
Development Policy

STRUCTURAL AND DEMOGRAPHIC CHANGE

Economic development with unlimited supplies of labor (1954)



W. Arthur Lewis

- How can developing countries raise the rate of investment during industrialization?
- The answer: drop the assumption of a fixed supply of labor
- This means that labor is not paid a wage that is equal to its marginal productivity and there must be another mechanism to set wages.

Two structural features of developing economies

1. The presence of surplus labor, particularly in the rural sector, which is unemployed or underemployed despite low market wages.
2. Low share of savings and investment in national income.

Structural change

- Four components:
 - Falling share of agriculture in national output and employment
 - Rising share of manufacturing and modern services
 - Migration from rural to urban areas
 - \cap shaped demographic transition: Falling mortality rates, then falling fertility rates
- Productivity growth more rapid in manufacturing than in agriculture, so that even as output grows in agriculture its relative in GDP share falls.
- Manufacturing share of GDP tends to increase until GDP per capita around \$14,000, but this varies based on country characteristics
 - Textiles, garments and food processing are first to develop: labor intensive, low tech, domestic demand
 - Successful manufacturing countries gradually move into more capital and knowledge intensive industries like machinery and vehicles

Engel's Law: The income elasticity of food is less than one.

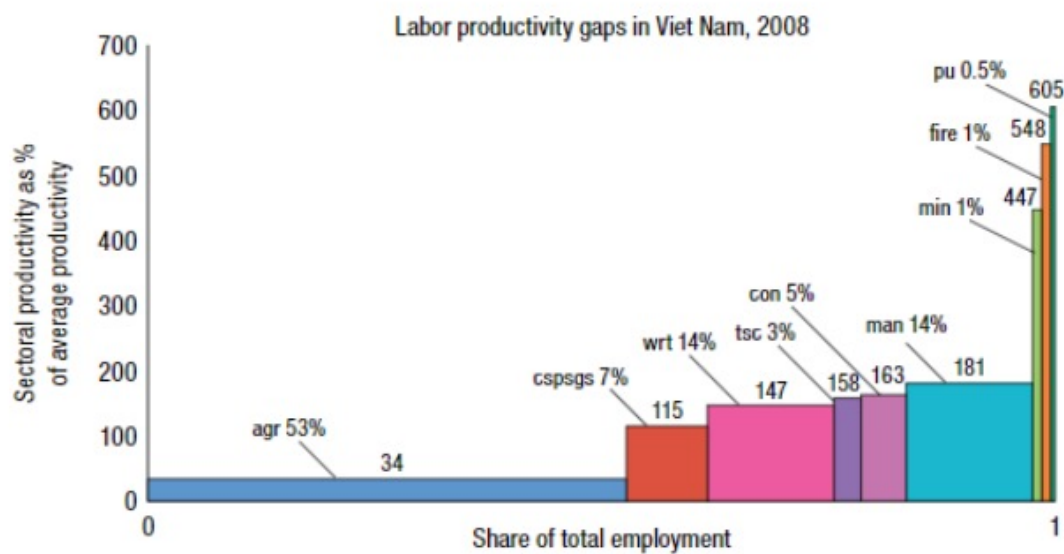
- The change in quantity of food demanded relative to the change in income
- $\varepsilon_d = \frac{\Delta Q/Q}{\Delta I/I}$, where Q is quantity demanded and I is income.
- For food, ε is greater than zero and less than 1 (demand goes up with income, but not as much as income goes up).
- As we get richer we spend less of our income on food and more on other things like housing, clothing, education, transportation, etc.

Productivity growth more rapid in manufacturing

- Manufacturing is not constrained by biological processes, seasonality or climate
- Increasing returns to scale more common in manufacturing than in agriculture
- Even as output increases in agriculture its share of GDP falls
- But labor productivity difference narrows as labor leaves agriculture for other sectors
- Manufacturing share of GDP tends to increase until GDP is about \$14,000 per capita, after which share of services increases faster

Labor productivity gaps in Vietnam, 2008

- Labor productivity in manufacturing 5x in agriculture
- Slow but steady movement of labor from agriculture to manufacturing and services
- Slow but steady movement of labor from unenumerated to enumerated sector

