Challenges to Thailand's Industry Electronic Equipment and Electrical Appliances

Bhanupong

Lecture 16

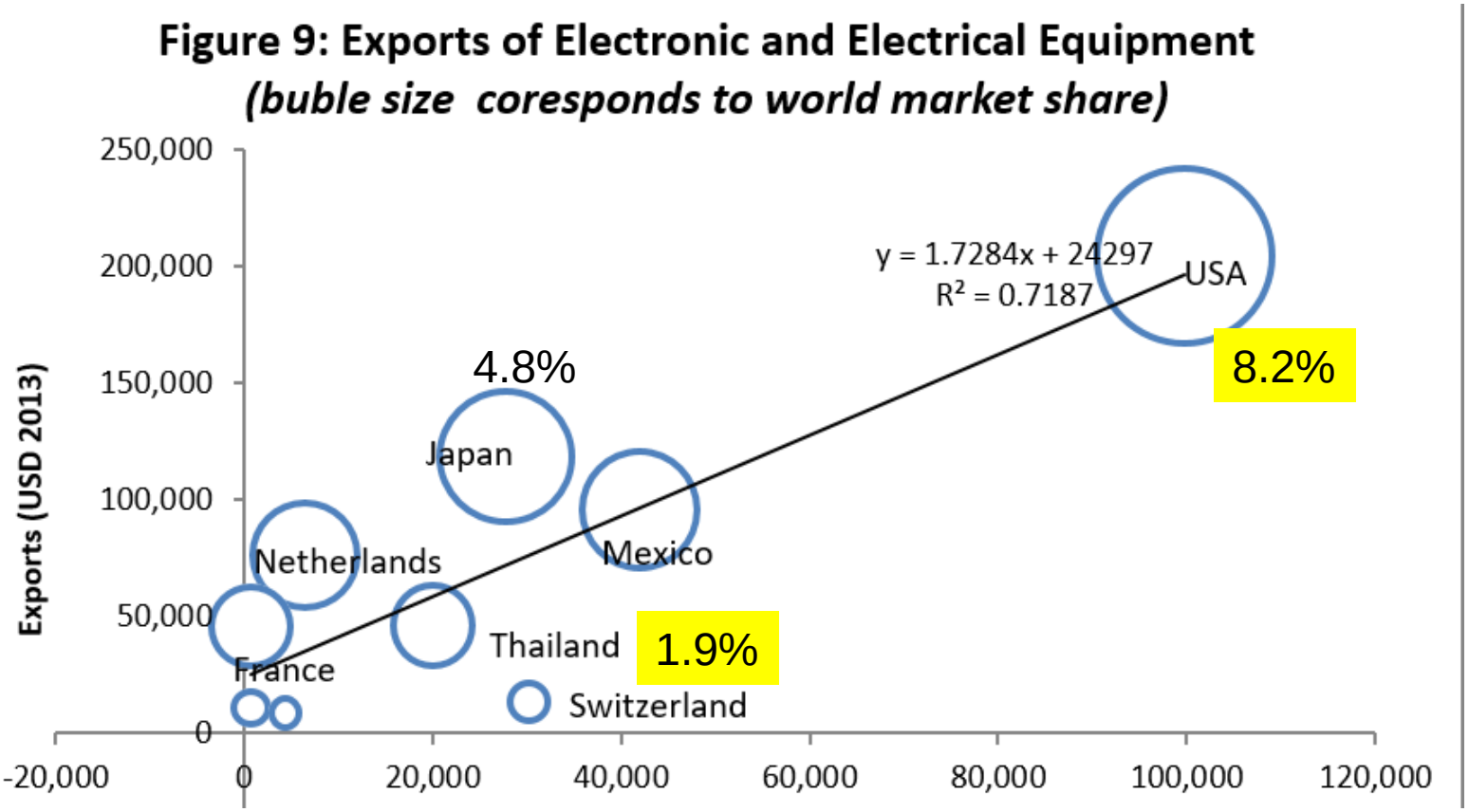
Course Syllabus
Lecture 16

- **The rise and fall of Thailand's export-oriented industries**
- We explore electronic equipment and electrical appliances industry
- While facing non-tariff barriers imposed by developed countries, these industries are still leading exports of Thailand.
- Does the success of these industries bode well for the resilience and dynamism of the EEA industry?

Key words

1. FDI and exports
2. Vulnerability, resilience, and competitiveness
3. International product fragmentation
4. Strategic industrial policy

1. Inward FDI stock and exports



Stock of Inward FDI

IT- led growth hypothesis

"Countries that invested more in Information Technology would ***achieve*** consistently higher productivity and income growth rates."

Samsung *products amounted to 15 % of Korea's GDP*

Samsung mobile phone has 22% of world market share, iPone 12% in 2016.

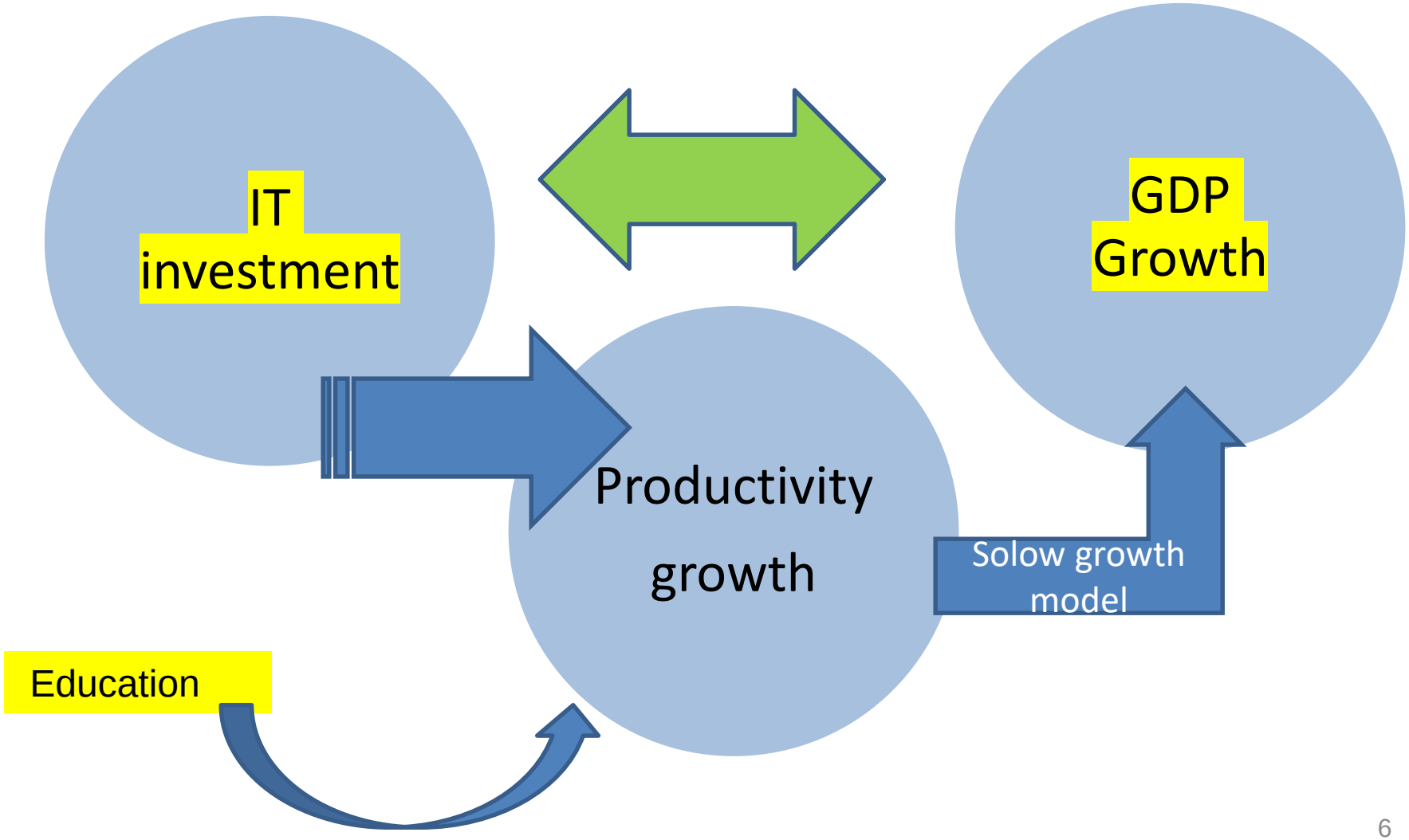
How do we verify this hypothesis?

