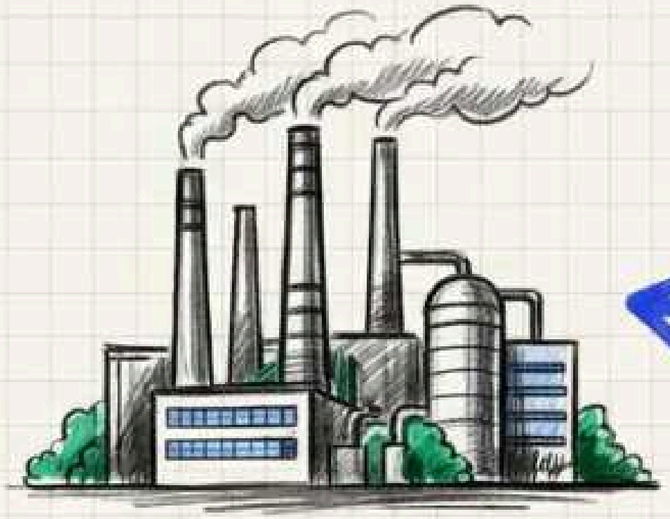
¶ 2.1



ECON 130 B Lecture 2: Economic Growth and Productivity

Why output per person grows: productivity, capital, ideas, institutions, and the power of compounding.

¶ 2.2

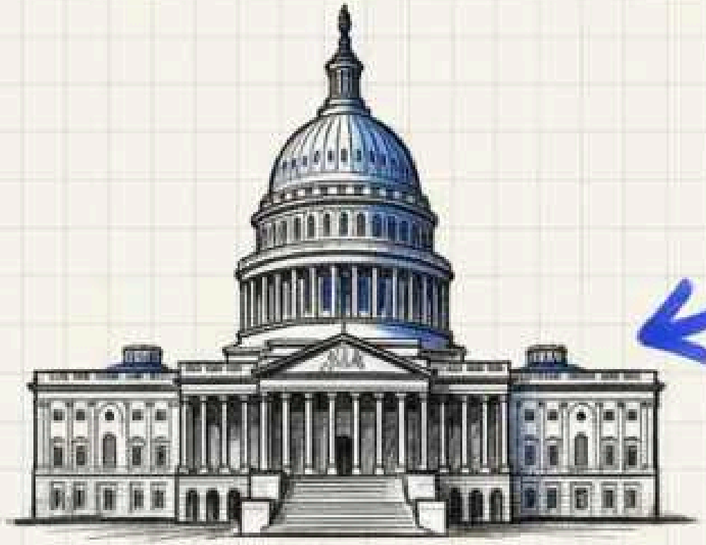


Scale & Productivity



Sources of Growth

Why are some countries rich rich & others poor?

