

Structural Changes and Development Strategies

Plan

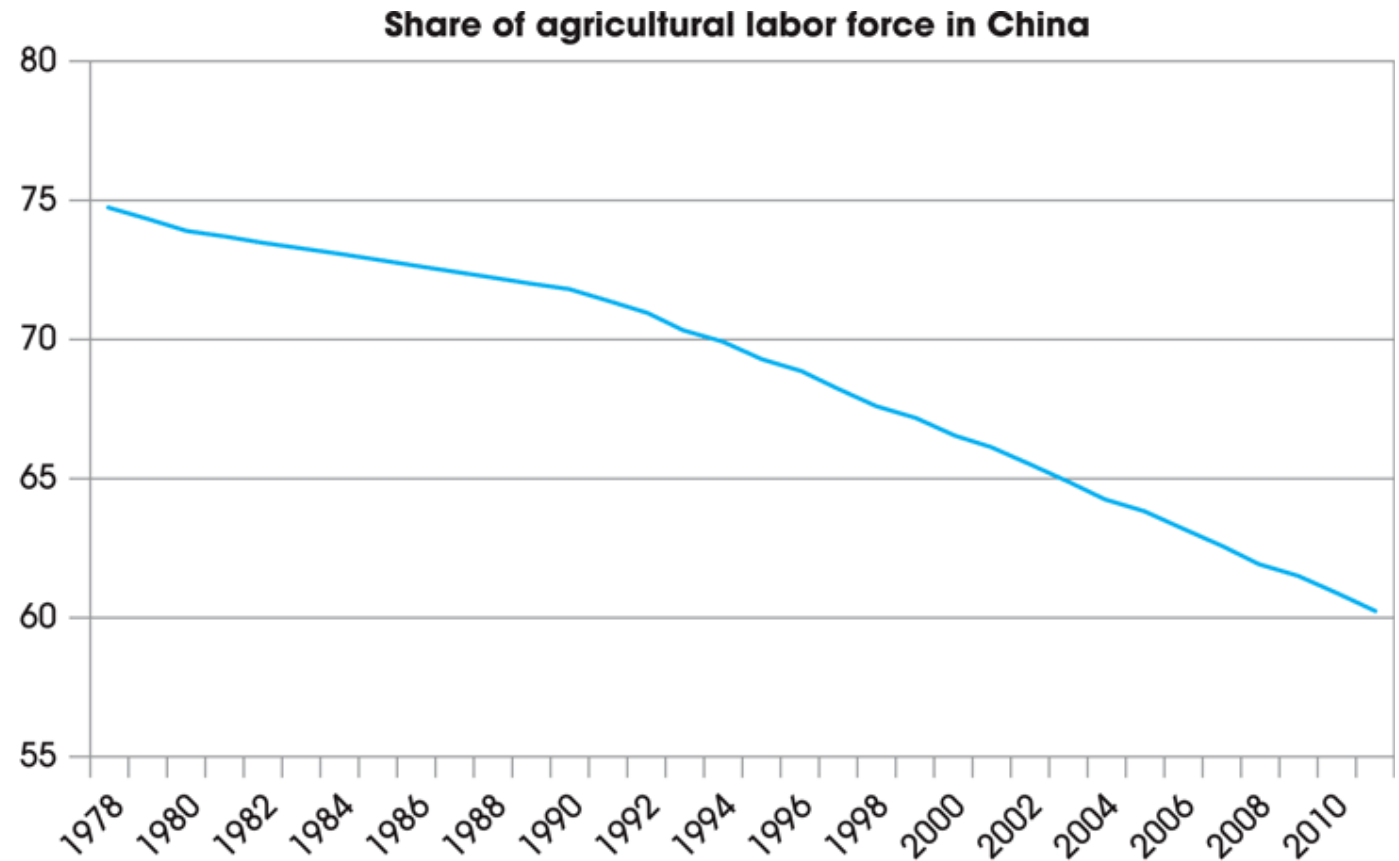
1. Describe structural changes in the process of economic development.
2. Lewis Model: “Economic Development with unlimited supplies of labour”
3. Structural change: Labor movements: rural to urban migration: Harris-Todaro model.
4. Examine different growth strategies including sector promotion, import substitution, and export promotion.
5. Closer look at Manufacturing: the flight of the geese
6. Services?

STRUCTURAL CHANGE

- In addition to growth, economic development entails important structural changes.
- A structural change occurs when “sectors” in the economy grow and shrink relative to other sectors.
- In the current context, we discuss the shift from a predominantly rural agricultural economy to a predominantly urban industrial economy.
- Labour shifts from low productivity farm jobs to higher productivity urban jobs in industry and services.
- As economies become wealthy, they experience continual structural change among industrial sectors (apparel to computers for instance) and, eventually, transform to a predominantly service economy (post-industrial).

STRUCTURAL CHANGE

Figure 5.1.
The
Percentage
Share of
China's
Agricultural
Labor Force,
1978-2011.



The share of China's agricultural labor force has been continuously declining since 1978 as millions of workers have left farms and rural villages for employment in the manufacturing sector.

Source: Food and Agriculture Organization of the United Nations (FAO), <http://faostat.fao.org>.

