Contemporary Issues on Industrial Development
-- Implications for Policy-making Process--

Policy Formulation in Developing Countries
GRIPS Development Forum
Outline

1. Overview of emerging mega trends related to industrial development

2. What do these mega trends mean? How do they affect industrial development?
   - Global value chains (GVCs)
   - Digital revolution (DX)
   - SDGs (green, ethical correctness, etc.)

3. Implications for policy-making process
   - What will change, and what will NOT change?
   - Examples: Taiwan (digitalization), Singapore (policymaking), Thailand (FDI-local firm linkage)
Globalization is not a new phenomena; but, today, it is proceeding simultaneously with ICT/digital revolution.
- Broad impact on the world economy—speed and scale
- Up to 1990, globalization on “trade” (goods); now, “know-how” (knowledge & info) is also crossing borders; “servicification” of manufacturing.

“Sustainability, Inclusiveness, and Resilience” are becoming essential elements of value chain management, as our globe faces various shocks.
- The SDGs “Leave No One Behind”— is exactly for this purpose

COVID-19 crisis seems to be accelerating digitalization and trends toward sustainability, inclusiveness, and resilience, while US-China trade frictions (decoupling?) are making globalization trends more complex.
Emerging Global Mega Trends

The shape of industrial development is changing in the 21st century.

Globalization
- Expansion of global value chains (GVCs), Multi-lateral Corporations (MNCs), Trade agreements (FTA/EPA), protectionism?

Digitalization
- DX, 4th Industrial revolution
- Industry 4.0, IoT, AI
- SDGs, ESG investment, Human rights, Green industrialization, Carbon-neutral, resilience ...

Environmental & Social Concerns
- Global shocks
  - Covid-19 pandemic
  - Natural disaster
  - Financial crisis, etc.

Source: Homma Toru (2021), and Keidanren HP “Society 5.0”
(1) Global Value Chains (GVCs) Expansion

- Advances in ICT & reduced logistics costs have enabled the fragmentation and dispersion of individual segments of a production process, while allowing for sufficient control and coordination (Baldwin 2011, AfDB/OECD/UNDP 2014)

- Such fragmentation provides opportunities for developing countries to participate in global production networks, or GVCs without nurturing a full-set of national industries in key sectors or outside the “Flying Geese pattern” of regional production networks.

Source: Baldwin (2016)
From Full-set Production System to Global Value Chains (GVC): Case of Apparel Industry

Production & Distribution Process (20th century)
Full-set production system (one company, one country)

- **Process 1** Design
- **Process 2** Procurement & production of intermediary inputs
- **Process 3** Cutting, knitting, sewing & assembling
- **Process 4** Marketing & distribution

GVC led by: Japanese firm A

Production & Distribution Process (21st century)
Fragmentation and Global Value Chains (GVCs)

- **Process 1** Japanese firm A
- **Process 2** Chinese firm B
- **Process 3** Vietnamese firm C
- **Process 4** Japanese firm A

Service Link

GVC led by: Japanese firm A

Source: Kenta Goto (2019), p.10, Figure 3-1.
GVCs: Policy Implications for Developing Countries

- Developing countries have broader opportunities to industrialize by joining global production networks.
- Industrialization can happen “stage by stage” in GVCs, rather than “sector by sector.”
- But, problems remain:
  - How to enter GVCs?
  - How to expand and strengthen participation in GVCs?
  - How to turn GVC participation into sustainable development?

- Global value chains are not magical. They open a new way to industrialize, but they do not solve the hardest development problems.
- The New Globalization may change the nature of the “master plan” of industrialization.
- But, having the right “master plan” is one thing, and its effective implementation is another task. (Baldwin 2016: The Great Convergence)
For many developing countries, apparel industry is the first entry point into GVCs; but there are risks of leading to “the race of the bottom” or “stacking at the bottom” unless host countries make hard efforts for enhancing local firm capability and HRD.

- Social upgrading as precondition for market entry
- Economic upgrading essential to remain and move up the value chain ladder
Need for a Coordinated Approach to Linkage Creation and Local Capacity Development

(i) Strategic attraction of quality FDI
(ii) Building an effective selection & matching mechanism (linkage promotion itself); and
(iii) Building local capability (so that local firms can participate in the linkage).

