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PUBLIC POLICY AND MANAGEMENT

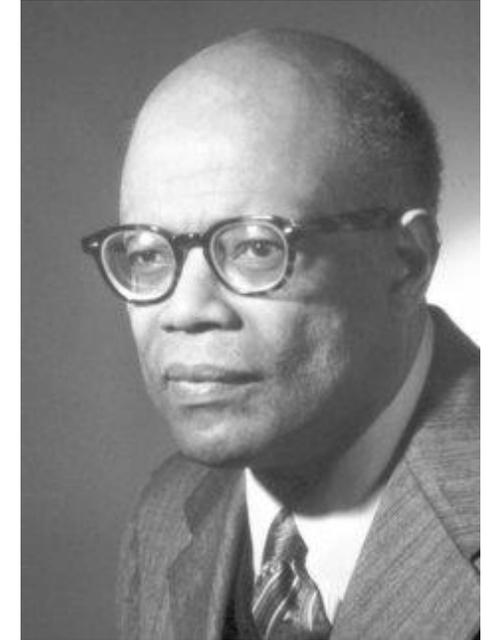
Structural Change

Development Policy
Summer 2023

Economic Development with Unlimited Supply of Labor (1954)



- How do developing countries raise the rate of investment during the process of industrialization?
- The supply of labor is not fixed because of widespread unemployment and underemployment.
- Wages are not equal to marginal productivity → they are set “institutionally” or by bargaining.
- 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.



W. Arthur Lewis



Four components of structural change

- Agriculture's share in *national output* and *employment* falls
- Share of manufacturing and modern services rises in national output and employment
- People move from rural to urban areas (and between rural areas)
- \cap shaped demographic transition: Falling mortality rates, then falling fertility rates.



Manufacturing and structural change

- Productivity growth is faster in manufacturing than in agriculture
 - Even as agricultural output grows its *share* of GDP falls.
 - Agricultural labor productivity releases labor to manufacturing while enabling food supplies to keep pace with demand.
- Manufacturing's share of GDP increases until GDP per capita reaches about \$14,000 (high income status)
 - Textiles, garments and food processing develop first: labor intensive, low tech, domestic demand
 - Successful countries move into more capital and knowledge intensive industries like machinery and vehicles



Manufacturing and productivity growth

- Manufacturing is not constrained by biological processes, seasonality or climate
- Increasing returns to scale more common in manufacturing than in agriculture
- Exports of manufactured goods creates opportunities for rapid productivity growth
- Labor productivity differences between sectors narrow as labor leaves agriculture for other sectors (few workers in agriculture means that each worker is more productive)

