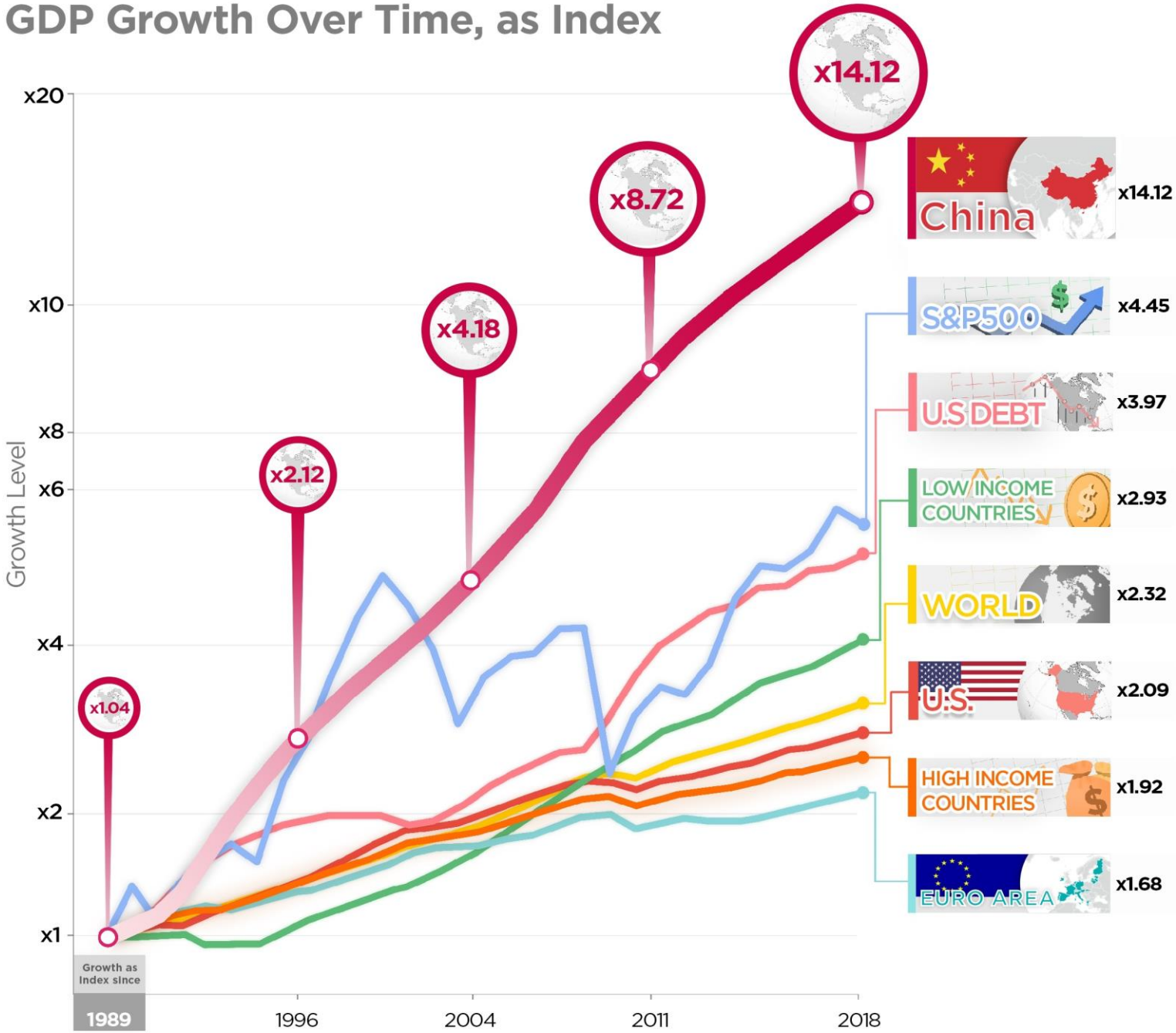




Source: International Monetary Fund, World Economic Outlook Database, October 2019. Estimates start after 2018.

China's Economic Growth in Perspective

GDP Growth Over Time, as Index



What is economic growth?

- **Definition**: increases in total real output produced by an economy (real GDP) over time; may also refer to increases in real output (real GDP) per capita (or per person).

- Growth is measured in **real GDP**, real means adjusted for inflation (inflation removed)
- Economic growth refers to an increase in real GDP, or the real quantity of goods and services produced over a period of time (typically a year), and is usually expressed as:
  - A percentage change in **real GDP** over a period of time, or
  - A percentage change in **real GDP per capita** over a period of time.

  - **Real GDP** measures the **total output** produced in an economy
  - **Real GDP per capita** is a better indicator of **the standard of living** of a population.

Calculating economic growth

$$\%\ \text{change in real GDP} = \frac{\text{Final value of real GDP} - \text{initial value of real GDP}}{\text{initial value of real GDP}} * 100$$

- If an economy had real GDP of $75.3 billion in 2017, $81.7 in 2018, by how much did real GDP grow in 2017-2018?

% change in real GDP = (81.7-75.3)/75.3*100 = 8.5%

Exercise

Suppose an economy had real GDP per capita of $1579 in 2017, $1611 in 2018 and $1597 in 2019. Find the rate of economic growth:

a. In 2017-2018
b. In 2018-2019
c. State when the economy experienced negative growth

a. (1611-1579)/1579*100 = 2.03%
b. (1597-1611)/1611*100 = -0.87%

Growth in real GDP & growth in real GDP per capita

- Positive real GDP growth rate does not necessarily mean positive real GDP per capita growth rate.
- It depends on how fast the population is growing.
  - If % of real GDP growth rate > % population growth rate
    → positive growth in real GDP per capita.
  - If % of real GDP growth rate < % population growth rate
    → negative growth in real GDP per capita.

% change in real GDP per capita	=	% change in real GDP	−	% change in population

Exercise

Suppose that an economy's real GDP grew by 2.2% in 2007, and its population grew by 1.5% during the same year. Calculate by how much its real GDP per capita grew.

% change in real GDP per capita = 2.2% - 1.5% = 0.7%

Short-term growth V.S. long-term growth

Economic growth occurs as a result of:

1. Increases in aggregate demand → short-term growth
2. Increases in short-run aggregate supply → short-term growth (less common)
3. Increases in long-run aggregate supply → long-term growth

Understand short-term & long term growth using AD-AS model

Short-term economic growth(real GDP increase) occurs as a result of:

1. Increases in **aggregate demand(AD)** caused by determinants of aggregate demand change.

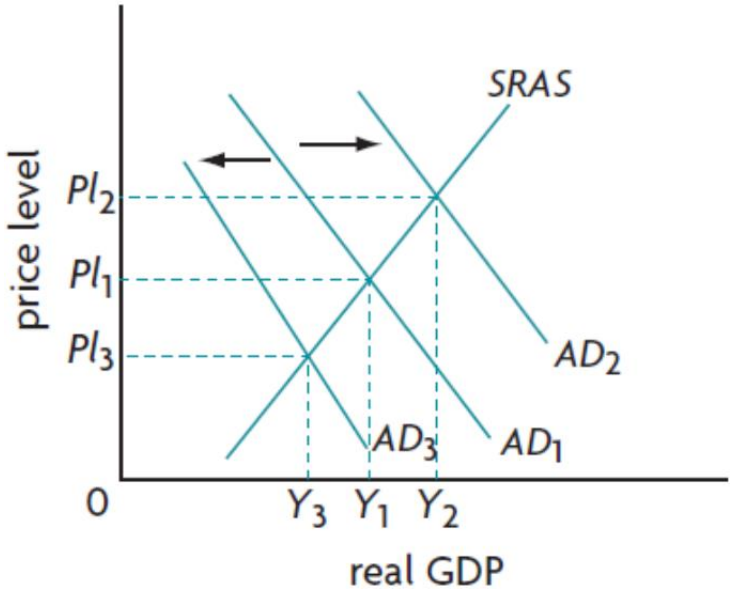
   a. **In monetarist/new classical model**