(Source) UNCTAD (2010), “Creating Business Linkages: A Policy Perspective.” UNCTAD/DIAE/ED/2009/1. Figure 1, p.14
(2) Digital Revolution

- Digital technology is transforming the process of manufacturing (greater efficiency, connectivity of various industrial activities through IoT) and driving innovation.

- With the development of new businesses (e.g., ICT, financial & business services), manufacturing and other sectors are becoming interdependent and mutually reinforcing.

- It also enables the emergence of start-up, which may lead to ‘leapfrog’ development.
  - E-commerce, mobile money transfer, medicine delivery by drone, personal ID for targeted subsidies, etc.

FIGURE 0.2 Recent technological advances accelerate the growth of firms

Source: WDR 2019 team, based on Walmart annual reports; Statista.com; IKEA.com; NetEase.com.

Drone (medicine delivery)

Aadahhar (unique identification authority)

M-Pesa (mobile money transfer)

Alibaba (e-commerce)
Only 15% of the world population has access to broadband internet. Nearly 60% of the world population has no access to internet. While 4/5 of the world population has mobile phones, 2 billion people do not have.
# Digitalization: Opportunities and Risks, Policy Implications

<table>
<thead>
<tr>
<th>Direct impact of Digitalization</th>
<th>Opportunities</th>
<th>Risks</th>
<th>Policy Implications</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Search &amp; information</strong></td>
<td>Inclusiveness through eliminating information asymmetry</td>
<td>Control, due to lack of accountability</td>
<td>Institutions that are capable &amp; accountable (access to information, privacy protection, participatory policymaking)</td>
</tr>
<tr>
<td><strong>Automation &amp; coordination</strong></td>
<td>Efficiency improvement of firms, life &amp; govt.</td>
<td>Inequality rise, if skill education is insufficient and informal labor expands</td>
<td>Skills to leverage digital (ICT literacy, foundational skills, lifelong education) &amp; social protection</td>
</tr>
<tr>
<td><strong>Scale economies &amp; platforms</strong></td>
<td>Scale economies &amp; innovation through network externality</td>
<td>Monopoly due to lack of competition</td>
<td>Regulations that promote entry &amp; competition</td>
</tr>
</tbody>
</table>

Source: Asei Ito (2020), p.159, Figure 4-1
Policy Priorities for Countries that are Emerging, Transitioning, or Transforming (from WB: WDR2016)

- **REGULATIONS**
  - that promote competition and entry
  - Remove barriers to adoption
  - Competition regulation and enforcement
  - Platform competition

- **SKILLS**
  - to leverage digital opportunities
  - Foundational skills and basic ICT literacy
  - Prepare for careers instead of jobs
  - Facilitate lifelong learning

- **INSTITUTIONS**
  - that are capable and accountable
  - Mobile phone-based services and monitoring
  - e-government delivery and citizen engagement
  - Participatory policy making and digital collaboration

*Note: ICT = information and communication technology.*

(3) Increased Focus on Societal and Environmental Goals

- **The SDGs** as a driver of sustainable, inclusive and resilient development. The COVID-19 crisis also highlights the importance of green recovery & human-centered approach.

- Vital importance of the role of the private sector in the SDG achievement
  - Finance, new biz model, job creation & developmental impacts, etc.

- Compared to the MDGs, the SDGs have broader focus including: industry, innovation, decent work, economic growth, sustainable production & consumption—in addition to gender, poverty reduction and social development

Aiginer & Rodrick (2020:191) “Rebirth of Industrial Policy and an Agenda for the Twenty-First Century”
- *Greening of industrial policy or new forms of industrial policy steered by employment concerns*
SDGs and ESG Investment

- Sustainable and responsible supply chains
  - Widespread adoption of sustainable standards by lead firms
  - Various kinds of public & private standards (mandatory, voluntary, multilateral, CSO-initiated, etc.)
- Expansion of ESG investment (esp. increased attention to “S”, with COVID-19)
- Growing attention to “stakeholder capitalism” (WEF 2020)