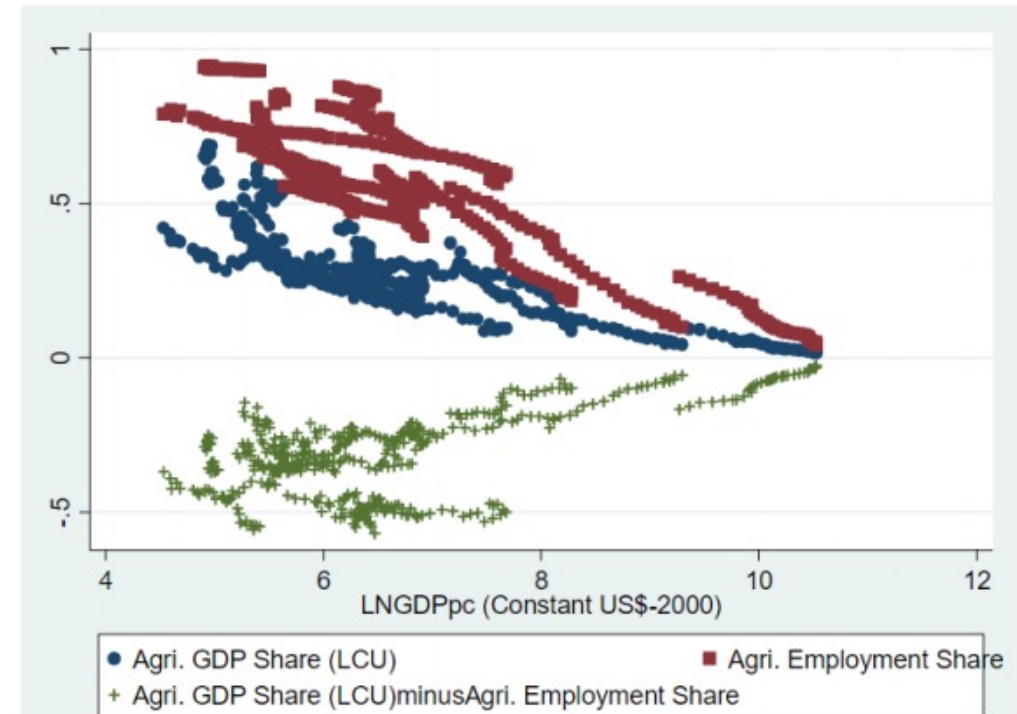


Source: McCaig and Pavcnik 2016

Gap between agriculture's employment share and GDP share is the productivity gap

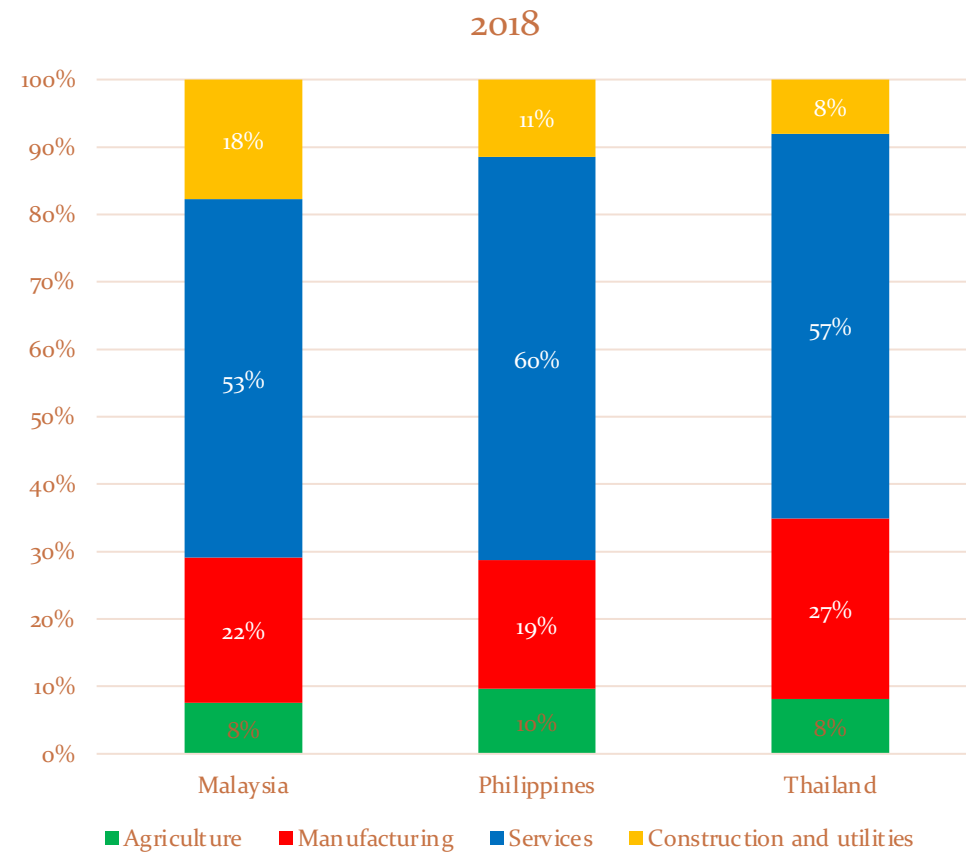
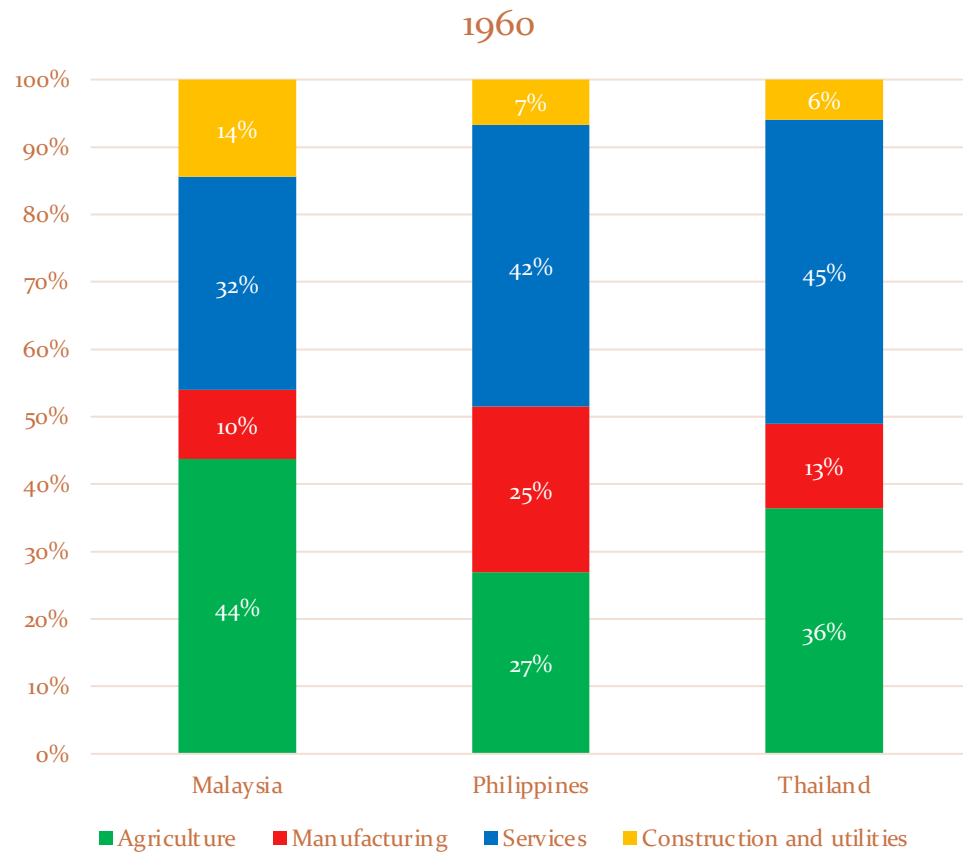
- Agriculture's share of the labor force decline more slowly than share of GDP
- Low productivity and surplus labor in agriculture
- Gap eliminated at high levels of income
- Asian countries shed labor from agriculture more slowly because more investment in rural sector

13 Asian Countries – Bangladesh, China, India, Indonesia, Japan, Korea, Malaysia, Nepal, Pakistan, Papua New Guinea, Philippines, Sri Lanka, and Thailand