THE LEWIS MODEL OF STRUCTURAL CHANGE

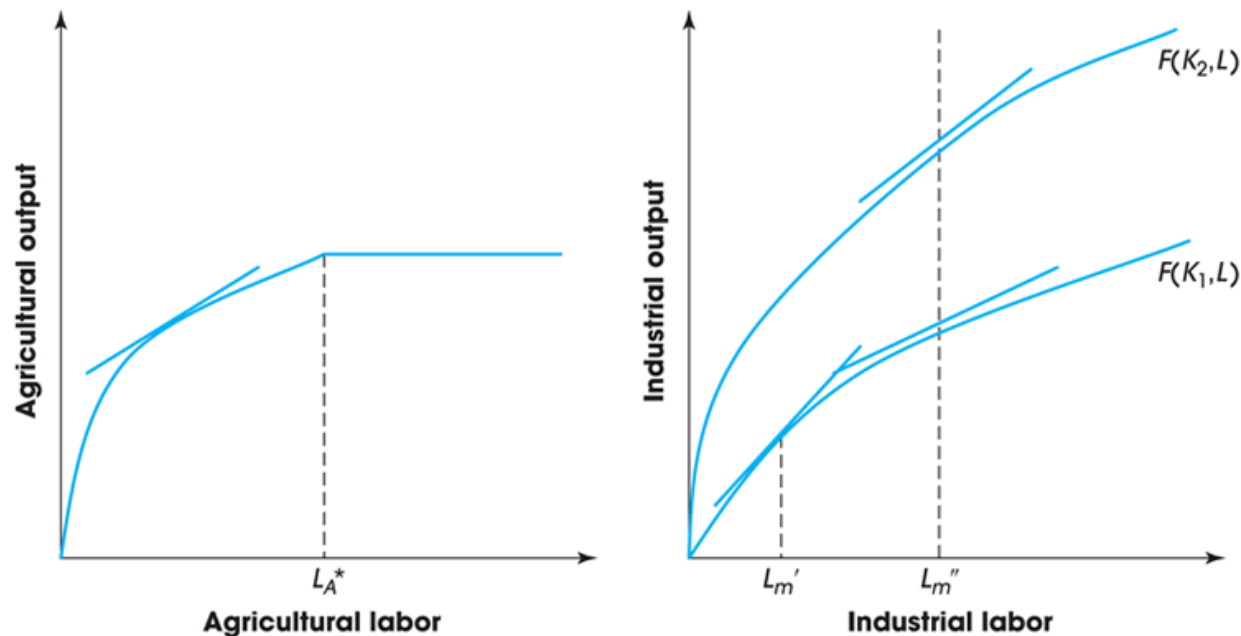
The Traditional and Modern Sectors

How can we encourage structural change to achieve growth and development? *Arthur Lewis* developed his model in the 1950s, but China in modern times is a good example.

- *Two sector model*: traditional (agriculture) and modern (industry)
- In traditional sector *marginal product of labor (MPL) is zero (surplus labor hypothesis)*, and it is possible to withdraw labor from sector without losing agricultural output.
- Figure 5.2: For high levels of agricultural labor ($> L_A^*$), the *slope of the production function* is horizontal.
- Figure 5.2: Model assumes industrial sector becomes more productive as it *accumulates capital* (production function shifts upward) so that the MPL is not only positive, but it increases with capital accumulation.
- Hence, at a given *(subsistence) wage*, when industrial capital increases the amount of labor demanded in the sector rises.

THE LEWIS MODEL OF STRUCTURAL CHANGE

Figure 5.2. The Production Function in the Traditional Agricultural and Modern Industrial Sectors.



In the traditional agricultural sector, output increases with agricultural labor: the marginal product of labor, the slope of the production function, is positive and declining. However, past point L_A^* , agricultural output stays flat as more labor is added: the marginal product of labor is equal to zero. In the modern industrial sector, even though the marginal product of labor declines with industrial labor (it is smaller at L_m'' compared to L_m'), capital accumulation shifts the production function upwards, from $F(K_1, L)$ to $F(K_2, L)$, and increases the marginal product of labor. For the same amount of labor L_m'' , the marginal product of labor is higher with the level of capital K_2 compared to the smaller level of capital K_1 .

THE LEWIS MODEL OF STRUCTURAL CHANGE

Transfer of Labor from the Traditional to the Modern Sector

- *Assumption 1:* Labor can be moved from agriculture to industry at **no cost** (i.e., agriculture output remain the same).
- *Assumption 2:* The labor market in the modern sector is competitive, and given excess labor in the agricultural sector **wages remain at subsistence** level regardless of demand.
- *Assumption 3:* Profits from the modern sector are **reinvested only in that sector**.
- Figure 5.3: Industrial labor supply is perfectly elastic at W^* until demand reaches $L^d(K_2)$. **Profits and capital investment** in the modern sector will be high.
- Eventually, agriculture labor falls below L_A^* the MPL in the sector turns positive. Then, industry faces a **rising wage rate**.
- Main Idea: As long as the MPL in agriculture is zero, industrial capital can accumulate quickly **promoting rapid structural change**.

THE LEWIS MODEL OF STRUCTURAL CHANGE

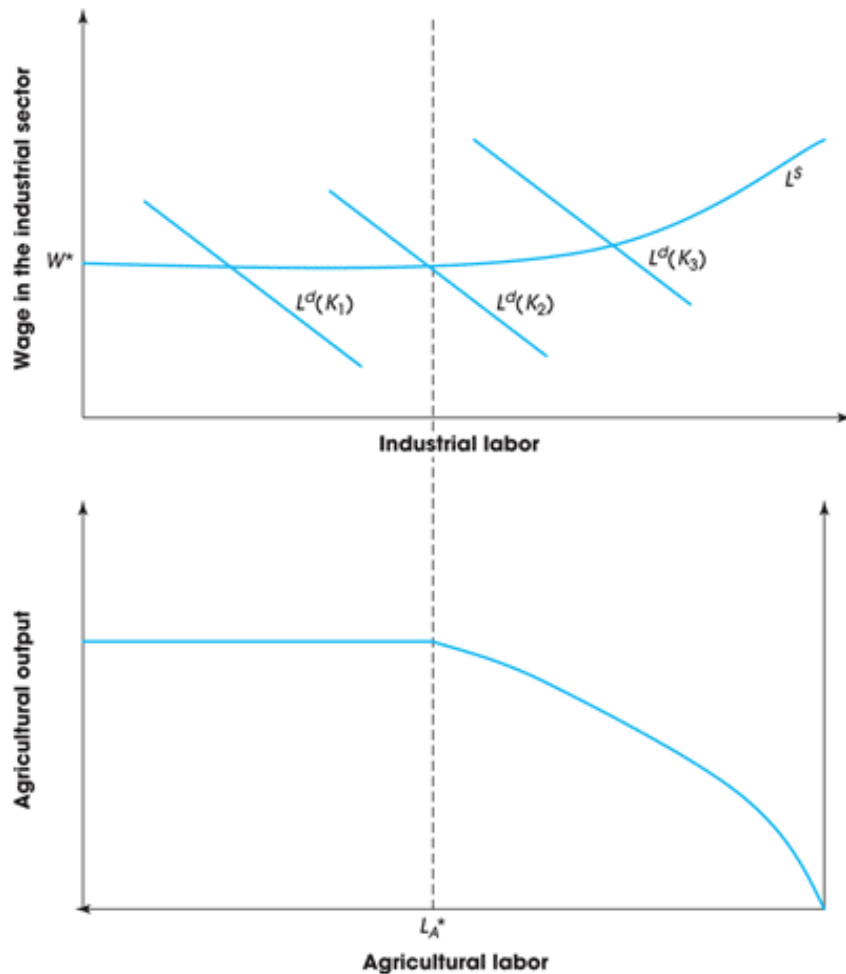


Figure 5.3. Labor Market and Capital Accumulation Equilibrium in the Industrial Sector.