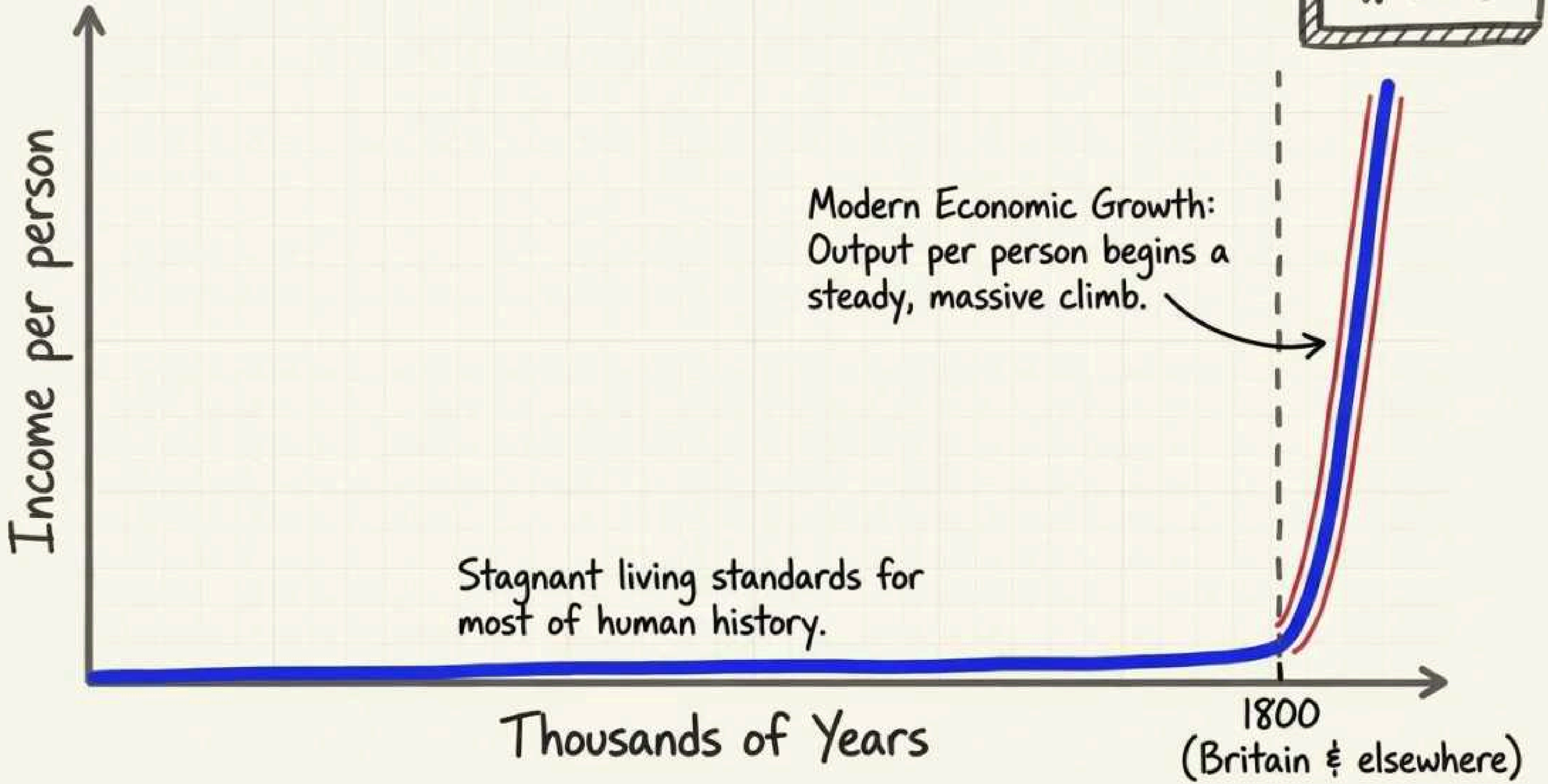


Government's Role



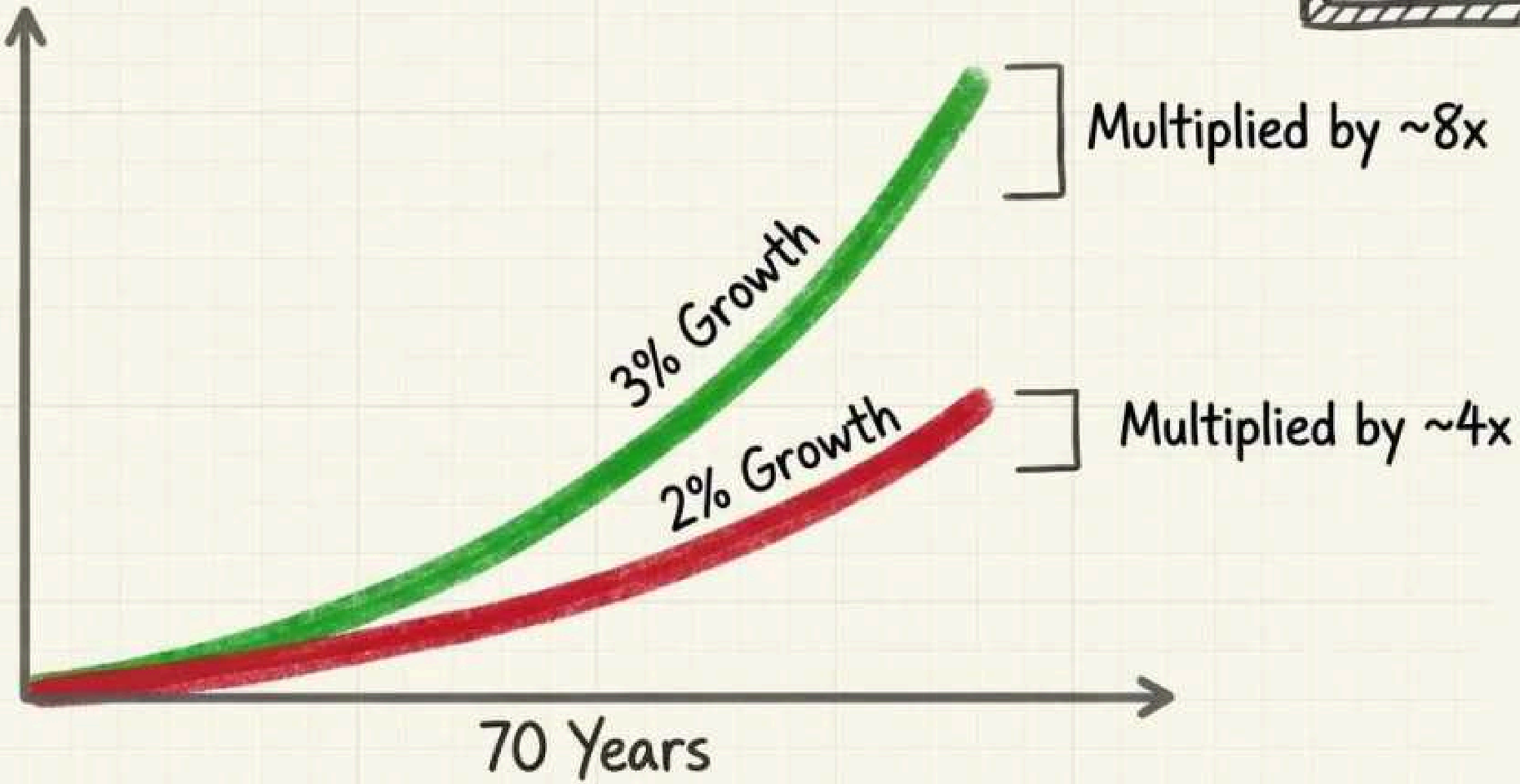
Limits & Costs

¶ 2.3


Income per person
Modern Economic Growth:
Output per person begins a
steady, massive climb.
Stagnant living standards for
most of human history.
Thousands of Years
1800
(Britain & elsewhere)

¶ 2.4

Growth = % Δ Real GDP per person



A single point of growth changes a country's future.
Small rate differences compound into massive divergence.