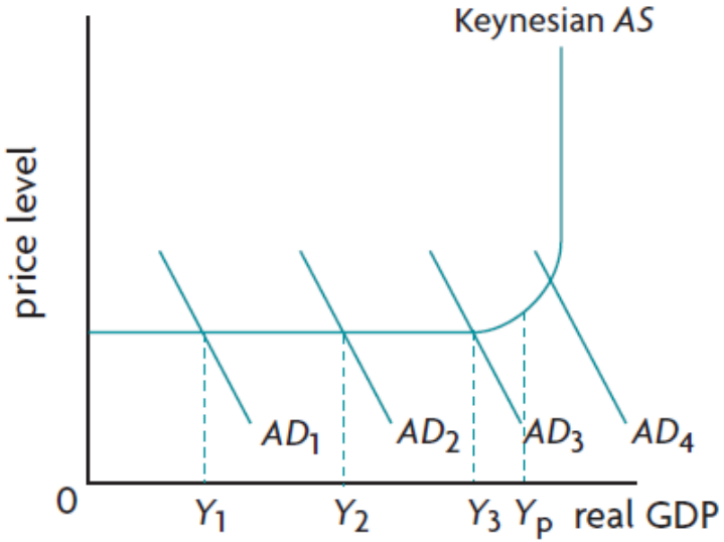
   - Aggregate demand increases, AD shift rightwards from AD1 to AD2, real GDP increase from Y1 to Y2.

   b. **In Keynesian model**

   - Aggregate demand increases from AD1 to AD2 to AD3 and AD4, result in real GDP increase from Y1→Y4.

→ Short-term economic growth **does not involve an increase in potential output**, therefore there is no rightward shift of the LRAS/Keynesian AS curve.





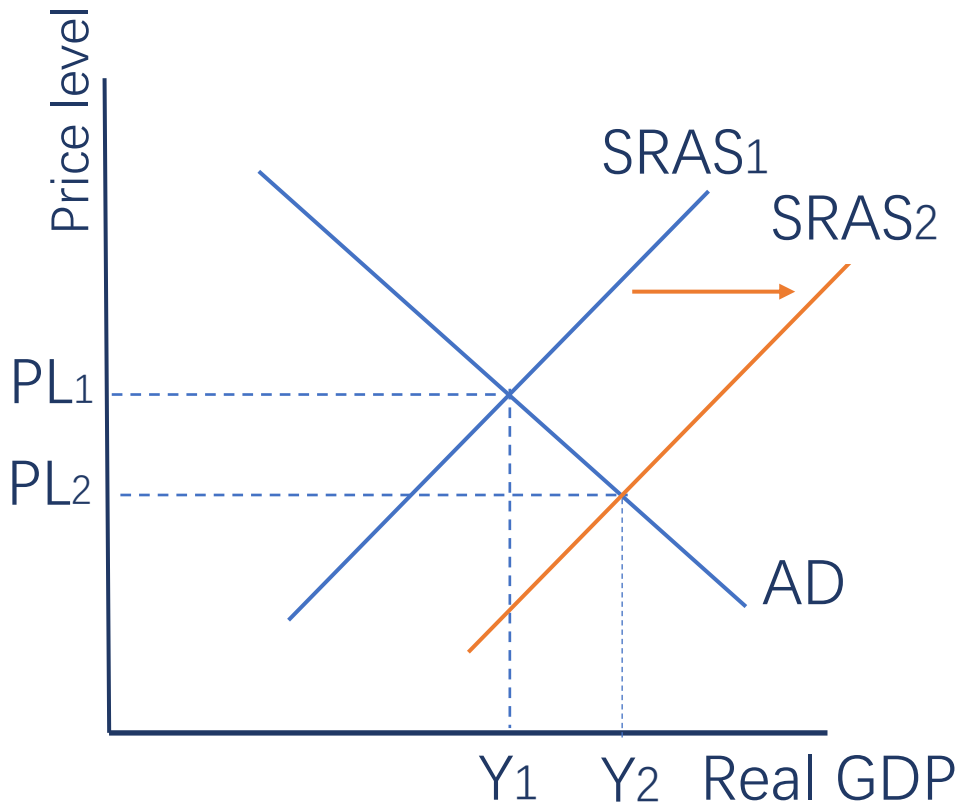
Understand short-term & long term growth using AD-AS model

Short-term economic growth(real GDP increase) occurs as a result of:

2. Increase in **short-run aggregate supply (SRAS)** caused by determinants of aggregate supply change

- SRAS shift from $SRAS_1$ to $SRAS_2$
- Real GDP increase from Y_1 to Y_2.

** The short-term economic growth is affected far more by increase in aggregate demand rather than in short-run aggregate supply.*

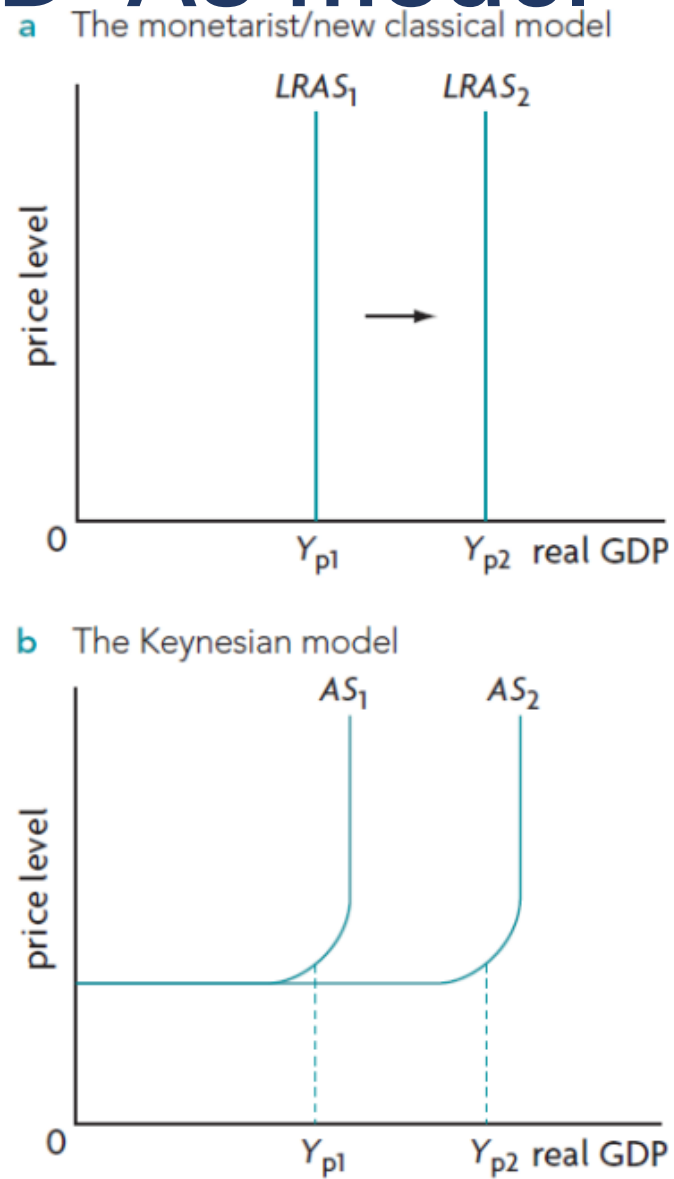


Understand short-term & long term growth using AD-AS model

Long-term economic growth (real GDP increase) occurs as a result of:

