LECTURE SEVEN - PART TWO

Growth Wheel #1: The Labor Force

- The quantity of workers is important BUT:
- The quality of labor inputs may be the single most important element in economic growth.

Skilled Versus Unskilled Workers

- A country rich in capital goods may still fail.
- The capital goods must be effectively used and maintained by skilled and trained workers.

Key Point

Improvements in literacy, health, and discipline, and the ability to use computers, add greatly to the productivity of labor.

Growth Wheel #2: Natural Resources

- Resources: Arable land, oil and gas, forests, water, and mineral resources.
- Canada and Norway have grown primarily on their outputs in agriculture, fisheries, and forestry and not manufacturing.
- The U.S. is the world's largest producer and exporter of grains.

Natural Resources Not Necessary for Rapid Growth!

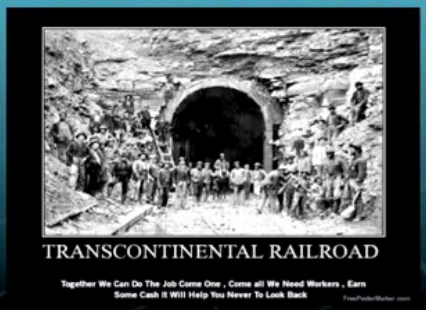
- Cities like New York and Singapore prosper on their high-density service industries.
- Countries such as Japan depend more on labor and capital than indigenous resources.

Growth Wheel #3: Capital Formation

- Capital includes:
  - Structures like roads and power plants.
  - Equipment like trucks and computers.
- The rapid accumulation of capital accounts for some astonishing growth stories.

A Study In Capital Formation

- The transcontinental railroads of North America brought commerce to the American heartland.
- Investment in automobiles, roads, and power plants increased productivity and provided the infrastructure which created new industries.



Capital Accumulation

- Requires a sacrifice of current consumption.
- Rapid growth means investing heavily in new capital goods.
- Rapidly growing countries may devote 10-20% of output to capital formation.

Key Concept: Social Overhead Capital

- It's not just about private sector investment!
- Government projects are also a key to growth.
- Roads and irrigation & water projects, for example, involve large "indivisible" investments with "increasing returns to scale."

Key Point

Government projects involve external benefits that private firms cannot capture so government is necessary to provide them.

Growth Wheel #4: Technological Change & Innovation

- A key to the rapid growth of living standards.
- Growth is NOT a process of simple replication.
- Growth IS a never-ending stream of inventions and technological advances.

Technological Change Defined

- Changes in production processes.
- Introduction of new products or services.

Fundamental Product Inventions

- The telephone, radio, airplane, phonograph, TV, radio, VCR, DVR, PDAs etc.
- Today's tiny notebooks are faster than computers in the 1960s.

The Technology Beat Goes On

- A continuous process of improvements.
- Over 100,000 new U.S. patents annually.
- Millions of small refinements.

Demand and Efficiency Factors

- The four supply factors of growth relate to the physical ability of the economy to expand.
- Two other factors are equally important.

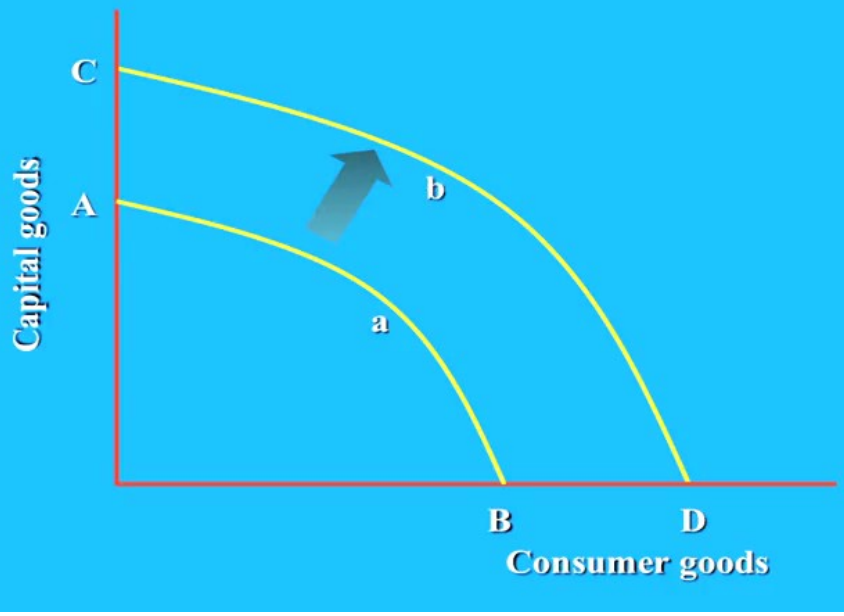
The Demand Factor

A nation must fully employ its expanding supply of resources to reach its potential so aggregate demand must grow!

The Efficiency Factor

- It's not just about reaching full employment!
- A country must achieve *productive efficiency* by using resources in the least costly way.
- A country must also achieve *allocative efficiency:* The specific mix of goods and services must maximize society's well-being.

A Production Possibilities Frontier Analysis!



Sources of growth		Percentage of total growth
1. Increase in quantity of labor		33
2. Increase in labor productivity		67
3. Technological advance	28	
4. Quantity of capital	20	
5. Education and training	12	
6. Economies of scale	8	
7. Improved resource allocation	8	
8. Legal-human environment and other	−9	
		100

Source: Edward F. Denison, *Trends in American Economic Growth, 1929–1982* (Washington: Brookings Institution, 1985), p. 30; *Economic Report of the President*, various years; authors' estimates.

Question

Which factors of growth have been most instrumental in increasing labor productivity?

Sources of growth		Percentage of total growth
1. Increase in quantity of labor		33
2. Increase in labor productivity		67
3. Technological advance	28	
4. Quantity of capital	20	
5. Education and training	12	
6. Economies of scale	8	
7. Improved resource allocation	8	
8. Legal-human environment and other	−9	
		100

Source: Edward F. Denison, *Trends in American Economic Growth, 1929–1982* (Washington: Brookings Institution, 1985), p. 30; *Economic Report of the President*, various years; authors' estimates.