¶ 2.5

$$\text{Years to Double} = \frac{70}{\text{Growth Rate (\%)}}$$

1% Growth ⟶ 70 years to double

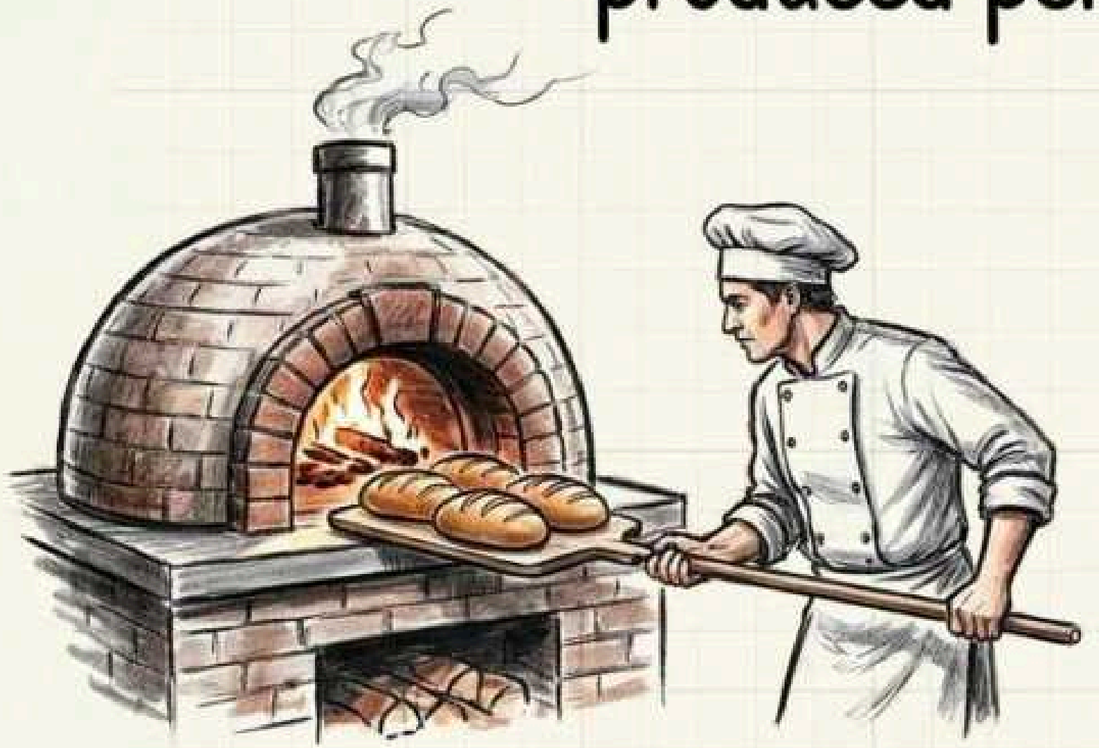
2% Growth ⟶ 35 years to double

3.5% Growth ⟶ 20 years to double

7% Growth ⟶ 10 years to double ★ Doubles every decade

¶ 2.6

Productivity = Quantity of goods/services produced per hour of work.



→ 10 loaves / hr



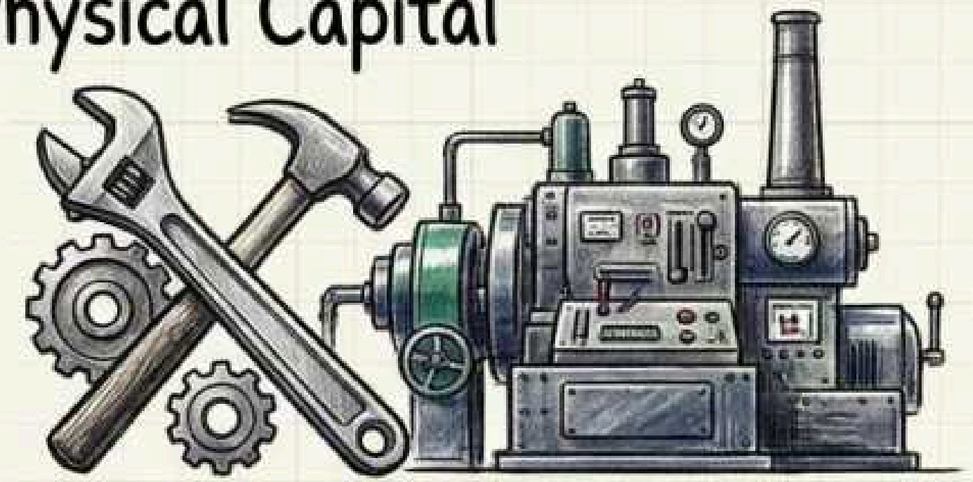
→ 15 loaves / hr

Productivity rose by 50%. A country can consume only what it produces; living standards differ precisely because productivity differs.