1. Increases in long-run aggregate supply (LRAS) or Keynesian AS.

- Factors that affect the positions of the LRAS and Keynesian AS curves need an extended period of time to take effect.
  - Increases in quantities of the factors of production.
  - Improvements in the quality of factors of production (resources).
  - Improvements in technology
  - Increases in efficiency
  - Institutional changes
  - Reductions in the natural rate of unemployment



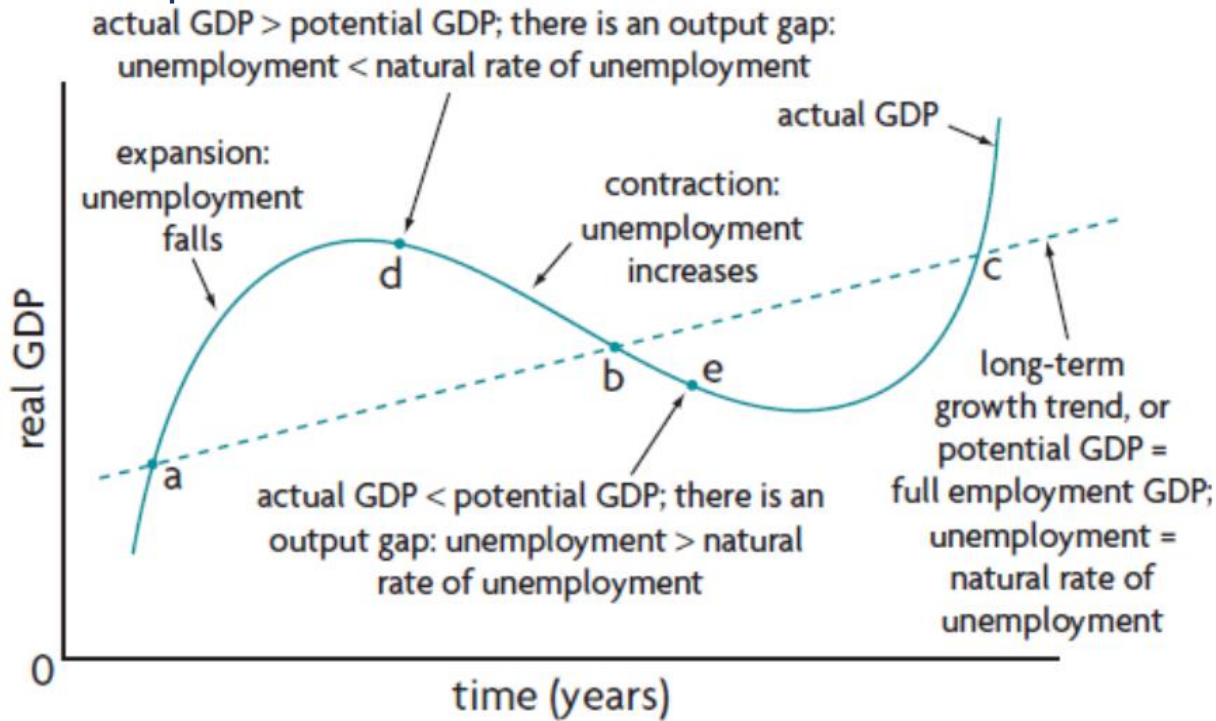
Connection between economic growth and the business cycle

1. Short-term

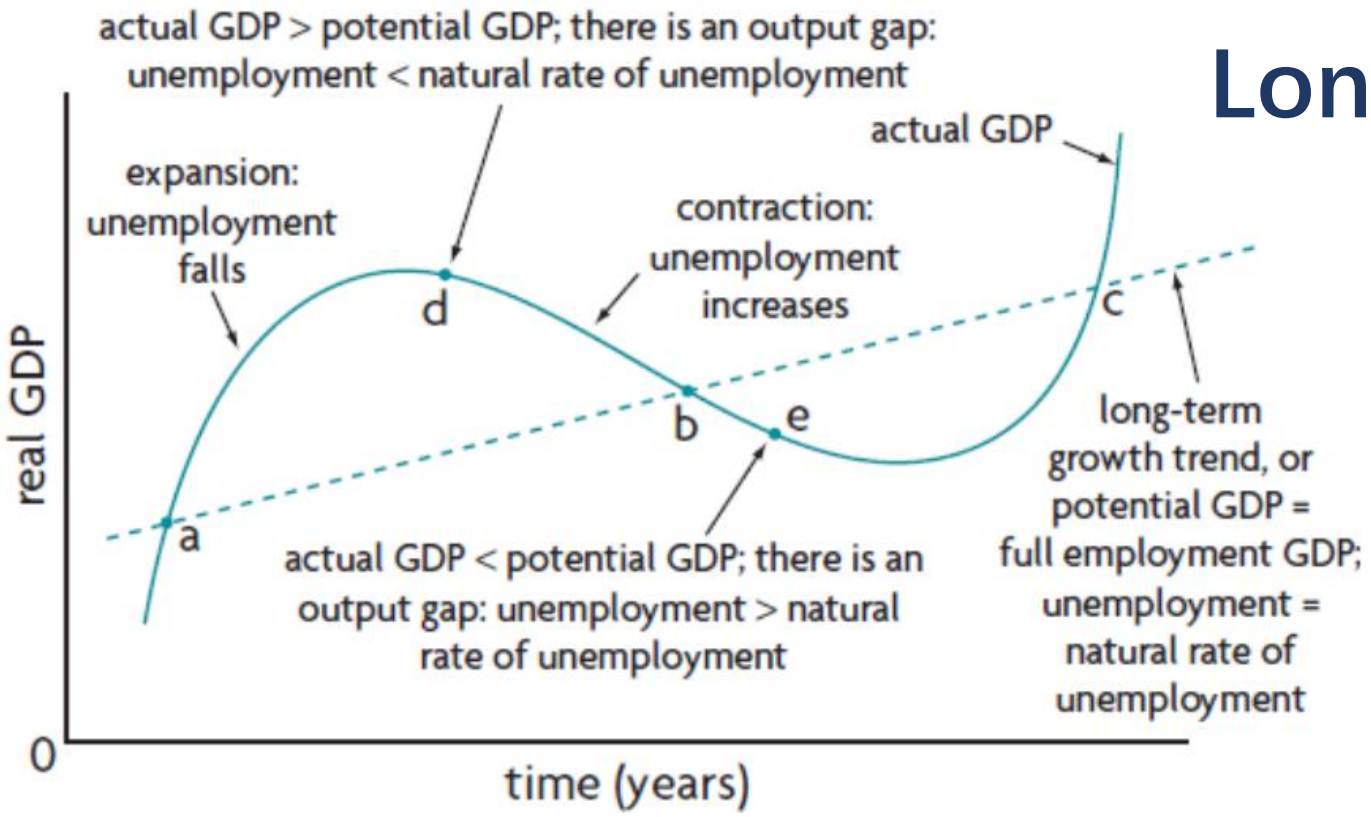
- Short-term positive growth → expansion phase
  - Caused mainly by increases in aggregate demand, to a lesser extent by increases in short-run aggregate supply.
- Short-term negative growth → contraction phase
  - Caused mainly by decreasing aggregate demand and to a lesser extent decreasing short-run aggregate supply.

