Economic Growth

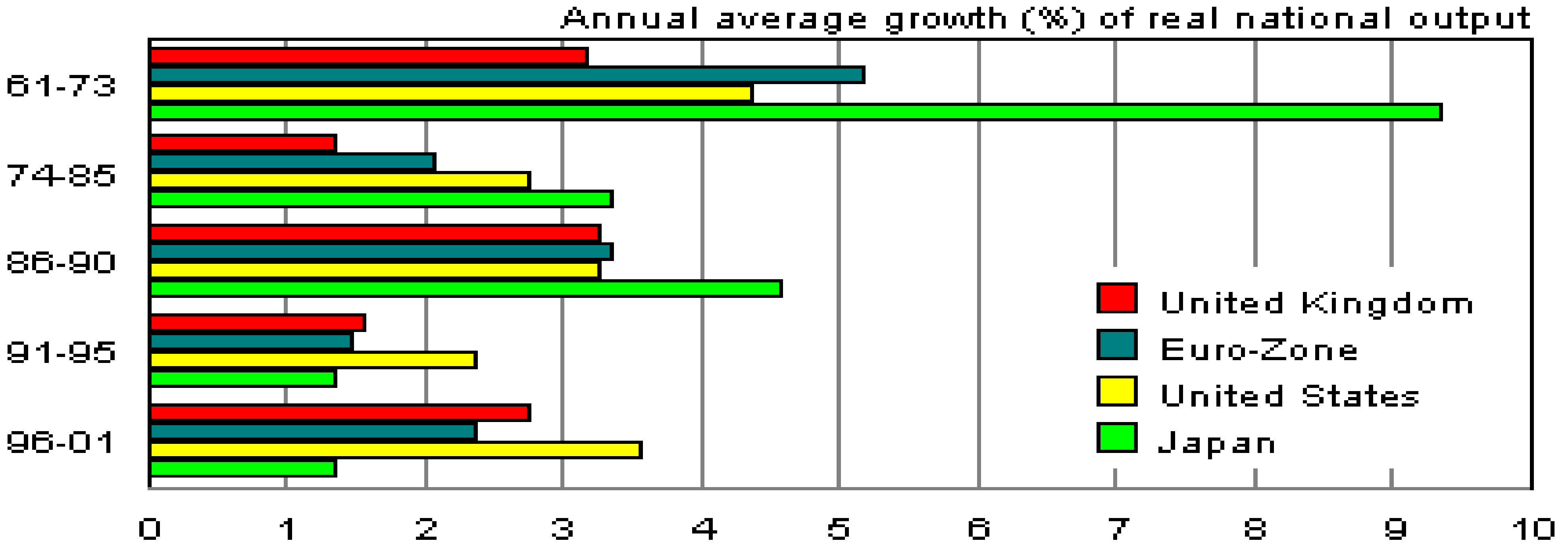
- ***Economic Growth***: expansion of a country's national output (***Real GDP***) or potential GDP. ***Output per person*** (***GDP per capita***) determines rise in nation's living standards.

- "***Rule of 70***": Dividing 70 by a country's average growth rate gives the number of years required for its income to double.

  - ✓ ***Example***: If China preserves current growth rate of 8%, Chinese GDP will double in less than 9 years (=70/8).

GROWTH OF NATIONAL OUTPUT

http://www.tutor2u.net/economics/content/topics/econgrowth/benefits_of_growth.htm



Factors of Growth

- ***Aggregate Production Function***:

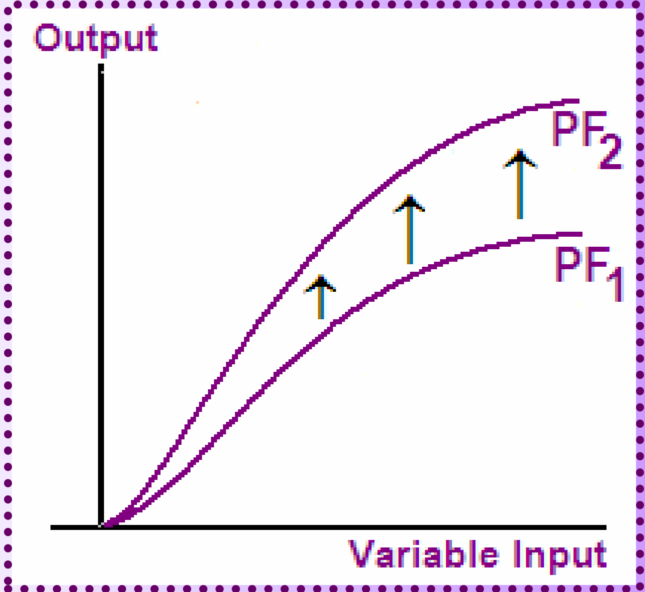
$$Q=A*f(K,L,R)$$

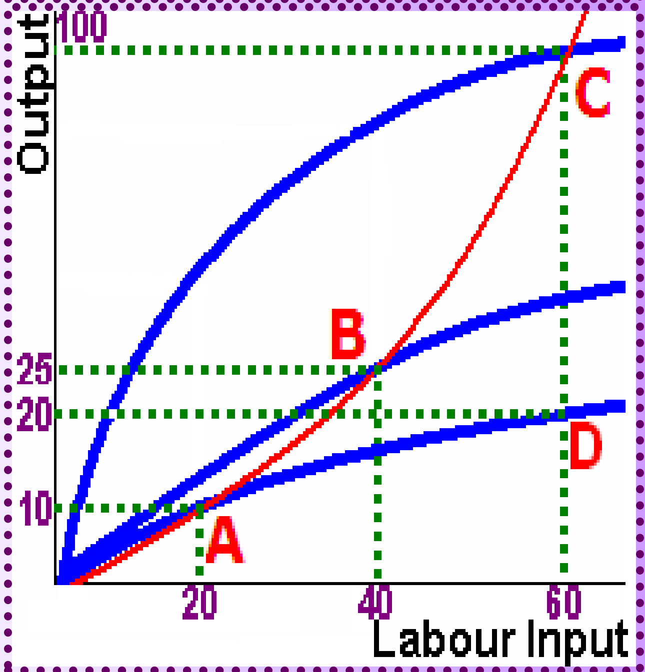
  - **Q** – output;
  - **A** – level of technology;
  - **F** – production function;
  - **K,L,R** – inputs: capital, labor, resources

- ***Factors of Growth***:
  - **human resources** (*labor supply, education, discipline, motivation*)
  - **natural resources** (*land, minerals, fuels, environment al quality*)
  - **capital formation** (*machines, factories, roads*)
  - **technology** (*science, engineering, management, entrepreneurship*)
  - **rates of savings** (*less consumption, but more investment today in support of economic growth - more consumption in the future*)

- ***Factor Productivity***: ratio of output to a weighted average of inputs:

- Technological change is reflected in productivity of inputs: labor productivity (output per worker – **Y/L**), capital productivity (output per capital – **Y/K**), total factor, productivity (see Microeconomics)





Growth Theories

- ***Theories of Economic Growth***:
  - ✓ Mercantilists (a nation's wealth depends on accumulation of money) and Physiocrats (a nation's wealth depends on agriculture)

    http://www.frbsf.org/publications/education/greateconomists/grtschls.html
  - ✓ Classical school of economics: economic growth is supply-side driven, expansions happen due to increase in production factors: land, labor, or capital - Adam Smith, David Ricardo, Thomas Malthus

    http://www.adamsmith.org/smith/
    http://cepa.newschool.edu/het/profiles/ricardo.htm
    http://en.wikipedia.org/wiki/Malthusian_catastrophe
  - ✓ Neoclassical Model (Robert Solow)

    http://cepa.newschool.edu/het/profiles/solow.htm
- ***Neoclassical Model***: economic growth with ***capital accumulation***:
  - ✓ major factors of economic growth are **capital and technological change**;
  - ✓ economic growth happens with ***capital deepening*** – increase of capital-labor ratio (**K/L**);
  - ✓ in the long run the economy will enter a ***steady state*** – no capital deepening, no real wage growth, interest rates & capital returns – constant;
  - ✓ with technological advance, aggregate production shifts up to a **new steady state**.