The Four Sources of Productivity

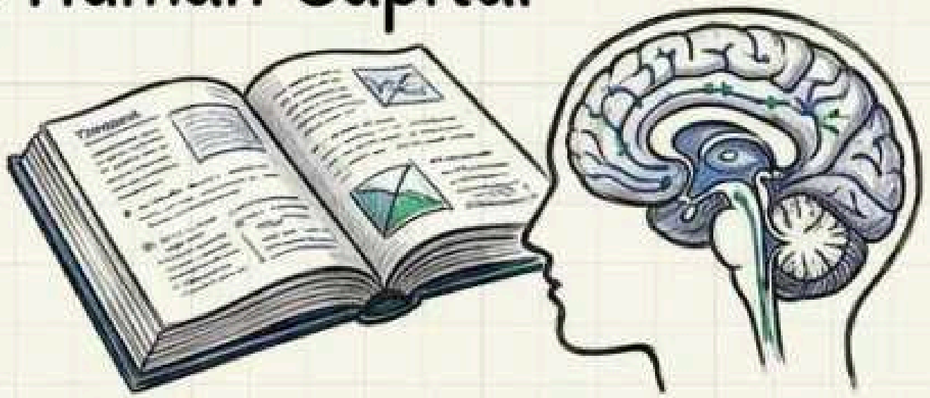
¶ 2.7

1. Physical Capital



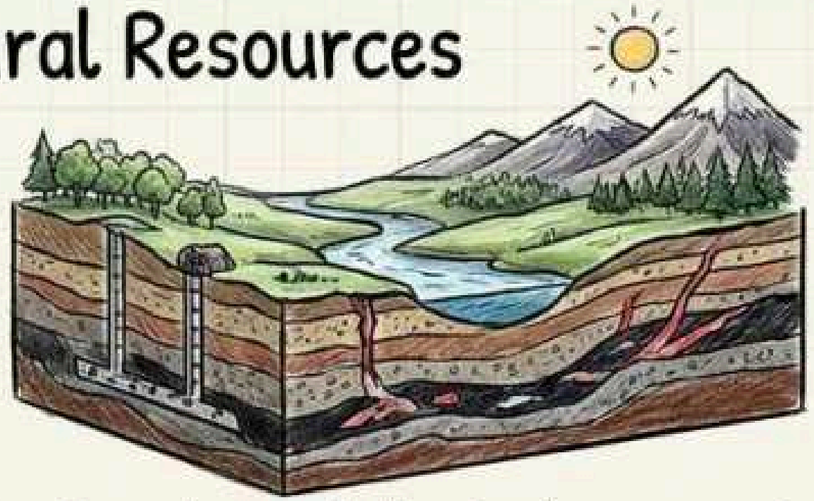
The tools, machines, and buildings workers use.

2. Human Capital



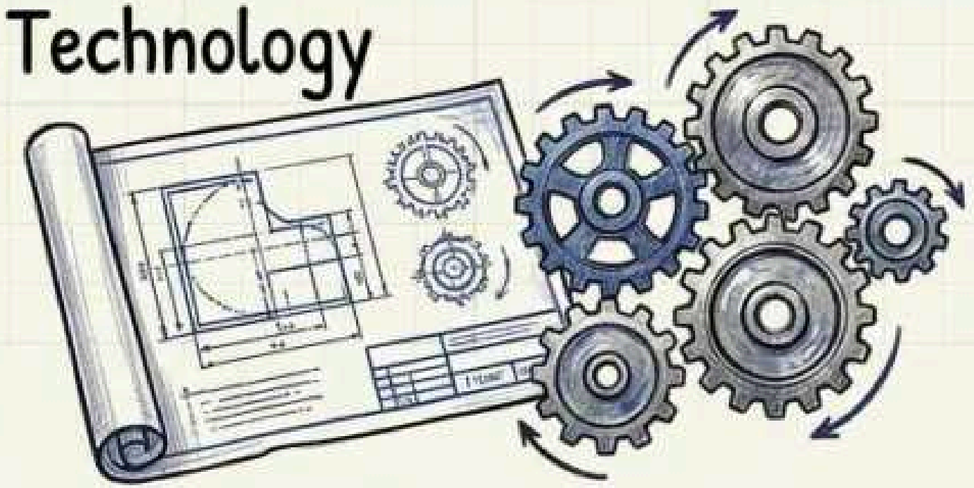
Knowledge and skills gained from education, training, and experience.

3. Natural Resources



Land, minerals, and physical geography.

4. Technology



Our knowledge of the best ways to produce goods.

$Y = A \cdot F(L, K, H, N)$

¶ 2.8

Output depends on technology (A), labor (L),
physical capital (K), human capital (H), natural resources (N).

Constant Returns

Double all inputs = Double Output.

1.



1 shovel = Good output.

Diminishing Returns

2.



2 shovels = Minor increase.

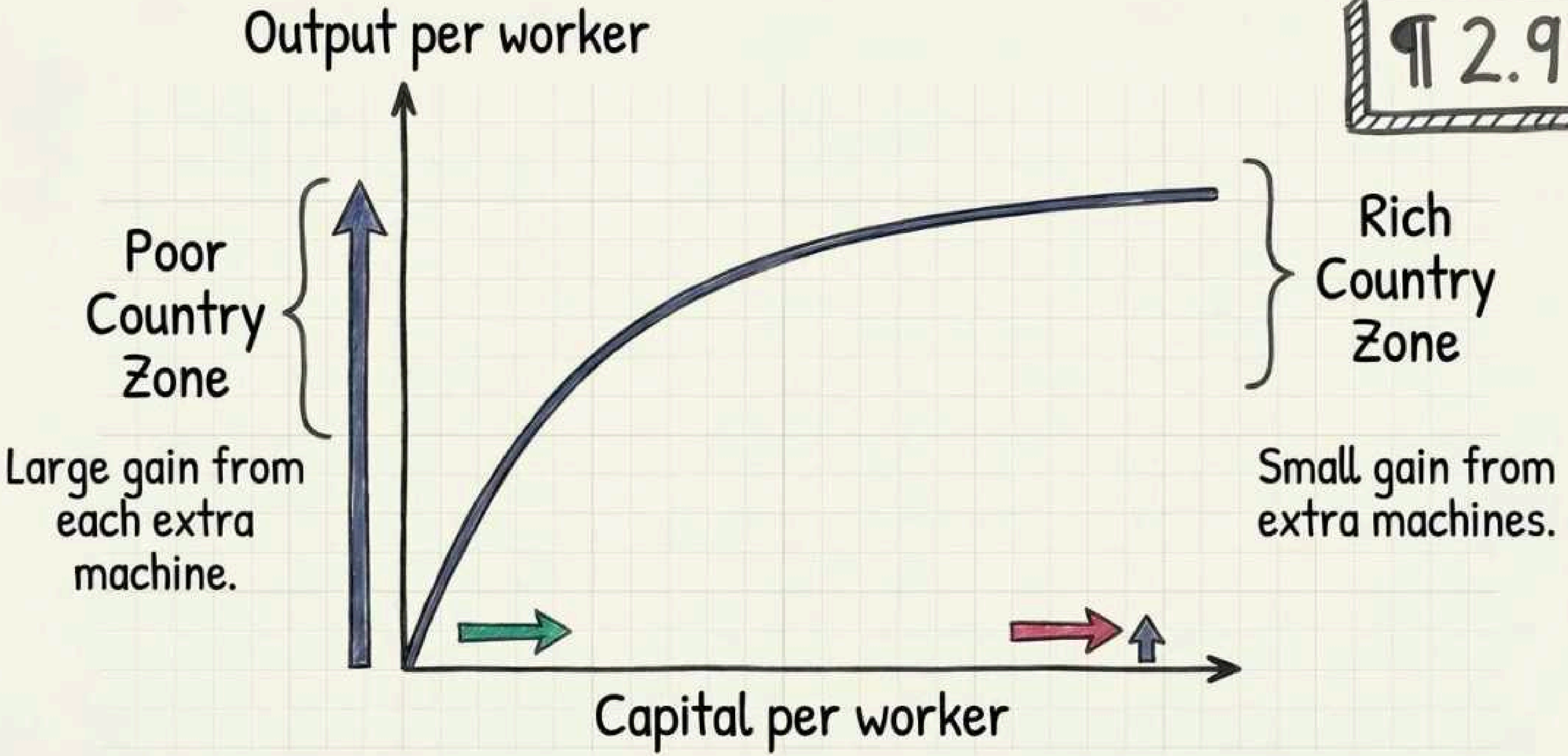
3.