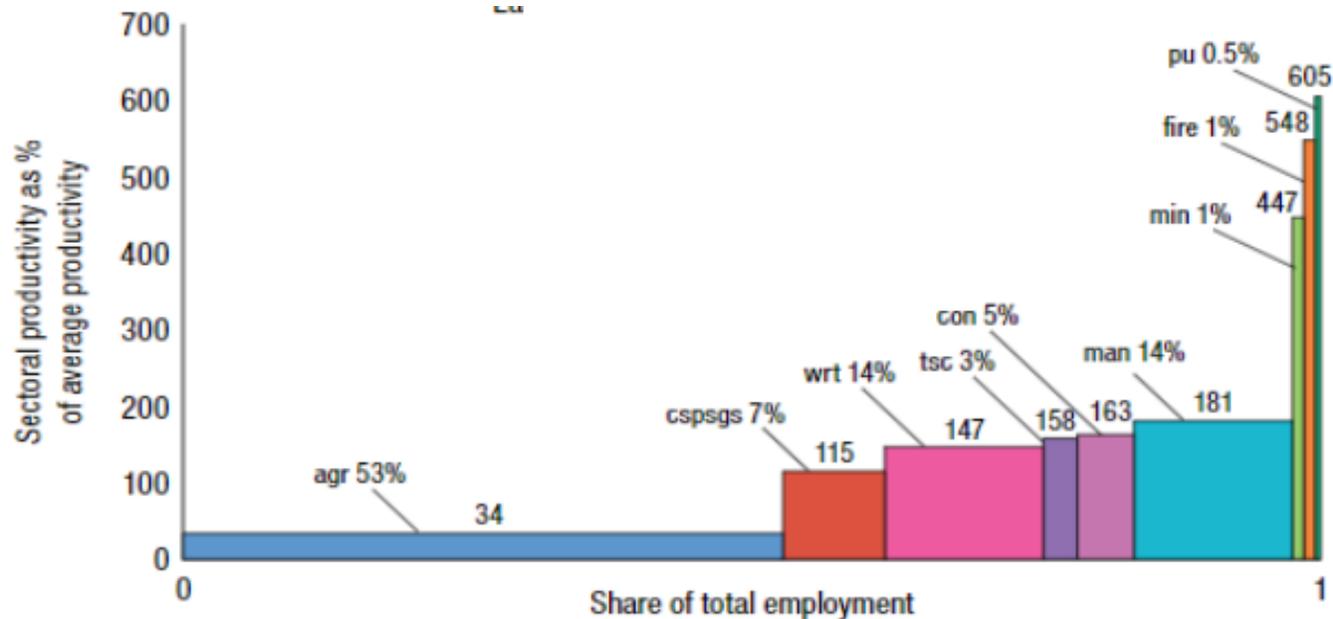


Engel's Law: Income elasticity of food is less than one

- Demand for food increases as incomes rise, but the proportion of additional income used to buy food falls.
- $\epsilon_d = \frac{\Delta Q/Q}{\Delta I/I}$, where Q is quantity demanded and I is income.
- As we get richer we spend less of our income on food and more on other things like housing, clothing, education, transportation, etc.



Labor productivity gaps in Vietnam 2008



Source: McCaig and Pavcnik 2016

Agr=agriculture

Cspsgs=community, social, personal and government services

Wrt=wholesale and retail trade

Tsc=transport and communications

Con=construction

Man=manufacturing

Min=Mining

Fire=Finance, insurance and real estate

Pu=Public utilities

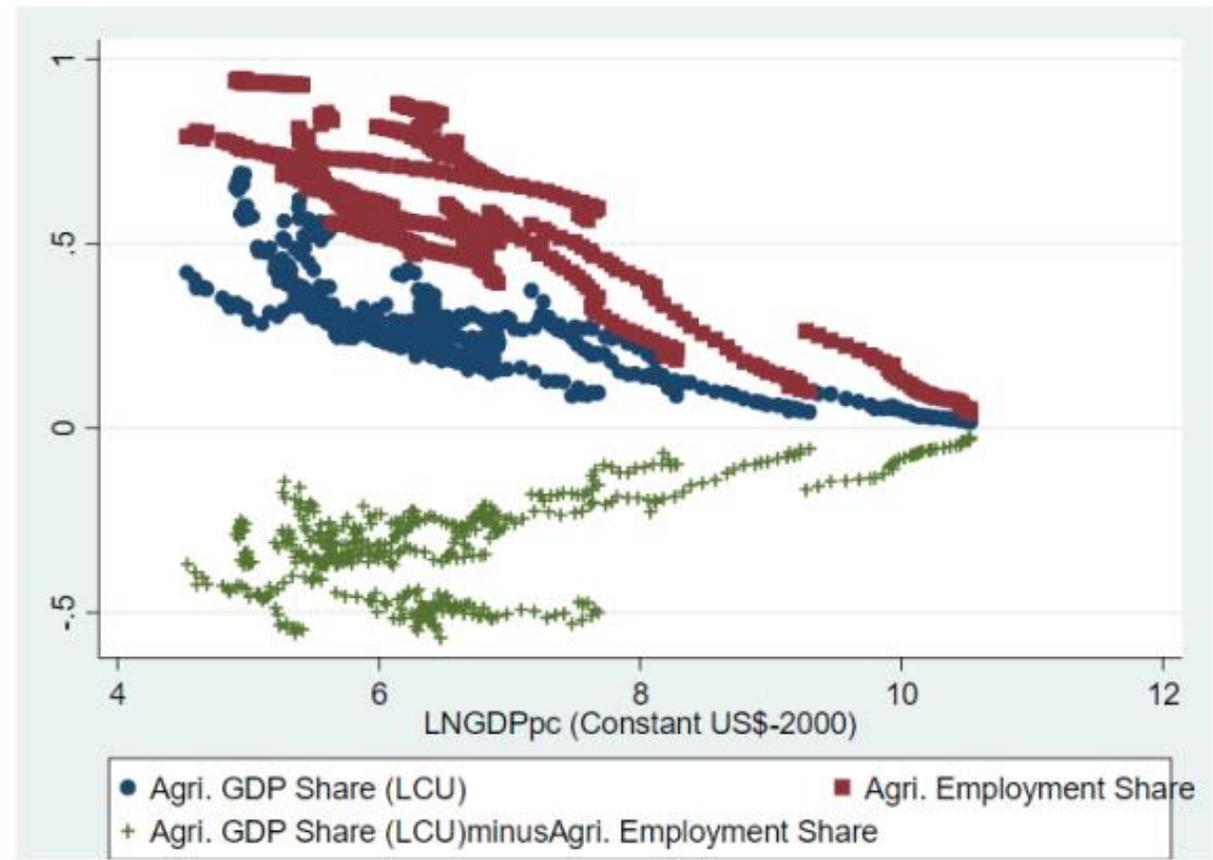
- Labor productivity in manufacturing 5x agriculture
- Productivity growth potential higher in manufacturing
- Slow but steady movement of labor from agriculture to manufacturing and services
- Slow but steady movement of labor from informal to formal sector