What are the caveats of this hypothesis?

(caveat emptor = buyers must beware of products they are purchasing)

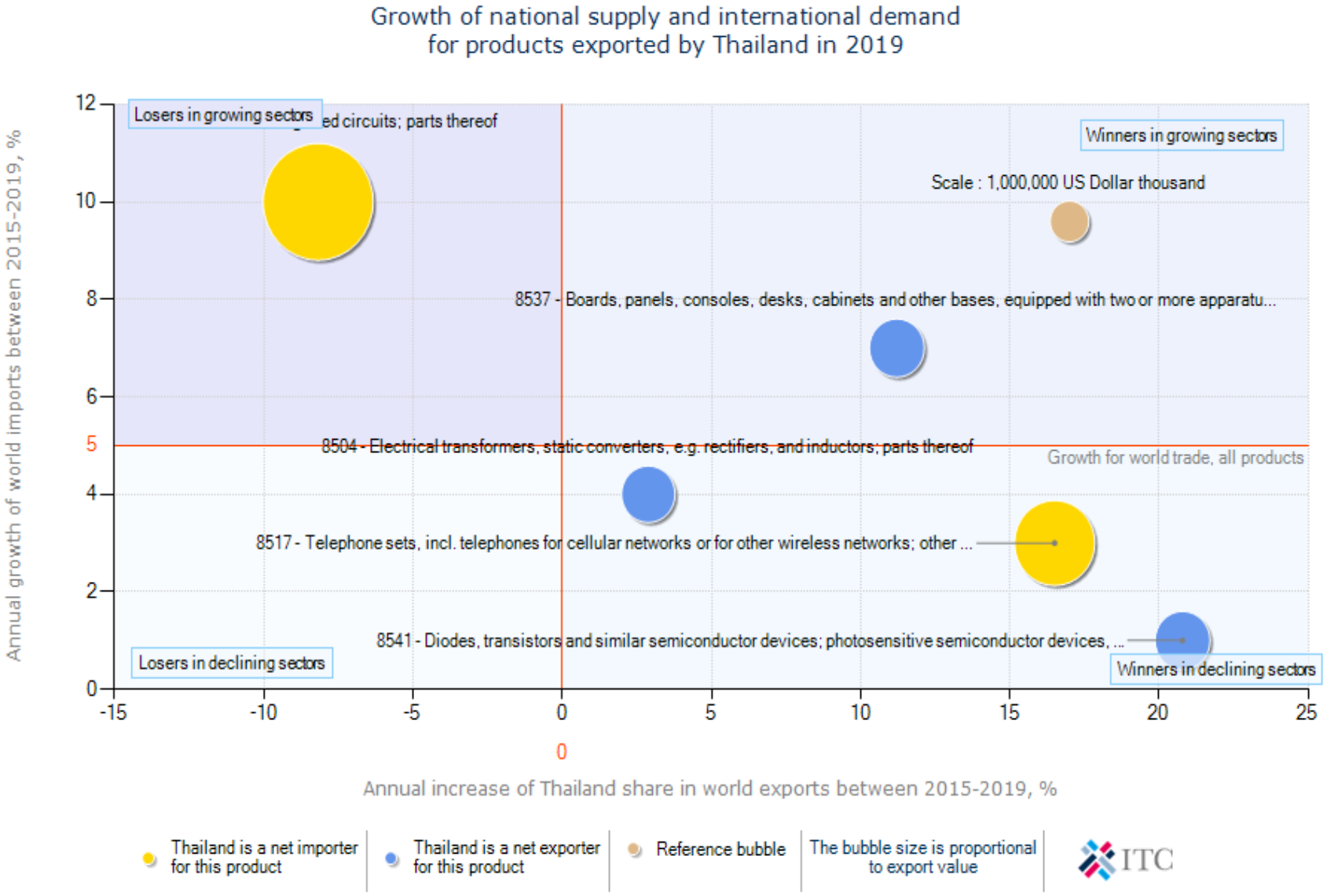
IT-led growth paradigm

two-way causations



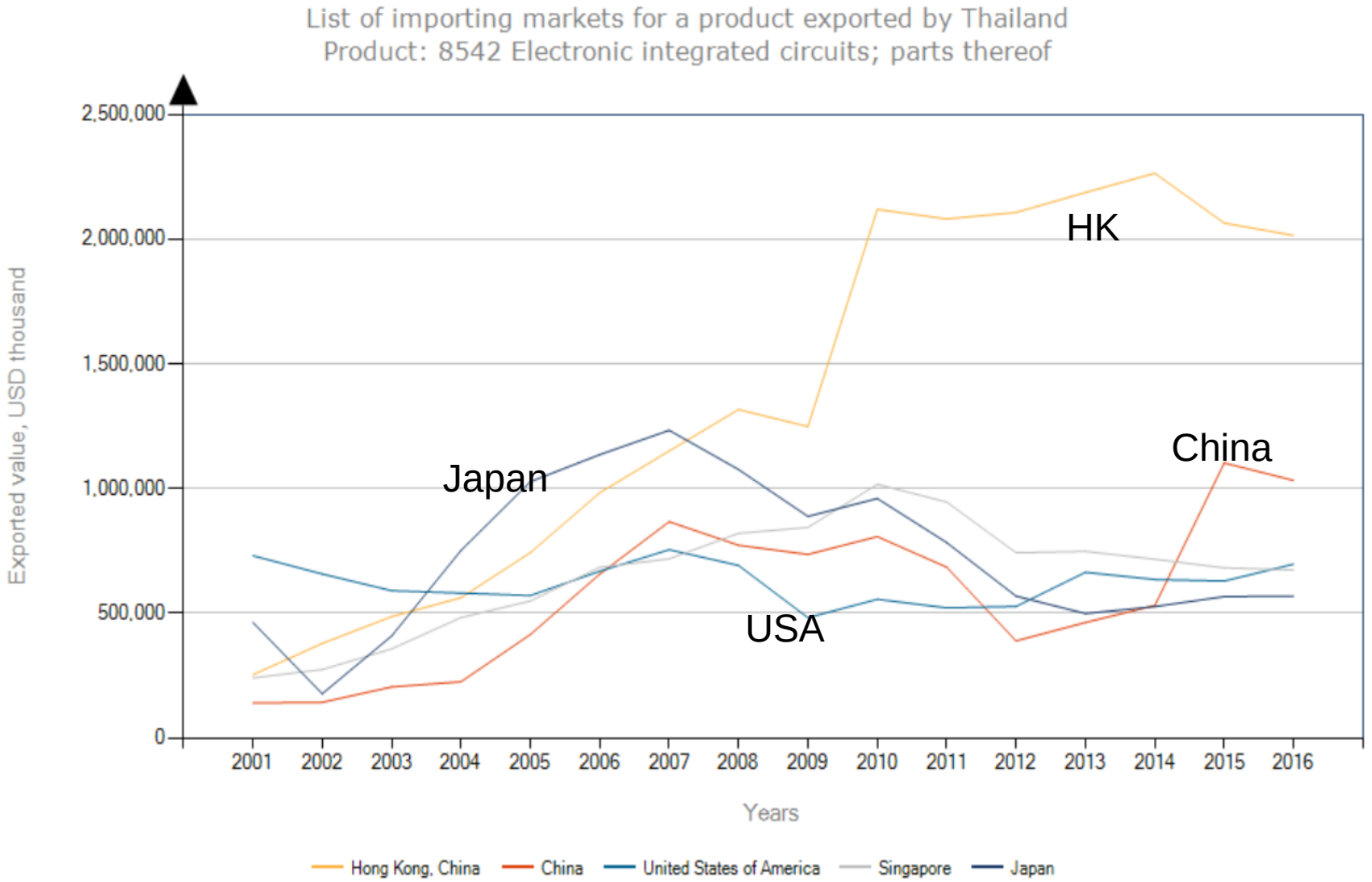
2. The EEA sector is extremely sensitive to world business cycle