10 shovels = No extra output.

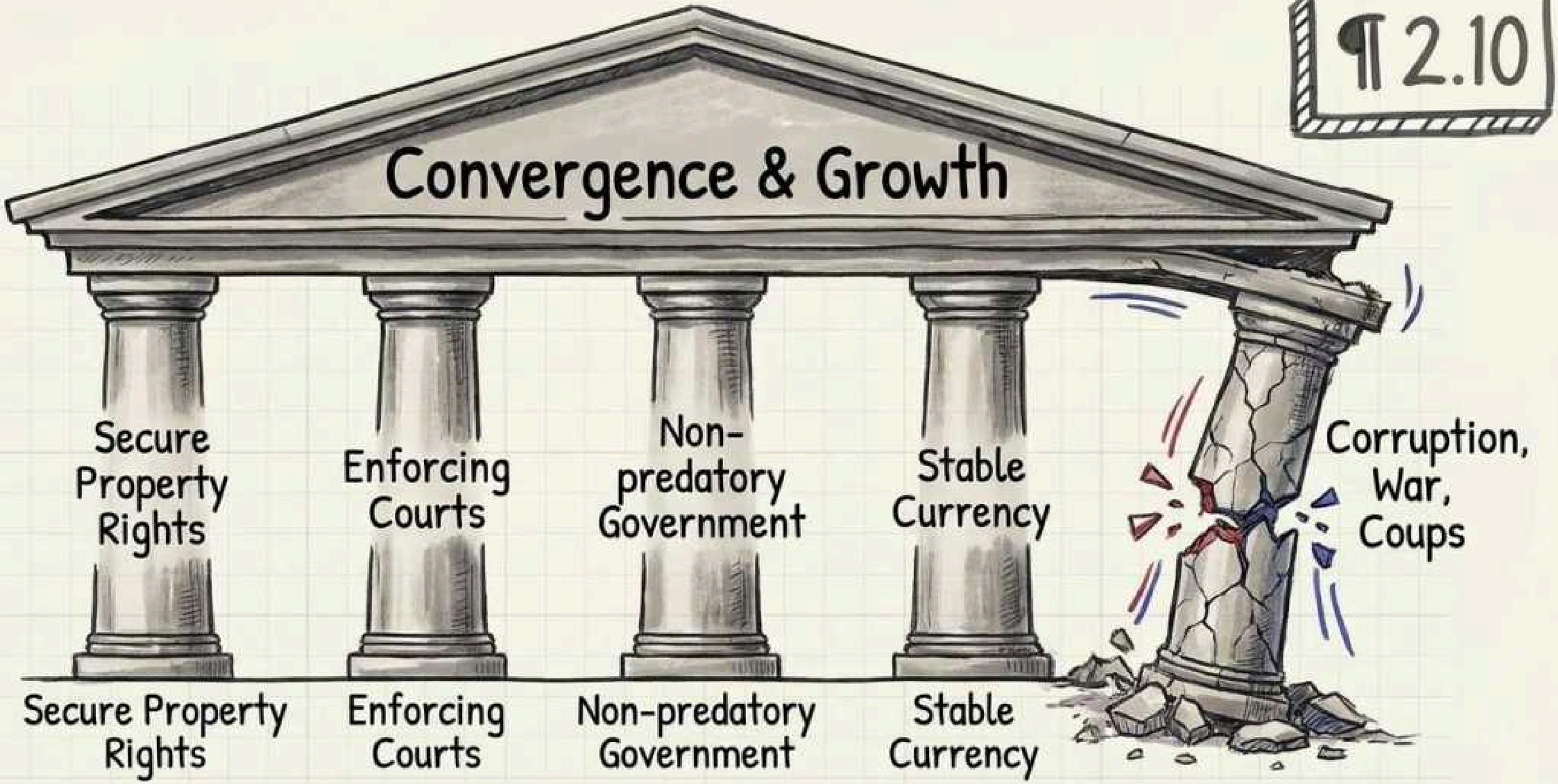
If only one input (like capital) rises,
its extra contribution shrinks.

¶ 2.9



Poor countries can grow faster than rich ones and converge, assuming they save, invest, and share world technology.

¶ 2.10



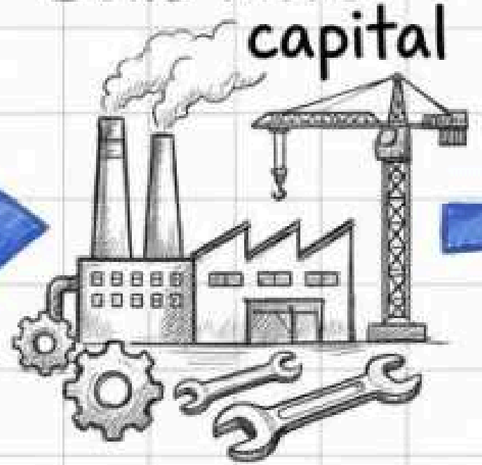
Growth is not guaranteed. Without secure institutions to protect rewards, investment collapses and poor countries fail to catch up.