Productivity gap: Gap between employment and GDP share



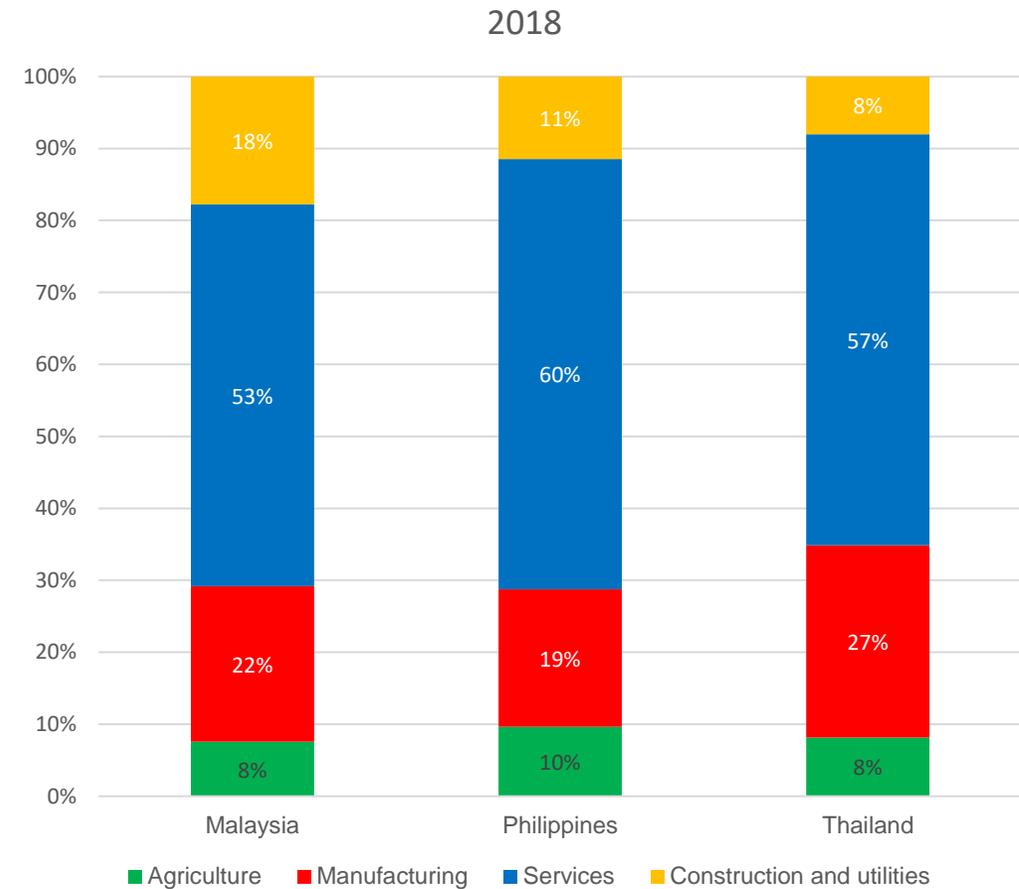
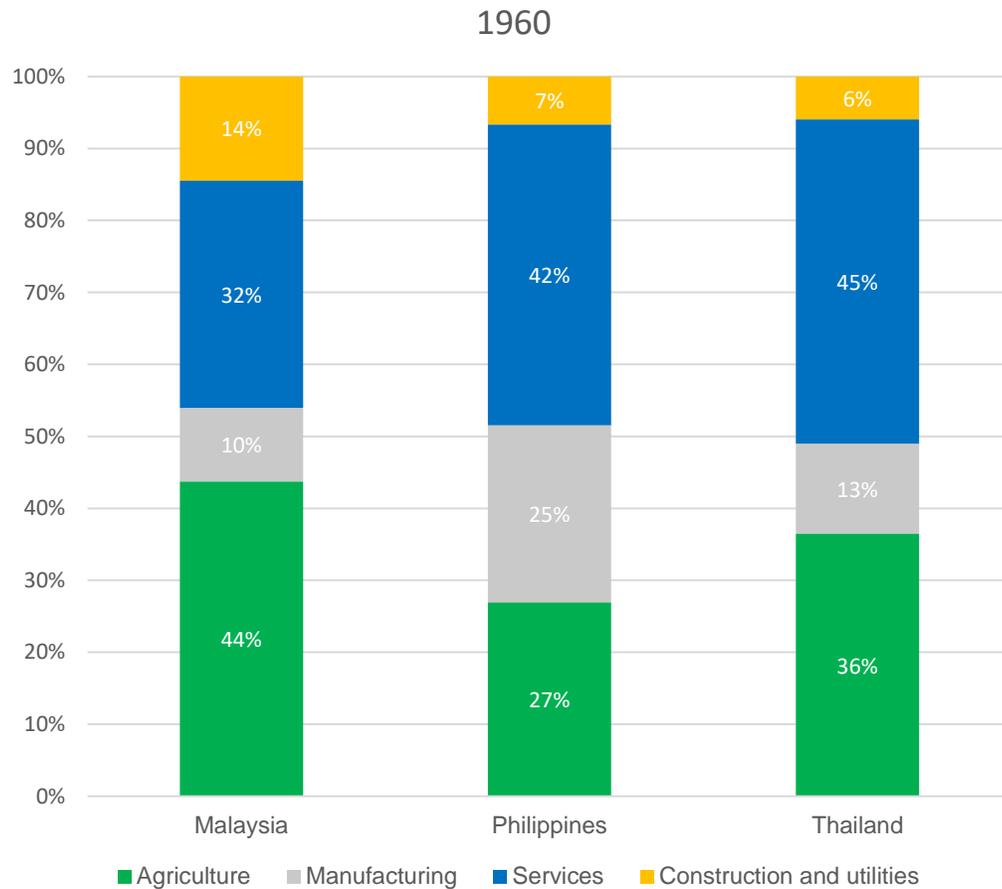
- Agriculture's share of the labor force (red dots) declines more slowly than its share of GDP (blue dots)
- At later stages employment share begins to fall faster (green dots=GDP share minus employment share)
- Early stages: low productivity and surplus labor in agriculture
- Gap between GDP share and employment share eliminated at high p.c. incomes
- 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