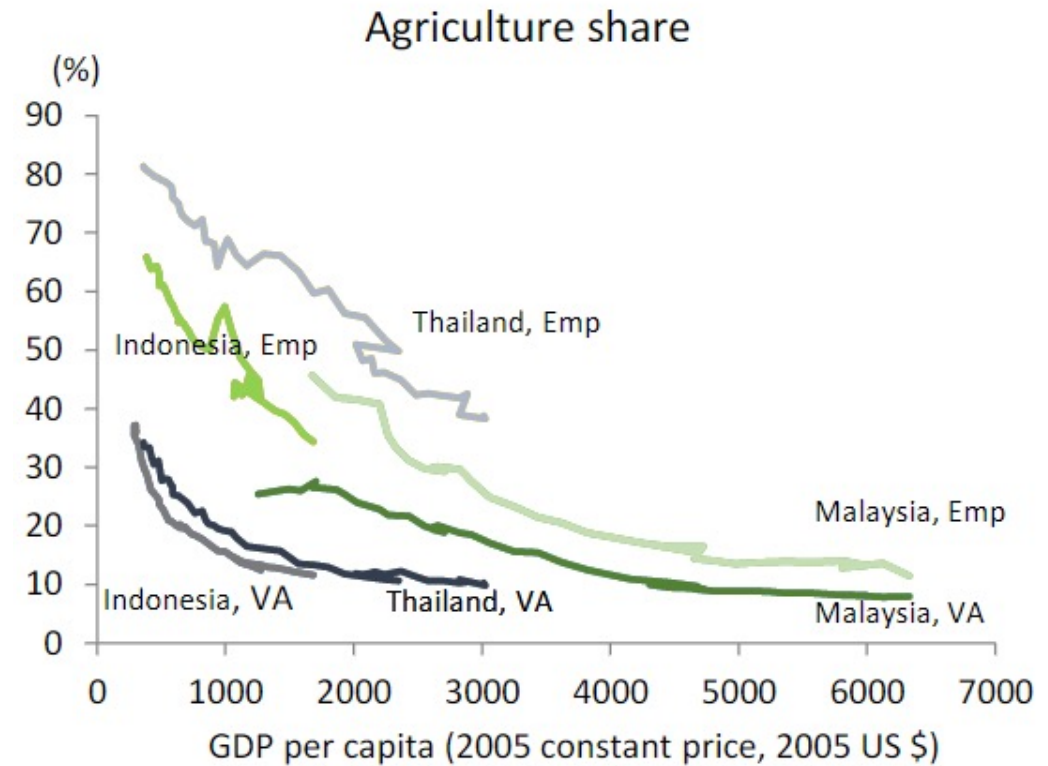
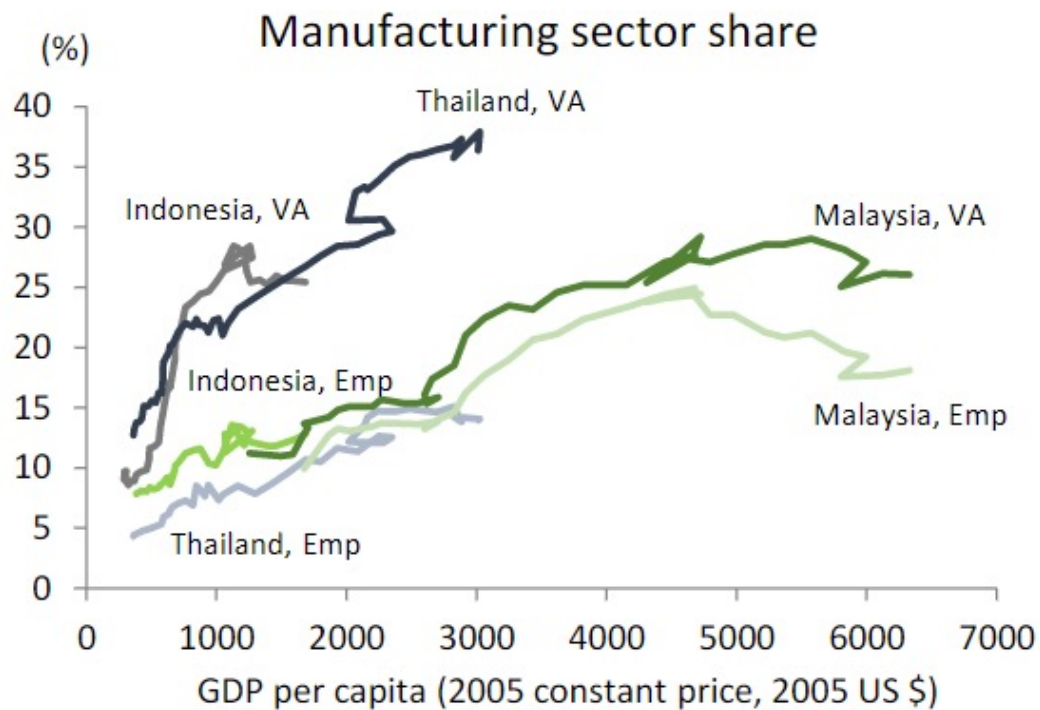


