Industrial Policy for Dynamic Structural Transformation:
A New Structural Economics Perspective

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- To become a dynamically growing high-income country is a dream shared by all developing countries.
- However, most developing countries have been trapped in poverty or middle-income since WWII.
- The nature of modern income growth is a process of continuous structural change in technologies and industries, which increase labor productivity, and in soft and hard infrastructure in the economy, which reduce transaction costs.
- Developing countries have the latecomer advantages in technological innovation, industrial upgrading and institutional innovation, and potentially can grow faster than advanced countries, and achieve convergence.
- In the talk, I will provide a new structural economics perspective to show:
  - Facilitating an economy's industries of latent comparative advantages to become actual comparative advantages by improving infrastructure and institution is the best way to achieve dynamic growth and convergence
  - The industrial policy is an essential tool for a state to play its facilitating role for structural transformation in a market economy
  - How to use the industrial policy effectively in a market economy

THE DEVELOPMENT SUCCESS AND FAILURE: A NEW STRUCTURAL ECONOMICS PERSPECTIVE

New Structural Economics and Structure & Structural Change

- **The New Structural Economics applies** neoclassical economic approach to study the determinates of **economic structure and its evolution** in development, which is the nature of modern economic growth
- **The main hypothesis**. Economic structure in an economy is endogenous to its factor endowments which are the smallest elements for forming any economic activity and are given at any specific time and changeable over time
- **Endowments** and **the endowment structure** at any specific time determine the economy's total budgets and relative factor prices at that time, which in turn determine that specific time's:
  - Latent comparative advantages of the economy, i.e., industries that have the lowest factor costs of production in the world
  - To turn comparative advantages from latent to actual requires improvement of infrastructure and institution to reduce transaction costs so that the total costs will be competitive in domestic and international markets
  - Industrial structure, infrastructure and institution are endogenous to endowment structure
- **Dynamics**. Income growth depends on:
  - Upgrading industrial structure, which in turn depends on
  - Upgrading of endowment structure
  - Improvements in infrastructure and institution to reduce transaction costs and make the latent comparative-advantage industries become actual comparative advantages and competitive in the market
- The low-income trap and the middle-income trap are both the result of a country's inability to have a dynamic structural change, which makes a developing county to grow faster than the high-income countries

Comparative Advantage following strategy and development success

- Facilitating the comparative advantage (determined by its endowment structure) to turn from latent to actual by improving the hard and soft infrastructure is the best way to achieve dynamic growth and convergence:
  - *The economy will be most competitive, produce the largest surplus, have the highest possible returns to capital and thus savings, ensure the fastest upgrading of endowments structure, and achieve the rapidest industrial upgrading and income growth*
  - *In this process, a developing country can have the latecomer advantages and thus have a faster technological innovation and industrial upgrading than high-income countries, which lead to convergence to high-income countries*

The Market and the State

- Firms maximize profits…choice of technology and industries based on relative factor prices…

→ ***Need for a competitive market system***

- Industrial upgrading and diversification needs to:
  - Address externalities for the first movers
  - Solve coordination problems in hard and soft infrastructure improvements

→ ***Need for a facilitating state***

Industrial Upgrading, State Facilitation and Industrial Policy

- A facilitating state is essential for rapid technological innovation, industrial upgrading, and economic diversification because of the need to:
  - Address externalities
  - Solve coordination problems
- Industrial policy is a useful instrument for a facilitating state.
  - Contents of coordination may be different, depending on industries.
  - The government's resources and capacity are limited. The government needs to use them strategically.

Comparative Advantage Defying and the Failure of Industrial Policy

- The fact is that almost all governments in the world attempted to use industrial policies to play the facilitating role, but most failed.
- The reason is that the government's targeted industries went against the country's comparative advantages.
  - For developing countries, the targeted sectors are often too capital intensive
  - For developed countries, the targeted sectors are often too labor intensive
- Consequence of the comparative advantage-defying industrial policy
  - The firms in the industrial policy's targeted sectors were **non-viable** in the competitive market. The factor costs of production are higher than those in countries with comparative advantages in those sectors.
  - To support its investment and to ensure the firms' continuous operation, governments supported the non-viable firms through all kinds of subsidies and protections.
  - Those measures led to misallocation of resources and rent-seeking.
  - As a result, the attempts to pick winners ended up picking losers.