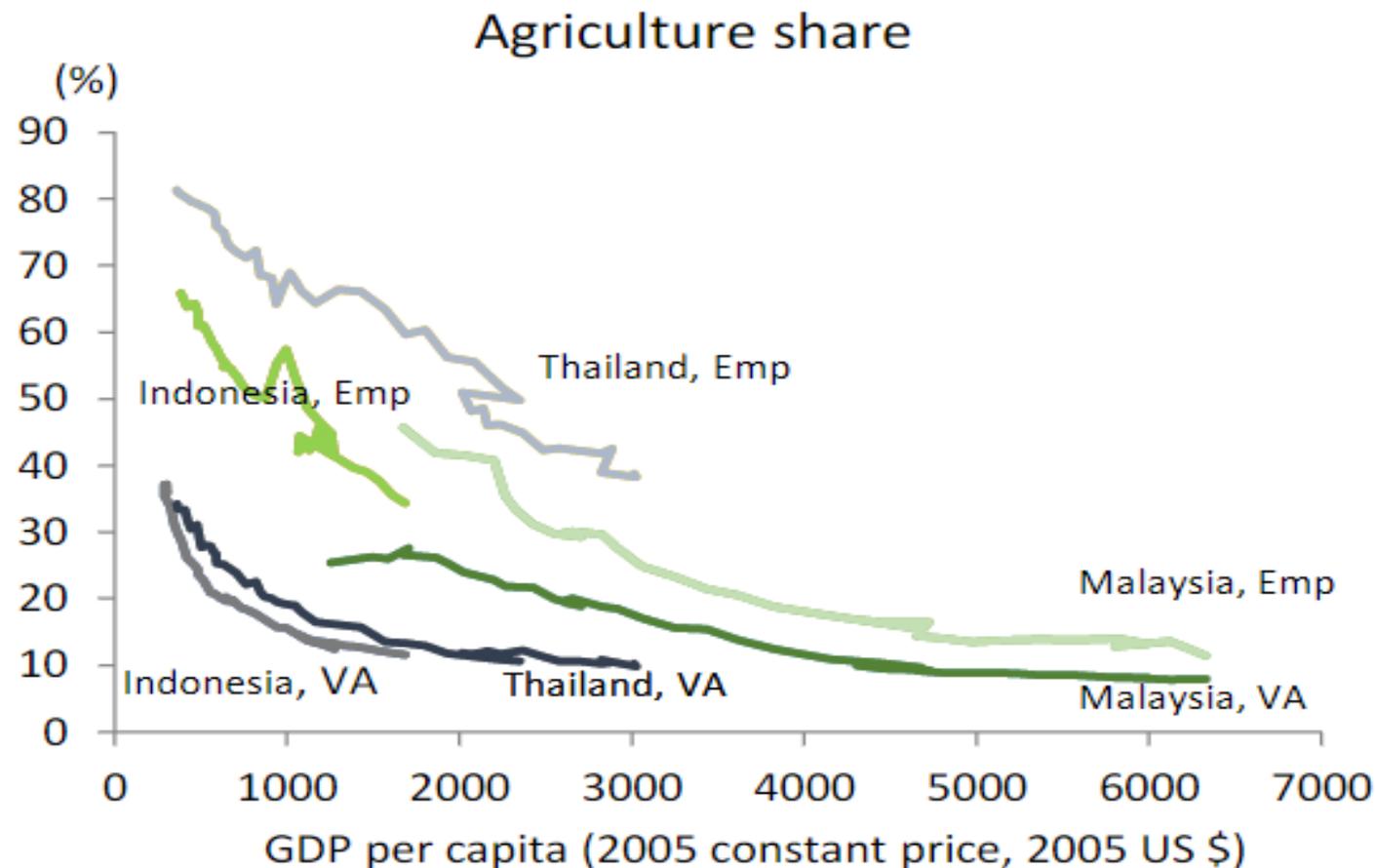
Structural change: Agriculture's share of GDP falls