- The year 2001 witnessed another poor performance of the Thai economy, when the GDP growth rate dropped to just 2 %.
- The IT industry suffered the same contractionary impact of slowdown in world GDP growth
- When the economy rebounded in 2002, the growth of the industry surpassed the GDP growth.
- We observed similar situation during the global recession in 2009 and the rebound of EEA exports in 2010.
- **There has been a rebound of EEA exports after the world economy recovered in 2018**
- ***Will the year 2021 be different from the previous rebounds?***


Growth of national supply and international demand
for products exported by Thailand in 2019
Losers in growing sectors
ed circuits; parts thereof
Winners in growing sectors
Scale : 1,000,000 US Dollar thousand
8537 - Boards, panels, consoles, desks, cabinets and other bases, equipped with two or more apparatu...
8504 - Electrical transformers, static converters, e.g. rectifiers, and inductors; parts thereof
Growth for world trade, all products
8517 - Telephone sets, incl. telephones for cellular networks or for other wireless networks; other ...
8541 - Diodes, transistors and similar semiconductor devices; photosensitive semiconductor devices, ...
Losers in declining sectors
Winners in declining sectors
Annual growth of world imports between 2015-2019, %
Annual increase of Thailand share in world exports between 2015-2019, %
Thailand is a net importer for this product
Thailand is a net exporter for this product
Reference bubble
The bubble size is proportional to export value
ITC

Thailand's exports of electronic integrated circuits (IC)

product 8542



Changing comparative advantage and changing technology

- Computer and Hard Disc Drive (HDD) *had* the most promising trend (note the past tense).
- Output of computer ***tripled within 5 years***, whereas output of HDD rose by 250 percent between 2000 and 2004.
- The output of integrated circuit has a moderate growth, while computer keyboard, printer, and monitor has been declining.

Changing comparative advantage and changing technology

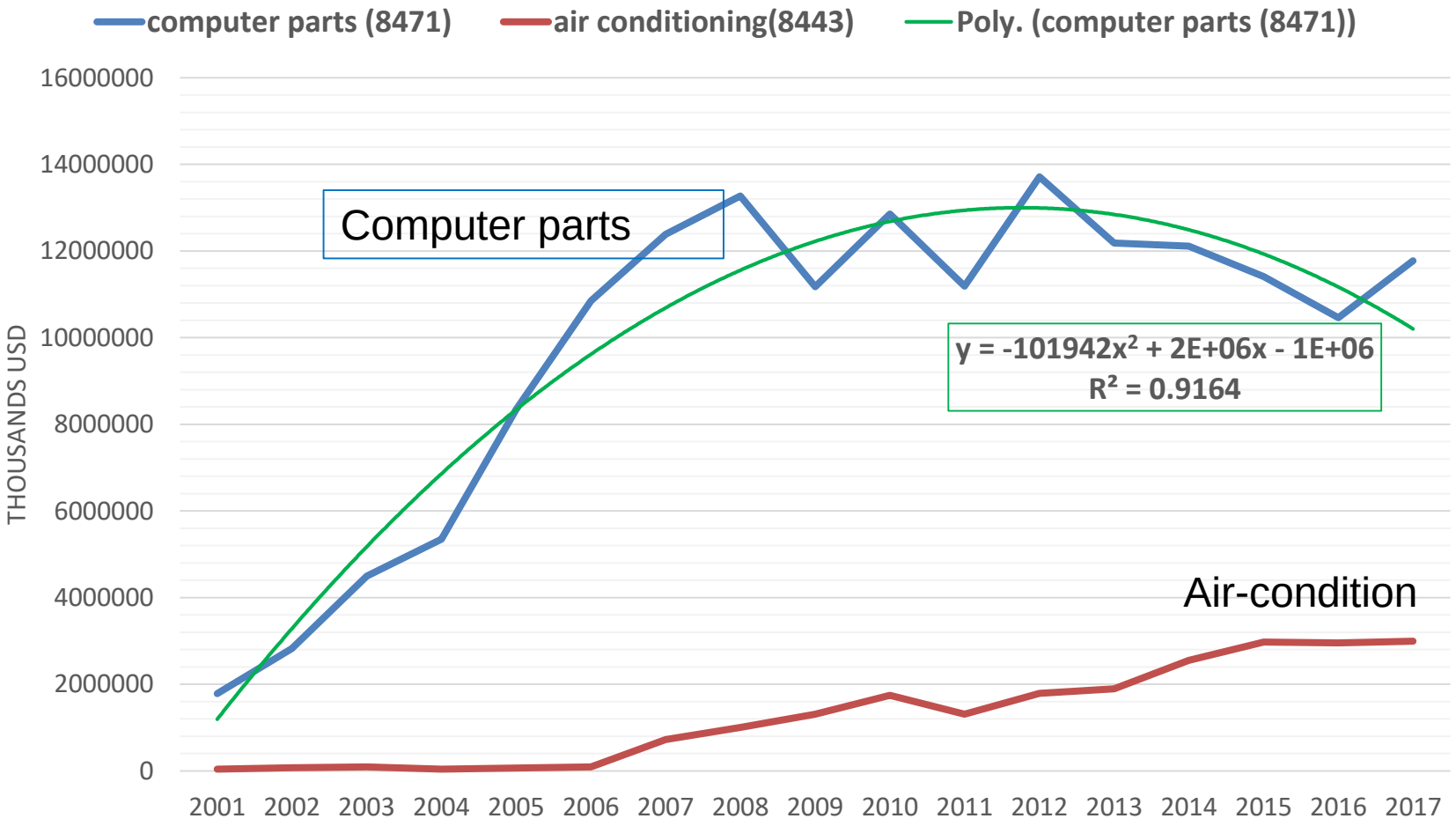
- Thailand cannot compete with cheap imports from low-cost countries.
- There is also a process of ***creative destruction (Schumpeter: A foreshadow of the Disruptive Technology)*** driven new technological innovation
- A bulky desktop will soon be replaced by an ultra-thin lap top.