As labor leaves agriculture (L_A moves from left to right in the lower panel of Figure 5.3), and supplies more labor to the modern industrial sector (movement from left to right on L^S in the upper panel of Figure 5.3), labor supply L^S is perfectly elastic (horizontal slope) until L_A reaches L_A^* . This is because the marginal product of labor in agriculture is equal to zero (flat slope of the production function). As long as L^S remains perfectly elastic, the industrial wage remains at level w^* . The low wage level in the industrial sector allows for large profits and rapid capital accumulation, leading labor demand L^d to shift to the right from $L^d(K_1)$ to $L^d(K_2)$. When labor in the agricultural sector falls below level L_A^* (moves to the right of L_A^* in the lower panel of Figure 5.3), the marginal product of labor in agriculture becomes positive and labor will be prepared to move to the modern sector only if the wage becomes higher than w^* . Therefore, labor supply becomes upward-sloping and labor market equilibrium at the intersection between L^S and $L^d(K_3)$ is at a higher wage than w^* .

THE LEWIS MODEL OF STRUCTURAL CHANGE

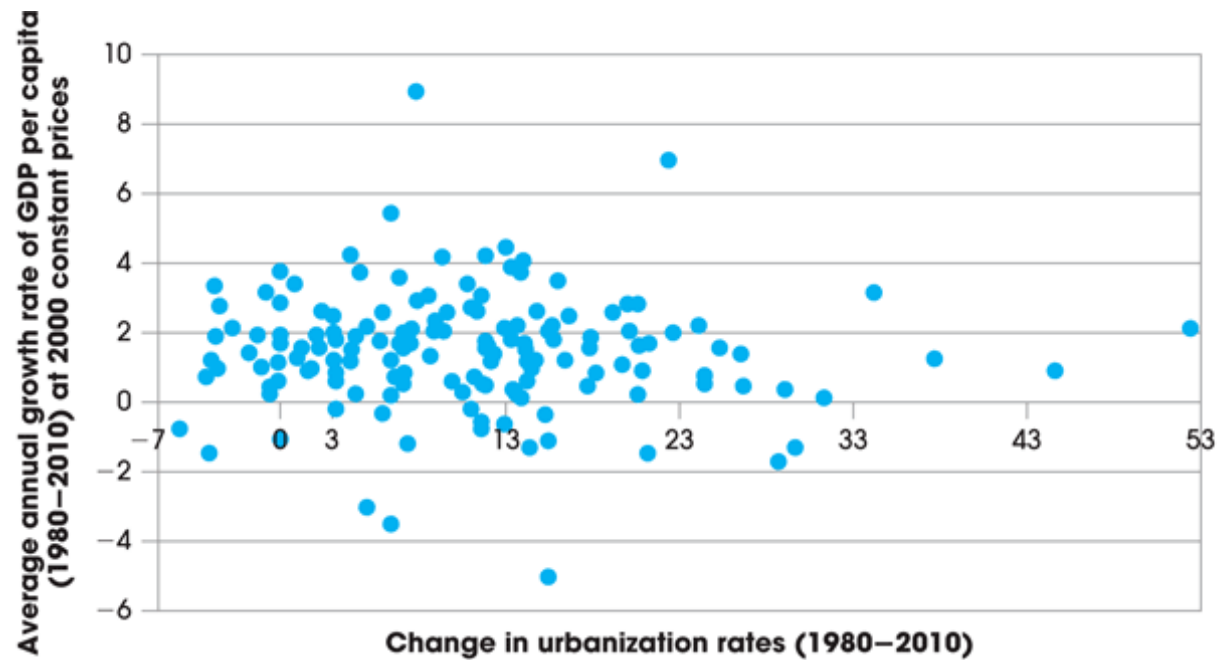
The Lewis Model in Practice

While influential, the model has displayed a limited ability to describe the course of development in several nations (Figure 5.4). In retrospect, it has several limitations:

- An initial *scarcity of capital* in the modern sector often limited its growth. Even where capital was injected to jumpstart the process, results were mixed at best.
- Modern sector *profits not always reinvested* in domestic economy
- The modern sector was often *inefficient*, especially when investment was directed or owned by the government.
- Organized *unions* pressed for higher wages.
- Large *rural-urban migration* flows created large *informal sectors* where productivity is not much larger than in traditional sector
- Rapid migration also led to high urban unemployment and poverty.

THE LEWIS MODEL OF STRUCTURAL CHANGE

Figure 5.4. The Relation between Change in Urbanization and Growth.



There is no correlation between increases in urbanization rates across the world between 1980 and 2010, and average annual growth of GDP per capita in the same period. The Lewis model suggests that there should be a positive correlation.

Source: The World Bank, World Development Indicators, series urbanization rate; GDP per capita (constant 2000 \$).

THE LEWIS MODEL OF STRUCTURAL CHANGE

Increases in urban migration, but little expansion of industrial sector. Why?

The Role of Institutions

- Some economists now see that the Lewis model *failed because it did not account for the role of institutions* in the transition from agricultural to urban sectors.
- When *return to capital is depressed* (via high taxes, regulation, corruption, inflation, etc.) and property rights are not protected (expropriation) wealthy citizens engage in *capital flight* (i.e., they invest profits in world markets instead of the domestic economy).
- *Government-directed industrialization* programs became opportunities to engage in *patronage*, creating wasteful jobs and privileges as a way to buy votes.

THE HARRIS-TODARO MODEL OF MIGRATION

Why do people move from rural to urban areas only to land in shantytowns and work in the informal sector or be unemployed?

- The *Harris-Todaro model* features:
 1. A worker's decision to migrate depends on a comparison of *lifetime expected income* between rural and urban alternatives. An individual does not go back to the countryside after migration.
 2. There is considerable *risk in migrating*. Migrant could end up unemployed, with probability rising with general unemployment.
 3. There will be *excess migration* if wages in urban areas are higher than wages in rural areas. Excess migration leads to *urban unemployment*.
- Simple model assumes one period with income equal to wage rate. Migration is assumed to be costless.

