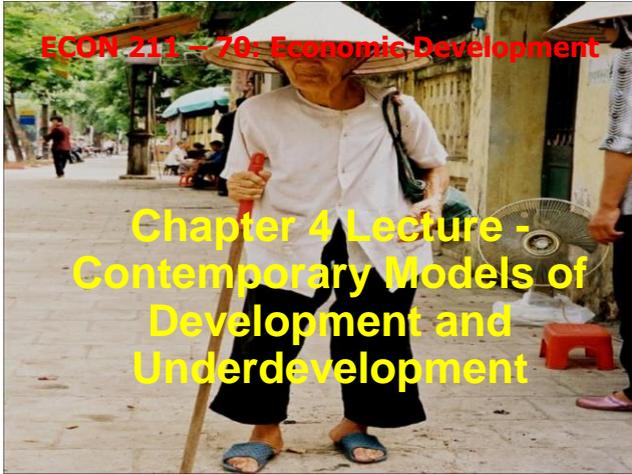


Chapter 4 Lecture - Contemporary Models of Development and Underdevelopment



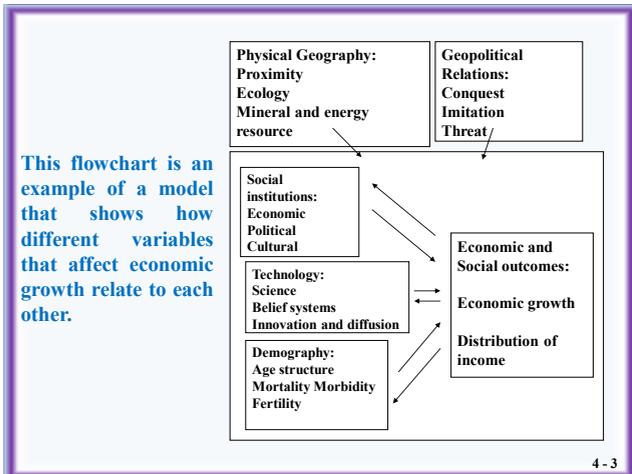
1

Beyond Solow – New Approaches to Growth

- Research by Solow and others reveals that GDP growth in the United States and many other countries has had to do largely, even primarily, with TFP growth (i.e., increases in productivity).
- Research has been conducted on why productivity growth has such a major impact and one explanation is that there are increasing returns to investment in knowledge. This may be a result of positive externalities (spillovers).

Can you think of an example?

2



3

To get a better understanding of how these variables relate to each other we will need to distinguish between mechanisms and contexts and institutions

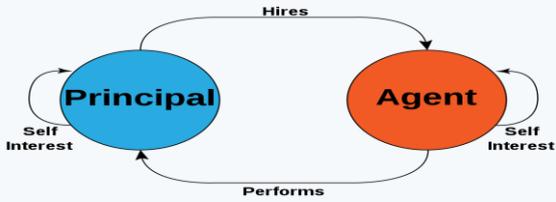
- **Mechanisms of Economic Growth**
 - Accumulation of capital
 - Division of labor
 - Innovation
 - Resource exploitation and depletion (pseudo growth)
 - Income transfers (e.g. .from rich to poor) (pseudo growth)
- **Social, Physical, and Geopolitical Context**
- **Kinds of Social Institutions**
 - Economic
 - Political
 - Cultural (norms, religious beliefs, governed by sanction)
 - Scientific

4

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Underdevelopment as Coordination Failure

- Economic development is difficult to achieve. It has been impossible for some countries (e.g., Nigeria, Sudan), but accomplished by others (e.g., S. Korea, Singapore)
- The success or failure of economic development policies can be explained by the “principal-agent” model.



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5

Underdevelopment as Coordination Failure

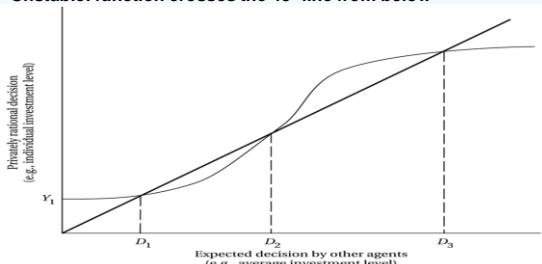
- **Principal:**
 - Government
- **Agents:**
 - Households
 - Private-sector firms
 - Public agencies
 - Government-owned enterprises
- International companies
- An effective principal is needed to coordinate actions taken by agents and achieve an optimal outcome, making all agents better-off.
- Coordination failure occurs when the principal fails to induce agents to coordinate their actions, which leads to an outcome that makes all agents worse-off.