Types of Effective Industrial Policies

- From the perspective of new structural economics, depending on a targeted industry's distance to the global technology frontier, there are five types of industrial Policy in a country:
  - Catching-up industries
  - Leading-edge industries
  - Comparative advantage-losing industries
  - Leapfrogging industries
  - comparative advantage-defying strategical industries

INDUSTRY POLICY FOR CATCHING UP HIGH INCOME COUNTRIES

Latent comparative advantage and catching up

- For the Catching-up type of industrial policy to be successful, the targeted new sectors should conform to the economy's latent comparative advantage
  - The latent comparative advantage refer to an industry that the economy has low factor costs of production, i.e., on which the economy has comparative advantage, but the transaction costs are too high, due to the constraints in hard and soft infrastructure, to be competitive in domestic and international markets
  - Firms will be viable and the sectors will be competitive once the government helps the firms overcome coordination and externality issues to reduce the risk and transaction costs.
  - Targeting the sectors with latent comparative advantage is the way to address the conflicting concepts of dynamic comparative advantages and static comparative advantages.

What Can Be Learned From History?

- Historical evidences show that successful countries in their catching-up stage all used industrial policies to facilitate their industrial upgrading and their industrial policies targeted industries existing in dynamically growing countries with a similar endowment structure and moderately higher per capita income:
  - Britain targeted the Netherlands' industries in the 16th and 17th centuries; its per capita GDP was about 70% of the Netherlands'.
  - Germany, France, and the USA targeted Britain's industries in the late 19th century; their per capita incomes were about 60% to 75% of Britain's.
  - In Meiji restoration, Japan targeted Prussia's industries; its per capita GDP was about 40% of Prussia's. In the 1960s, Japan targeted the USA's industries; its per capita GDP was about 40% of the USA's.
  - In the 1960s-80s, Korea, Taiwan, Hong Kong, and Singapore targeted Japan's industries; their per capita incomes were about 30% of Japan's.
  - In the 1970s, Mauritius targeted Hong Kong's textile and garment industries; its per capita income was about 50% of Hong Kong's.
  - In the 1980s, Ireland targeted information, electronic, chemical and pharmaceutical industries in the USA; its per capita income was about 45% of the USA's.
  - In the 1990s, Costa Rica targeted the memory chip packaging and testing industry; its per capita GDP was about 40% of Taiwan's, which was the main economy in this sector.
- Unsuccessful industrial policies, in general, targeted industries in countries where their per capita GDPs were less than 20% of the targeted countries

Why did successful catching up industrial policies target industries in dynamically growing countries with a similar endowment structure and somewhat higher income?

- Countries that have a similar endowment structure should have similar comparative advantages.
- Industrial upgrading is based on changes in comparative advantages due to changes in endowment structure.
- A dynamically-growing country's industries should be consistent with the country's comparative advantages. Some of its industries will lose comparative advantage as the country grows and its endowment structure upgrades. Those "sunset" industries will become the latent comparative advantage of the latecomers that have a similar endowment structure.
- For countries with a similar endowment structure, the forerunners' successful and dynamic industrial development provides a blueprint for the latecomers' industrial policies.

Growth Identification and Facilitation

Step 1

Find fast **growing countries** with similar endowment structures and with about 100% higher per capita income, or 20 years ago had a similar per capita income. **Identify dynamically growing, tradable industries** that have performed well in those countries over the last 20 years. Alternatively identify major imports that are produced in countries with about 100%-200% of per capita income

Avoid the government doing the wrong things or being captured by vested groups for rent seeking

Incorporate the idea of tacit knowledge

Step 2

See if some **private domestic firms** are already in those industries (existing or nascent). Identify constraints to quality upgrading or further firm entry. Take action to remove constraints

Growth Identification and Facilitation

Import or cultivate tacit knowledge

Benefit from opportunities arising from new technologies

Step 3

In industries where no domestic firms are currently present, **seek FDI** from countries examined in step 1, or **organize new firm incubation programs**.

Step 4

In addition to the industries identified in step 1, the government should also pay attention to **spontaneous self discovery** by private enterprises and give support to **scale up successful private innovations** in new industries.

Growth Identification and Facilitation

Play the coordination function in a pragmatic way

Step 5

In countries with poor infrastructure and bad business environments, **special economic zones or industrial parks** may be used to overcome barriers to firm entry, attract FDI, and encourage industrial clusters.