Agriculture share of employment and GDP

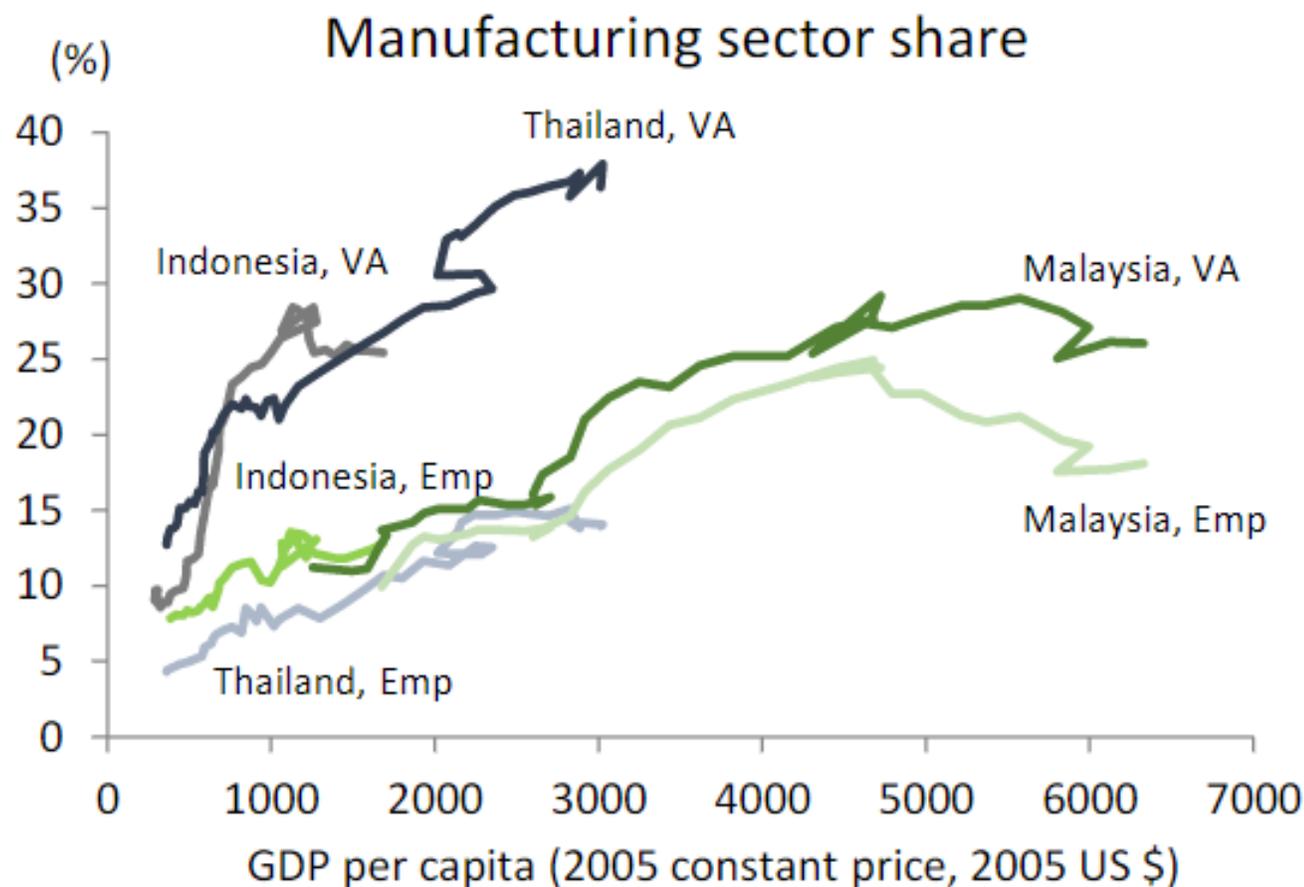
- In Thailand and Indonesia foodcrop agriculture was largest employer
- Plantation agriculture, mining and forestry in Malaysia—slower decline in employment and GDP share
- Still large gap between GDP and employment shares in Thailand and Indonesia





Manufacturing share of employment and GDP

- Manufacturing GDP share rises sharply in Thailand
- Rises and then stalls in Indonesia and Malaysia after East Asian financial crisis
- Employment in manufacturing peaks in Thailand and Indonesia around 15% (already over 20% in Vietnam)
- At higher income levels gap between GDP share and employment in manufacturing widens again



