Session:
Industry 4.0 for Inclusive Development:

Commentary
by

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Overall Impression:
Report on **Industry 4.0 for inclusive development**

- Nice review of the issues on implications of Ind 4.0 for development
- But, less dealing with changing situation since the Covid-19 and the US-China tensions.
- So, two ways to complement

- 1) Changing GVC and renewed possibility for reshoring and nearshoring
- 2) Possibility and need for not manufacturing but Resource-based development (a mode less relying on GVC but on domestically available resources)
- eg) new resource sectors in Chile and Malaysia

Digitalization also shape GVC in post-Pandemic era

and thus affect Reshoring and nearshoring

Three factors determining GVC in Asia (Lee and Park 2021): Digitalization, US-China Conflict, and Covid-19 => De-globalization ->reshoring/nearshoring

- US-China trade conflicts (tariffs against China):

=push factor for trade/FDI diversion

(out of China to Southeast Asia: nearshoring, or onshoring;

also rising wages and competition in China)

- Digitalization (automation, smart factory)

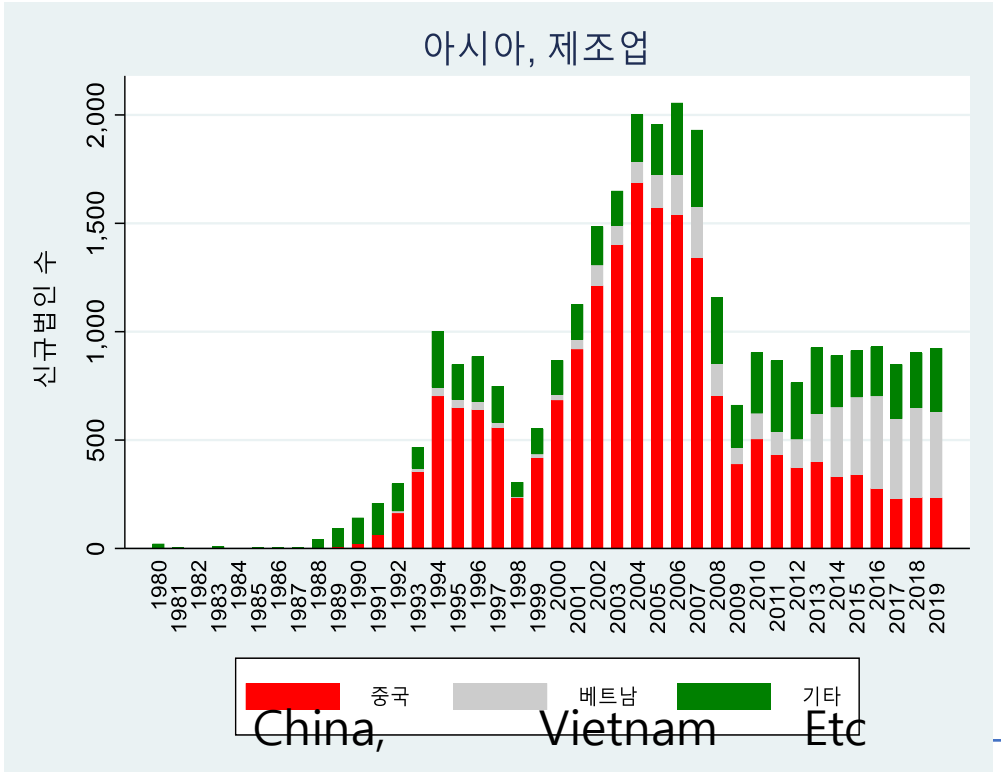
= enabling factor for reshoring back home

