Chapter 22
Economic Growth

The Basics of Economic Growth

- The **economic growth rate** is the annual percentage change of real GDP.
- The standard of living depends on real GDP per person, which is real GDP divided by the population.
- Sustained growth of real GDP per person can transform a poor society into a wealthy one.

- We calculate how many years it takes for the level of any variable, including real GDP per person, to double, by using the **Rule of 70**.
- The Rule of 70 states that the number of years it takes for the level of any variable to double is approximately 70 divided by the annual percentage growth rate of the variable.

Long-Term Growth Trends

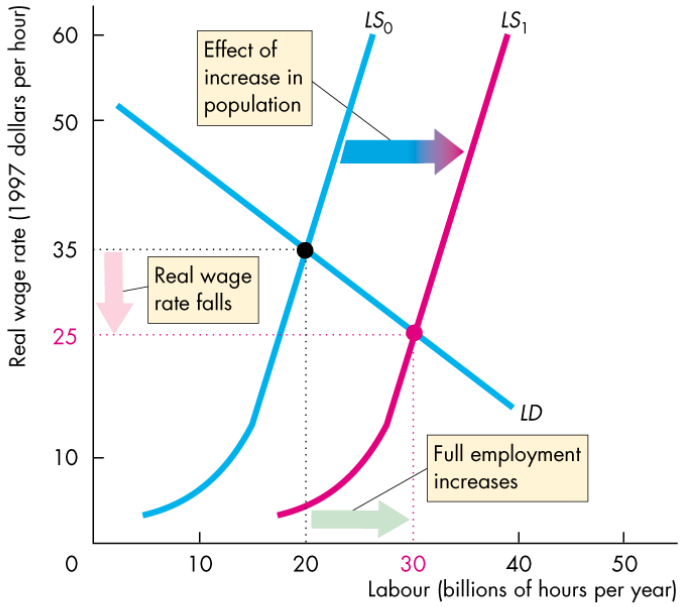
- Long-term growth trends are the trends in *potential GDP*.
- Check out Figure 22.2 on p. 518 of your textbook to study real GDP per person in Canada between 1926 and 2007.
- During this period, real GDP per person grew 2.1 percent a year, on the average.

- Real GDP growth has been similar in Canada, the Europe Big 4 (France, Germany, Italy, and the United Kingdom), and the United States since 1960. Growth in Japan was very rapid during the 1960s, slower during the 1980s, and even slower during the 1990s.

Changes in Potential GDP

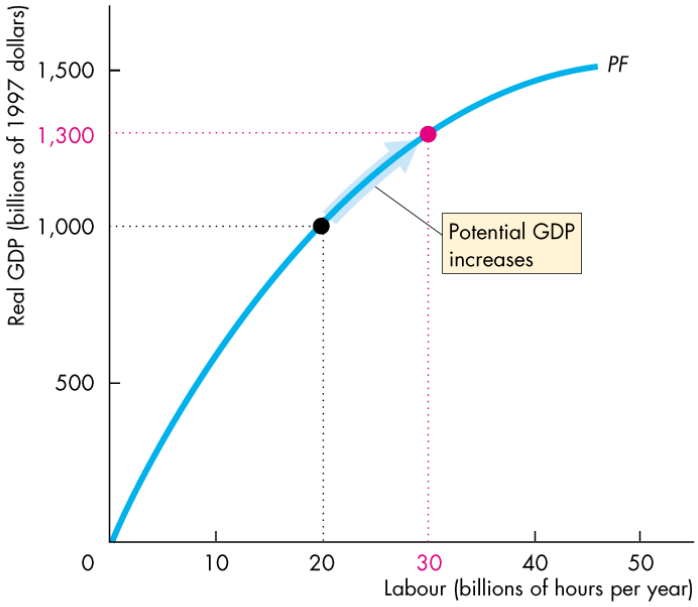
- Potential GDP increases if there is an increase in population or an increase in labour productivity.

- An increase in population increases the supply of labour.
- In the figure, the labour supply curve shifts rightward from LS_0 to LS_1, the real wage decreases and the quantity of labour employed at full employment increases.



(a) The labour market

- In the figure below, the increase in the full-employment level of labour increases potential GDP from $1,000 billion to $1,300 billion along the production function.

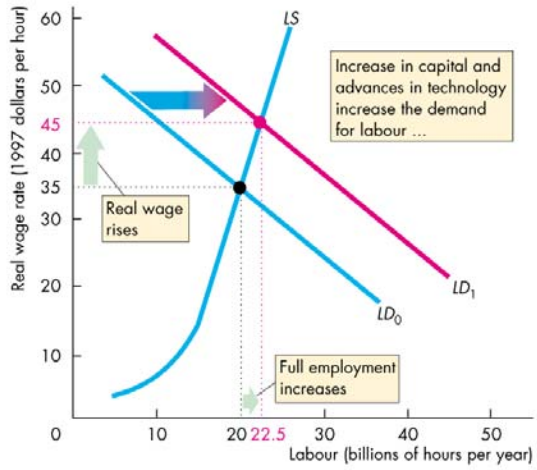


(b) Potential GDP

- With an increase in population, potential GDP per hour of work decreases.
- Initially, with potential GDP at $1,000 billion and labour hours at 20 billion, potential GDP per hour of work was $50.
- With the increase in population, potential GDP is $1,300 billion and labour hours are 30 billion, and potential GDP per hour of work is $43.33.
- Diminishing returns are the source of the decrease in potential GDP per hour of work.

