Chapter 8

Economic Growth and Rising Living Standards
Economic Growth and Rising Living Standards

- How do we explain the fact that living standards in many less developed countries are low?
  - Living standards have increased in many nations but not in others
  - Can governments do anything to speed up the rise in living standards?

- Economic growth: Long-Run increase in an economy’s output of goods and services
  - Growth arises from shifts of the curves of the classical model
The Importance of Growth

- Achieving higher growth rate in long-run
  - Some sacrifice in short-run
- Average standard of living
  - Total output (real GDP) per person
The Importance of Growth

- Output grows faster than the population
  - GDP per capita rises
- Output grows more slowly than the population
  - Average standard of living will fall
- Economic growth is important both for low-income and developed countries
What Makes Economies Grow?

- What determines potential GDP in any given period?
  - The amount of output the average worker can produce in an hour
  - The amount of hours the average worker spends at the job
  - The fraction of the population that is working
  - The size of the population

- All else equal, if any of them increases, real GDP rises.
What Makes Economies Grow?

• Labor productivity (or just productivity)
  □ Output produced by the average worker in an hour
  ■ Productivity = Output per hour
    □ Total output (real GDP) over a period of time divided by the total number of hours that everyone worked during that period

\[
\text{Productivity} = \frac{\text{Total output}}{\text{Total hours worked}}
\]
What Makes Economies Grow?

- Number of hours the average worker spends at the job: total hours worked over a period divided by the number of people who worked during the period
  \[
  \text{Average hours} = \frac{\text{Total hours}}{\text{Total employment}}
  \]

- Fraction of the population that is working (employment-population ratio)
  \[
  \text{EPR} = \frac{\text{Total employment}}{\text{Population}}
  \]
What Makes Economies Grow?

- Total output = Productivity × Average hours × EPR × Population (how?)
- Growth equation
  - Make use of a mathematical rule
  - $\%\Delta(A \times B) = \%\Delta A + \%\Delta B$

- $\%\Delta$Total output =
  $\%\Delta$Productivity + $\%\Delta$Average hours + $\%\Delta$EPR + $\%\Delta$Pop.

Almost all of the growth in real GDP over the last 50 years has come from population growth and productivity.
Economic Growth and Living Standards

- Growth in real GDP—by itself—does not guarantee a rising standard of living
  - Look at real GDP per capita
  - Over the long-run, living standards will depend on potential output per person
    \[
    \text{Total output} \over \text{Population} = \text{Productivity} \times \text{Average Hours} \times \text{EPR}
    \]

- \(\%\Delta\) Total output per person =
  \(\%\Delta\) Productivity + \(\%\Delta\) Average hours + \(\%\Delta\)EPR

- Growth in output per person and living standards
  - Employment–population ratio increases
  - Productivity grows
Growth in EPR

- Over the L/R the EPR rises only when total employment rises at a faster rate than the population
  - Thereby contribute to rising living standards
  - If EPR is falling, it will contribute to a drop in living standards

- For a given population growth rate
  - The greater the growth of total employment
  - The greater the rise in the EPR
  - Or the smaller the drop in the EPR

- What causes the employment to grow?
  - Classical model
    - Increase in labor supply—increase in the number of people who would like to work at any given wage.
    - Increase in labor demand
    - Combination of both
An Increase in Labor Supply

At point A, equilibrium employment level of 150

An increase in labor supply raises employment to 180 million (at point B) although with a lower wage rate.

With more people working, real GDP rises from $10 trillion to $11.5 trillion.
An Increase in Labor Demand

If firms demand more labor, employment will increase (from 150 million to 180 million) while the wage rate rises.
Growth in EPR

- U.S. experience
  - A combination of both (increase in labor supply and increase in demand)
  - Increase in labor supply
    - Population ↑, female participation in the workforce ↑
  - Increase in labor demand
    - More and better capital equipment
    - Better education and training for workers
The U.S. Labor Market Over A Century

Figure 3 The U.S. Labor Market Over A Century

- Real Hourly Wage
- Millions of Workers

W1, W2: Levels of real hourly wage
L1, L2: Levels of millions of workers
LDS1, LDS2: Supply curves
LD1, LD2: Demand curves
A, B: Equilibrium points
How To Increase Employment and the EPR

- Increase the labor supply
  - Decrease income tax rates (increases the rewards from working)
    - why economists often recommend cutting taxes to encourage more rapid growth in employment
    - Tax cut passed in June 2001
  - Cut benefits to the needy (increases the hardship of not working)
    - Families receiving welfare payments are reluctant to increase their work effort
    - Reforms in US welfare system, August 1996
How To Increase Employment and the EPR

- Increase the labor demand
  - Subsidies for education and training
  - Subsidies for the wages of disabled, college work-study participants

- Results
  - Speed the rightward shift in the labor supply and labor demand curve
  - Raise EPR
  - Raise output per person
Growth in Productivity

- Population growth: can raise real GDP but cannot raise real GDP per capita
- Growth in the average standard of living - attributed to growth in productivity
- Increase productivity
  - Capital stock
  - Investment spending
  - Human capital
  - Technological change
Growth in the Capital Stock

- ↑ capital per worker (total capital stock divided by the labor force), ↑ productivity
- If the capital stock grows faster than the labor force
  - Capital per worker rises
  - Labor productivity rises
- If the capital stock grows more slowly than the labor force
  - Capital per worker falls
  - Labor productivity falls
Growth in the Capital Stock

Figure 4  Capital Accumulation and the Production Function

Real Output

$12 trillion
$10 trillion

Millions of Workers

100
Investment and the Capital Stock

- Rate of planned investment spending in the economy - determines
  - How fast the capital stock rises
  - Whether it will rise faster than the labor force
- Stock variable - quantity at a moment in time
  - Capital stock—the total amount of plant and equipment that exists in the economy
- Flow variable - process over a period of time
  - Investment spending—the amount of new capital being installed over some time interval
    - Adds to the capital stock over time
Investment and the Capital Stock

- Depreciation reduces the capital stock
  - Investment > depreciation
    - Capital stock will …..