Main elements of the Todaro Model

- Migration is a rational decision
- The decision depends on expected rather than actual wage differentials
- The probability of obtaining a city job is inversely related to the urban unemployment rate
- High rates of migration are outcomes of rural urban imbalances

Expected Wage

$$prob_of_job * wage = \frac{L_M}{L_{Urb}} (\bar{W}_M)$$

Where

$prob_of_job$ = probability of getting hired

L_M is employment in manufacturing

L_{Urb} is total urban labor pool

W_M is the urban minimum wage

Agricultural workers will migrate to urban as long as the expected wage in urban is deemed to be larger than agricultural wage.

Equilibrium (no more migration) when

$$W_A = \frac{L_M}{L_{urb}} (\bar{W}_M)$$

Where

W_A is agricultural income,

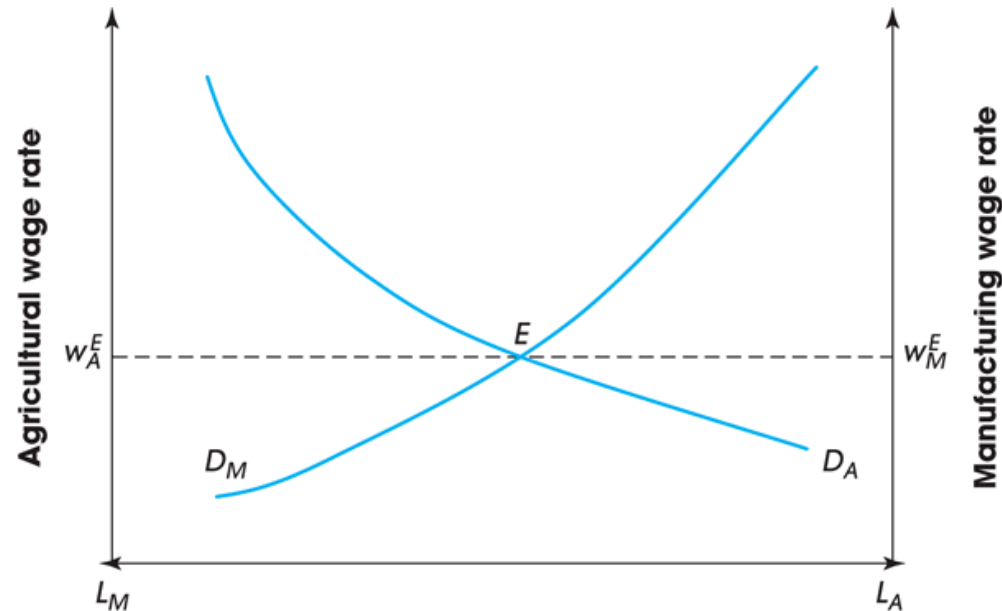
L_M is employment in manufacturing

L_{urb} is total urban labor pool

$\bar{W}_M$ is the urban minimum wage

THE HARRIS-TODARO MODEL OF MIGRATION: flexible case

Figure 5.5a. The Harris-Todaro Model: Migration with Full Urban Employment.



D_A and D_M are the labor demand curves in agriculture and manufacturing, respectively. With full wage flexibility, the migration equilibrium is at point E . At point E , workers are indifferent to leaving or staying in agriculture as the wages in agriculture and manufacturing are equal and there is no urban unemployment.

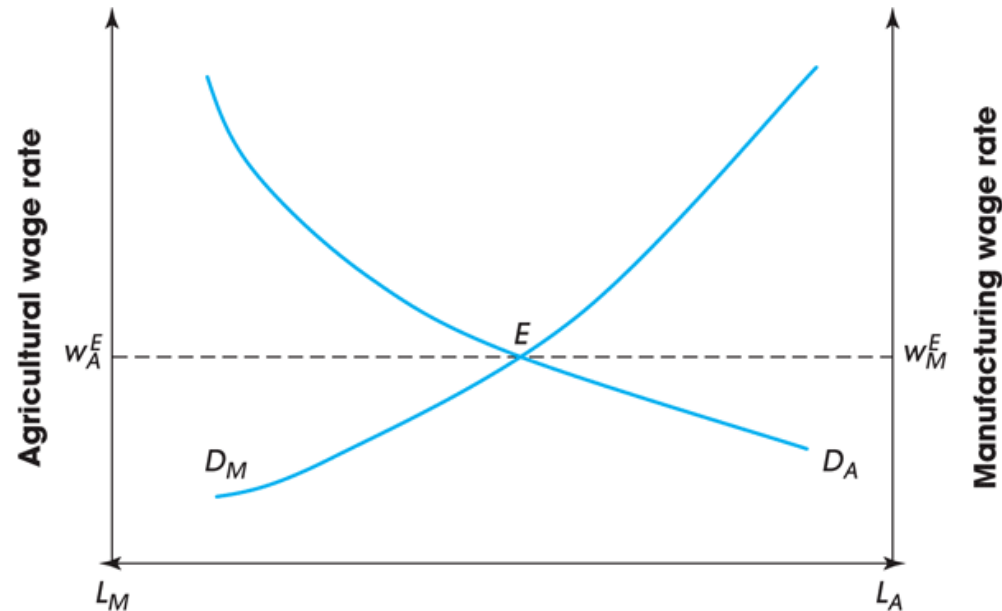
THE HARRIS-TODARO MODEL OF MIGRATION

The Migration Equilibrium

- Figure 5.5a: If the urban wages are *fully flexible*, then migration occurs until wages are equalized across the agricultural and manufacturing sectors ($w_A = w_M$) and the labor market clears. There is *no urban unemployment*.
- Figure 5.5b: Wages in manufacturing cannot fall below $w_{\min}$. Unlucky job seekers receive no income, yet new migrants induced as long as *expected urban wage* exceeds agricultural wage, i.e., $w_{\min}(L_M/L_{urb}) > w_A$ (left hand term is *mob* line)
- Predicts the joint possibility of *migration and urban unemployment* in equilibrium. The higher $w_{\min}$, the higher is unemployment.
- There are many reasons why urban wages might be “artificially” high (minimum wage laws, efficiency wages, etc.).

THE HARRIS-TODARO MODEL OF MIGRATION: Flexible wage case

Figure 5.5a. The Harris-Todaro Model: Migration with Full Urban Employment.