Major producers of HDD in Thailand

- Hitachi Global Storage Technology
- Seagate Technology
- Western Digital Corp
- Toshiba

Major Exports of Electronic Equipment and Electrical Appliances

Product 84



HDD vs SSD

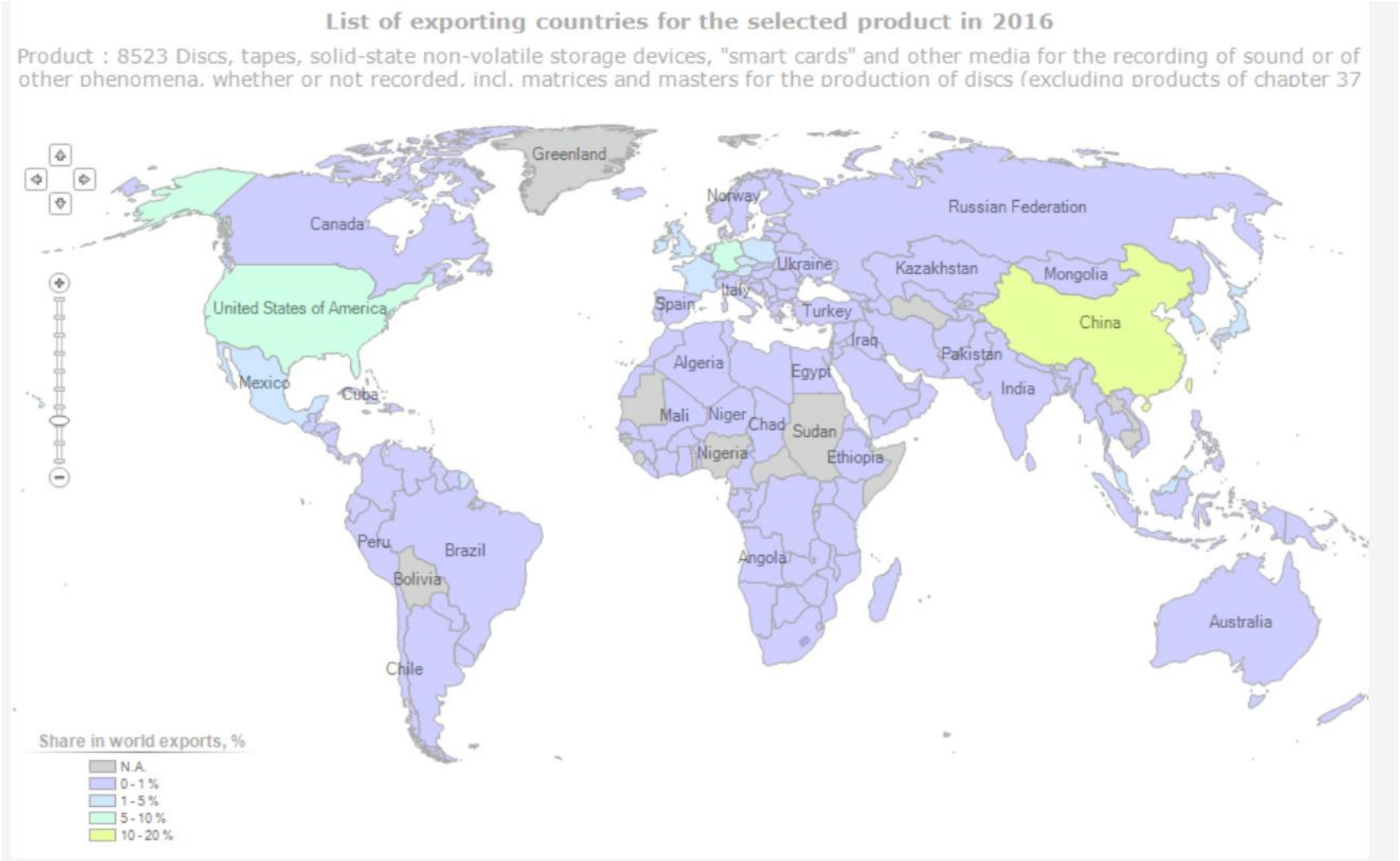
- Sales of **hard disk drives** (HDD) have been on the decline this year because of slow demand for personal computers and tough competition from **Solid-State Drives** (SSD).
- **In the long-term, HDD makers will have to lower the price of their products because of competition.**
- ***Sales*** of SSD increase at the expense of HDD.

The head stack is the most labor intensive part of HDD

If you like your storage cheap and plentiful, choose HDD, or fast and safe, choose SSD

Share in world exports: SSD

Product 8523



3. Product fragmentation:

Changing comparative advantage

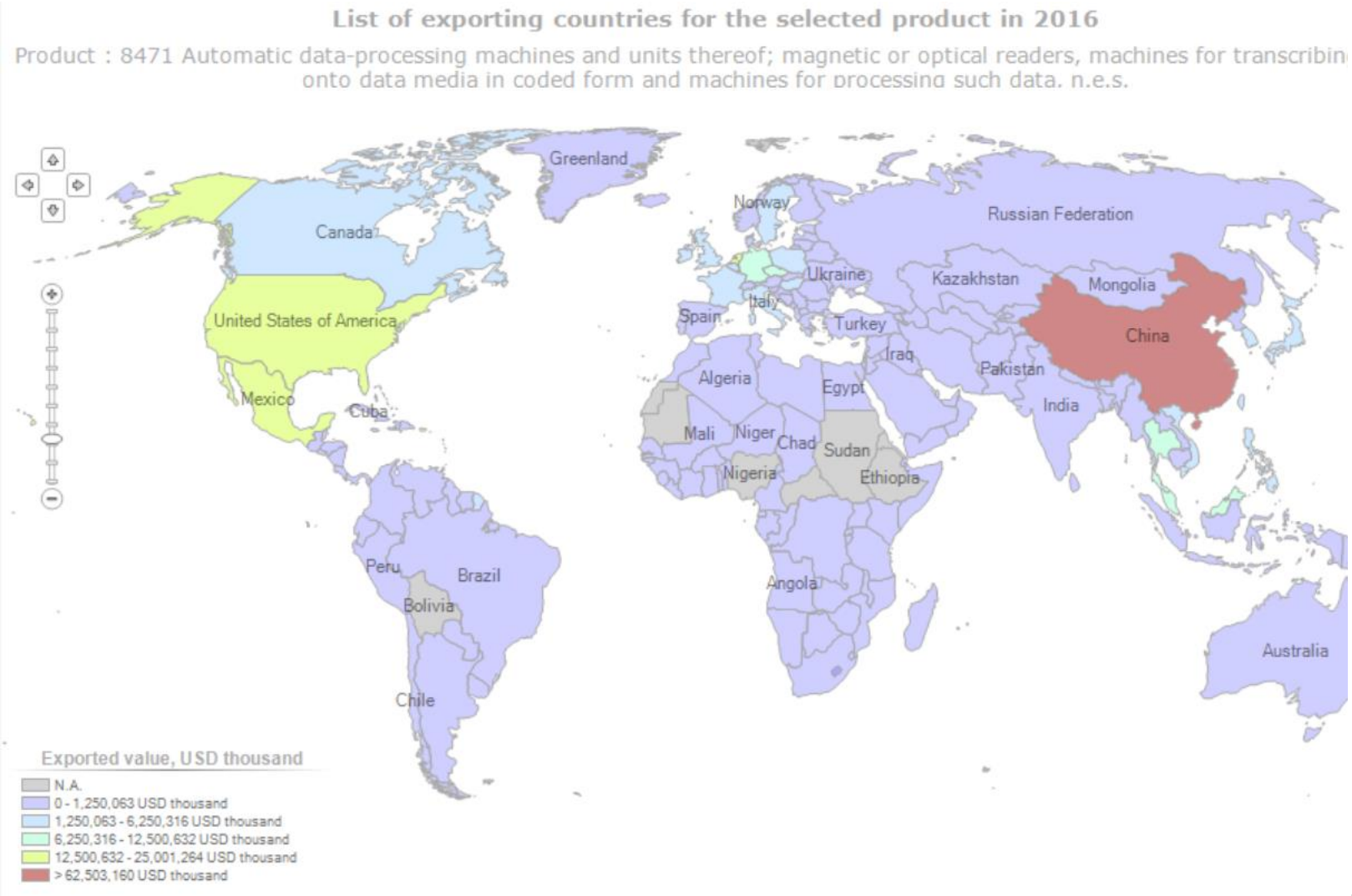
- The changing comparative advantage has made some of Thailand's EEA products become less competitive.
- **Product fragmentation** in manufacturing process generates **intra-industry trade**, where firms in different countries engaging in trading parts and components.