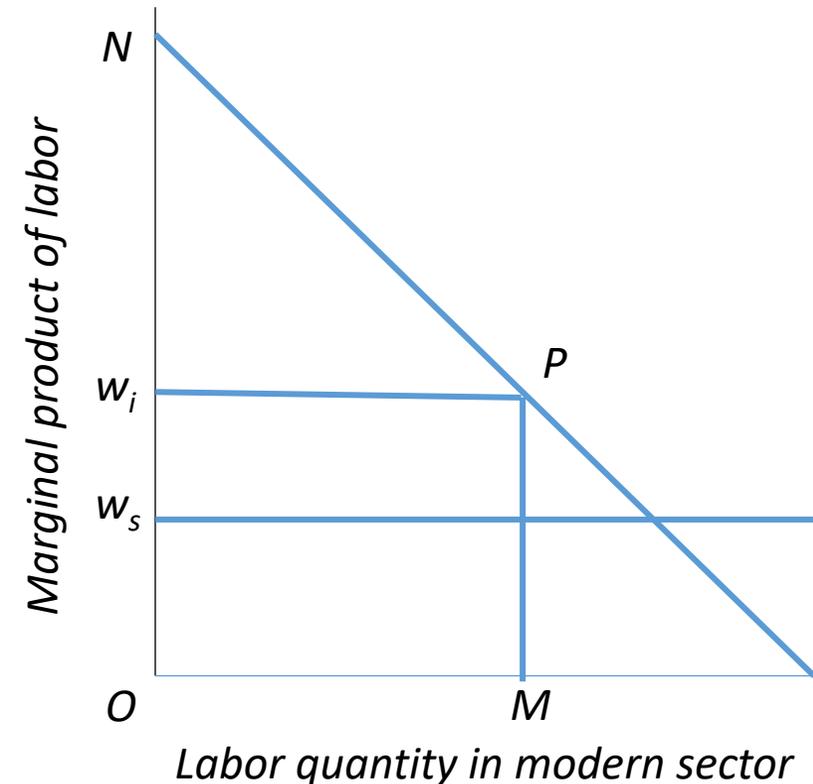
Agricultural labor force declines as workers move into industry and services



Lewis: Economic development with unlimited supplies of labor (1954)



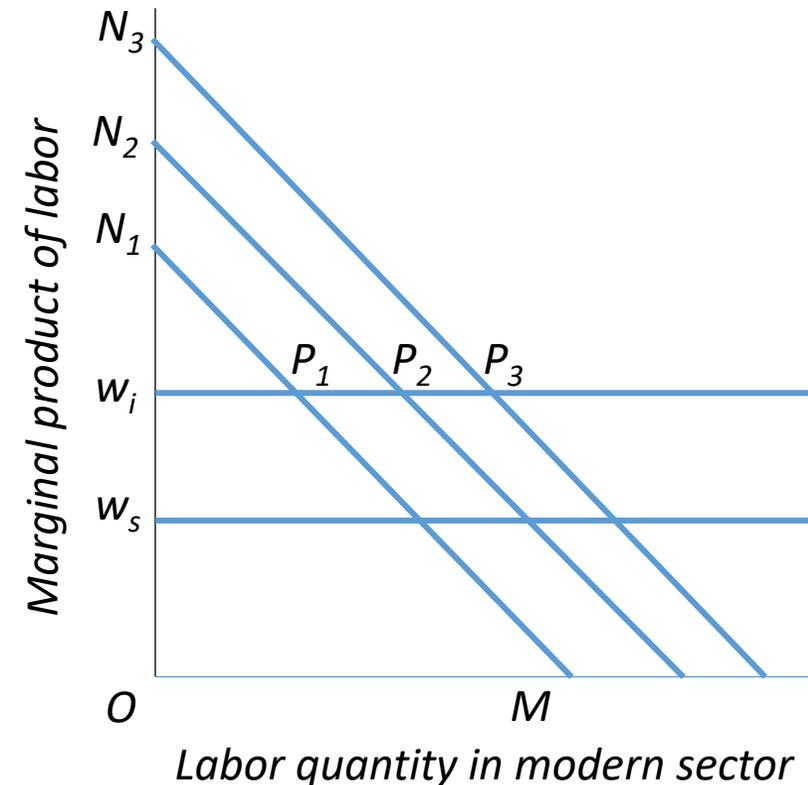
- Labor underemployed: unpaid family workers, petty trade, informal sector
- At the subsistence wage (w_s) the supply of labor is greater than demand \rightarrow labor is therefore said to be “unlimited”
- Modern sector pays w_i (w_i above w_s) to attract labor.
- Modern sector employers hire labor until MPL is equal to w_i so marginal product is $NPMO$
- Labor's share is $PMOw_i$
- Employer's share is NPw_i
- Savings for investment in the modern sector come from profits



Lewis: Economic development with unlimited supplies of labor (1954)



- “The key to the process is the use which is made of the capitalist surplus.”
- As profits are reinvested, the marginal productivity of labor and the quantity of labor in the modern sector both increase.
- Employers’ surplus therefore increases.
- Savings in low income countries is low because the modern sector is small, not because incomes are low.
- The solution to the problem of low savings is not higher interest rates, but more investment in the modern sector.