4-4-6

6

Multiple Equilibria: A Diagrammatic Approach

- Often, these models can be diagrammed by graphing an S-shaped function and the 45° line
- Equilibria are
 - Stable: function crosses the 45° line from above
 - Unstable: function crosses the 45° line from below



4-7

7

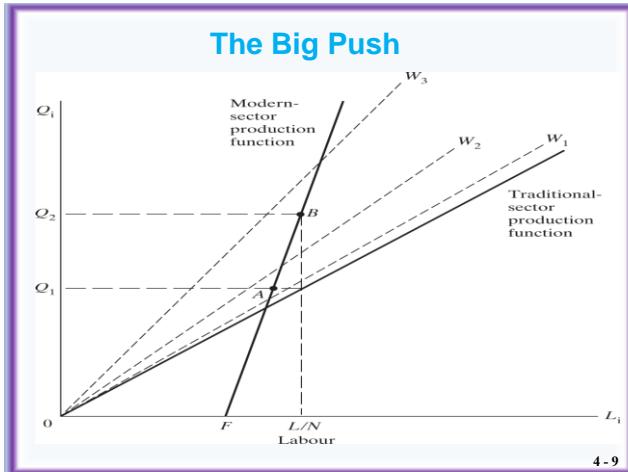
Starting Economic Development: The Big Push

- Sometimes market failures lead to a need for public policy intervention
- The Big Push: A Graphical Model
- To draw the graph, 6 assumptions are needed
 - One factor of production
 - Two sectors (in the sense of modern and traditional production techniques)
 - Same production functions (modern and traditional) for each activity
 - Consumers spend an equal amount on each good
 - Closed economy
 - Perfect competition with traditional firms operating, limit pricing monopolist with a modern firm operating
- Use the graph to examine conditions for multiple equilibria

4-8

8

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9

- ### Big Push Model Equilibria
- With a wage bill line like W_1 , passing below point A , it is profitable for a modern firm to enter even one sector, with all other sectors continuing traditional "cottage" production, so industrialization is the only equilibrium
 - With a wage bill line like W_3 , passing above point B , even if a modern producer entered in all product sectors, all of these firms would still lose money, so only the traditional technique would be used.
 - The steeper (i.e., more efficient) the modern-sector production technique, and/or the lower the fixed costs, the more likely it is that the wage bill will pass below the corresponding point A .
 - But if the wage line passes between points A and B , it is efficient to industrialize; but in general the market will not achieve this on its own.
 - Thus, with a wage bill line like W_2 , passing between A and B , there are two equilibria: one in which there is industrialization and the society is better off (point B) and one without industrialization (point A).
 - The market will not move the economy to point B because of coordination failure – a type of large-scale market failure

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- ### The Big Push Model: Some Points to Keep in Mind
- The three wage levels are examples of what might prevail in a given economy: They are NOT a succession of three wages over time
 - The diagram is only one easy-to-depict illustration among several reasons why a Big Push might be needed
 - The point is NOT that the problem of industrialization is commonly that workers demand too high wages – that might be unusual; it is used as an illustration because it is easy to describe graphically
 - In this regard, note that other causes of multiple equilibria are discussed in the context of this model, such as fixed costs that are lower for later-entering firms than for pioneers, a technological externality such as "learning by watching" (the phrase being a contrast with "learning by doing")
 - Moreover, other models discussed in the chapter show multiple equilibria can arise from additional causes

11

- ### Why the Problem Cannot be Solved by a "Super-Entrepreneur"
- Super Entrepreneur?
 - Capital market failures
 - Cost of monitoring managers- Asymmetric Information
 - Communication failures
 - Limits to knowledge
 - Lack of any empirical evidence that would suggest this is possible

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In a Nutshell: Big Push Mechanisms