Vertical *infra*-industry trade

- The new trade pattern differs from the **inter-industry** trade pattern where trade of different ***final goods*** or ***intra-industry*** trade where same ***intermediate goods*** with **different attributes** are traded (e.g. garment and textile).
- Electronics and electrical machinery industries can be **fragmented** because they are manufacturing industries which the technology allows "*slicing the value chain*."

Exporters of automatic data-processing machines

Product 8471



International product fragmentation creates **structural interdependence**, intensifying the ***synchronization*** of world business cycle

- Cross-border dispersion of component production within vertically integrated production process.
- **Each country specializes in *a particular stage* of production processes**.
- Rapid growth of trade in parts and components at a rate ***exceed***ing that of trade in final goods because a good crosses multiple borders while in the production process.
- ***Deepening structural interdependence*** **of the world economy intensifies the Synchronization of World Business Cycle**

Trade fragmentation (Network Trade)

Production and trade networks result from the strategies of *multinational corporations* which shifted from exports to *international production* to reduce production costs and to react quickly to market and technological changes.

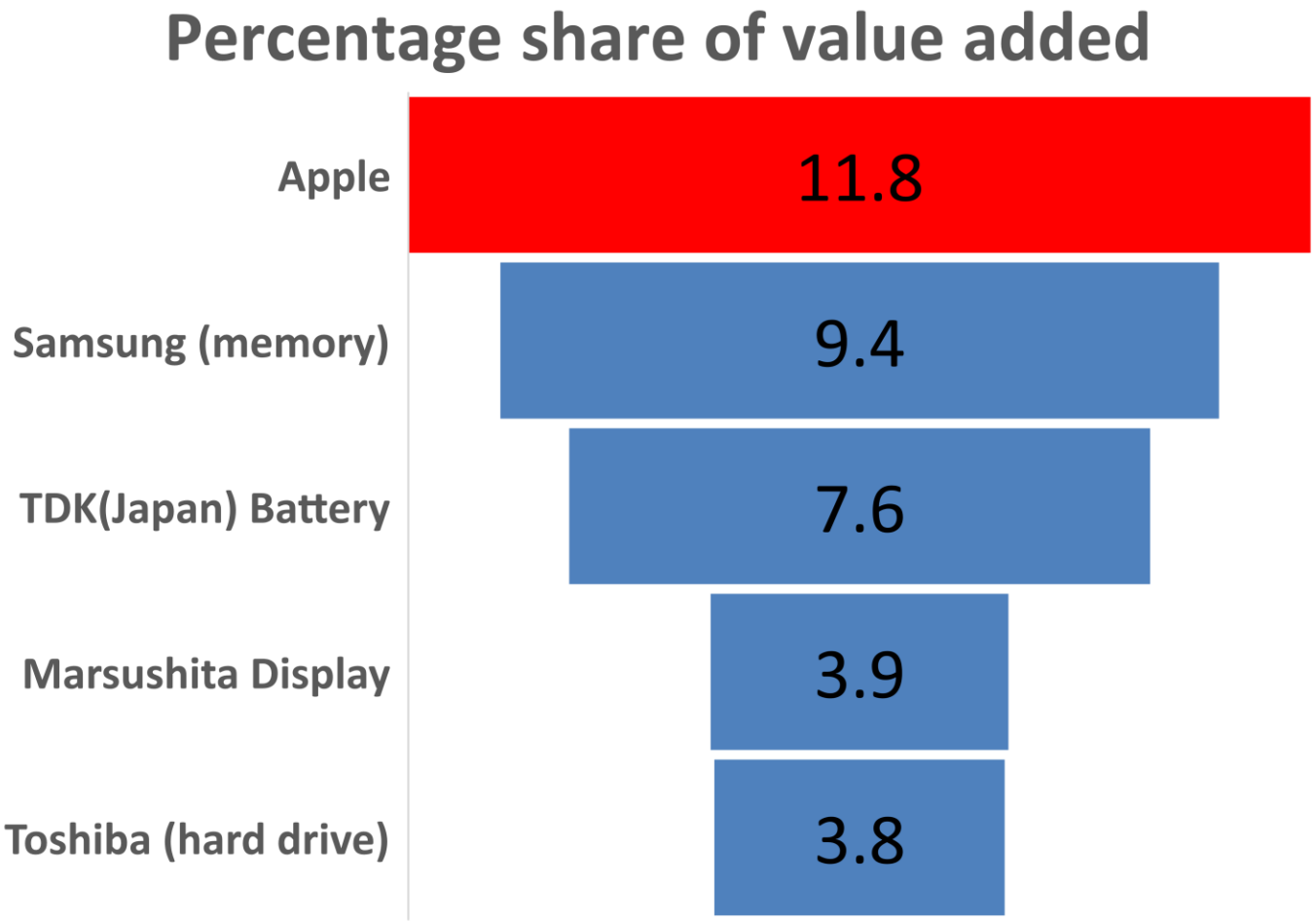
The iPhone

- Even though the retail price of iPhone 4 was $549 in 2010, the value captured through assembly in ***China was around $10 (1.8%),*** whereas the value captured by ***Apple was $312 (58.5%)***
- ***The rest goes to other companies in different countries: imported components***

Global Value Chain (GVC)
The case of iPod

- iPod was designed by Apple in the US and *assembled* by Inventec Appliances in China, its intermediate inputs come from various countries.
- The **value added** measured by operating margin was distributed across firms in different countries.
- The large export share in the world of China ***does not mean*** that industry has a large value-added if its main production process of simple **assembly activities**, based on imported intermediate inputs.
- *The value-added* in China is very low even though iPod was assembled there.

Global Value Chain: The case of iPod



Global Production Networks

- The global economy is increasingly structured around global value chains (GVCs) or global production networks that account for *a rising share of international trade*, global GDP and employment.
- International production, trade and investments are increasingly organized within global production networks (GPNs) where the different stages of the production process are located across different countries.
- Globalization motivates companies to restructure their operations internationally through outsourcing and offshoring of activities.