Timmer and Akkus 2008

Structural change: Agriculture's share in GDP falls

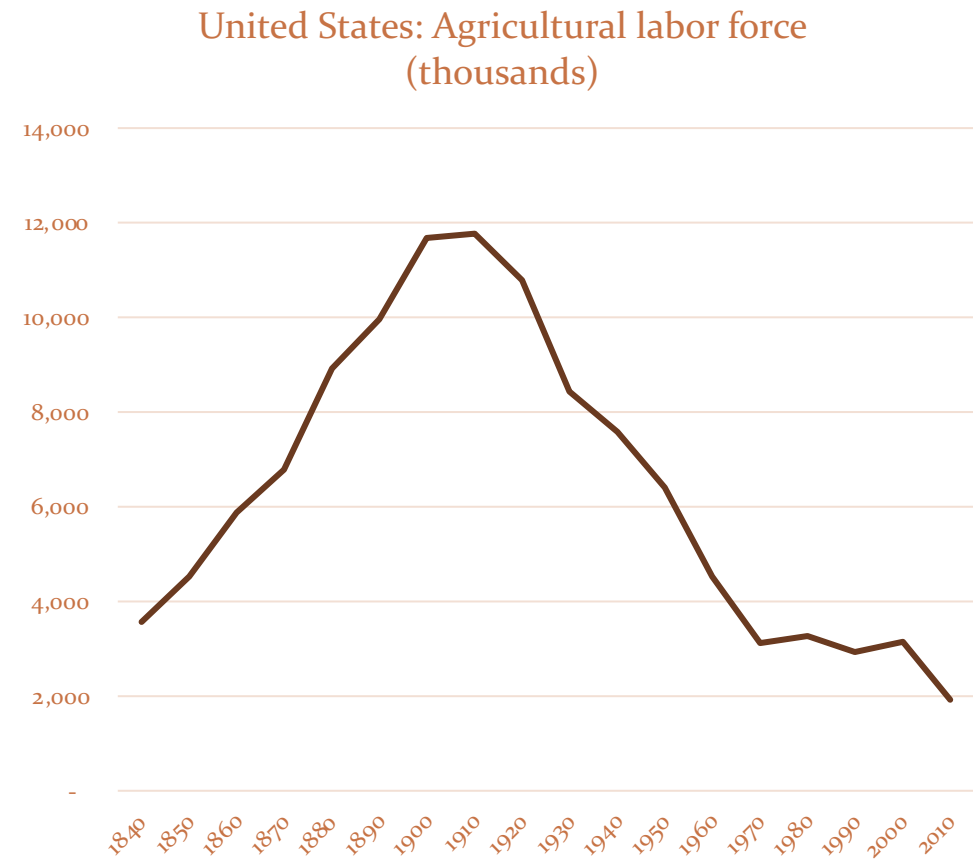
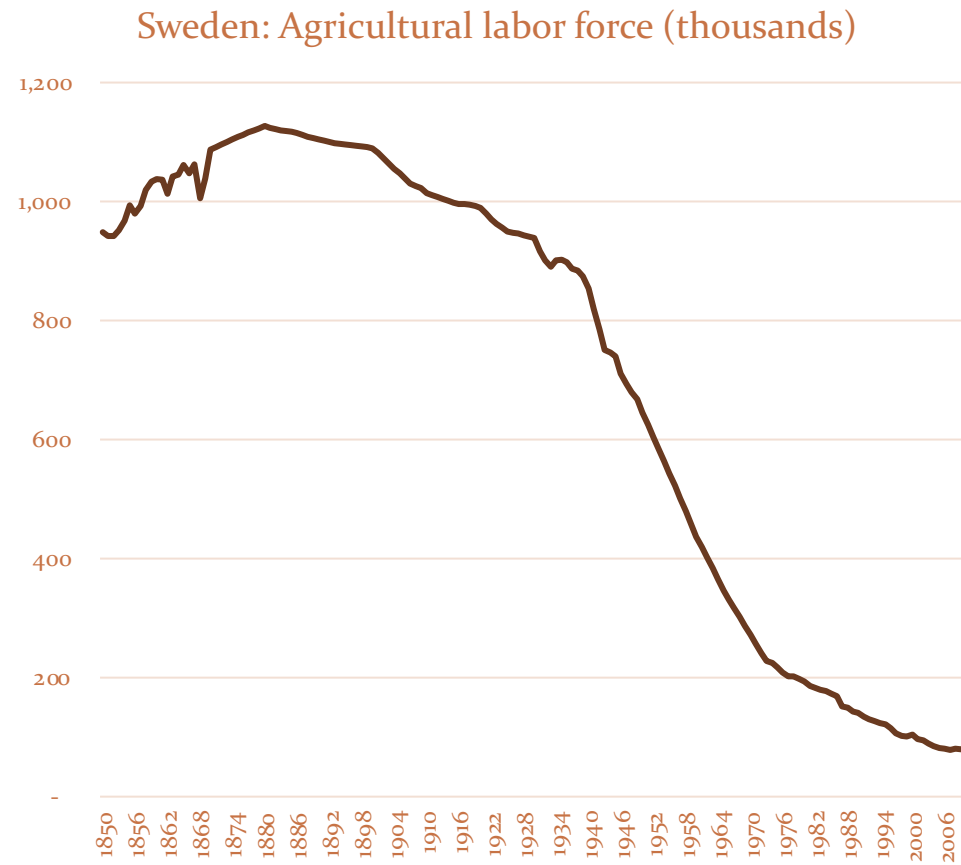