¶ 2.11

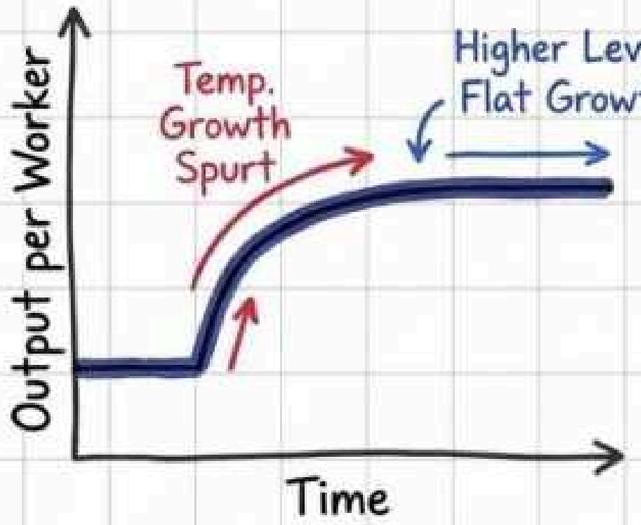
Save 10% of Income

Jump to 20% Saving

Build more capital



Output per worker rises.

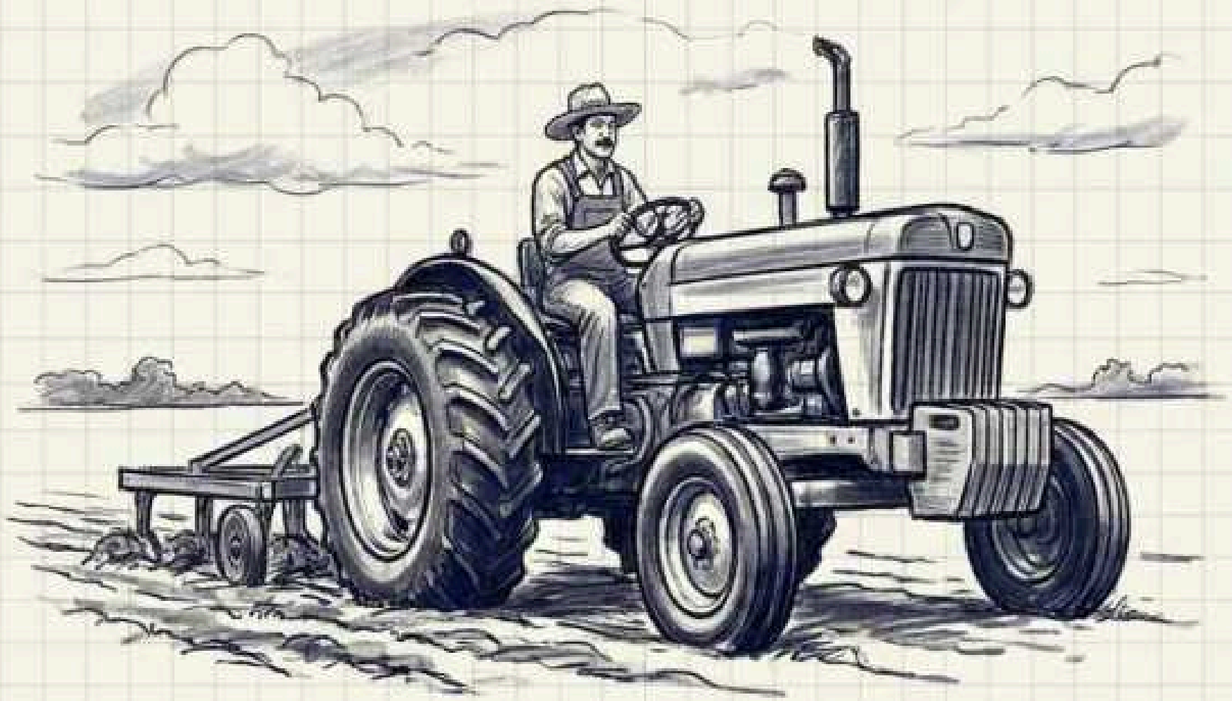


Due to diminishing returns, the gain flattens out. Higher saving pduces a higher *level* of income and a temporary period of faster growth, but not growth forever.