- **Covid-19 + incentives for resiliency:**

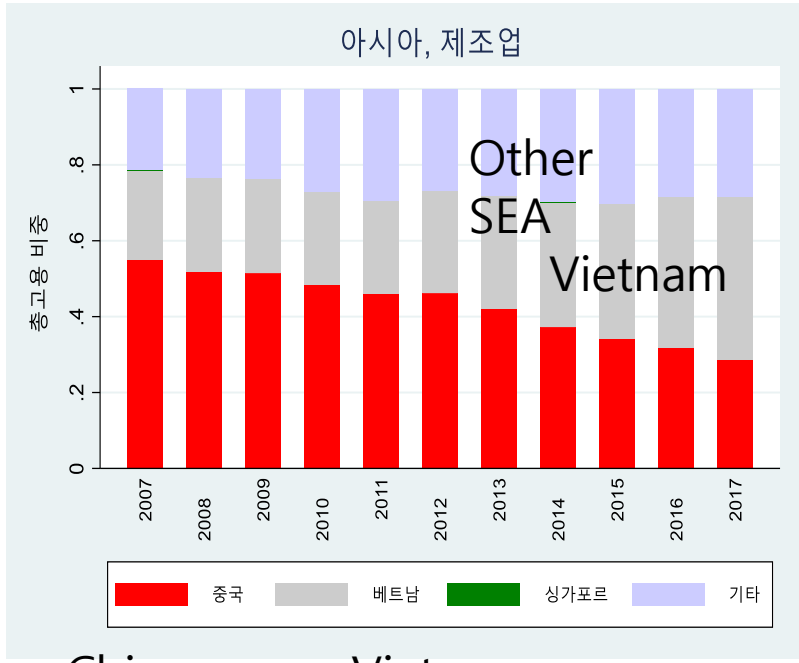
= expediting factor for reshoring or nearshoring

Changing Locations of Korean FDI in Asia: from China to Vietnam and others; + some reshoring

No of FDI cases, 1980-2019



Share in Employment



출처: 수출입은행 해외직접투자 통계 자료 이용 박지형/안재빈 계산; https://stats.koreaexim.go.kr/main.do

Exit from China:
rise of local firms' competitiveness; rising wages
=> Many case of nearshoring and reshoring

1) 19 cases of nearshoring to SEA (south east Asia):
mostly due to the US-China Conflicts

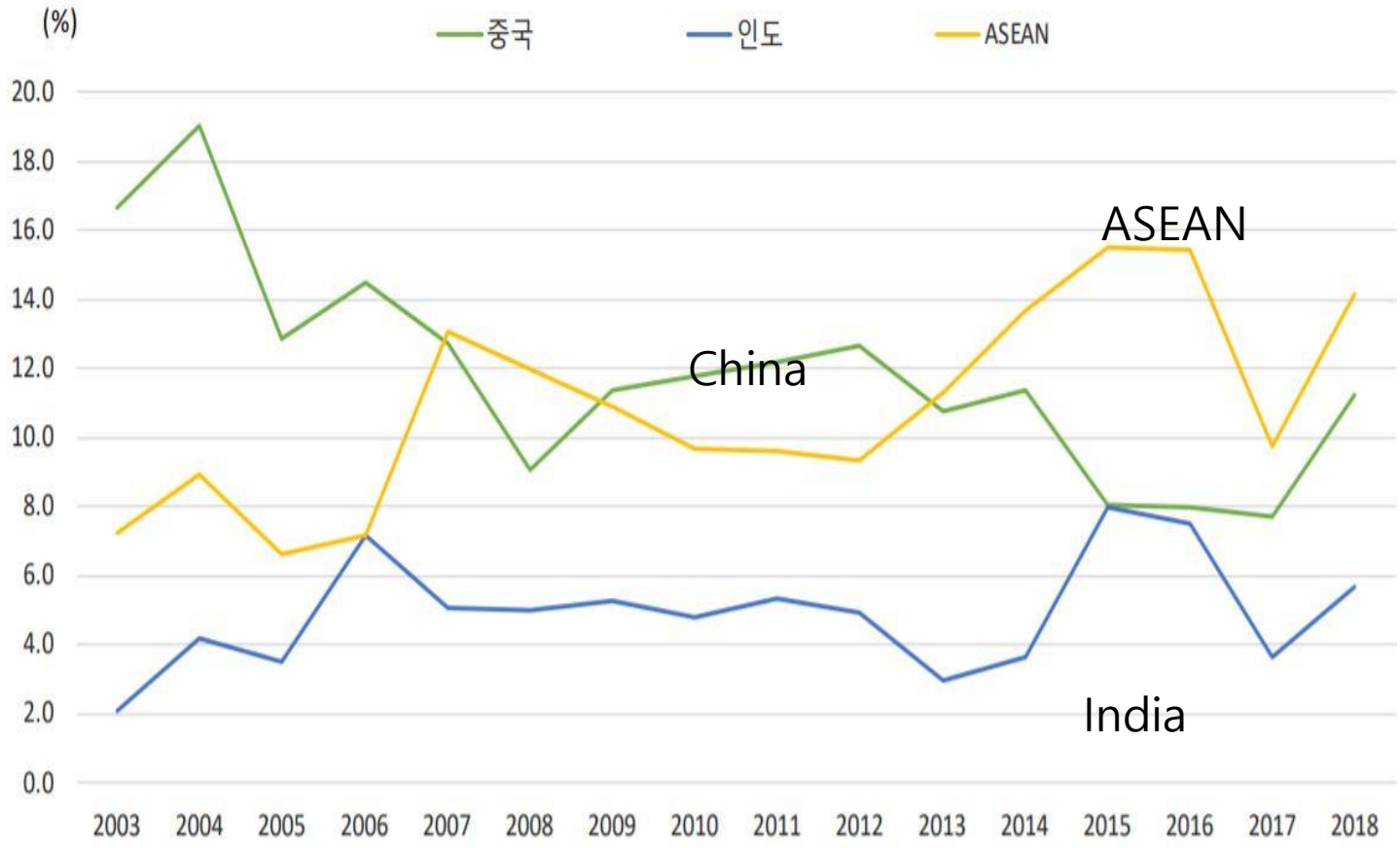
eg) Sharp (Japan) : LCD screen subject to the US tariffs;
moving factory from China to Vietnam