Manufacturing value added rises with GDP per capita



Source: Arief and Sumner 2017

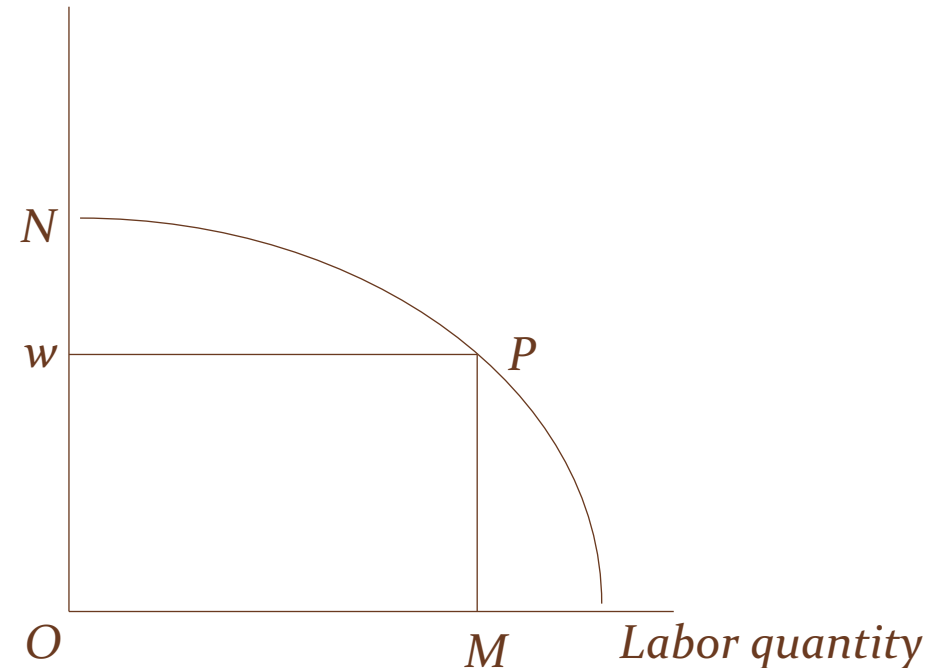
Agricultural labor force declines as workers move into industry and services