Challenges of GPNs in China

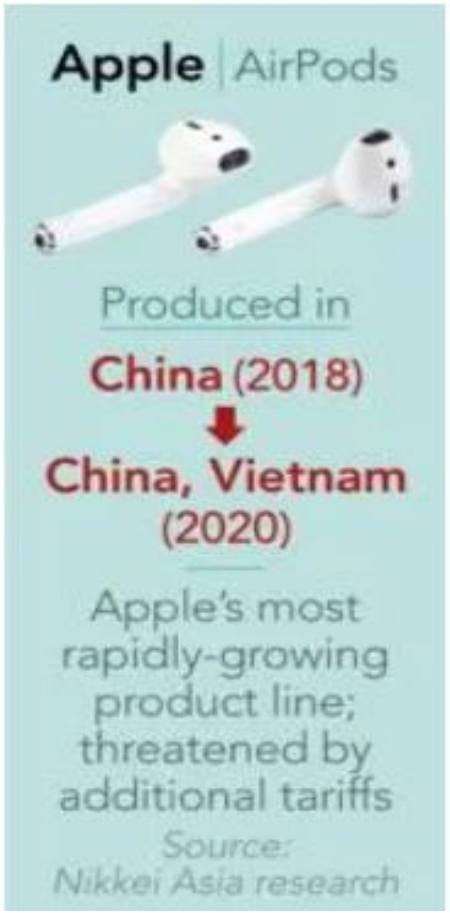
- Even before the trade war, several suppliers were looking to move some production to Southeast Asia amid rising costs and labor shortages in China.
- For the past four to five years, it was already getting harder for manufacturers to attract enough production-line workers during peak season.
- Lack of workers and rising land prices and wages have become a common headache for suppliers in recent years, and had already prompted companies to look for alternatives outside of China.

Thanks to the China-US trade war

- A new supply chain is emerging in Southeast Asia and India, less than 1,000 days after the first wave of punitive tariffs against Chinese imports was implemented in 2018 as tit-for-tat Washington-Beijing trade tensions escalated.
- Big tech suppliers like Apple Watch maker Compal Electronics have secured land in Vietnam; AirPods and Xiaomi phone maker Inventec has facilities in Malaysia; while iPhone and Acer notebook assembler Wistron has plants in the Philippines.

the US campaign to cut China out of the tech supply chain

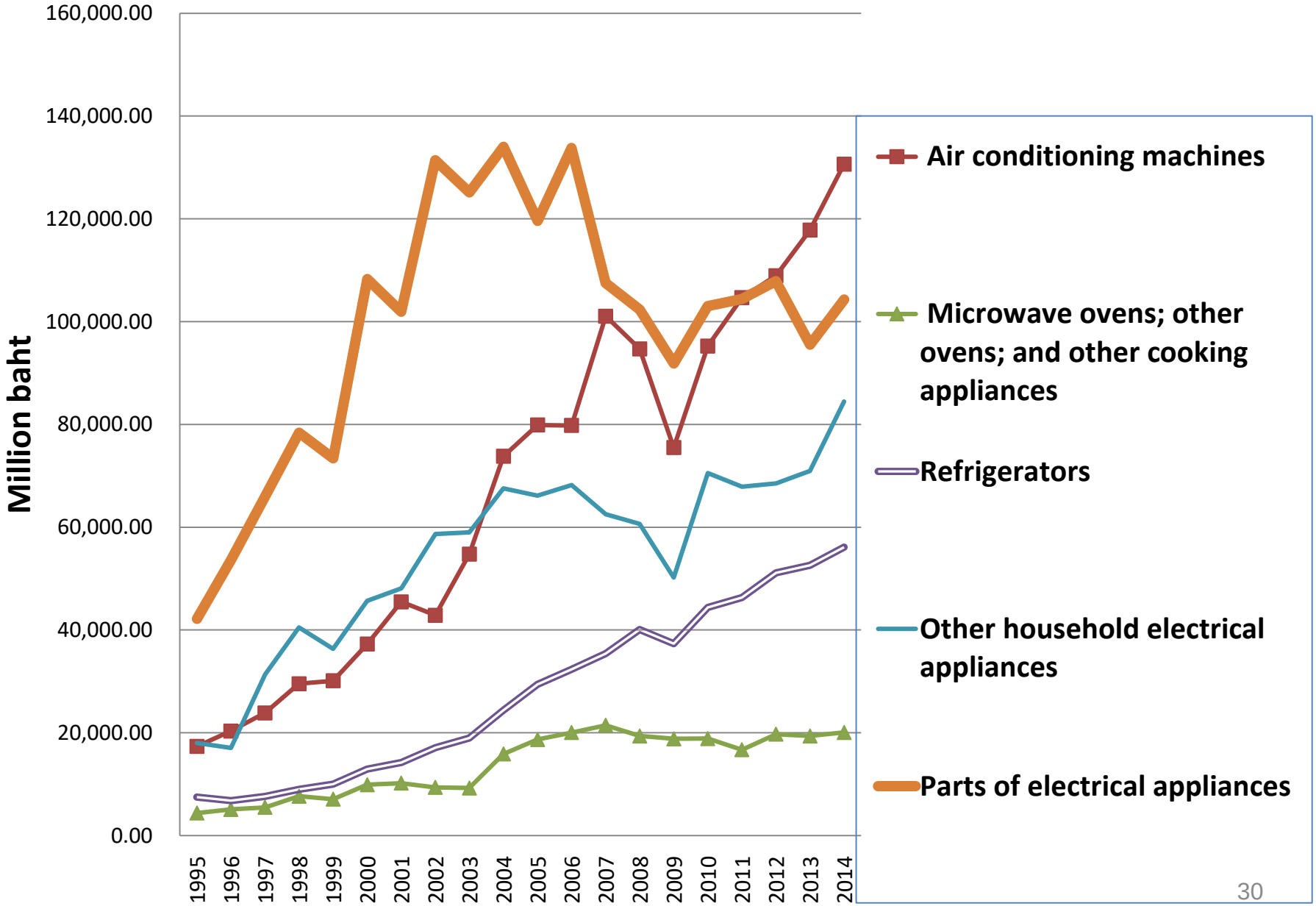
- Apple, Google and others shift production to prepare for 'decoupled' global market.



Out of China


Chain reaction
The tech industry must now face the new reality of growing trade protectionism, and rely increasingly on a scattered, decentralized supply chain emerging in Southeast Asia.
(Tech companies and number of key suppliers with recently expanded facilities in Southeast Asia)
Vietnam (Google, Dell, Amazon)
14
Thailand (Google, HP*, Amazon)
5
Taiwan (Facebook, Google, Amazon)
5
3
India (Apple)
3
Philippines (HP*, Acer)
1
Malaysia (Google, Xiaomi)
2
Indonesia (Sagemcom, Technicolor)
*Hewlett-Packard
Source: Nikkei Asia

Thailand's Exports of Electrical Appliances



Changing pattern of Thailand's exports

- The share of high-tech exports rose from 45 percent in 1993 to about 60 percent of total Thailand's exports in 2000.
- The rising share in total exports of the high-tech products and the declining importance of labor intensive products demonstrate the changing pattern of comparative advantage of Thailand's industry.
- *The share of high-tech exports in 2019?*

Relatively low value added industry

- Thailand's **factor endowment** has been altered through massive FDI flows into "high-tech", rather than labor-intensive manufacturing sector.
- **Electronic products require only 13.6 percent of their input locally, resulting in heavily depending on imported raw materials.**

Higher fluctuations in global growth, higher volatility in EEA exports

- Exports of electronic products rely mainly on the strength of the world economy.
- Thailand's exports of the products fluctuate along the world trade volume.
- Thailand's export volatility is ***far greater*** than the volatility of the world trade growth.