2. Long-term

- Most economies experience positive economic growth over long periods of time.
- Refer to as potential output.

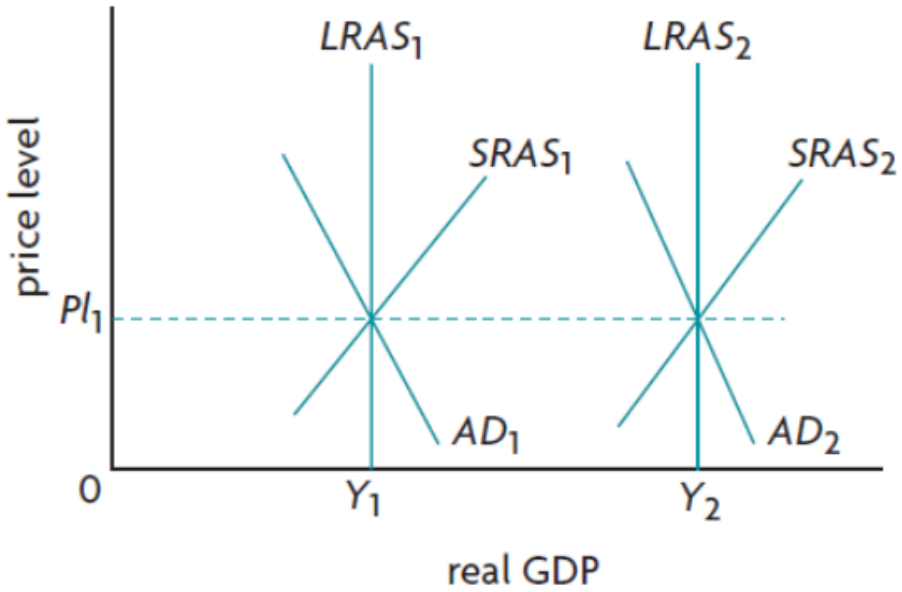


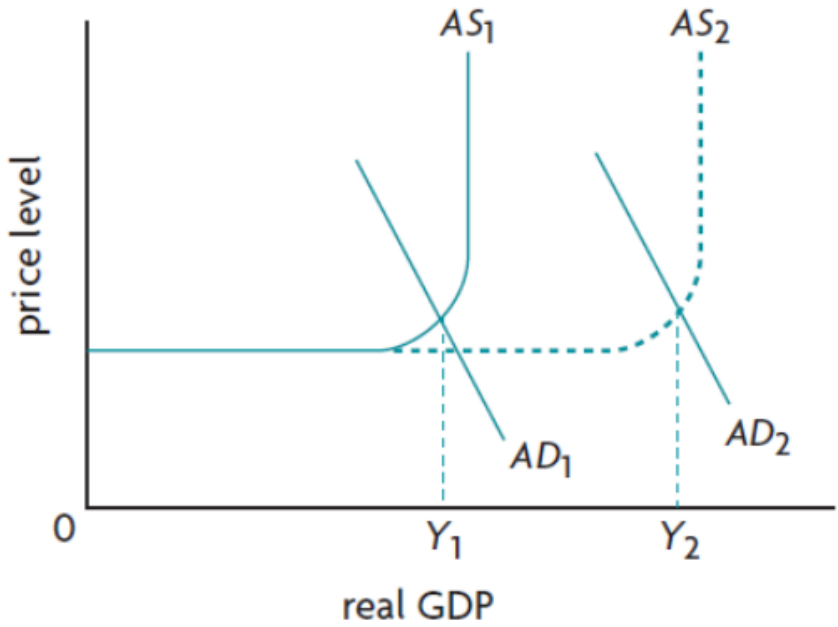
Long-term economic growth & the business cycle



- Y_1 and Y_2, which are the long-run equilibrium points correspond to points in the business cycle diagram where actual output =potential output.

Macroeconomic equilibrium changes over the long term when potential output is increasing.





Understanding growth using PPC model

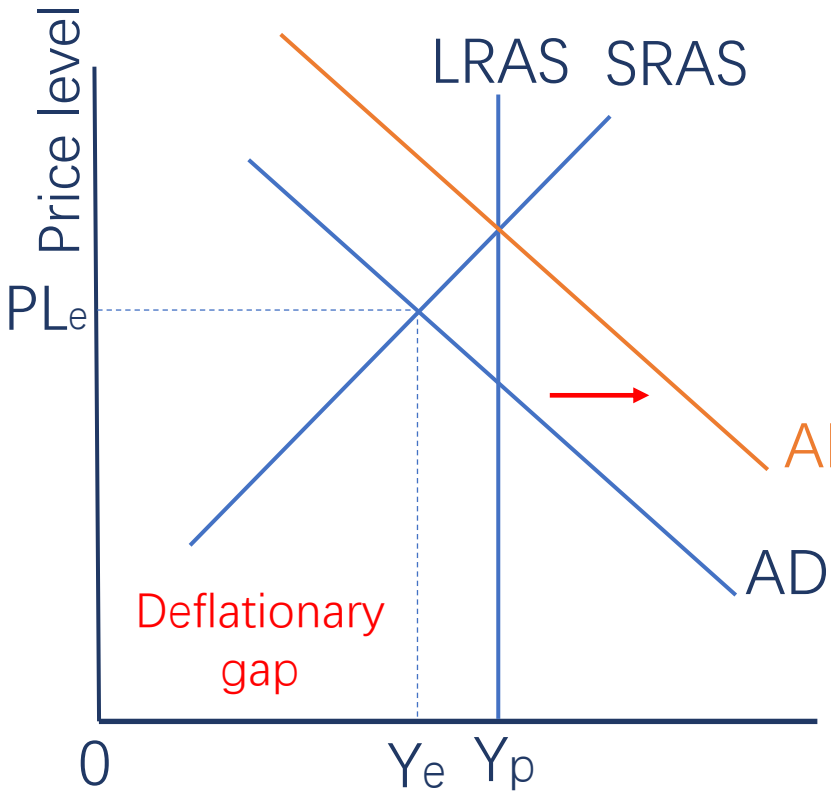
- **Production possibilities curve**: a curve showing all possible combinations of the maximum amounts of two goods that can produced by an economy, given fixed and unchanging resources and technology, when there is full or maximum employment of resources and efficiency in production.