Lewis: Economic Development with Unlimited Supplies of Labor (1954)

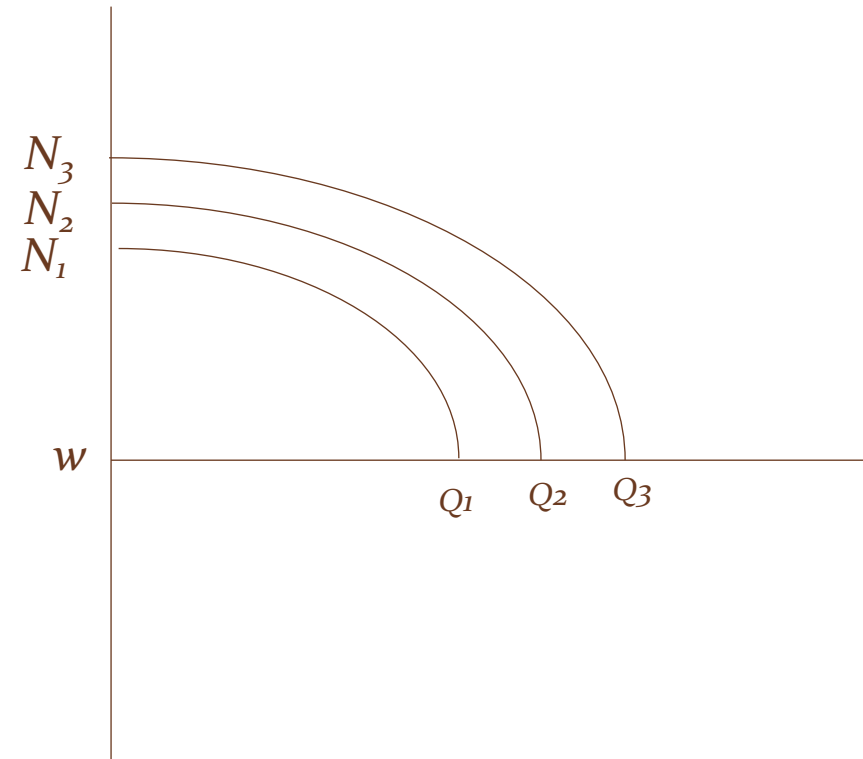
- Marginal productivity of labor is low → extra family workers on a small farm; petty traders; shoe-shiners; unpaid female workers.
- The supply of labor at the subsistence wage is greater than demand and is therefore “unlimited”.
- If w is the wage that capitalists must pay to attract labor (above subsistence)
- Capitalists hire labor to the point at which the marginal product equals the wage
- The workers’ share is $wPMO$ and the capitalists’ share is NwP
- Workers outside of the capitalist sector earn less than w beyond M

Marginal product of labor



Economic Development with Unlimited Supplies of Labor (1954)

- “The key to the process is the use which is made of the capitalist surplus.”
- As the surplus is reinvested, the marginal productivity of labor and the amount of labor in the capitalist sector increase, which increases capitalist surplus.
- Why do poor countries save so little? Not because they are poor, but because the capitalist sector is small. Profits small as a share of national income.



Lewis as a departure from the neoclassical model

- In neoclassical economics, all labor is paid its marginal product
- Therefore any increase in savings (purchase of investment goods) must come at the expense of consumer goods.
- With “surplus” labor, wages are less than marginal productivity in the capitalist sector, creating a surplus for reinvestment that does not affect the volume of consumer goods.
- The mechanism only works if there is a sufficient supply of food (wage goods) to prevent inflation and rising wages (which reduce surplus) – the “wage goods constraint”
- The process ends when surplus labor is employed and real wages rise.