Eg) Samsung: moved all final assembly out of China to SEA but kept only three intermediate parts (memory chips, electric batteries, and MLCC);

- Eg) M/S of cell phone in China: 20% in 2010s to 0.5% in 2020

2) 8 cases of reshoring back to home:
owing to incentives for reshoring; smart factory; near to markets
Eg) Intel: owing to reshoring incentives (corporate taxes)

% Shares in total Green field FDI to Emerging Economies: ASEAN > China, India



Implications for Southeast Asia (SEA): New Opportunity for onshoring/nearshoring

- China exodus

  = new opportunity for SEA to overcome the challenges posed by 4IR

  to keep onshoring (existing FDI) or attract new nearshoring out of China

cf) The Earlier Challenges from the 4iR

1) With automation, low-cost labour is less effective strategy to attract manufacturing investment
2) A trend towards re-shoring of manufacturing back to the rich world

   (eg Apple in the US and Adidas making shoes in Germany)

- But grabbing this new opportunity requires upgrade human capital;

  reskilling/up skilling

Penang =Some Hollowing out, Upgrading, and Local Spillovers (spinoffs)

1) Some Sings of Downsizing of MNCs with rising wage;
to rationalise their resources and reduce redundancies over the past few years.
-- eg) Amphenol, Hitachi Global Storage Technologies (HGST).

2) Also, some strong signs of Adjustment and upgrading
MNCs (Intel) reducing in low value adding operation,
for more R&D, prototyping and servicing centre;
b/c Penang = a strong supply chains that enable state-of-the-art technologies & services.

⇒**Penang evolving towards a cluster that provides software, engineering design, R&D and industrial system-based services.**

3) Also, some spillover leading to emergence of Local Firms
- Local firms defining niches and new industries for Penang.
- - committed to advance their highly value added activities in Penang.

Eg) a) Vitrox (a spin-off from HP producing automated machine inspection vision system);

B) Globetronics (a spin off from Intel providing semiconductor process services);

C) EngTek (from a humble workshop in 1970s providing services to MNCs to producing hard disk drive components, precision tooling).

How to respond to the Challenge of 4IR: Up- and Re-skilling
Training Center = Penang Skill Development Centre (PSDC)

- Penang Development Centre (PDC) = a state established in 1969

=> HP, Intel and Motorola founded Penang Skill Development Centre (PSCD) in 1989;

-- a non-for-profit institution to provide technical knowledge and training program to engineers in the industrial park for advanced manufacturing operations.

- Now serving about 200 member firms;
- trained 7,048 individuals as certified skilled workers.

- PSDC, playing a significant role in developing competencies for 4IR, such as:
  - I4.0: the idea, architecture, demand and approach
  - Embedded Systems for IoT
  - Cloud Architectures & Technologies
  - Cybersecurity Fundamentals for I4.0
  - Big Data: Methods and Solutions
  - The Robot Operating System

Another alternative since the Pandemic: Resource-based development which requires less integration to GVCs

- Disruption of GVC in the post-pandemic era posts both additional difficulties and new opportunities for emerging countries

  => new modes of development relying more on domestic resources

  for a more resilient pattern of GVC and development

- Further, given a high entry barrier for high end manufacturing;

  high-value-addition in resource-based sectors should be tried.