- **"maximum employment" in PPF ≠ "full employment" in AD-AS models**
  (all resources are employed to the fullest extent and there is zero unemployment) (natural rate of unemployment)

- It is highly unlikely for any economy to be producing on its PPC but only producing at a point inside its PPC. It can move closer to its PPC and increase the actual quantity of output it produces by:
  - Reducing unemployment or
  - Improving the efficiency of resource use.

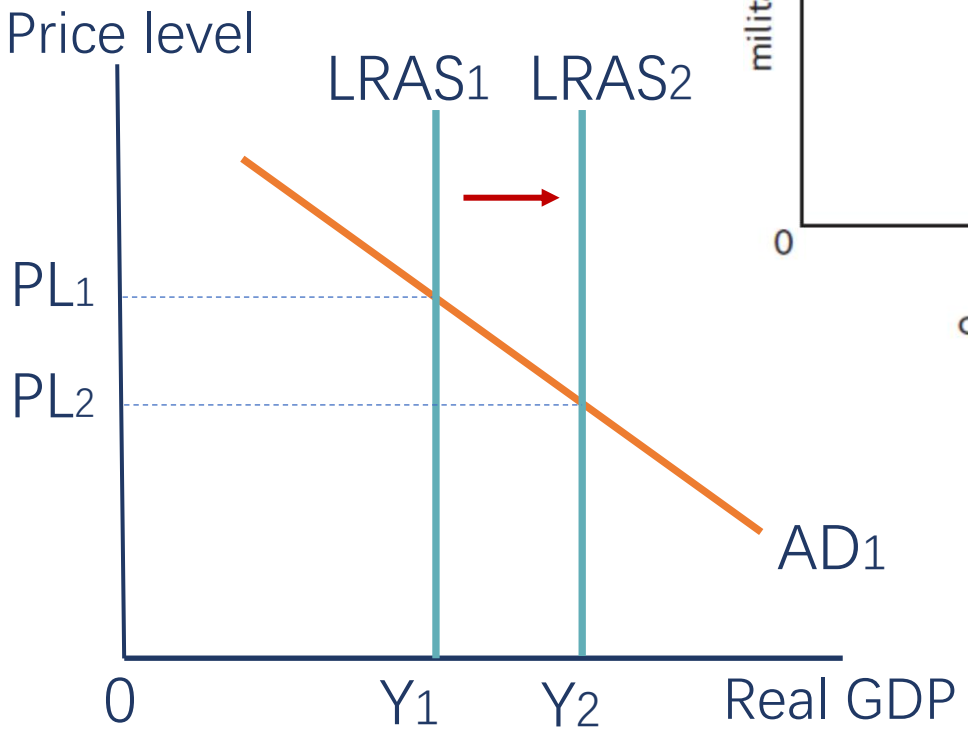
Short-term growth in PPC: growth in actual output → actual growth

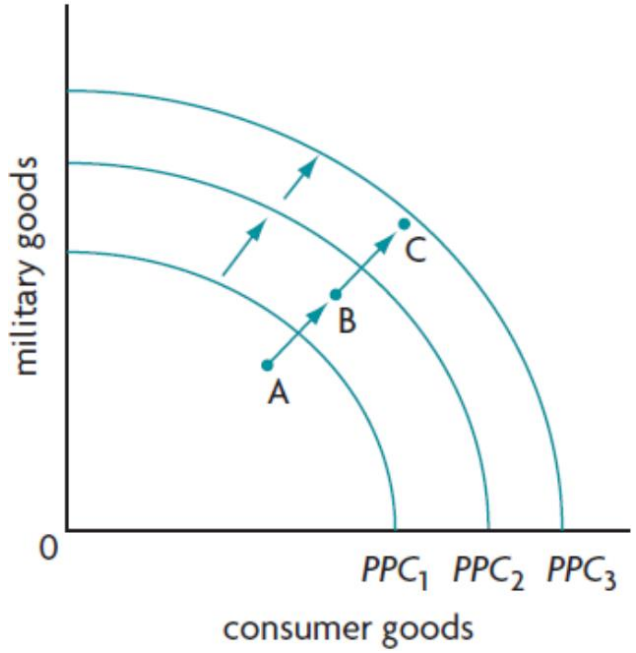
- Initially, there is spare capacity or a **deflationary gap**
- There are resources that are not being used or used inefficiently as seen by point **A** inside the PPC
- There is determinants of AD shift AD_1 to AD_2. there is no more output gap
- More resources are being used; We move from point **A** to **B** on the PPC. Notice that **B** is not on the PPC because it is not possible to use all resources (natural unemployment)



Long-term growth in PPC: growth in production possibilities

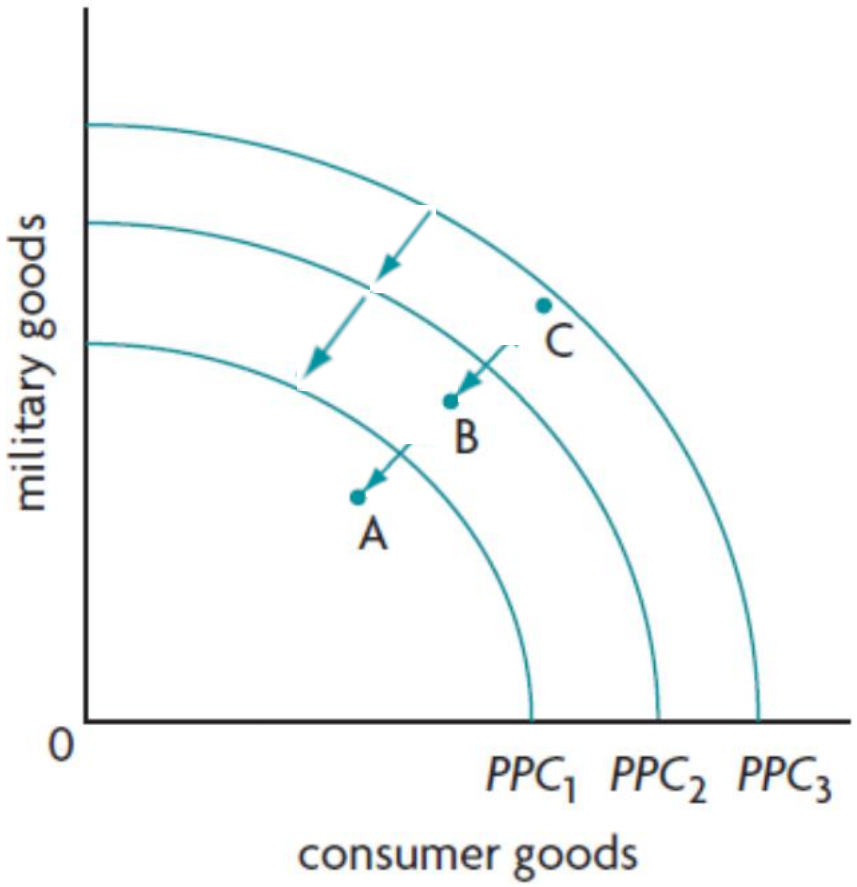
- The presence of the PPC sets a **maximum bound** to how much more output can be produced.
- Shifts of LRAS from **LRAS1 to LRAS 2** represents increase in potential output. It can be shown as the PPC shifts outward, from **PPC1** to **PPC2** to **PPC3**, it allows more of both groups of goods to be produced.
- Together with the growth in production possibilities, efforts must be made to **keep unemployment at low levels** and **reduce inefficiencies** to ensure that actual output grows along with production possibilities from **A** to **B** to **C**.