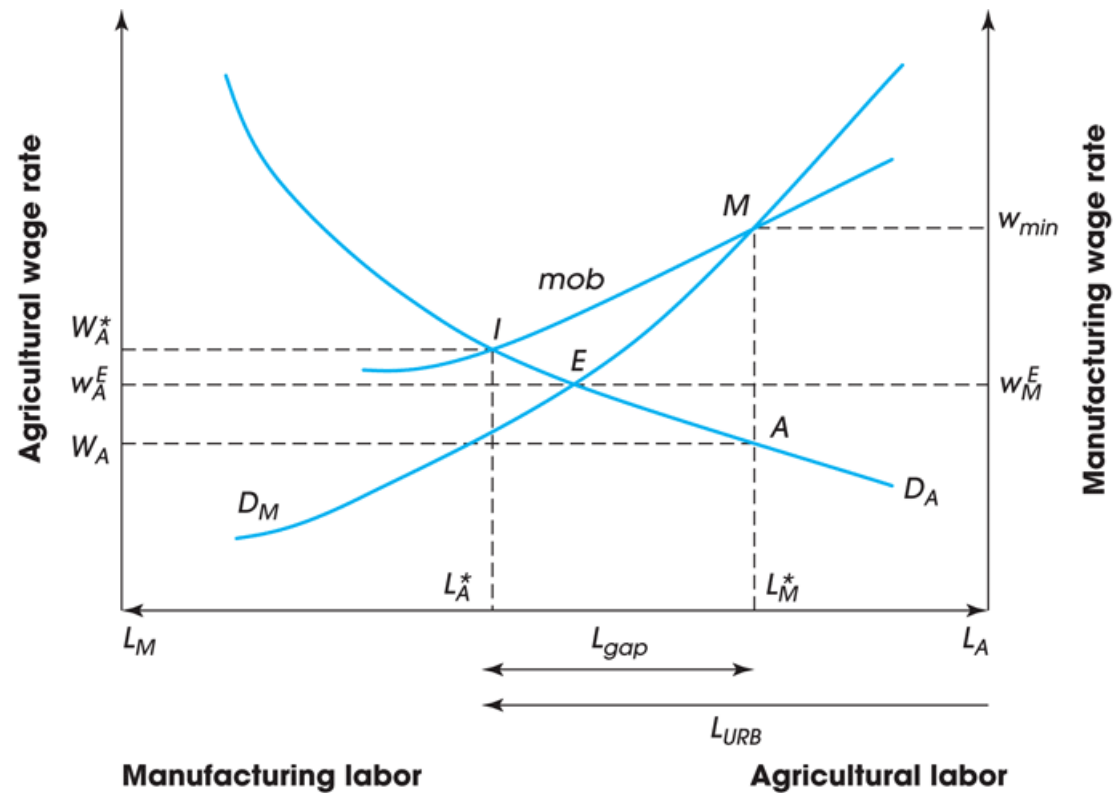


D_A and D_M are the labor demand curves in agriculture and manufacturing, respectively. With full wage flexibility, the migration equilibrium is at point E . At point E , workers are indifferent to leaving or staying in agriculture as the wages in agriculture and manufacturing are equal and there is no urban unemployment.

THE HARRIS-TODARO MODEL OF MIGRATION: urban fixed wage

Figure 5.5b. The Harris-Todaro Model: Migration with Urban Employment.

Fixed wage in urban creates unemployment in that sector



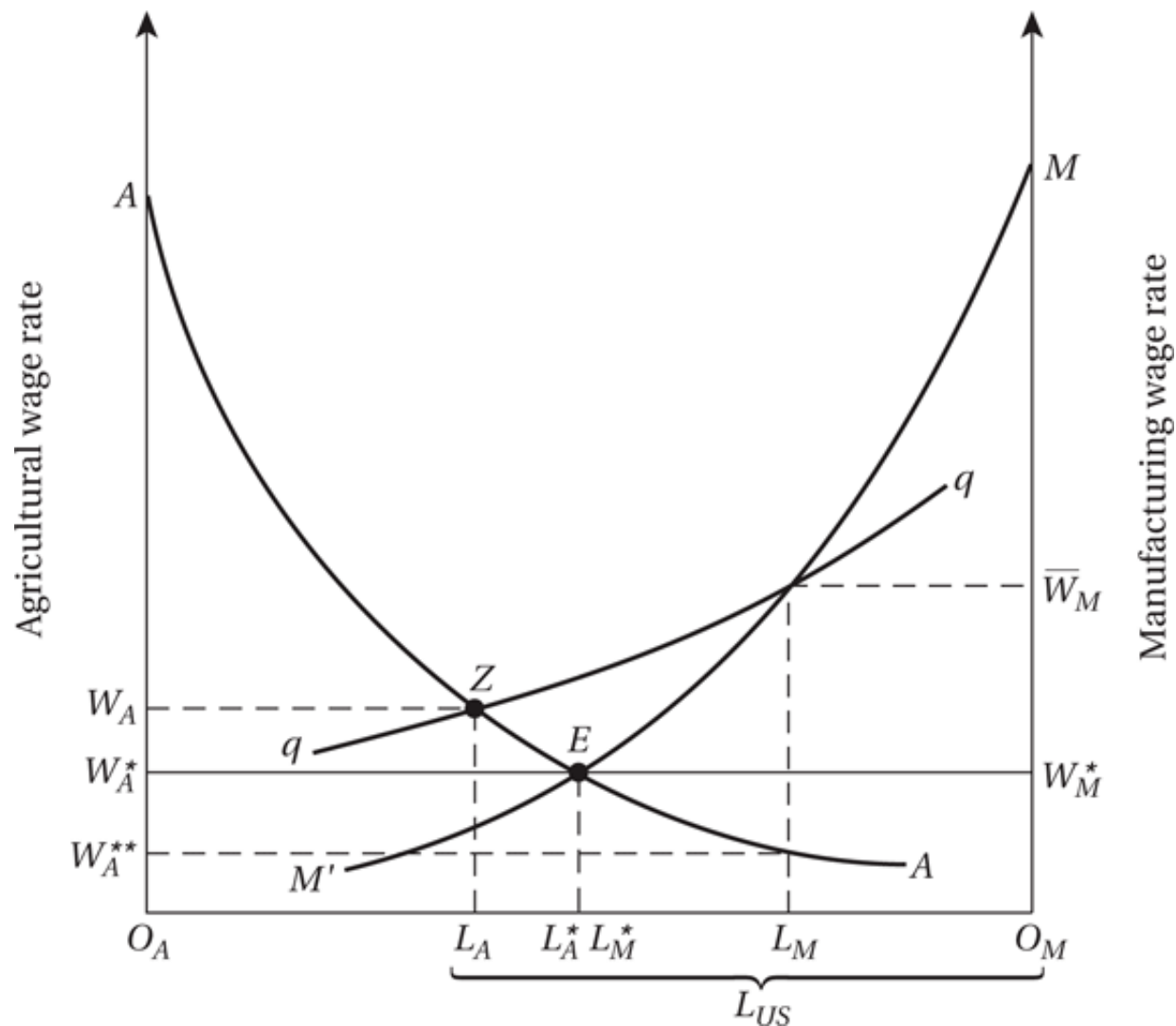
If the wage rate in manufacturing cannot fall below w_{min} , the migration equilibrium is at point I on the intersection between curves D_A , the demand for labor in agriculture and the curve mob of points (w_A, L_{URB}) where workers are indifferent between wage w_A in agriculture and income w_{min} received with probability L_M/L_{urb} (the ratio of labor in manufacturing over urban population) and income zero when unemployed, received with probability $1 - L_M/L_{urb}$. In a migration equilibrium, labor in manufacturing is at L_M^* and agricultural labor is at L_A^* . The difference L_{gap} between L_A^* and L_M^* is the urban unemployment rate.