- For a given rate of depreciation and a given growth rate of employment, a higher rate of investment spending - faster growth in
  - Capital per worker
  - Productivity
  - Average standard of living
How to Increase Investment

- Government
  - Target businesses
  - Target households
  - Target its own budget

- Target businesses - Increase the incentive to invest
  - Reduce business taxes
  - Specific investment incentives

- Shift the investment demand curve rightward

- Faster growth
  - Physical capital
  - Productivity
  - Output per capita
Target Businesses

Figure 5 An Increase In Investment Spending

Interest Rate

5%

3%

Supp

y of Funds (Saving)

New Demand for Funds ($I^P_2$)

Original Demand for Funds ($I^P_1$)

Trillions of Dollars Per Year

1.5 1.75 2.25
How to Increase Investment

- Target Households - Increase incentive to save
  - Drives down the interest rate
- Government can increase incentive to save
  - Decrease capital gains tax
    - Capital gain: profit you earn when you sell an asset
  - Switch to consumption tax
  - Change transfer payments system
- Shift supply of funds curve rightward
  - More funds available for investment
- Faster growth
  - Capital stock
  - Living standards
Target Households

**Figure 6** An Increase In Savings

![Graph showing economic relationships between interest rate, supply, and demand.

- **Demand for Funds (I_P)**
- **Original Supply of Funds (S_1)**
- **New Supply of Funds (S_2)**

Interest Rate

- 5%
- 3%

Trillions of Dollars Per Year

- 1.75
- 2.25
- 2.5

A, B, and F are points on the graph representing different economic conditions and relationships.
How to Increase Investment

- G ↑ completely crowds out C and IP
  - G ↓ will have the opposite effect
- Shrink the budget deficit or rise surplus
  - Reduce interest rates
  - Increase investment
- Faster growth in the capital stock
- Important proviso about the Budget Deficit
  - A reduction in budget deficit or an increase in budget surplus (even if IP ↑) are not necessarily pro-growth measures
  - Government investment
    - New capital
    - Maintenance of existing capital
- Effect of deficit reduction depends on which government programs are cut
Deficit Reduction and Investment Spending

**Figure 7** Deficit Reduction and Investment Spending

Interest Rate

Supply of Funds (Saving)

- 5%
- 3%

1.0 1.5 1.75

Trillions of Dollars Per Year

\[ I^P + (G - T) \]
Human Capital and Economic Growth

- Human capital—skills and knowledge possessed by workers

- Increase in human capital
  - Production function shifts upward
  - Productivity increases
  - Output increases
  - Increases the average standard of living

- Human capital
  - Stock variable that increases by flows of investment

- Human capital investments
  - Businesses
  - Government
  - Households
Technological Change

- Technological change
  - Invention or discovery of new inputs, new outputs, or new production methods
  - Shift the production function upward
  - Enables any given number of workers to produce more output

- The faster the rate of technological change
  - The greater the growth rate of productivity
  - The faster the rise in living standards
Technological Change

- Rate of technological change
  - Depends on firms’ total spending on R&D
- Policies that increase R&D spending (like enhancing patent protection)
  - Increase the pace of technological change.
Growth Policies: A Summary

- Classical Model
  - Fiscal policy
    - No demand-side effects
    - Supply side effects
  - Employment ↑ (EPR growth rate ↑)
    - Examples: T ↓, employment subsidies
      - L^s ↑, L^d ↑
Growth Policies: A Summary

- Capital (Human & Physical) ↑ and R&D ↑, productivity growth rate ↑
  - Investment tax credit, corporate profits tax ↓
    - IP ↑
  - Tax incentives to ↑ savings
    - r ↓ → IP
- G ↓, T ↑, Transfer payments ↓
  - r ↓ → IP
Economic Growth in LDCs

- Three common characteristics
  - Very low real GDP per capita
    - Trade-off between consumption and capital goods
    - Poorest LDCs cannot reduce consumption below current levels
      - They cannot produce enough capital to keep up with rising population
  - High population growth
    - Cruel circle
  - Poor infra-structure
    - Lack of domestic and foreign investment
      - Low capital and productivity growth
Economic Growth in the LDCs

Figure 8 LDC Growth and Living Standards
Economic Growth in LDCs

- Problem faced in some LDCs
  - Growth in capital stock is not fast enough to increase capital per worker
    - No productivity growth
  - Increase K
    - Might not be possible, if C is at lowest possible level
      - Apply force
      - Cut C of the wealthy
      - Restrict population growth (ex: China)
      - Foreign assistance (IMF, World Bank)