Understanding growth using PPC model

- **Long-term growth** in PPC: negative growth in production possibilities
  - PPC can also **shift inward**, indicating a decrease in production possibilities. Result from:
    - A decrease in the quantity of resources
    - Worsening of resource quality.
    - And so on.



Summary

	AD-AS model	*PPC* model
Short-term growth	• increases in *AD* • increases in *SRAS* (less important)	• reduction in unemployment • improvement in efficiency
Long-term growth	• increased resource quantity • improved resource quality • technological change	
	• improvements in efficiency • institutional changes	–

Consequences of economic growth （AO3）

1. Impact of economic growth on living standards
2. Impact of economic growth on the environment
3. Impact of economic growth on income distribution
4. Impact of economic growth on unemployment and inflation

Standards of living

Living standards refer to levels of income, wealth and consumption of goods and services, including health care and education.

Consequences of economic growth on living standards

Living standards improve when a country sustains a **rise in economic growth per capita**, **rise in real income (GNI) per capita** and when the **benefits of growth are widely spread.**

- If there is an increase in GDP per capita, it indicates that there is a greater potential for people to increase their consumption of goods and services and improve their standards of living.
- But these improvement do not occur automatically but **require appropriate policies** to make effective use of the resources growth.

Factors that allow economic growth to have positive effects on standards of living:

① The distribution of income.

The greater the share of income going to poorer households, the greater the potential for contributing to improvements in living standards.

② Household spending

The greater the share of household income spent on goods and services such as food, education and health care, the greater the improvement in living standard.

③ The share of income controlled by women.

The greater this is, the strong the impact.

④ Government spending on merit goods

Government spending on education, health care and infrastructure, including clean water supplies and sanitation.

⑤ Contributions by non-governmental organizations (NEGs)

The poverty orientation and effectiveness in reaching poor people.

Consequences of economic growth on living standards

Possible positive consequences:

1. An increase in national income means GDP per capita increases which should increase the **material living standard**.
2. The reduction or **elimination of absolute poverty** in the country owing to higher real incomes per person.
3. Economic Growth will contribute to **technology development**, making life easier and more pleasurable.
4. The creation of **new jobs and lower unemployment** in the economy also help to improve standards of living. → raise consumption and encourages further investment in capital → **sustain growth** in the economy.

Consequences of economic growth on living standards

Possible positive consequences:

5. Increased consumer spending will lead to **higher sales revenues for firms and greater profits**. → possible higher wage and employee welfare, rise in planned capital investment spending and expand the productive capability.
6. Increased tax revenues enable the government to fund **more merit goods and services** such as education and health care.→ sustain the growth of the economy and further improvements in standards of living.
7. Higher economic growth leads to more trade: **more imports** gives more choices to domestic consumers, increased productivity leads to **higher levels of exports**.
8. As national income rises, the education level (human capital) increase as well as the demands for **freedom and democracy**

Consequences of economic growth on living standards

Possible negative consequences:

1. An economic growth and increase in income **does not necessarily leads to happiness**
2. **Composition of output**: if growth is primarily because of higher output in sectors that detract from human welfare (e.g. weapons industry), then it may not make the typical household better off.
3. Sense of **freedom and safety**
4. **Sacrifice of leisure time**
5. Risk of **demand-pull inflation** (increased AD) can lead to unsustainable price level, such as high property price.
6. As income level increase, **demerit goods** spending also tends to increase.

Consequences of economic growth on the environment

- **Conflict between growth and sustainability** – economists' systematic neglect of the factor of production 'land'
- Rapid economic growth often leads to **unsustainable resource use**, especially in the case of **common pool resources**. There is common belief that economic growth and environmental sustainability are conflicting objectives.
  - →High levels of urban air pollution
  - → Fossil fuel consumption (use of cars, air conditioners, air travel, etc.)
  - → Soil degradation due to soil erosion
  - → Waterlogging and overgrazing
  - → Biodiversity threats and serious deforestation

“grow now, clean up later”? But…

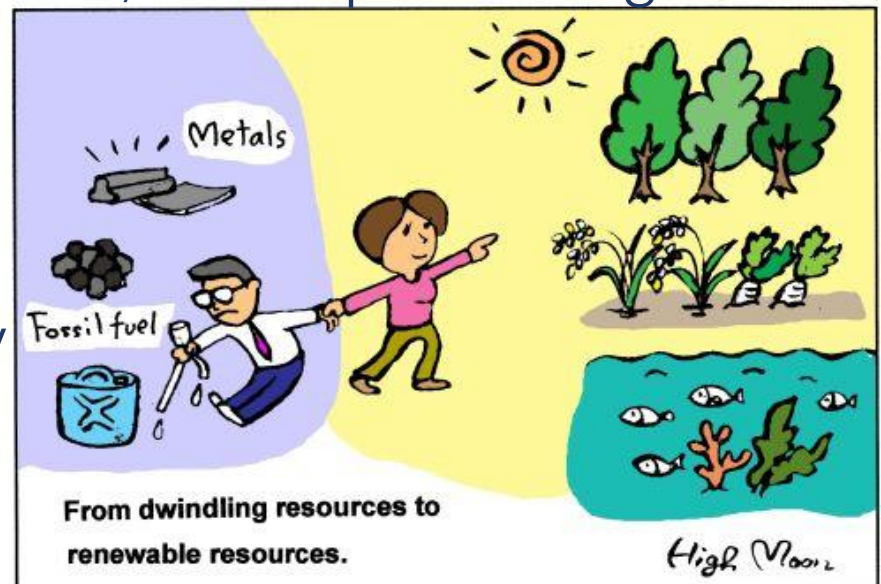
- Some environmental damage is **irreversible**, it will not be possible to correct the damage in the future, and some resources will be lost forever.
- It justifies government inaction on the environment.
- It is not growth itself that is bad for the environment, but rather the ways that growth is pursued.
- Growth based on unsustainable resource use may lead to destruction of natural resources on such a wide scale that the possibility of continued future growth may be threatened.

The economic growth negatively affect environmental sustainability when…

- **Inappropriate government policies, such as:**
  - Encourage producing higher output while neglect the negative externalities of production → problems for the environment → damage the social and economic well-being of people.
  - Producing higher output may lead to more depletion of non-renewable resources. Economic growth come at the expense of sustainable development.

The economic growth positively affect environmental sustainability when…

1. Governments implement market-based policies that "internalize the externalities".
2. Governments pursue more environmental regulations that encourage pollution-free technological change (green technologies)
3. There is an increased emphasis on human capital in production (pollution-free) as opposed to physical capital.
4. There is an increased emphasis on 'green' investments, which promote growth while not hurting the environment.
   - Building public transportation systems
   - Investing in insulation in homes and buildings.
   - Investing in clean technology R&D
5. There are changes in the structure of the economy toward more services (pollution-free), together with more investments in the protection of natural resources.