- Raising total demand
- Reducing fixed costs of later entrants
- Redistributing demand to later periods when other industrializing firms sell
- Shifting demand toward manufacturing goods (usually produced in urban areas)
- Help defray costs of essential infrastructure (a similar mechanism can hold when there are costs of training, and other shared intermediate inputs)

4 - 13

13

The O-Ring Theory of Economic Development

- Production is modeled with strong complementarities of inputs (labor & capital) and interdependencies among firms (output of one firm is input of another)
- Positive assortative matching in production: skilled labor works with its peers; profitable and modernizing firms coordinate with their counterparts
- Implications of strong complementarities for economic development and the distribution of income across countries will induce countries at the same level of development to coordinate their actions
- MDCs cooperate and coordinate with each other in the development and transfer of modern technology

4-14

14

Kremer's O-Ring Theory: A Numerical Illustration

- Suppose a Human Resources (HR) Department has four workers - two H-types and two L-types;
- Strong complementarities are present when output Q is determined by the product of the qualities, i.e. $Q = q_i q_j$
- How to allocate for efficiency: {HL, LH} or {HH, LL}?

HH + LL versus 2HL

- We know $(H - L) > 0$ so : $(H - L)^2 > 0$
- $(H - L)^2 = H^2 - 2HL + L^2 > 0$ thus $H^2 + L^2 > 2HL$
- That is: Mix or Match?
- This illustrates that with strong complementarity it is more efficient to match, i.e. produce using positive assortative matching

4-15

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Kremer's "O-Ring theory": Implications

- Firms tend to employ workers of similar skills for tasks
- Workers performing the same task at a high skill firm earn higher wages than in a low skill firm
- Explains why a worker of given skill moving from a developing to a developed country receives a higher wage using the same skills
- In the model, wages increase with q at an increasing rate, so wages will be more than proportionally higher in developed countries
- When co-workers or others doing complementary work have higher skills, greater *incentive* to acquire more skills
- This type of income externality is by now a familiar condition in which multiple equilibria can emerge

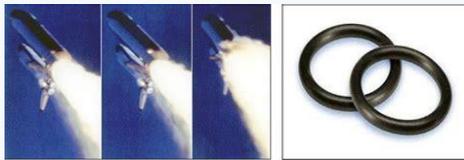
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Kremer's O-Ring Theory of Economic Development

- As a result, economies can have multiple equilibria—a bad one with low-skilled working together vs a good one high-skilled working together.
- This offers an alternative explanation to why modest individual skill differences can mushroom into huge aggregate productivity differences



Space Shuttle Challenge Disaster

O-ring Seals

4 - 17

17

Economic Development as Self-Discovery

No person is born knowing their comparative advantage; specific comparative advantage of an economy also not obvious; no alternative to trial and error...

- Hausmann and Rodrik: A Problem of Information
- Not enough to say developing countries should produce “labor intensive products,” because there are thousands of them
- Industrial policy may help to identify true direct and indirect domestic costs of potential products to specialize in, by:
 - Encouraging exploration in first stage
 - Encouraging movement out of inefficient sectors and into more efficient sectors in the second stage

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The Growth Diagnostics Framework

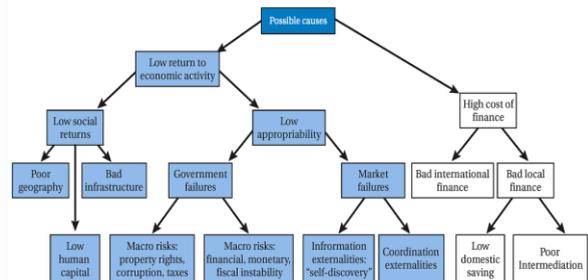
- Focus on a country's most binding constraints of economic development: low rate of return on investment and high cost of financing
- No “one size fits all” in development policy of market coordination
- Look at diagram on next slide that assumes Insufficient investment in physical, social, environmental, and human capital

4 - 19

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The Growth Diagnostics Framework