THE HARRIS-TODARO MODEL OF MIGRATION

Implications

- *Excess migration:* Free mobility plus urban wage rigidities produce urban unemployment in equilibrium.
- *Urban planning:* Excess migration results in *congestion* in the provision of urban public services (infrastructure, education, etc.).
- *Adverse effects of rural education:* Educated rural youth more likely to seek jobs in cities.
- *Higher unemployment:* Job creation programs may just attract more migrants, generating higher urban unemployment.
- *Rural to urban migration policy:* Most countries do not restrict migration. Increasing rural incomes would be helpful.
- In China, authorities have used both carrots (*TVEs*) and sticks (*hukou system*) to reduce migration. But the income differential still attracted millions of migrants.

Once again, using the Todaro-Smith figure



Equilibrium (rural employment, urban employment and unemployment) determined by:

$$W_A = \frac{L_M}{L_{US}} (\bar{W}_M)$$

Where

W_A is agricultural income,

L_M is employment in manufacturing

L_{US} is total urban labor pool

$\bar{W}_M$ is the urban minimum wage

DEVELOPMENT STRATEGIES: SECTORAL GROWTH

Should governments engage in *sectoral growth* policies? (promoting the growth of particular sectors at the expense of others)

Balanced and Unbalanced Growth

- With *balanced growth sectors growing at the same pace*, it reduces the possibility of bottlenecks (excess demand or excess supply).
- With *unbalanced growth* one or two key sectors are promoted. Upstream and downstream industries which support the key sectors grow and develop through *intersectoral linkages*.
- *With backward linkages* the key activity promotes development of upstream sectors (suppliers). *Forward linkages* from key industries promote downstream (customer) sectors.
- Balanced growth makes sense in theory, but it assumes government has *administrative capacity* to promote it. Unbalanced growth has proved to be more effective in practice (e.g., Japan).

DEVELOPMENT STRATEGIES: SECTORAL GROWTH

Big Push Theories

- *Big push theories* promote the idea that development can be achieved only when government helps expand many sectors of the economy rapidly and simultaneously.
- Stresses *complementarities* and *coordination problems* such as the need for public infrastructure to support private investment
- Some observers feel that the *East Asian Miracle* (Japan, South Korea, Taiwan, Hong Kong, Singapore) is at least partly due to *close communication coordination between governments and the private sectors*, and among *complementary sectors* such as steel and autos.
- For example, *development banks* were used to channel capital to support growth of favored sectors, especially export-orientated firms.
- *Investments in infrastructure and education* were also large and coordinated.