- **Lebdioui et al (2020): Malaysia and Chile = beyond the middle income trap,**

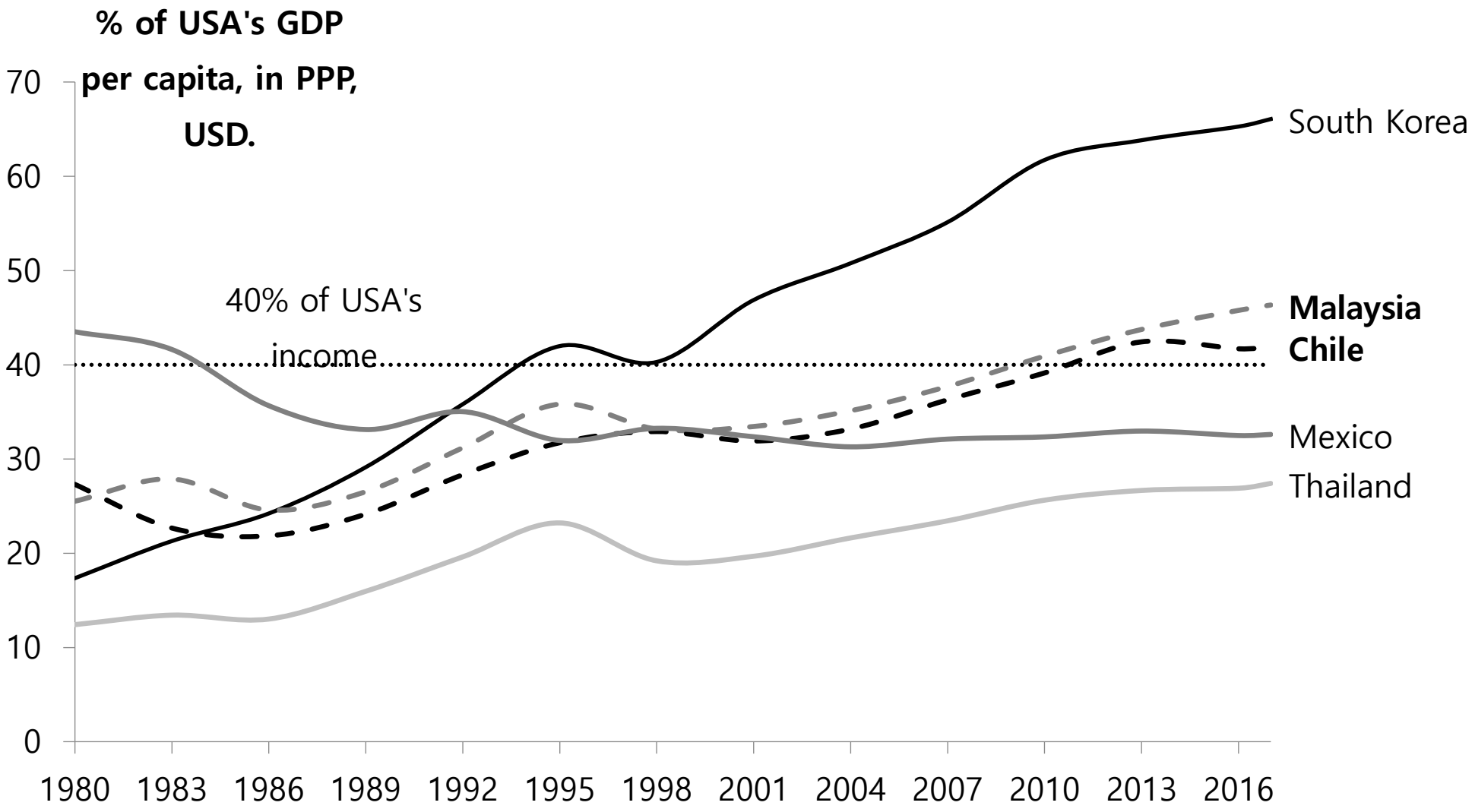
  => owing to their success not in manufacturing but in several resource-based sectors :

  Malaysia: petroleum, rubber and palm oil sectors

  Chile: salmon, fruits, wine and wood products in Chile.