Problem: Low levels of private investment and entrepreneurship

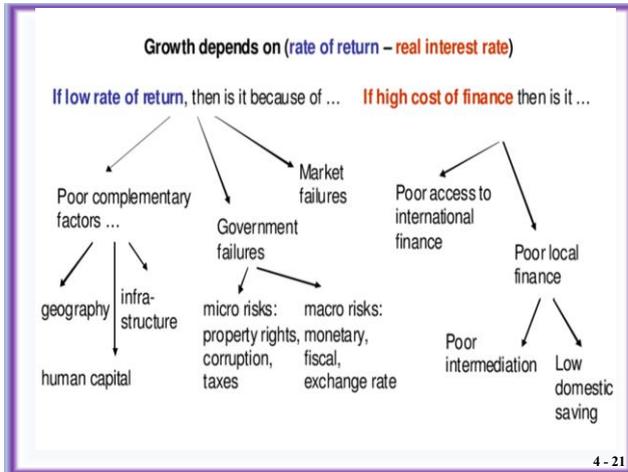


Source: Ricardo Hausmann, Dani Rodrik, and Andrés Velasco, “Getting the diagnosis right,” *Finance and Development* 43 (2006), available at <http://www.inf.org/external/pubs/ft/fandd/2006/03/hausmann.htm>. Used with permission.

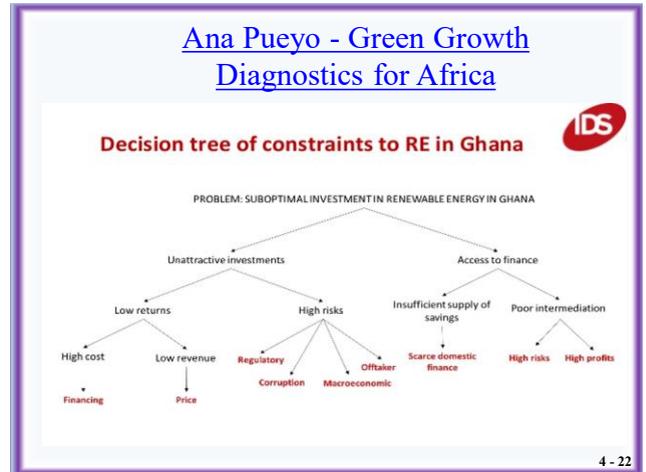
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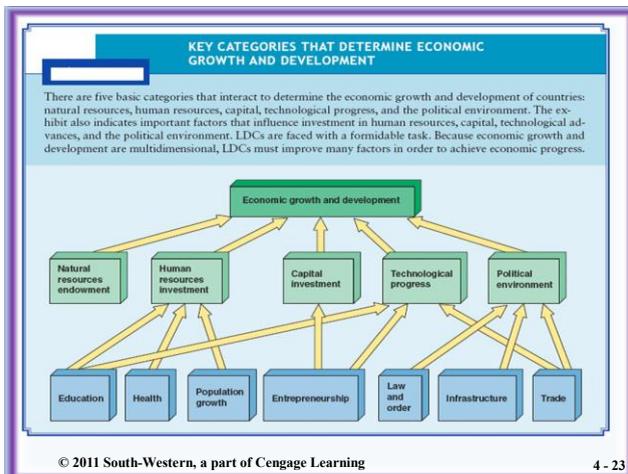
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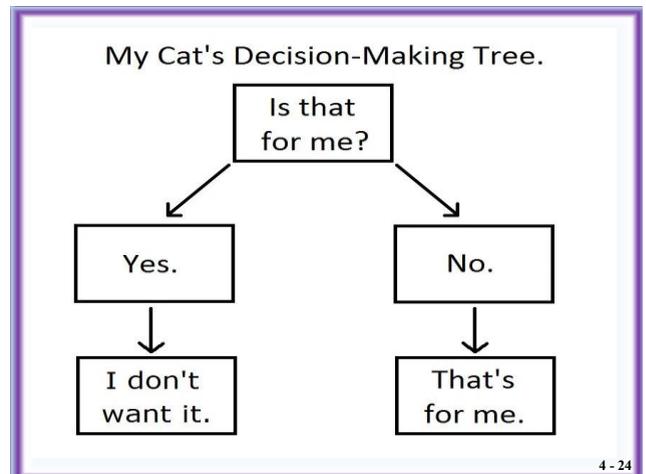
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