Address the externality issue

Step 6

The government may **compensate pioneer firms** identified above with:

- Tax incentives for a limited period
- Direct credits for investments
- Access to foreign exchange

INDUSTRY POLICY FOR MAINTAINING TECHNOLOGY LEADERSHIP GLOBALLY

- A developing country may have some sectors which are on the global technology frontier, such as household electronic appliances in China, due to the exit of high-income countries from those sectors
- To maintain technological leadership in those sectors, the firms need to have indigenous innovations in new technologies and products, which rely on R&D
- The government should support universities or research institutions for basic research related to the innovation of new technology in those sectors. Based on the breakthrough in basic research, the firms in those sectors should develop new technologies/products
- The government can also use procurement to support the new products from the sectors so the firms can reach economic scale of production quickly

INDUSTRY POLICY FOR FACILITATING EXIT FROM COMPARATIVE ADVANTAGE-LOSING SECTORS

- Due to the rise of wage, a middle-income country may lose comparative advantages in some existing sectors
- The government may adopt policies to
  - Support some firms to shift to higher value-added activities such as branding, product design, and market channel management
  - Help other firms to relocate their production to lower wage regions/countries
  - Train existing workers for jobs in other sectors

INDUSTRY POLICY FOR LEAPFROGGING IN SHORT INNOVATION-CYCLE SECTORS

- New products and technologies in some modern industries, such as Software and AIs have short innovation cycle and require primarily human capital for innovation
- Such properties make a middle-income country, especially that with sufficient human capital and a large domestic/regional market, a possibility to compete with high-income countries in such type of innovations
- The government in a middle-income country may encourage leapfrogging in such sectors by
  - Setting up incubation park
  - Encourage venture capitals
  - Strengthening intellectual property protection
  - Procurement of new products

INDUSTRY POLICY FOR COMPARATIVE ADVANTAGE-DEFYING NATIONAL DEFENSE SECTORS

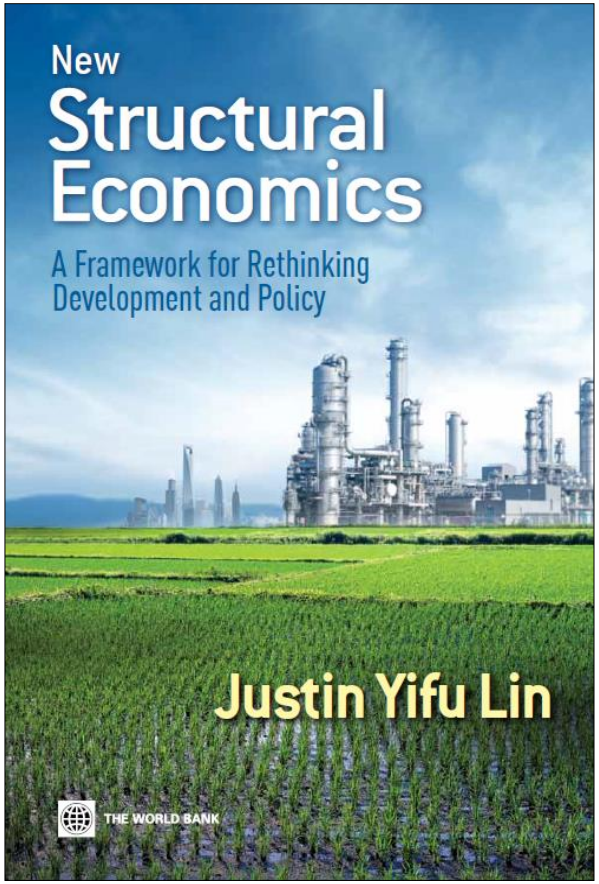
- For the national security reason, a middle-income country may have to develop indigenously national defense industries, which are capital-intensive, require long innovation cycle and are against the country's comparative advantages.
- The government needs to subsidize firms in such industries, no matter they are owned by the state or by the private.
- The subsidies are made either directly from fiscal appropriation or indirectly by prices/market distortions.
- It is better to provide subsidy directly as direct subsidy is more transparent, easier to supervise than indirect subsidies through distortions, and less costly to the economy.