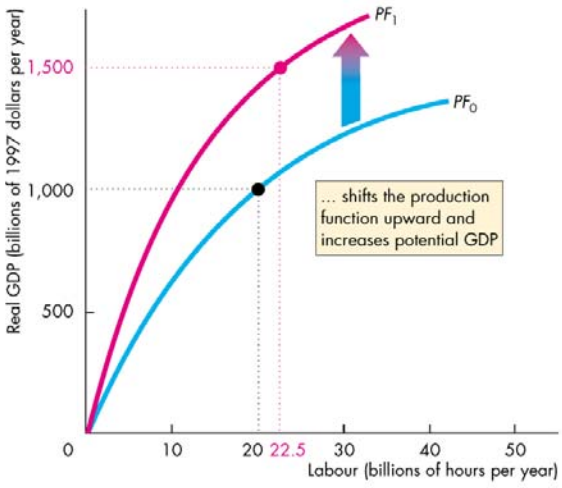
- Labour productivity is the quantity of real GDP produced by an hour of labour, calculated by dividing real GDP by aggregate labour hours.

  - Labour productivity increases if there is:
    - An increase in physical capital
    - An increase in human capital
    - An advance in technology
  - In the figure below, an increase in labour productivity increases the demand for labour, and the demand for labour curve shifts rightward from LD_0 to LD_1.



(a) The labour market

  - The real wage rate rises from $35 an hour to $45 an hour and the full employment quantity of labour increases from 20 billion hours to 22.5 billion hours.
  - The production function shifts upward and potential GDP increases from $1,000 billion to $1,500 billion. Potential GDP per hour of work also increases from $50 to $66.67.



(b) Potential GDP

- The purpose of **growth accounting** is to calculate how much real GDP growth results from growth of labour and capital and how much is attributable to technological change.

- The **law of diminishing returns** states that as the quantity of one input increases with the quantities of all other inputs remaining the same, output increases but by ever smaller increments.

- Applied to capital, the law of diminishing returns states that if a given number of hours of labour use more capital (with the same technology), the *additional* output that results from the *additional* capital gets smaller as the amount of capital increases.
- But how much less?
- The answer is given by the *one-third rule*.

- According to the **one-third rule**, on the average, with no change in technology, a 1 percent increase in capital per hour of labour brings a *one-third of 1 percent* increase in real GDP per hour of labour.

Growth Theories

- The task of growth theory is to *explain* the trends in economic growth.
- The three growth theories we study are
  - Classical growth theory
  - Neoclassical growth theory
  - New growth theory

- **Classical growth theory** is the view that real GDP growth is temporary and that when real GDP per person rises above the subsistence level, a population explosion eventually brings real GDP per person back to the subsistence level.

- A technological advance occurs, and wage rates increase.
- Now earning more than the subsistence wage, people have more children and are living longer, and the population grows.
- A growing population means that labour hours grow, so capital per hour of labour falls.
- As capital per hour of labour falls, real GDP per hour of labour falls and keeps falling as long as the population grows and capital per hour of labour falls.
- The process ends when real GDP per hour of labour is back at the subsistence level.
- The dismal conclusion of classical growth theory is a direct consequence of the assumption that the population explodes if real GDP per hour of labour exceeds the subsistence level.
- To avoid this conclusion, we now study the neoclassical growth theory.

- **Neoclassical growth theory** is the proposition that real GDP per person grows because technological change induces a level of saving and investment that makes capital per hour of labour grow.

- Neoclassical growth theory implies that growth rates and income levels per person around the globe will converge.
- New growth theory attempts to overcome this shortcoming of neoclassical growth theory.

- **New growth theory** holds that real GDP per person grows because of the choices people make in the pursuit of profit and that growth can persist indefinitely.

- The theory begins with two facts about market economies:
    - Discoveries result from choices.
    - Discoveries bring profit and competition destroys profit.

- Two further facts play a key role in the new growth theory:
    - Discoveries are a public capital good.
    - Knowledge is capital that is not subject to the law of diminishing returns.

- According to new growth theory, people want a higher standard of living and are spurred by profit incentives to make the innovations that lead to new and better techniques and new and better products.

- These new and better techniques and products lead to the birth of new firms and new and better jobs.

- The result is a higher standard of living.
- But people want a still higher standard of living, and the growth process continues.