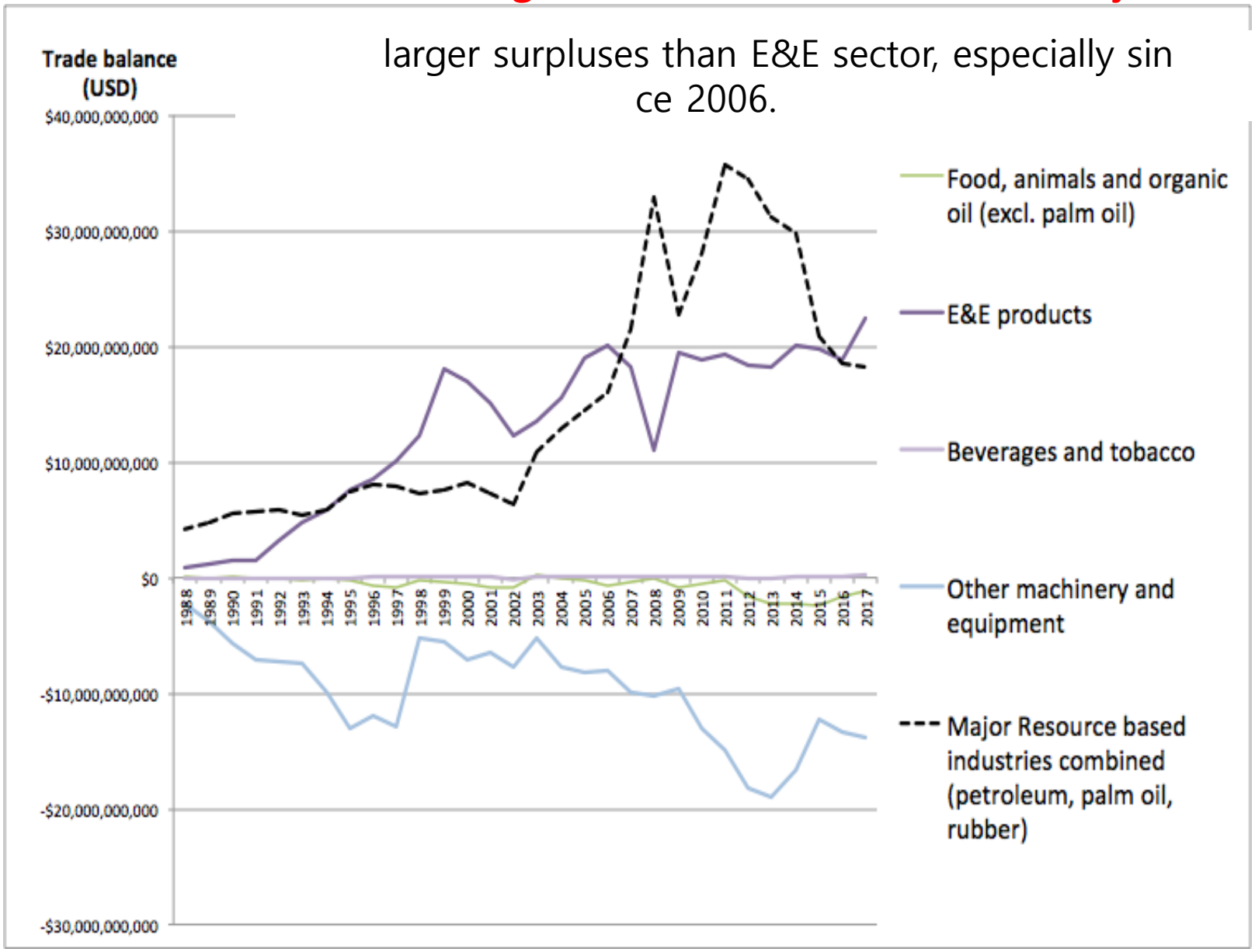
Chile and Malaysia's growth in perspective

GDP per capita as % of US GDP per capita in selected countries



Contribution to earning dollars (trade balance) in Malaysia

larger surpluses than E&E sector, especially since 2006.