Expansion of ESG Investment

Trend of ESG Investment & SDGs in Japan

- GPIF: Promoting ESG investment
- Keidanren: 「Charter of Corporate Behavior」 Referring to SDGs
- Japan Securities Dealers Association: 「SDGs Declaration」
- Japanese Bankers Association: 「Framework」 Referring to SDGs

ESG: Environment, Social & Governance
CSO: Civil Society Organization
GPIF: Government Pension Investment Fund

Global Sustainable Investment Alliance(GSIA)
(Source) JICA
# Types of Corporate Standards and Their Motivations (Triple Bottom Line)

<table>
<thead>
<tr>
<th>Standard</th>
<th>Type of standard</th>
<th>Function of standard</th>
<th>Primary driver</th>
</tr>
</thead>
<tbody>
<tr>
<td>Economic bottom line</td>
<td>- Time</td>
<td>- T: Reduce inventories</td>
<td>Lead firm and first-tier suppliers</td>
</tr>
<tr>
<td></td>
<td>- Quality</td>
<td>- Q: Enable JIT production and ensure quality of final product</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Cost</td>
<td>- C: Reduce cost of production in value chain</td>
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<tr>
<td>Social bottom line</td>
<td>Working conditions in supply chain</td>
<td>- Competitive advantage</td>
<td>Parties external to the chain (e.g. International Labour Organization (ILO))</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Licence to operate</td>
<td></td>
</tr>
<tr>
<td>Environmental bottom line</td>
<td>Environmental character of supply chain</td>
<td>Competitive advantage</td>
<td>Parties external to the chain (e.g. Greenpeace)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Licence to operate</td>
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</tr>
</tbody>
</table>

Source: Kaplinsky & Morris (2017). “How regulations and standards can support social and environmental dynamics in global value chains”
Making GVCs Sustainable, Inclusive, and Resilient

Rana Plaza factory collapse
(April 24, 2013, Dhaka)

Eight-story building housing 5 garment factories supplying global brands suddenly collapsed, killing more than 1,100 people (too many floors, too much heavy equipment for the structure to withstand....)

Apparel industry is labor-intensive (employing more than 60 million workers with 80% are female).
Ethiopia: Public-Private Partnership for Sustainable Textile & Apparel Supply Chains

(Cotton Certification)
- Cotton Made in Africa, Better Cotton Initiative, etc.

(Skill Development & TVET)
- GIZ, DFID, WB, UNIDO, etc.

(Decent Work)
- Better working conditions; soft skill
  - ILO, SIDA, etc.

(IPs Infra. Standards)
- Social & environmental Compliance
  - GIZ, WB, UNIDO, ILO, etc.

H&M, PVH, Tchibo, Tesco, etc.

(Source) Elaborated by the author based on the information obtained from Japan-Ethiopia industrial policy dialogue (July 2017)

- Major destination of Apparel exports: Germany (76%), US (14%), Sudan (6%), UK (6%)
- Major destination of Textile exports: Turkey (58%), Germany (14%), Italy (13%), China (11%), US (2%)
Additional Challenges in Linkage Creation & Industrial Upgrading in the SDG Era

- Today, latecomer countries must satisfy twin global standards to successfully participate in GVCs.
  - Economic/industrial upgrading: QCD requirements
  - Social/environmental upgrading: labor and other ethical correctness, green/carbon neutral
- Both are crucial for market access and productivity enhancement; but require a different and complex set of capabilities at managerial and workers’ levels.
- Digital infrastructure & skill are also important to be connected with GVCs.
Implications for Policymaking Process and Examples

- These mega trends are mutually related, and their inter-linkages need to be recognized for proper industrial policymaking. They include:
  - Usefulness of digitalization/Industry 4.0 for efficient GVCs
  - Accelerated digitalization/Industry 4.0 by COVID-19 for resilient VC management and contactless workplace
  - Ensuring sustainable & inclusive VCs throughout the entire VCs
  - Possibility of leapfrog innovation (e.g., Corona-Tech)

- This implies that even more sophisticated policy capability would be required for developing countries:
  - Enhancing linkages btw. FDI (MNCs) & local firms, and building local industrial capability (connection with domestic devt.)
  - The whole-of-the government approach (as problems become more complex, comprehensive)
  - Speedy response
Taiwan: Digital Economy as a Game-Changer Beyond Catch-up Industrialization Model