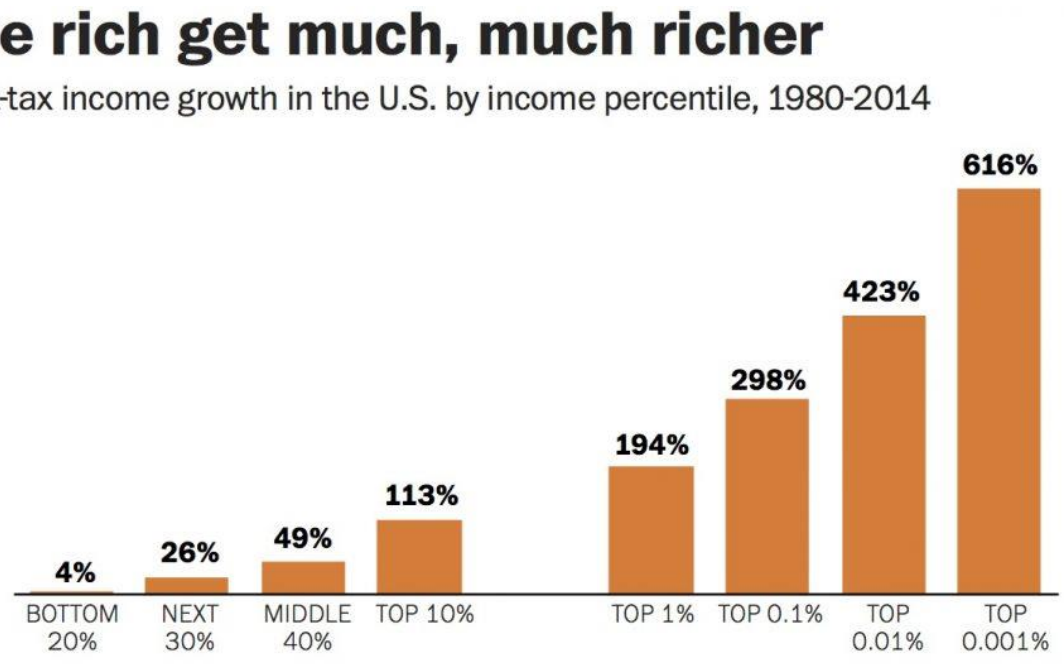


Consequences of economic growth on income distribution

- Is there a positive relationship between growth in GDP per capita and income distribution?

→Inconclusive result, in many countries, there is no clear relationship between growth in GDP per capita and income distribution.

→Income inequalities in many countries around the world have been widening over the past decades.

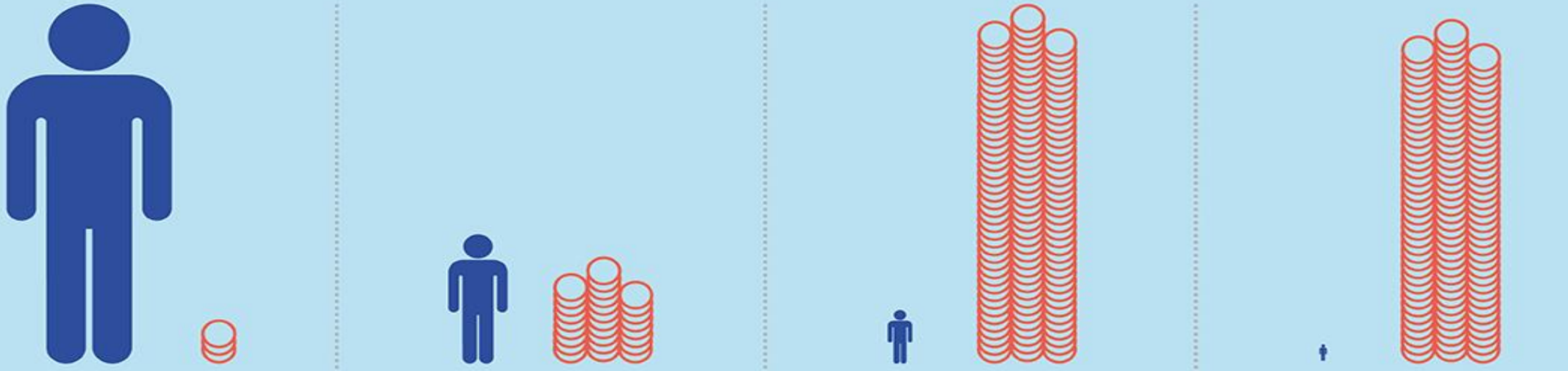


How is the **world's wealth** shared amongst its population?

WORLD ECONOMIC FORUM
COMMITTED TO IMPROVING THE STATE OF THE WORLD

% of the world's population

% of the world's wealth



71.0%	3.0%	21.0%	12.5%	7.4%	39.4%	0.7%	45.2%
> $10,000		> $10,000 -100,000		> $100,000 -1 million		> $1 million	

Wealth (USD)

"Wealth" is defined as the marketable value of financial assets plus non-financial assets (principally housing and land) owned by an adult, less debts
Source: Global Wealth Report 2015, Zurich: Credit Suisse

Consequences of economic growth on income distribution

Positive: Eliminate/reduce the income gap

- Economic growth leads to greater tax revenues which enables the government to use these tax revenues to redistribute income and wealth in the economy.
- Better education/health care
- Training for low skilled workers.

Negative: Enlarge/widen the income gap

- The rich get richer, the poor get poorer
- As economic growth, the economy move from primary to secondary to tertiary sectors which might lead to structural unemployment.

Consequences of economic growth on unemployment and inflation

Inflation:

- **Positive:**
  - Economic growth leads to rightward shift of LRAS, production potential increased. Result in price level decrease and output increase.
- **Negative:**
  - If the household incomes do not keep up with inflation, higher incomes may not actually improve the standards of living over time. Demand side growth lead to serious Inflationary gap → overheated economy with unsustainable price level.
  - Abuse of monetary policy (too much money supply)

Consequences of economic growth on unemployment and inflation

Unemployment:

- **Positive:**
  - Economic growth leads to lower rate of unemployment → reduced cyclical unemployment → reduce income gap
  - Better education and health care leads to lower unemployment
- **Negative:**
  - The development of high technology industry, secondary and tertiary sector might result in structural unemployment, as certain skills are no longer demanded in rapidly growing economies.

Three sources of economic growth

the **increases in resource quantities** and **improvements in resource quality** cause long-term growth.

Expanded meaning of capital: resources that can produce a future stream of benefits.

1. **Physical capital** "capital goods"
   - Result from investments to produce equipment, machines, roads, etc.
2. **Human capital** – the skills, abilities, knowledge and levels of health of workers.
   - It results from investments on education, training, provision of health care services, clean water supplies, good nutrition, etc.
3. **Natural capital** = Everything under the land + Everything on the land + A country's overall natural environment and ecosystem.

* "land" is assumed to be given by nature and does not change.
* "Natural capital" does change. It can be destroyed and be improved.
  - It depends on investments that aim to preserve and improve natural resource quantity and quality.

The roles of physical capital in economic growth

- Increase in the **quantity** of physical capital
  - Increase in the **number of** machines, tools, equipment, road systems, ports, etc. in an economy.