Lewis's assumptions depart from the standard economic model



- In the textbook model, labor is always paid its marginal product so there are no profits
- Therefore, savings must come from lower consumption → workers save their earnings in banks, and banks loan this capital to investors.
- But if labor is “surplus” then wages are less than the marginal productivity of labor, and employers earn profits which can be reinvested.
- The mechanism only works if there is a sufficient supply of food (wage goods) to prevent inflation and rising wages from eating away at profits
- The process is completed when labor is fully employed and real wages start to rise (the “Lewis turning point”)



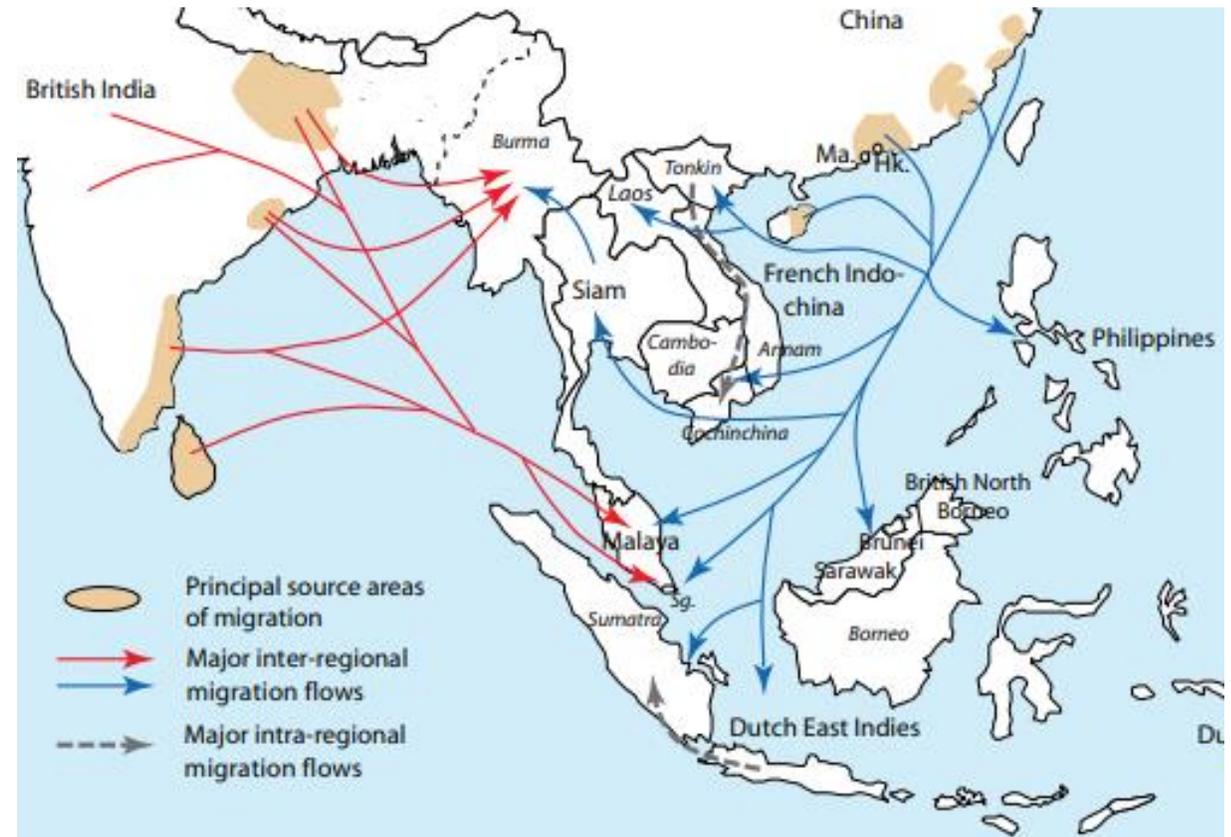
Southeast Asia: From Land Surplus to Labor Surplus

- Imperial powers came to Southeast Asia in 19th century in search of land, not labor
- Falling cost of transport and rising demand for tropic products like rubber, coffee, tea, sugar and for minerals (oil, tin)
- Suez Canal and US transcontinental railroad completed in 1869; advances in steamships made long distance shipping commercially viable
- 1900 Southeast Asian population was 80 million, with 1/3 living in Java
- Burma, Thailand and Vietnam exported rice to feed to growing labor force in mines, on plantations and in factories.