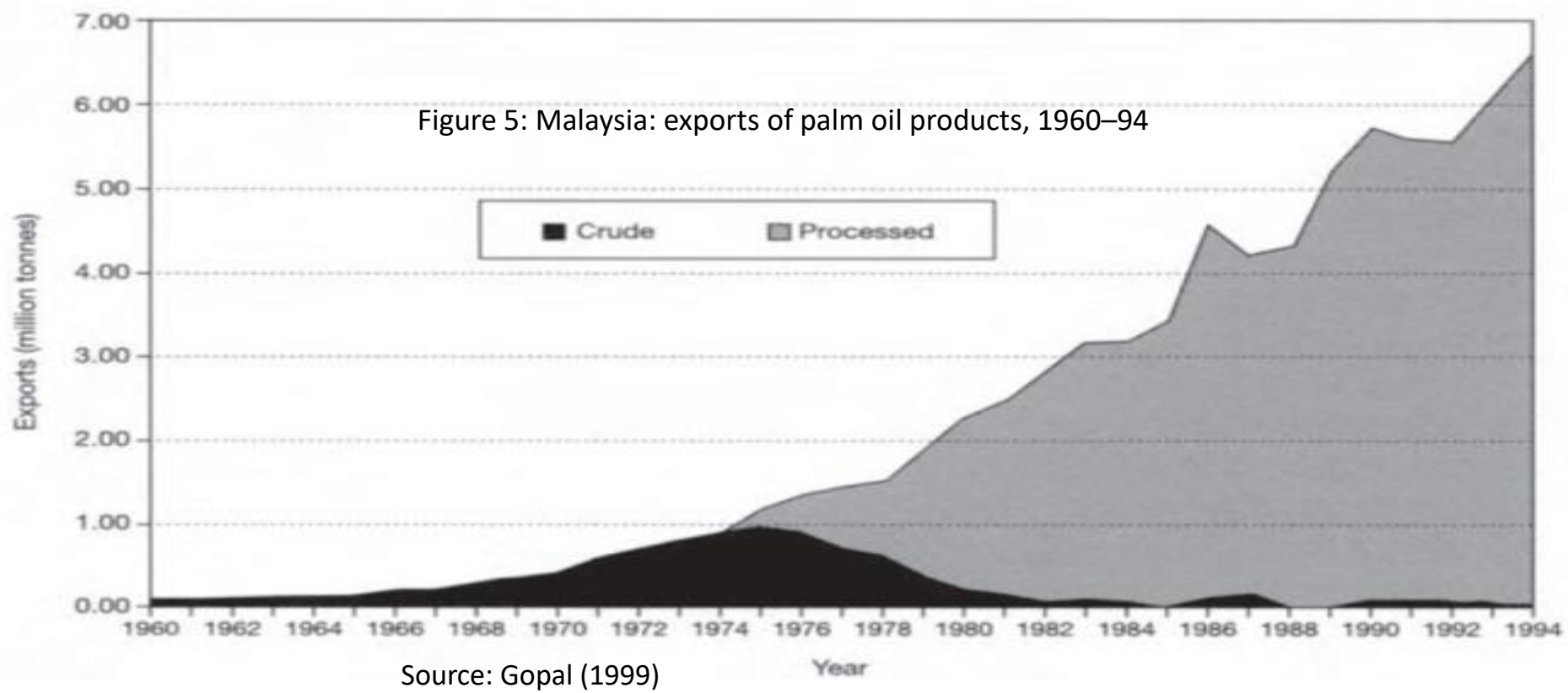


Source: UN Comtrade

Upgrading in Palm Oil in Malaysia: from crude to processed: cf) Indonesia's' export of crude palm oil

- The palm oil industry = second largest contributor to trade;
  fourth-largest contributor to gross national income.
- Export earnings : from USD15 million in 1960 to USD27 **bil.** in 2011.
- **share of processed exports in total palm oil product exports;**
- **from 0% in 1974 to 99% by 1994.**

Figure 5: Malaysia: exports of palm oil products, 1960–94



Source: Gopal (1999)

Industrial/Innovation policy and local ownership to overcome latecomers' disadvantages in Palm Oil:

1) trade policy and promotion

(to counter the European tariffs not on crude but on processed palm oil);

imposed export taxes on crude palm oil

2) Nationalization and takeover of foreign ownership:

Hostile takeover in the London stock exchange

of British owned plantations in Malaysia in 1981 .

3) R&D support and fiscal incentives for value addition

Palm oil Research Council; Oil Palm Genetics Laboatory (OPGL)

Tax incentives for the utilization of oil palm biomass

Tax incentives for reinvestment in resource-Based industries R&D

Conclusions: Finding New Sources of Growth to Recover

- Changing environment:

  Digitalization, Covid-19, high wages in China; US-China conflicts (tariffs on China)

=> New Opportunity for Leapfrogging/Nearshoring and new sources and modes of growth

1) Nearshoring + digitalization for manufacturing in Indonesia

- Need upskilling and reskilling and infrastructure

2) New innovation-based growth with resource-based sectors

for high value-added, export orientation, by combining new technologies;

--need targeted innovation policy and financing including P-P venture capital,

promoting new alliances (vertical and horizontal)

3) Leapfrogging with diverse combinations of IT with diverse domains (eg. fishing, mobility, etc)

eg) IT-based startups in software/platform businesses : eg Grab!

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