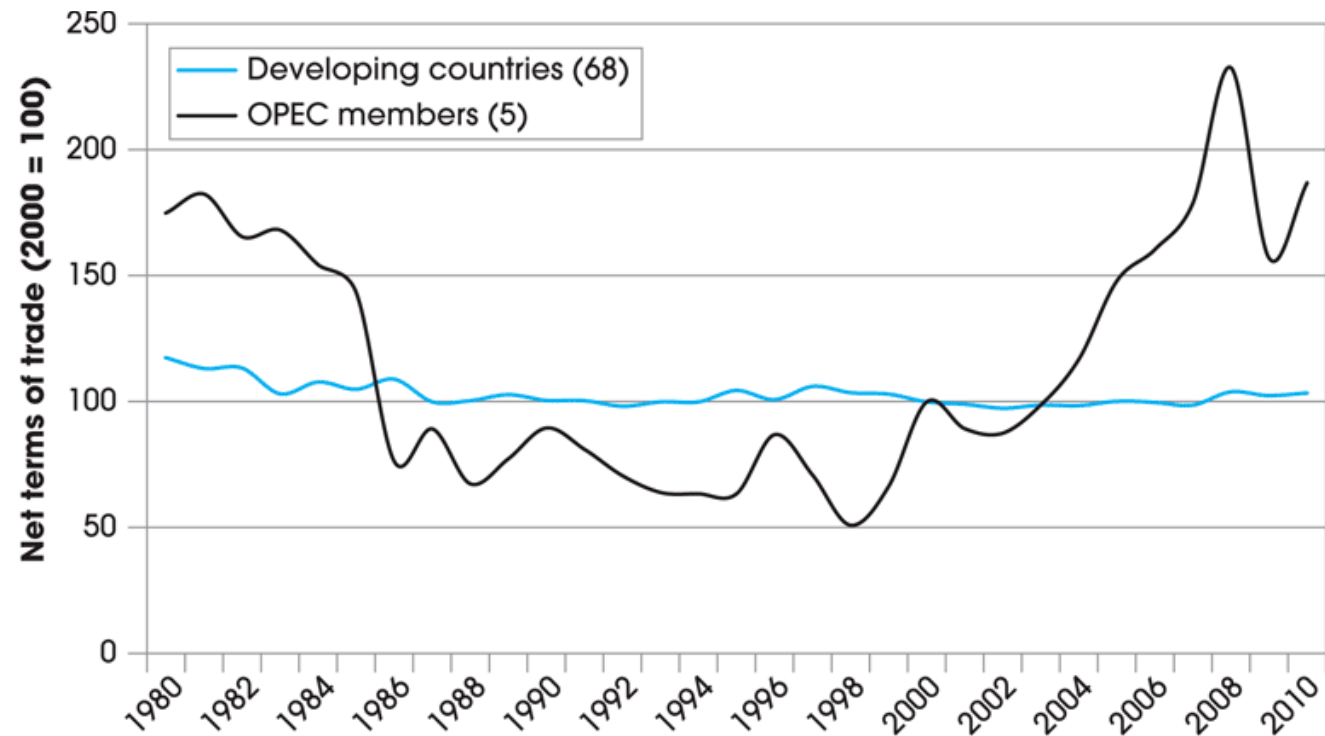
DEVELOPMENT STRATEGIES: TRADE

Import Substitution versus Export Promotion

- *Import substitution strategies* focus on the development of domestic industries to alleviate dependency on imports.
- *Exports promotion strategies* focus on developing competitive sectors for the export of products to the world market.
- The *Prebisch-Singer hypothesis*: countries that specialize in *primary commodity exports* (raw materials & agricultural products) will face declining *terms of trade* (i.e., the ratio of export to import prices).
- Prices for primary products will lag manufacturers because as income rises, *relative demand for food and raw materials falls*.
- Since the 1980s, however, the trend in terms of trade in developing countries has been virtually flat (Figure 5.6).

DEVELOPMENT STRATEGIES: TRADE

Figure 5.6.
The Evolution
of the Terms
of Trade for
Developing
Countries
and OPEC
Nations.



The percentage ratio of the export price index to the corresponding import price index is measured relative to the base year 2000. The terms of trade for developing countries have remained very flat. They have been quite volatile for OPEC countries as a result of movements in world oil prices.

Source: The World Bank, World Development Indicators: Series net barter terms of trade, using annual median per continent and/or group of countries. The sample of developing countries consists of 68 countries for which complete data series for 1980–2010 is available. The OPEC sample includes five countries: Algeria, Angola, Ecuador, Nigeria, and Venezuela.

- <https://www.economist.com/blogs/graphicdetail/2015/08/commodity-dependency>
- <https://www.economist.com/the-economist-explains/2018/01/11/why-commodity-prices-are-surging>
- <https://www.economist.com/economic-indicators/2020/01/30/economic-data-commodities-and-markets>

DEVELOPMENT STRATEGIES: TRADE

Industrialization and the Protection of Infant Industries : Argument

- Dependence on primary commodity exports will lead to disappointing growth and development.
- In the 19th century, Europe and the U.S. used *tariff and other trade protections* to industrialize.
- Such *import substitution* was recommended to establish domestic industries to replace imports and produce growth.
- Compared to primary commodities, the *income-elasticity of demand* is higher for industrial goods.
- The protection (with tariffs, quotas, subsidies) of domestic *infant industries* was key to the success of this strategy.
- In principle, protection is meant to be *temporary*, but in practice it lingers and the infants never grow up.
- In reality, import substitution proved to be very *disappointing*: Latin America and India

DEVELOPMENT STRATEGIES: TRADE

Export Promotion and the Asian Miracle

- *Export promotion* policies include preferential credit for exporters, easier access to imported inputs, and subsidies.
- Japan's MITI played an active role in promoting Japanese firms' export expansion.
- Export promotion may face *protectionist backlash* from customers.
- There are *different opinions* concerning the Asian export success:
 - *Neoclassical explanation* holds that success was based on *market-friendly philosophy*. At the end of the day, exporters had to compete in global markets.
 - Other commentators highlight good macro policy, balanced budgets, and a strong emphasis on education and capital accumulation.
 - Some cite ample government coordination and intervention.
- Regardless of the underlying explanations, the Asian Miracle *involved strong institutions to provide the framework for competition and respect for the "rules of the game"*.

Let's go further in explaining structural changes towards industrialization



Flying Geese Pattern of development

Kaname Akamatsu (1930)

- One economy, like the first goose in a V-shaped formation, can lead other economies toward industrialization, passing older technologies down to the followers as its own incomes rise and it moves into newer technologies.
- This requires thinking across firms, industries and across countries, as conditions change in a country (labor, technology, capital).

Flying Geese (FG) model

- The flying geese (FG) model intends to explain the catching-up process of industrialization of latecomer economies from the following three aspects:
- **Intra-industry aspect:** product development within a particular developing country, with a single industry growing over three time-series curves, i.e., import , production , and export .

Flying Geese (FG) model

- **Inter-industry aspect:** sequential appearance and development of industries in a particular developing country, with industries being diversified and upgraded from consumer goods to capital goods and/or from simple to more sophisticated products.
- **International aspect:** subsequent relocation process of industries from advanced to developing countries during the latter's catching-up process.

Flying Geese (FG) model

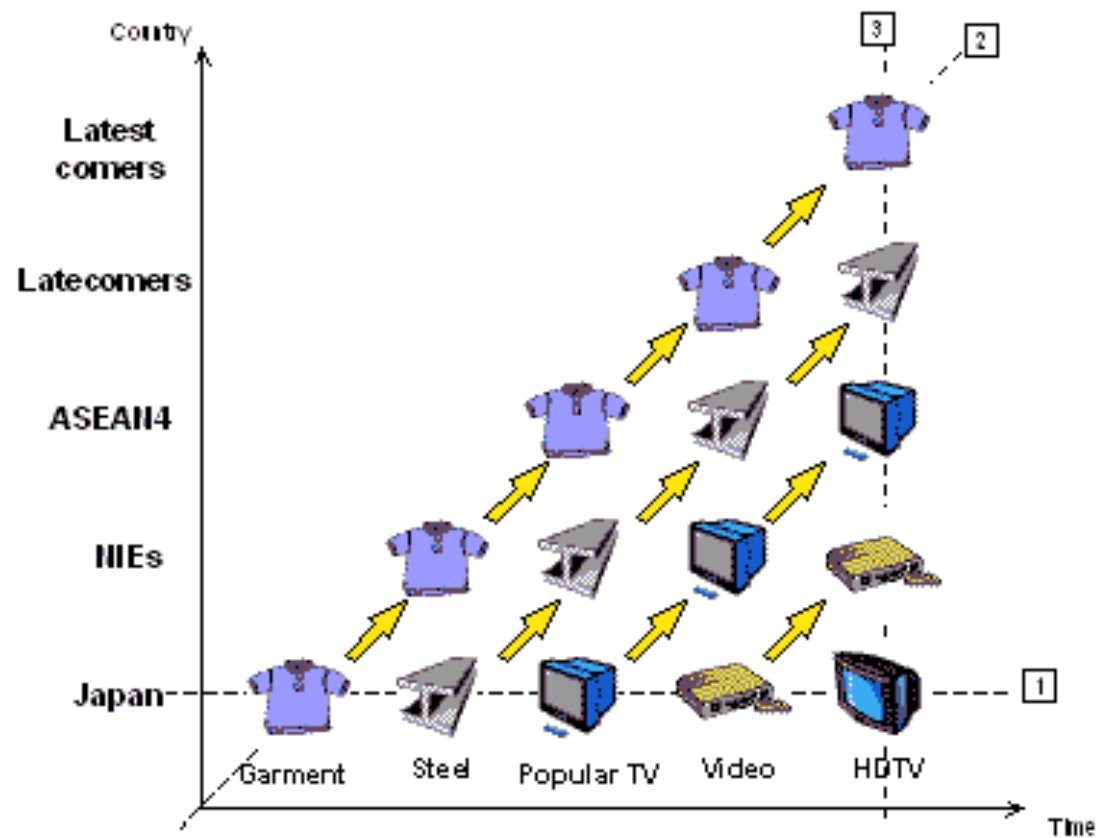
- The lead goose in this pattern is Japan itself, the second-tier of nations consisted of the newly industrializing economies (South Korea, Taiwan, Singapore and Hong Kong).
- After these two groups come the main ASEAN countries: Indonesia, Thailand and Malaysia.
- Finally the least developed major nations in the region: China, Vietnam, Philippines etc. make up the rear guard in the formation