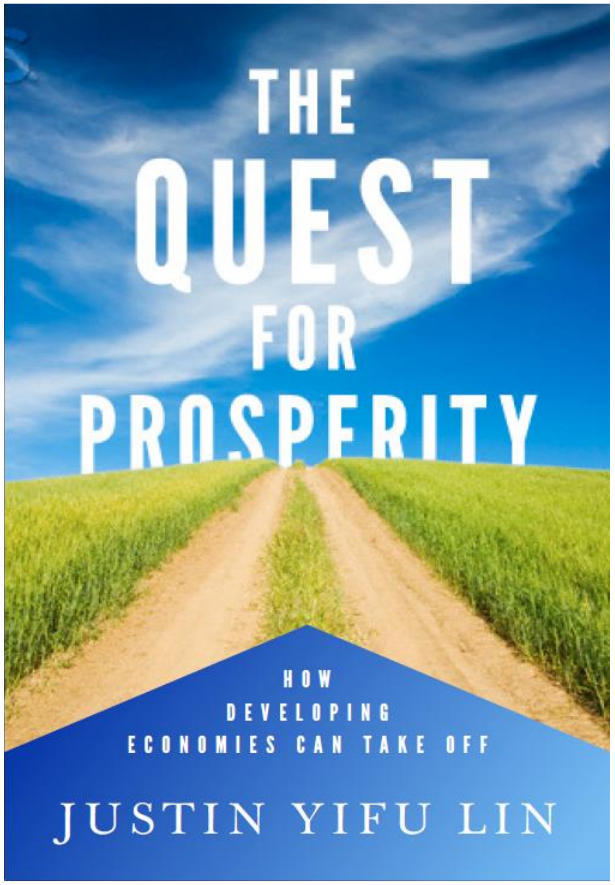
Two additional points

- The discussion so far focused on the development of manufacturing industries. Agricultural development is also crucial for developing countries:
  - Agriculture provides the majority of jobs in developing countries, especially low-income countries
  - Agricultural development is crucial for poverty reduction
  - Agricultural development also requires structural change in technology and product composition
- The discussion so far focused on the development of manufacturing industries, relevant especially for labor abundant countries. For a resource-abundant country, diversification to manufacturing industries is essential for inclusive and sustainable development. The resources will be a blessing, instead of a curse, if:
  - The country has a good management of resources (some of the revenues from resources must be saved for business downturns and future generations, and enclave rent capture must be avoided.)
  - The country uses (part of) the wealth generated from resources to facilitate diversification and industrial upgrading

Concluding Remarks

- **Every developing country has the potential to grow dynamically for decades, and to become a middle-income or even a high-income country in one or two generations, as long as the government has the right industrial policy to facilitate the development of the private sector along the line of the country's comparative advantages and tap into the latecomer advantages.**
- **The New Structural Economics provides a useful guideline for the government to play its facilitating role for structural change in a market economy**
- **The New Structural Economics can be found in the following two books:**


New
Structural Economics
A Framework for Rethinking Development and Policy
Justin Yifu Lin
THE WORLD BANK


THE QUEST FOR PROSPERITY
HOW DEVELOPING ECONOMIES CAN TAKE OFF
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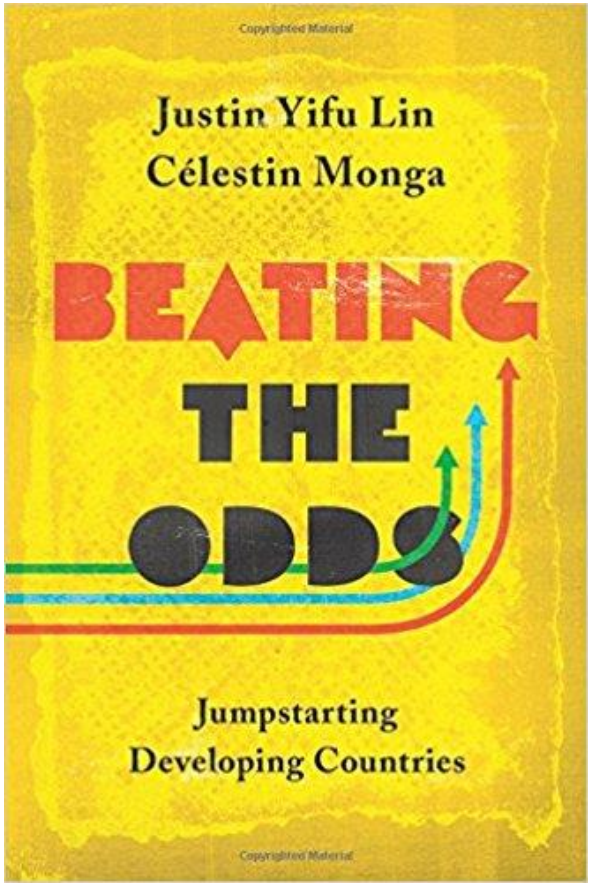
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