EEA are export-orientated products

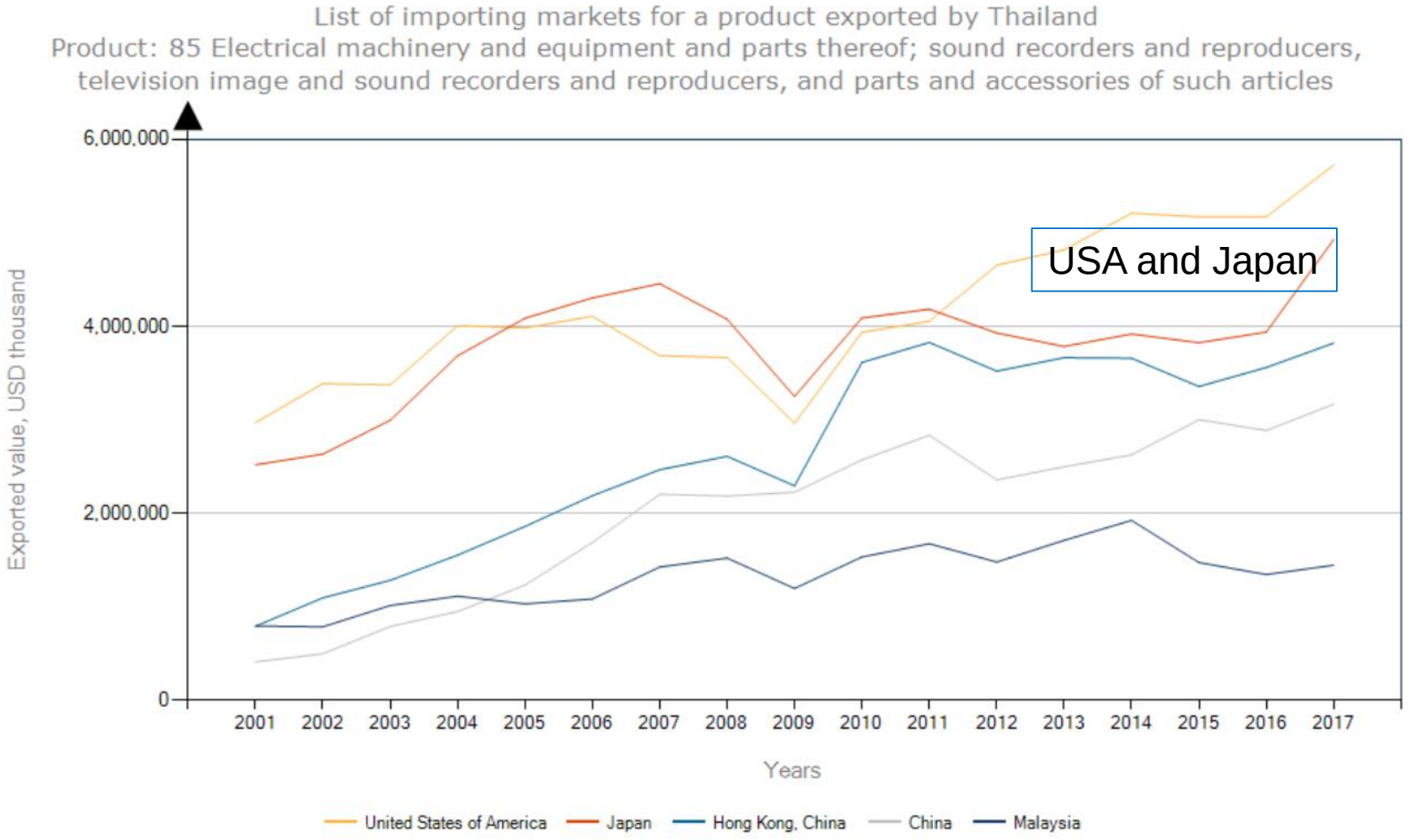
60%> X/Q> 30%

- ***Integrated Circuit (IC), Computer, Monitor, HDD, Printer***
- Canned pineapple and seafood
- Leather product
- TV, air conditioner, washing machine
- Rubber block and rubber gloves
- Wood furniture, glass sheet, leather footwear

As a price taker

- Dynamic ***supply response*** is the key to success to take the opportunity of the boom.
- Declining EEA prices would return after the world glut of EEA products.
- How to deal with ***temporary*** declining prices and excess supply?
- *Quantity adjustment and market reorientation are required*.

Thailand's exports markets of Electrical Machinery and Equipment: Product 85



Technical barriers: WEEE and ROHS

- Among the top importers of EEEA products from Thailand, the EU has the market share around 15 percent.
- The EU legislations that electronics manufacturers must comply are:

(1) Reduction of Hazardous Substances (ROHS),

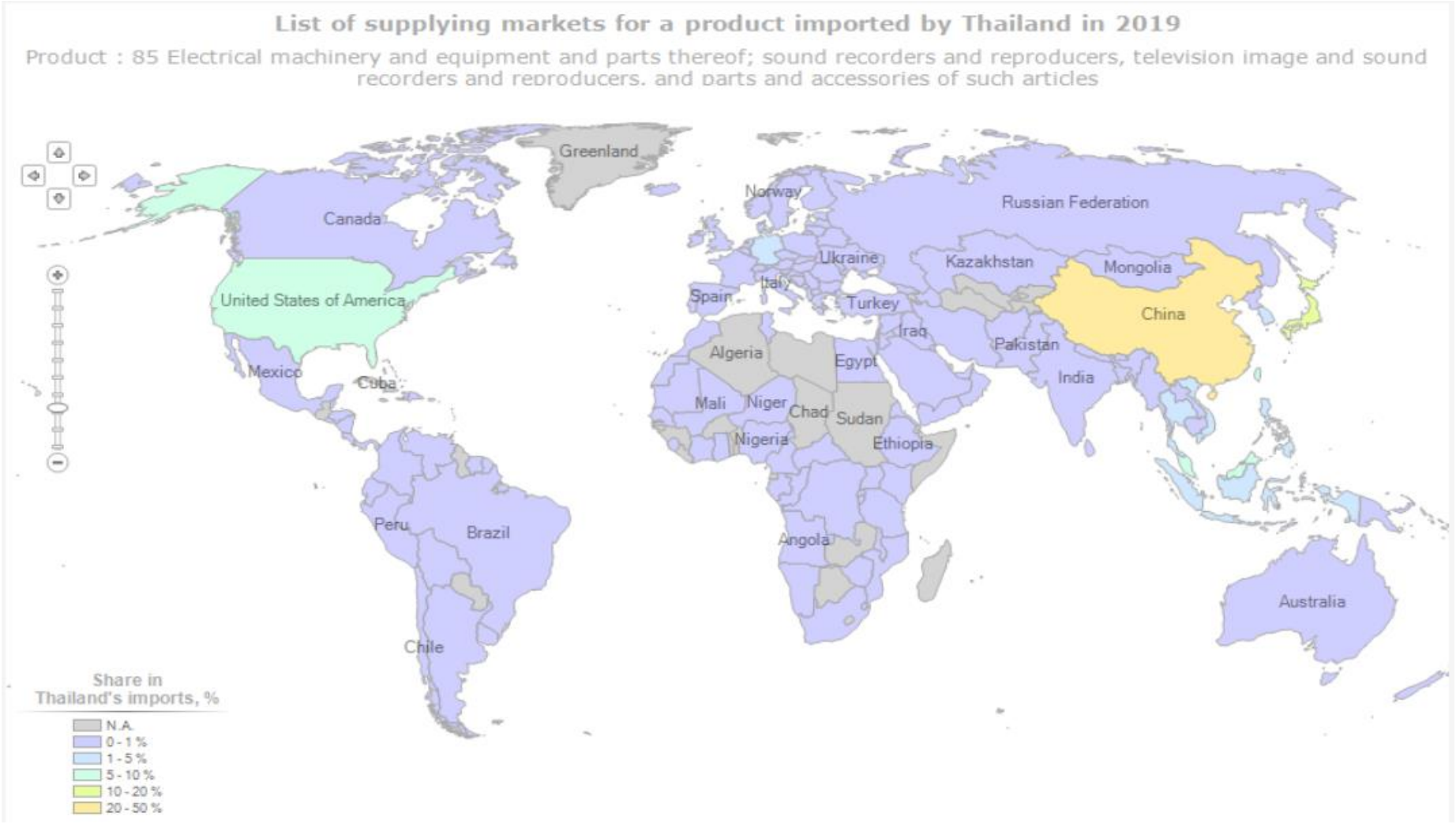
(2) Waste Electrical and Electronic Equipment (WEEE)

(3) Registration, Evaluation, Authorization and Restriction of Chemicals (REACH) since 2007

Is Thailand just an assembler?