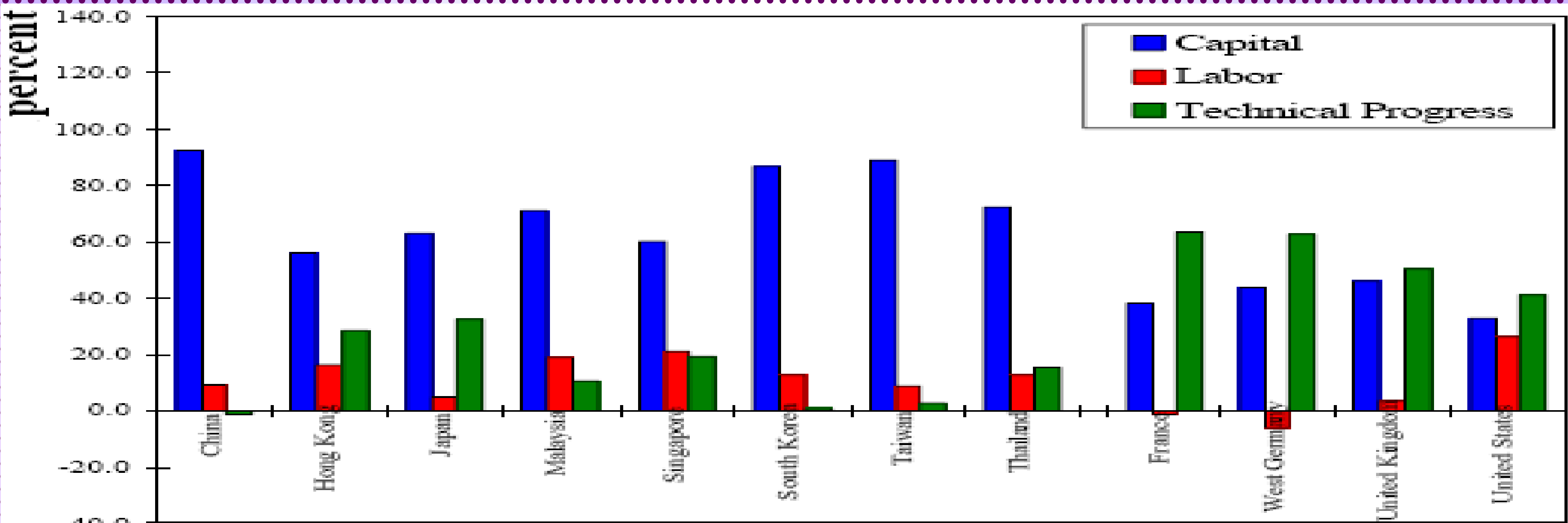
Neoclassical Model: Graphics & Example

- Growth in Output (*Q*) is due to the growth of the inputs (*K,L,R*) plus the contribution of the technological change (T.C.)

$$Q=A*f(K,L,R)$$

- Fundamental Equation of Growth Accounting:
  - ✓ %ΔQ = ¾(%ΔL) + ¼(%ΔK) + T.C.
  - ✓ %ΔQ/L = %ΔQ - %ΔL = ¼(%ΔK/L) + T.C.
  - ✓ T.C. = %ΔQ - ¾(%ΔL) - ¼(%ΔK)

- ***Example***: For the U.S. (1900-1996) annual %ΔL=1.3, %ΔK=2.5, %ΔQ=3.1
  - ✓ T.C. = 3.1 - ¾ 1.3 - ¼ 2.5 = 1.5



Basic Trends in Economic Development

- **The advanced nations showed certain commonalities in their development over the last century:**
  - ***Capital deepening*** – the capital stock grows more rapidly than population & employment.
  - Strong upward trend in ***real wages***
  - The ***share of wages/salaries*** in national income remained constant lately.
  - ***Interest rates & profit rates*** were fluctuating along with business cycles, but there was no strong trend up or down
  - ***Capital-output ratio*** declined.
  - ***Ratios of national savings and investment to GDP*** were stable, except for the savings rate in the U.S., where it declined since 1980.
  - ***Output growth*** has been higher than weighted average of the growth of ***K***, ***L***, and ***R*** inputs due to technological innovation.
- **Most of these facts support major statements of the neoclassical theory, such as capital accumulation and deepening, productivity growth, etc.**

Key Concepts

- ✓ **GDP growth – measure of economic development**
- ✓ **other measures of economic development**
- ✓ **aggregate production function, technological change, factor productivity**
- ✓ **factors (sources) of economic growth**
- ✓ **theories of economic growth**
- ✓ **neoclassical growth model: capital deepening, steady state**
- ✓ **growth accounting: $\%\Delta Y = \frac{3}{4}(\%\Delta L) + \frac{1}{4}(\%\Delta K) + TC$**
- ✓ **basic trends in global economic development**

Course Web Support:

- ➢ http://www.skylinecollege.info/mosesov/macro/
- ➢ www.mhhe.com/economics/samuelson17/students/Ch27.mhtml