Imperial powers imported labor from India and China

- From 1880 to 1940, 20 million Indians and 30 million Chinese migrated to Southeast Asia → equivalent to the European migration to North America
- Mostly male (until 1920s) and often circular → permanent migrants about 20%



Principal migration routes to Southeast Asia, 19th century
(Source: Husa and Helmut Wohlschlägl, 2014)



Southeast Asia's population 1900-2010

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

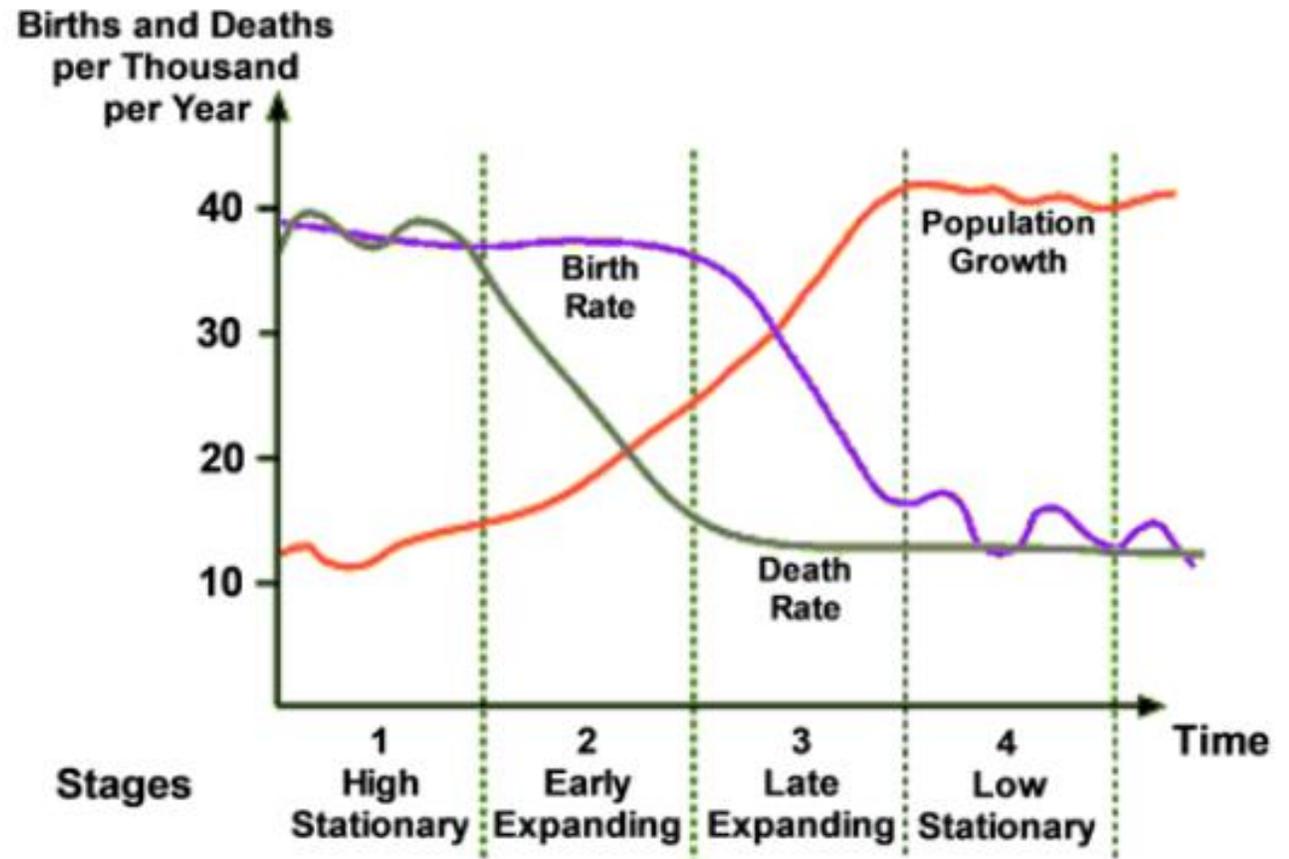
	Colonial Censuses		UN Population Estimates						
	c. 1900–11	1930–39	1950	1960	1970	1980	1990	2000	2010
World			2,532	3,038	3,696	4,453	5,306	6,123	6,896
Asia			1,403	1,708	2,135	2,638	3,199	4,164	4,164
SE Asia	~85	~130	173	219	285	359	445	524	593
% of World Pop			6.8%	7.2%	7.7%	8.1%	8.4%	8.6%	8.6%
% 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

Source: Hirschman and Bonaparte 2012



Southeast Asia's demographic transition

- Colonialism production increased demand for rice and stimulated expansion of irrigated rice
- Colonial administration reduced warfare and political instability
- Declining mortality after independence: 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.





Policy implications

- Development entails transfer of labor from agriculture to industry, and rising investment in the modern sector.
- 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 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. Explain the relationship between surplus labor and the accumulation of capital for investment. What are some of the factors that could disturb this relationship?
2. Describe the transition in Southeast Asia from land surplus to labor surplus economies? What will happen when and if the labor surplus is exhausted in Vietnam?