- Digitalization is transforming innovation, and digital transformation brings about challenges to innovation management and policies.
- New digital technologies, as a driver, have had to co-evolve with the organizational governance, institutional arrangements and regulatory regime for the economy in an appropriate and desirable manner.
- **Existing digital sectors**: export-oriented ICT industrialization (to serve primarily production & exports and focus on modularization & ‘production interfaces’ along the value chain).
- **Digital sectors to-Be**: strong flavor of cross-fertilization, solution-orientation and software & hardware integration. Also, more internationalized.

Source: Chen and Ou (2021), pp.50-51
A Scenario of the Digital Transformation of Taiwan’s ‘Digital Sector’

The Existing Digital Sectors

Selected applied research institutes (ITRI, III, etc.) --legacy of catch-up industrialization

The Digital Sectors to-Be

‘Digitalized economy’ of multi-contextual spheres, ICT innovation at the societal level --‘Digital sector’ of the digital economy

The Major Subsectors

ICT hardware
- PC-based
- Service-based
- Handset-based

Software

Information services

Telcom (4G)

e-commerce

Cable TV

Different Digital Technologies and Their Application
- AI, software-based AI
- IoT-based solutions
- Robot and its solutions
- AR/VR
- Cultural technologies
- GPU...

Innovative Applications in a Variety of Fields
- Integrated solutions for applications
- ‘hardware+software)+services

Transformation of Other Existing Sectors
- e.g. The machine industry going digital

Note: ITRI: Industrial Technology Research Institute / III: Institute for Information Industry
Source: Shin-Horng Chen and Yi-Pey Ou (2021), “Digital Transformation and Structural Change in Taiwan’s National Innovation System,” P.44. Fig. 3-4
New Developmental Models and Innovation Trajectories

5+N innovative industries and transformation of Taiwan’s national innovation system

To unleash the potential of next-generation industries

Innovations for Application

To strengthen the synergy of talent, capital and market across countries

Internationalization of the NIS & innovation ecosystem

Links to the Future

Cross-Fertilization

Solution-oriented, software & hardware integration

Links to the Local

Links to the International

To capitalize on advantage of industrial clusters & Establish connections with each local industrial clusters

Source: Chen and Ou (2021), P.42. Fig. 3-3
Radical Democracy: Govt. Mechanisms for Creating Open and Inclusive Societies

Creating various mechanisms within the govt. for sharing info. & ideas with civil society to improve public policies & actions.

- **Public Digital Innovation Space (PDIS)**
  - Minister Audrey Tang’s office; cross-cutting functions within the govt.
  - Staffed by govt. officers (one person from each ministry/agency/commission) and private-sector experts good at listening to citizen’s voices.
  - Host “collaboration meetings,” with PDIS acting as a platform to collect voices from minority opinions.

- **Participation Officers (POs)**
  - Represent each govt. office (32) and explain their policies and actions to the public.
  - Listen to citizen voices, share with govt. offices, and convene meetings as necessary; meet among POs to discuss cross-cutting issues across govt.
  - With more than 5,000 signatories and vote at monthly PO meetings, the govt. will be asked to put their proposals into policy actions.

- **Social Innovation Lab (SIL)**: Weekly office hour with organizations engage in social innovation.
**gOV (零時政府) Movement**

**Existence of Active Civic Tech Community**

- **g0v** is a decentralized civic tech community, started by Taiwanese hackers (IT programming & system experts) in late 2012.
  - Rethinking the role of government from ZERO
  - Using internet & digital thinking to change the traditional govt.
  - Easy access to vital information & power for citizens to shape the civil society
- Aim to promote transparency of govt. info and build “tec solutions” for citizens to participate in public affairs from the bottom up.