Technology: The Long-Run Engine

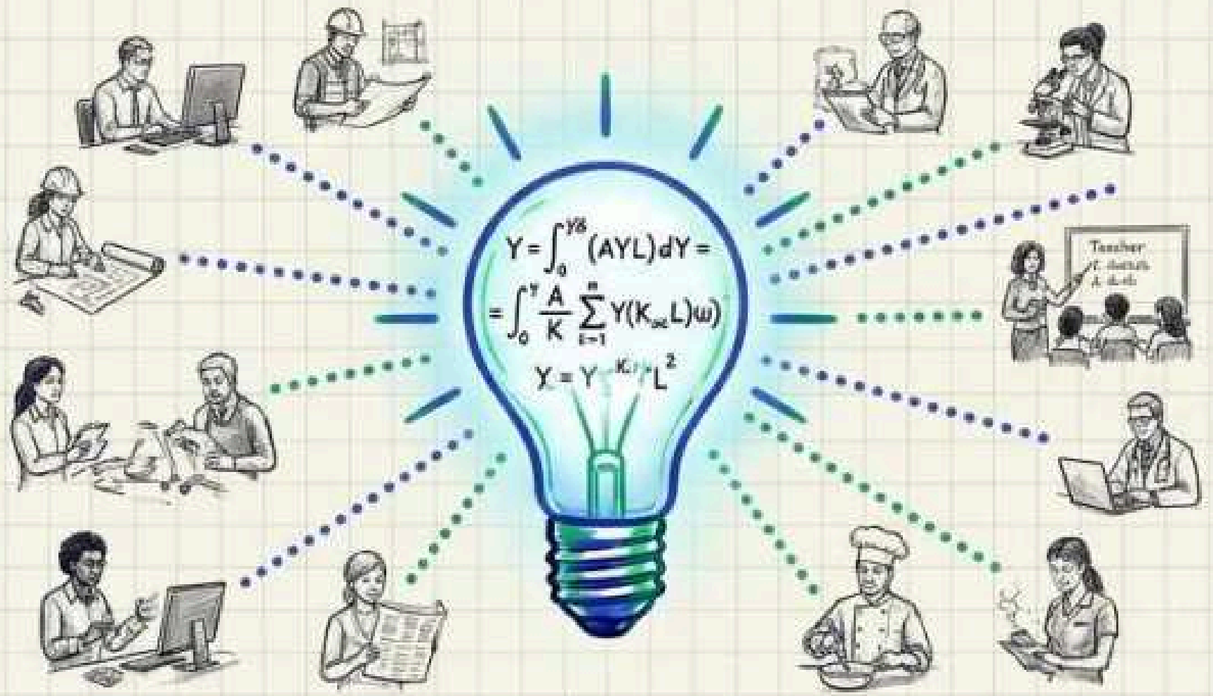
¶ 2.12

Machines are Rival.



Used by only one person at a time.

Ideas are Non-Rival.

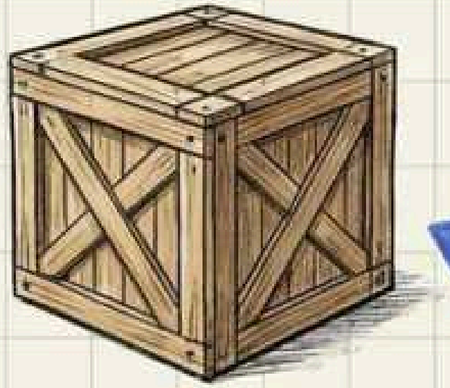


Once discovered, used by everyone at no extra cost.

This infinite scalability creates massive benefits for society, which is why we protect inventors with limited-time patents to encourage discovery.

Three Benefits of Open Trade

¶ 2.13



Access:
Buy capital and goods you cannot make domestically.





Scale:
Reach bigger markets, allowing local firms to specialize.



Exposure:
Introduction to foreign competition and new ideas.

Mid-20th century closed economies grew slowly.
Open economies (e.g., East Asia) grew fast.

What Governments Can Do

¶ 2.14

- [x] Protect property rights & maintain public order.
- [x] Invest in fundamentals: education, health, roads, & basic research.
- [x] Control inflation & budget deficits (creates a stable setting for firm planning).
- [x] Encourage saving and private investment.

Economists universally agree on these foundational basics, but debate heavily on how much further the government should intervene.

The Costs and Limits of Growth

¶ 2.15



Better technology and recycling can stretch resources, but growth requires trade-offs and does not automatically reduce inequality.

Applied Calculation: The 10-Year Projection

¶ 2.16

Country at $10k growing at 4%

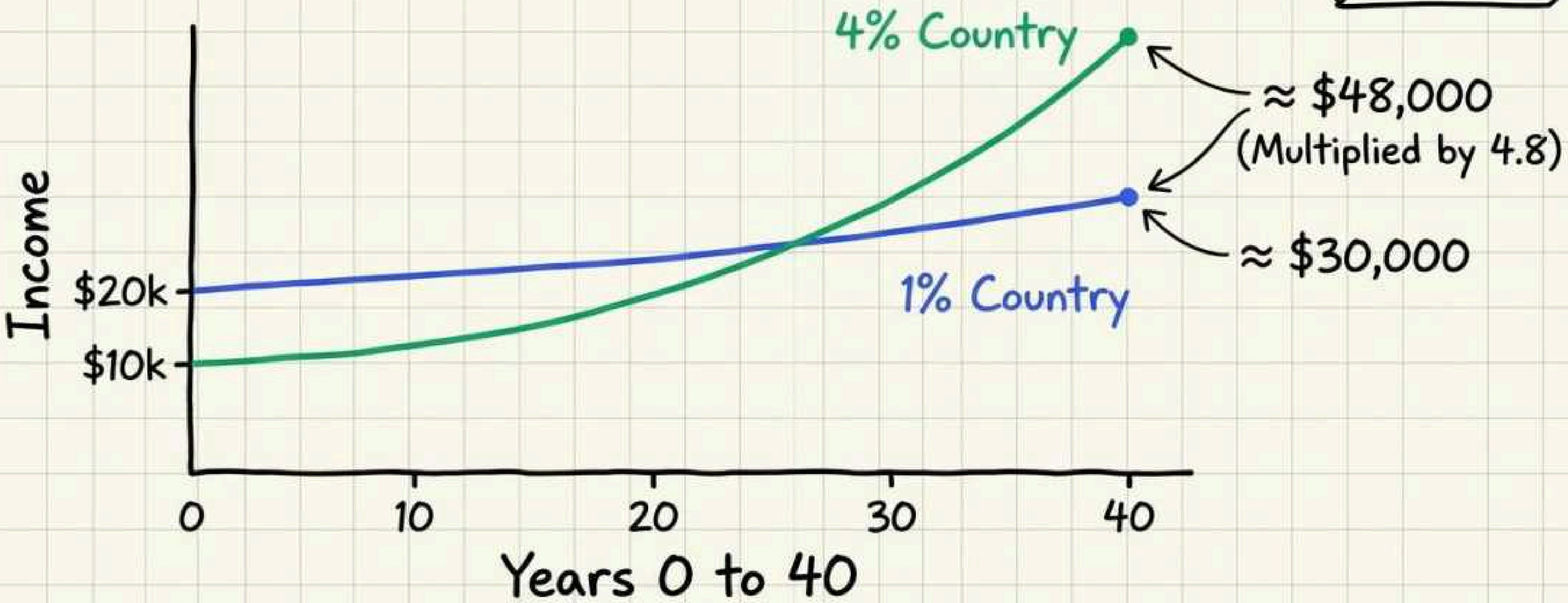
$$\$10{,}000 \times (1.04)^{10} \longrightarrow \$14{,}800$$

Country at $20k growing at 1%

$$\$20{,}000 \times (1.01)^{10} \longrightarrow \$22{,}000$$

After just one decade, the wealth gap is already narrowing.