Flying Geese (FG) model

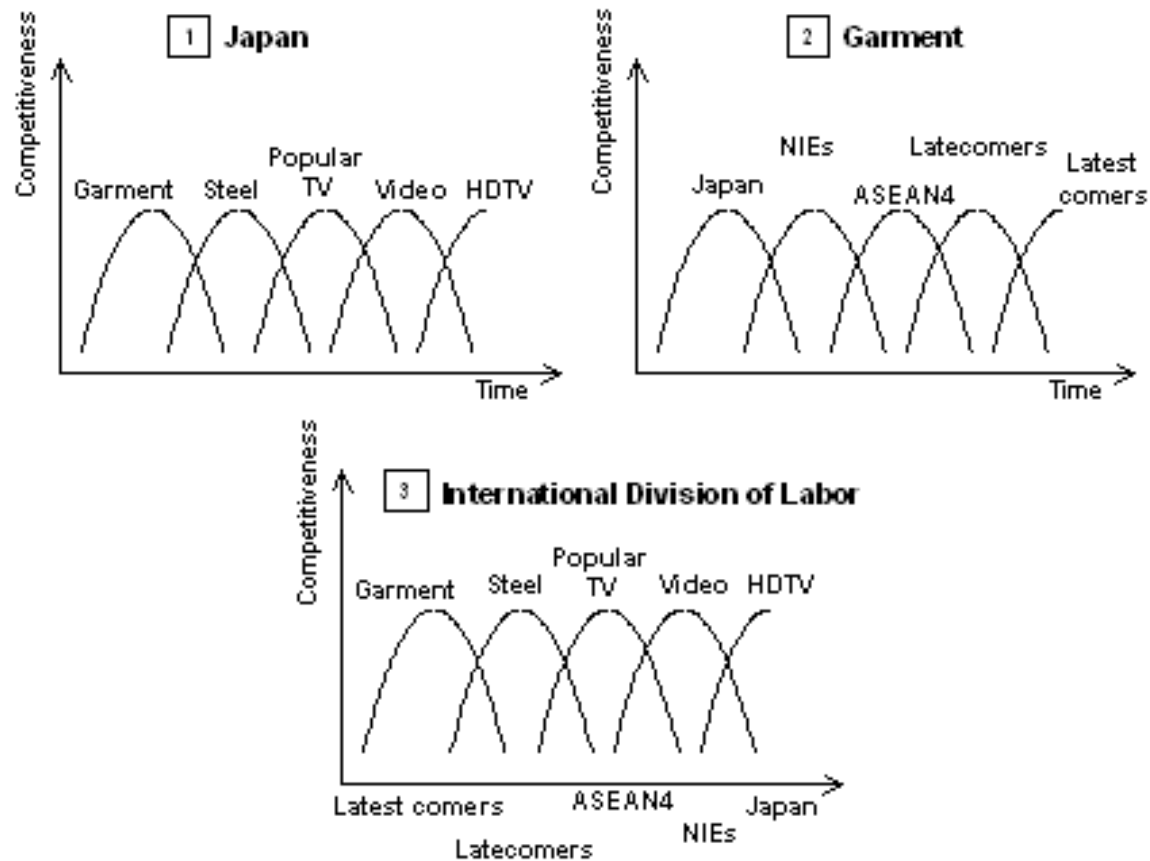
- The main driver in the model is the "leader's imperative for internal restructuring » due to increasing labor costs.
- As the comparative advantages (on a global scale) of the "lead goose" causes it to shift further and further away from labor-intensive production to more capital-intensive activities it sheds its low-productivity production to nations further down in the hierarchy in a pattern that then reproduces itself between the countries in the lower tiers.

FG model

Structural Transformation in East Asia



FG Model



FG model in practice in the past

- The FG has proved to be a useful tool when describing the regional production patterns in East Asia as industries such as the textile industry has left not only Japan – the most advanced East Asian nation – but also, at a later point, South Korea and Taiwan etc.
- These second tier nations (China) have now firmly established themselves in for instance the automotive industry and are now beginning to shift to the even more advanced production of microcomputers and the like.

FG model: What about now?

- Latecomers:
- Latest comers: Laos, Cambodia, Myanmar..
- How does the technological transfer work?
- Any other country in Asia?
- What about Africa?
- What if technology changes drastically?

Besides industrialization,

- Some economies (or some sectors) bypass manufacturing and go into services
- India: call centers, financial services
- Can services lead to increase in productivity ?

Can service industries lead to economic growth and absorbing vast amounts of labour?

- Already, services contribute the bulk of GDP in developing countries, even in low-income countries where agriculture has traditionally played a big part.
 - Young workers who leave the farm for the cities are increasingly absorbed into urban services jobs instead of manufacturing.
- In addition, international trade in services has tended to expand more rapidly than trade in goods.