- In Taiwan, there exist a cadre of young hackers who are interested in promoting democratic system and social innovation.
- Sunflower Movement (Mar.18-April.10, 2014) was an important “successful experience,” widely shared among young generation, of reflecting citizens’ voice on the political process.
- Minister Tang, coming from **g0v**, serves as the bridge btw. the govt. and the **g0v** community.
Taiwan’s Digital Social Innovation: Creating Open and Participatory Platforms

Four elements of Open Government:
- Transparency
- Participation
- Accountability
- Inclusion

Changing the culture of public services:
- From “for the people” to “with the people”

Ministers without portfolio

Participation Officer (PO)
Reverse mentoring

Public Digital Innovation Space (PDIS)

Social Innovation Lab (SIL)
Office hour:
10:00-17:00 every Wed.

Citizens

g0v (Civic tech)
COVID-19: Are Pink Masks Only For Girls? Taiwan Health Officials Say “No!”

Source: Taiwan govt. website
It started with a voluntary initiative by an IT engineer to build a convenience-store mask map (based on the information reported by the general public) to let people know where to buy masks.

After finding out this initiative via g0v, Minister Tang facilitated the govt. to cooperate with private developers by making the National Health Insurance Administration (NHI)’s data available, so that the information on the Mask Map become more comprehensive.

Cooperation of NHI and private developers in establishing the eMasks Mask-Distribution System Platform allows people to receive real-time information and to enjoy greater convenience in making purchases.
Center for Strategic Futures (CSF) was created in 2009 in PM’s Office to conduct long-term scenario planning from national and global perspectives and analyze chances and risks that may affect Singapore’s future.

- Whole-of government approach (strategic planning and prioritization, coordination and development).
- Similar “Future Divisions” in different ministries.

Working closely with research institutes, universities, and other stakeholders to collect information and facilitate vision-sharing.

Singapore has no regular national development plans (only one Five-Year Development Plan in the 1960s).

- Long-term vision formation and strategic planning through ad hoc and task-based committees & councils, and scenario planning by “Future Divisions” are main planning methods.

As a small and open economy, the govt. attaches high importance on flexibility and quick-response capacity to changing global environment.
Future Scenario Planning

Institutional Mechanisms for Boosting Skills & Enterprise Productivity through National Effort (based on the findings of GDF mission of Sept. 2010)

Stakeholder consultations for vision formulation

An Example of Task-based Ad Hoc Council

• Whole-government approach
• Close stakeholder consultations

Center for Strategic Futures (in PMO)
Singapore: Strategic FDI Attraction (Queen Bee Approach and Partnership with MNCs)

- **Industry Div. of MTI** (policy) and Economic Development Board (**EDB**: implementation as one-stop agency) are responsible for FDI attraction and industrial development.

- They work closely to attract FDI, foster “industry verticals” (suppliers of intermediate inputs) and enhance biz. environment.
  - Target: transport engineering, biomedical sciences, logistics, infocomm & media, education, professional services..., as well as new growth areas (clean energy, environmental technologies, biotechnology, digital media, etc.)

- **Queen Bee approach**: In addition to improving biz. environment, EDB offers targeted, company-specific support and incentives based on individual negotiations.
  - (e.g.) Rolls-Royce, Pratt & Whitney, ST Aerospace, Seletar Aerospace Park

- EDB Board members include representatives of MNCs & labor union. It also has an international advisory council chaired by PMO’s senior minister, with CEOs of 16 MNCs.
Thailand: Linkage Policy Network

Thai govt. forms a loosely coordinated network for strategic FDI attraction & linking with local firms (BOI), and capacity building of local firms (MOI). “Japan Desk” is established in both agencies.

Source: BOI presentation (May 2013)
Note: This network was created when the BOI was placed under the MOI at the time of former Prime Minister Yingluck Shinawatra.
Thailand: BOI-BUILD Matching Services

- As an investment promotion agency, BOI is the first contact point for foreign investors.
- **BUILD** was established in 1992 within BOI. It receives inquiries from FDI and finds local firms.
- BUILD provides free services to both Thai and foreign buyers source parts and components in Thailand.
  - When an inquiry is received from a buyer, BUILD identifies potential suppliers that meet the buyer’s requirements.
  - Normally, BUILD announces the specification and volume requirements of foreign buyers in the website and solicits expression of interest from Thai suppliers.
  - One-on-one meetings can also be arranged for a buyer to discuss individually with each potential buyer.
  - There are various channels through which BUILD receives inquiries from foreign buyers (including the One Start One Stop Investment Center, overseas offices of BOI).
Thailand: MOI-BSID