¶ 2.17



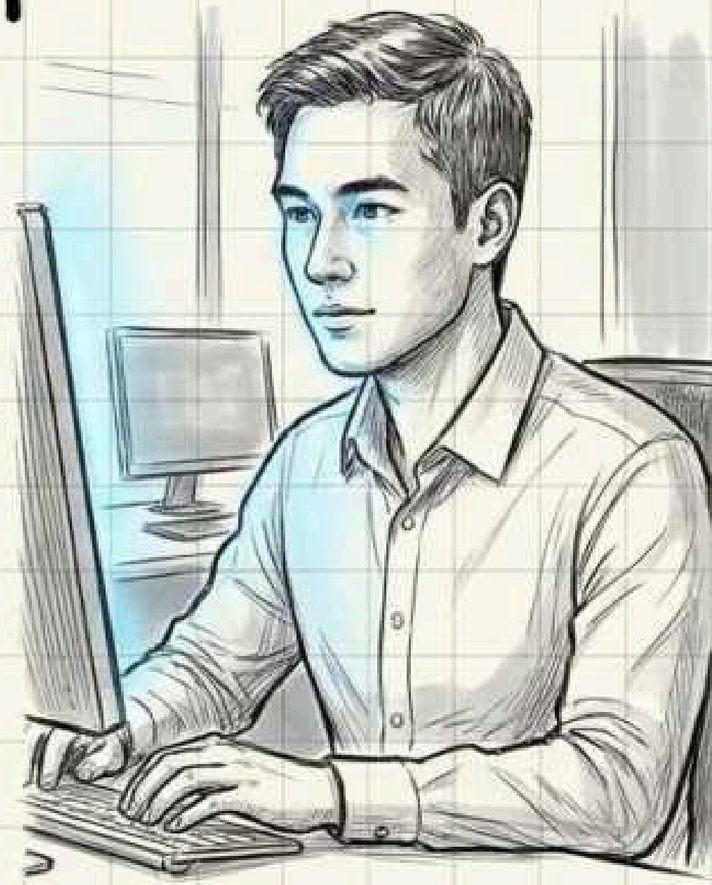
The ranking reverses. A poorer country growing fast will inevitably overtake a richer country growing slowly.

¶ 2.18

What makes you more productive than your grandparents?



- ☐ Capital?
- ☐ Skills?
- ☐ Technology?
- ☐ Institutions?



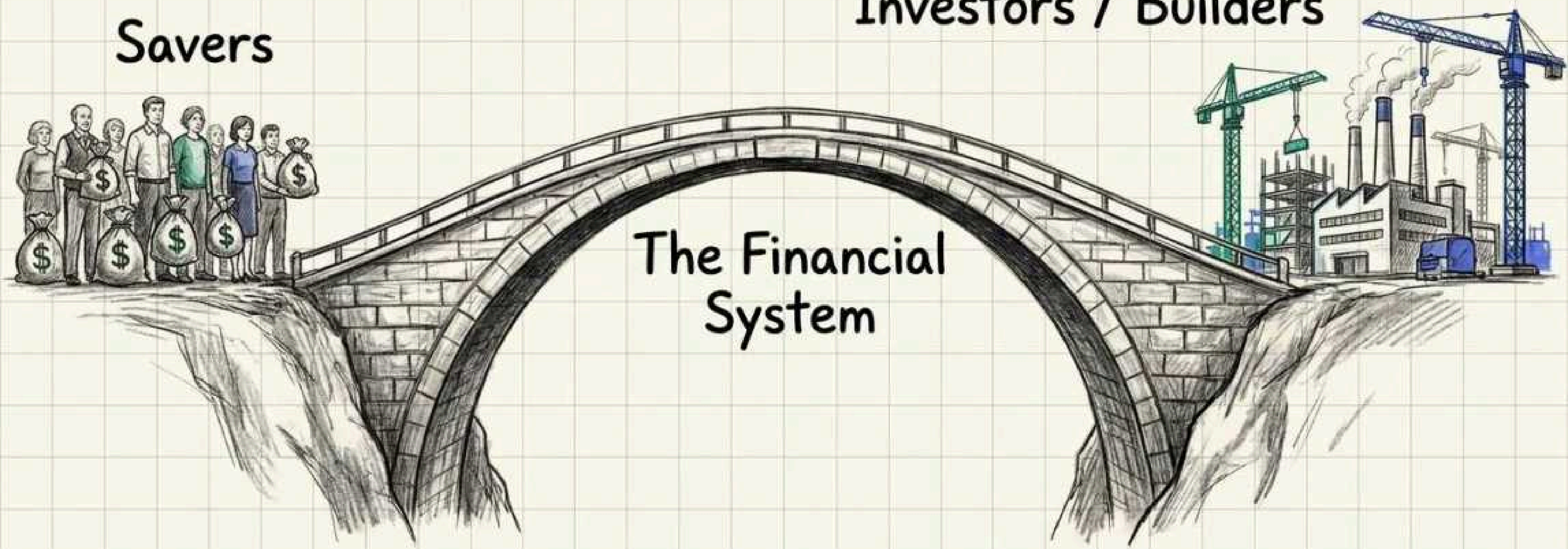
How would you know that the effect driving this productivity is a lasting one?

Looking Ahead to Lecture 3

¶ 2.19

Savers

Investors / Builders



Next: How saving and investment move money from those who have it, to those who can use it to build the future.