Southeast Asia from land to labor surplus

- 1900 Southeast Asian population was 80 million, with 1/3 in Java: weak states, porous borders, shifting cultivation.
- The Industrial Revolution and advances in transportation gave rise to demand for tropical products like rubber, tea, coffee, sugar and minerals like oil and tin.
- Suez Canal and US transcontinental railroad completed in 1869; advances in steamships made long distance shipping commercially viable
- Burma, Thailand and Vietnam exported rice to feed to growing labor force in mines, on plantations and in factories.
- 1880-1940 20 million Indians and 30 million Chinese migrated to Southeast Asia → a migration equivalent to the European migration to North America
- But migration mostly male (until 1920s) and often circular → permanent migrants about 20%



- Local peasantry mostly left to grow food, while plantations and mines run with cheaper migrant labor; local elite resisted use of local labor on plantations

From land to labor surplus (Hirschman and Bonaparte 2012)

Population Estimates (Millions) and Average Annual Growth Rates by Country:
1950 to 2010, with Projections to 2050 (continued on next page)

	Colonial Censuses		UN Population Estimates			1980	1990	2000	2010
	c. 1900–11	1930–39	1950	1960	1970				
World			2,532	3,038	3,696	4,453	5,306	6,123	6,896
Asia			1,403	1,708	2,135	2,638	3,199	4,164	4,164
SE Asia	~85	~130	173	219	285	359	445	524	593
% of World Pop			6.8%	7.2%	7.7%	8.1%	8.4%	8.6%	8.6%
% of Europe			31.6%	36.3%	43.5%	51.8%	61.8%	72.1%	80.4%
Brunei Darussalam			0.0	0.1	0.1	0.2	0.3	0.3	0.4
Cambodia	1.7		4.3	5.4	6.9	6.5	9.5	12.4	14.1
Indonesia	40.2	60.7	74.8	91.9	118.4	150.8	184.3	213.4	239.9
Laos	0.6		1.7	2.1	2.7	3.2	4.2	5.3	6.2
Malaysia	2.4	3.8	6.1	8.2	10.9	13.8	18.2	23.4	28.4
Myanmar/Burma	10.5	14.7	17.2	21.0	26.2	32.9	39.3	45.0	48.0
Philippines	7.6	16.0	18.4	26.0	35.5	47.1	61.6	77.3	93.3
Singapore	0.2	0.6	1.0	1.6	2.1	2.4	3.0	3.9	5.1
Thailand	8.3	11.5	20.6	27.3	36.9	47.5	57.1	63.2	69.1
Timor-Leste			0.4	0.5	0.6	0.6	0.7	0.8	1.1
Vietnam	14.9	17.6	28.3	35.2	44.9	54.0	67.1	78.8	87.8

Rising fertility and declining mortality

- Colonialism production increased demand for rice and stimulated expansion of irrigated rice into frontier areas.
- Colonial administration reduced warfare and political instability
- Not much evidence of declining mortality until after independence: But after 1950 historic falls in mortality → insecticides (malaria); childhood immunization programs.
- Fertility transition from the 1980s: rising income levels and female secondary and tertiary education the main factors.
- Southeast Asian population will stabilize in second half of 21st century.

From labor scarce to labor surplus and structural change in Southeast Asia

- It was underutilized land that attracted imperial powers to Southeast Asia, not surplus labor.
 - During the early years of colonialism labor was imported from China and India to work on the plantations and in mines.
 - Vietnam was a partial exception: labor was imported from north to work rubber plantations in the south—the degree of exploitation of local labor was crucial to the nationalist and communist movements
- Unintended consequence of imperialism: fertility rates rose as colonial powers imposed order (fewer wars) and stimulated demand for food crops (rice) → the long transition from labor scarce to labor abundant
- Mortality rates fell after independence, rapid increase in population.

Some policy implications

- Development entails transfer of labor from agriculture to industry, and rising investment in industry.
- This *does not mean* falling investment in agriculture: As we shall see in coming weeks, structural change can be choked off by slow productivity growth in agriculture.
- Employment creation is the driver of poverty and inequality reduction: If employment growth is slow, labor will be stuck in low productivity, unsteady jobs, which makes inequality worse.
- Outcomes depend on how the surplus (capital) created during structural change is invested. If it is invested in speculative (land) rather than productive (factory) assets, growth will be slower.

Discussion questions

1. In what ways are developing countries structurally different from advanced countries?
2. Did demographic change drive development in Southeast Asia or did development drive demographic change?