Step by Step Approach to SI Development

- **BSID**, under the **Department of Industrial Promotion (DIP) of MOI**, is responsible for SI development.
- BSID was established in 1996, by upgrading the Metal-working and Machinery Industries Development Institute (MIDI). JICA supported MIDI capacity building.
- When the number of SI firms was limited, BSID directly provided technical & managerial support to individual companies. Private consultants (Kaizen, Shindan experts, etc.) were also nurtured with Japanese JICA & others’ support.
- When the number of SI firms grew (to approx. 1,000), BSID established and managed **thematic forums** of SI (design, metal, machinery, foundry, etc.), serving as their coach and secretariat.
- Gradually, these forums have gained experience and developed into truly privately-run **industrial associations**.
Mega Trends (Summary)

- Expansion of global value chains (GVCs)
- Digital revolution (DX)
- Environment, social & governance (ESG) concern
- Unexpected shocks (e.g. pandemic, natural disaster, fin. crisis)

- Opportunities: Possibility of leapfrog, participation of global production networks without regional “Flying Geese”
- Risks: Digital divides, ethics, use of personal data, privacy...

- What may change?
  - Policy details & priority settings; digital-oriented, sustainability, resilience...
  - Speediness of policymaking and implementation
  - The whole of government approach (complex problems, holistic approach...)
  - Likelihood of catch-up (“leapfrog” and even “reverse innovation”?)

- What will NOT change?
  - Importance of public policy & govt’ role (more sophisticated policy capability)
  - Global cooperation

Source: Homma Toru (2021). “Contemporary Agenda for Policy Support to Industrial Development in Developing Countries”
Five conditions for effective policy design

While basic framework does not change, broader interface and speed will be required in the age of digitalization/GVCs/SDGs era

1. Vision & commitment
   - Multi-sectoral coordination with speed; open, citizen engagement

2. Consensus building
   - Brainstorming
   - Studies & surveys
   - Stakeholder consultation
   - Set broad goals & direction

3. Documentation
   - Drafting work
   - Comments & revisions
   - Finalize & approve
   - (Drafting may be outsourced)

4. Substantive stakeholder participation
   - Top leader

5. A secretariat with sufficient authority and capacity to coordinate the entire process
   - Use of digital tech, platform for communication

Increased emphasis

Regions & localities
- Multi-sector, open citizen engagement

Academics & consultants
- Strategic engagement of foreign actors

Businesses

Ministries & agencies
GVCs: Actors and Governance

Growing demand for compliance with standards: quality, technology, social, environmental...

Linkage with domestic development

Comprehensive requirement (economic, social, environmental...) (digital...)

Policy capability of host-county govt.

Source: Adapted by the author, based on Gereffi & Lee (2016). “Economic and Social Upgrading in Global Value Chains and Industrial Clusters: Why Governance Matters”
## Strategies for Industrialization and Digitalization Compared

<table>
<thead>
<tr>
<th></th>
<th>Systems for Industrialization</th>
<th>Systems for Digitalization</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Human Resources &amp; Skill Development</strong></td>
<td>Primary &amp; secondary education, TVET, OJT</td>
<td>Digital literacy, data scientist education, entrepreneurial education, life-long education</td>
</tr>
<tr>
<td><strong>Infrastructure Development</strong></td>
<td>Water, Power, Gas supply networks, transport infrastructure (road, railway, ports, etc.)</td>
<td>Telecommunication infrastructure, Cloud services, Electronic personal authentication system, Open API</td>
</tr>
<tr>
<td><strong>Finance</strong></td>
<td>SME finance, FDI, Policy loans to large-scale projects</td>
<td>Venture capital, deregulation for cashless payment</td>
</tr>
<tr>
<td><strong>Support Measures &amp; Policies</strong></td>
<td>Post-ISI policy, EPZ (IPs), FTA, IPR</td>
<td>Incubation facilities (accelerators, etc.), Sandbox system, Privacy data regulation, fact checking</td>
</tr>
</tbody>
</table>

Source: Asei Ito (2020), p.204, Figure 6-1.