- Improvement in the **quality** of physical capital depends **on technological advances.**
  - Better machines, tools and equipment that embody a new technology.

→ **larger quantity of output produced**

→ Increases in the quantity and improvements in the quality of physical capital, arising from **investments in physical capital** and **new technology**, are among the **most important sources** of economic growth over long periods of time.

The roles of human capital in economic growth

- An increase in the **quantity** of human capital. E.g. Foreign workers, increasing birth rate
  - Many less developed countries face high levels of unemployment and underemployment → increase in quantity of human capital may not be the source of growth.

- Improvement in **the quality** of labour, such as skills, abilities, knowledge and levels of health of the workforce.
  - The result of investments in human capital (spending on education, building schools, vocational training, medical services, immunization, sanitation, clean water supplies, keep the environment unpolluted)

→ Increased quantities of labour are unlikely to be a source of economic growth over long periods, but improvements in the quality of labour, arising from investments in human capital, are among the most important sources of growth.

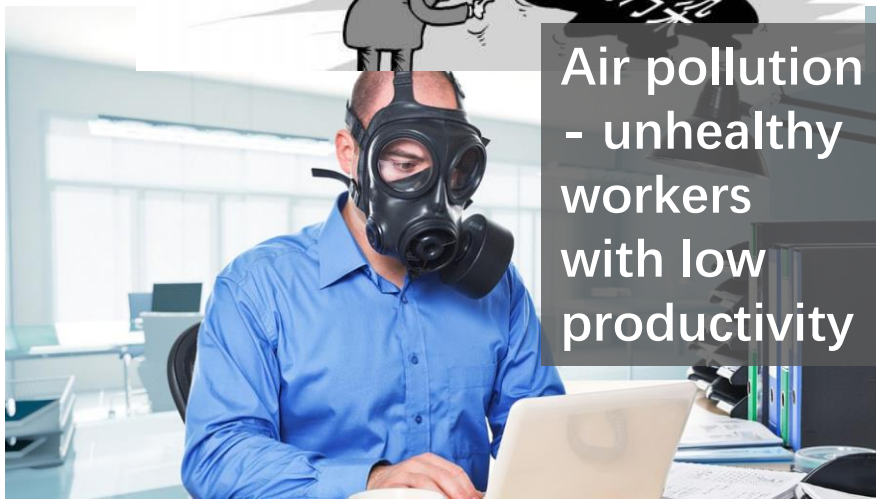
The roles of natural capital in economic growth

Pool quality soils produces less output

Two kinds of natural capital:

- **Marketable commodities**: commodities that are bought and sold – timber, minerals, natural gas, coal and oil;

→It can contribute to growth but are **not essential**. Countries do not need to be rich in marketable commodities to achieve high rates of growth.



Air pollution - unhealthy workers with low productivity

Fish-depleted sea have a smaller catch

- **Common pool resources** (ecological resources) – soil quality, rivers, clean air, biodiversity, the ozone layer.
  - Common pool resources are **crucially important to long-term growth**, it depends on the ability of countries to maintain and improve environmental quality, therefore continue economic growth over long period.
  - Environmental destruction can have direct effects on the amount of output produced.

The central importance of productivity as a source of economic growth

- **Productivity** refers to the quantity of output produced for each hour of work of the working population.
- **An economy's productivity =** $\frac{\text{Real GDP}}{\text{Total number of hours worked}}$

- An improvement of productivity means that workers produce more quantity of output in an hour of work.

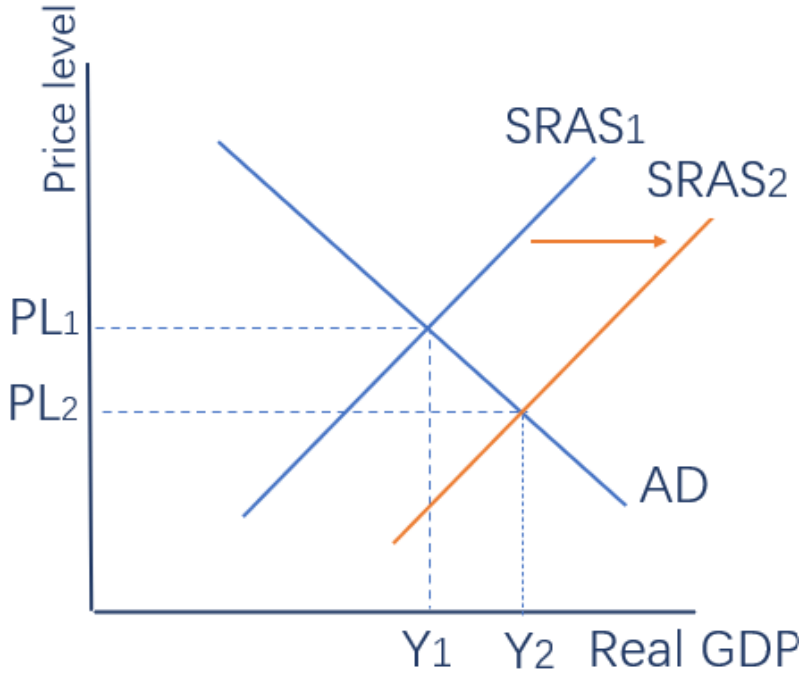
- **Factors that improve the productivity**:
  - Increases in quantity and improvements in quality of physical capital.
  - Improvements in the quality of labour
  - Improvements (maintenance) in the quantity and quality of ecological resources.

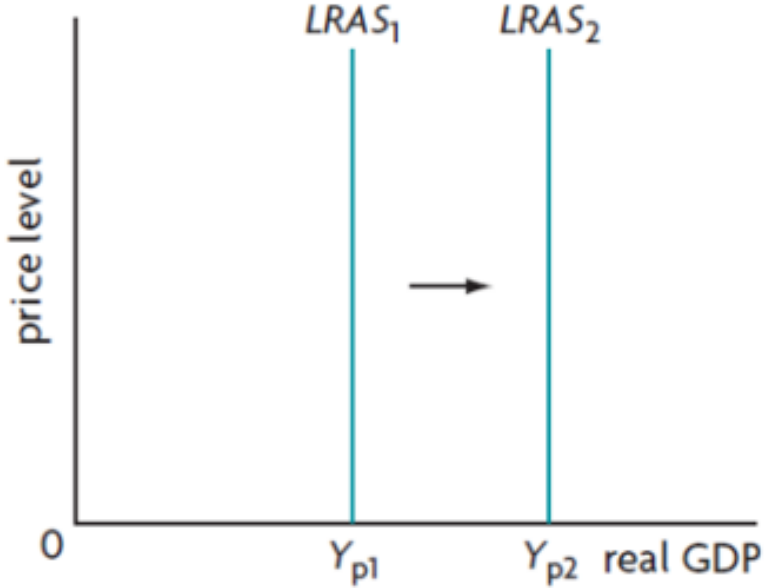
→ Exactly the factors making the most important contributions to long-term economic growth.

The effects of higher Productivity in SR&LR

In short-run:

Improved productivity will reduce unit costs of production in the short run and shift the SRAS to the right, leading to an increase in gross domestic product (GDP) and short-run economic growth





In long-run:

Improved productivity will increase the productive capacity of the economy in the long run, thus shifting LRAS to the right and causing long-run economic growth