- FDI in the electronic industry brought along imported machinery as well as imported raw materials.
- The industry produces according to the specification of the multinational corporations that have chosen Thailand as assembly plants.
- "Exports of potato chips are fine, computer chips are not." Discuss.

Share in Thailand's imports of electrical machinery and equipment: Product 85

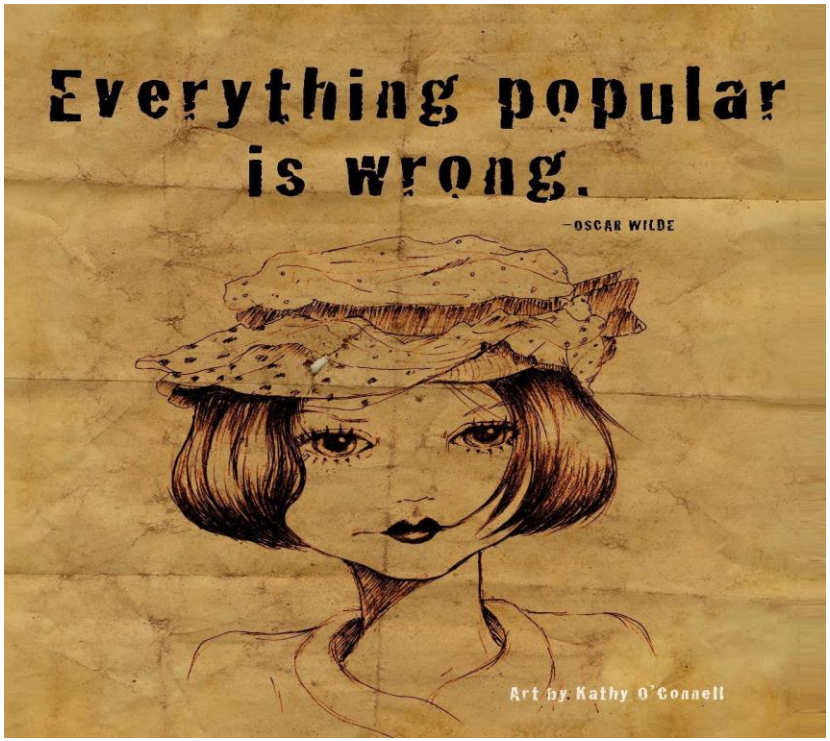


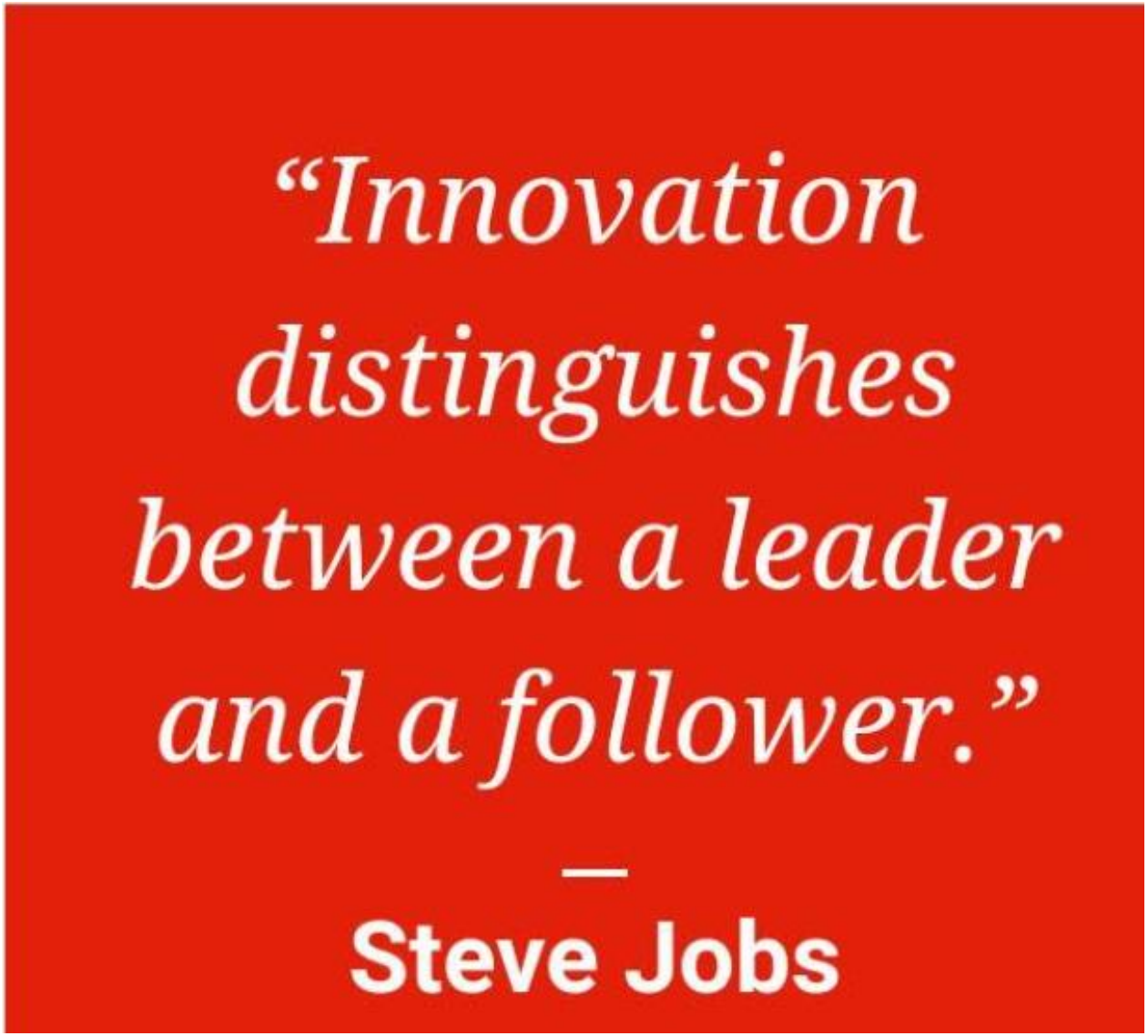
Innovation and originality is the key

- Similar to the automobile industry, the Thai EEA industry do not have world recognized original designs that can create its own market or brand names.
- The ability to do so depends on quality of human resources and telecommunication infrastructure.
- The effectiveness of the ***government policy*** in enhancing competition in the telecommunications so that they can provide efficient infrastructure for EEE users and development.

Oscar Wilde

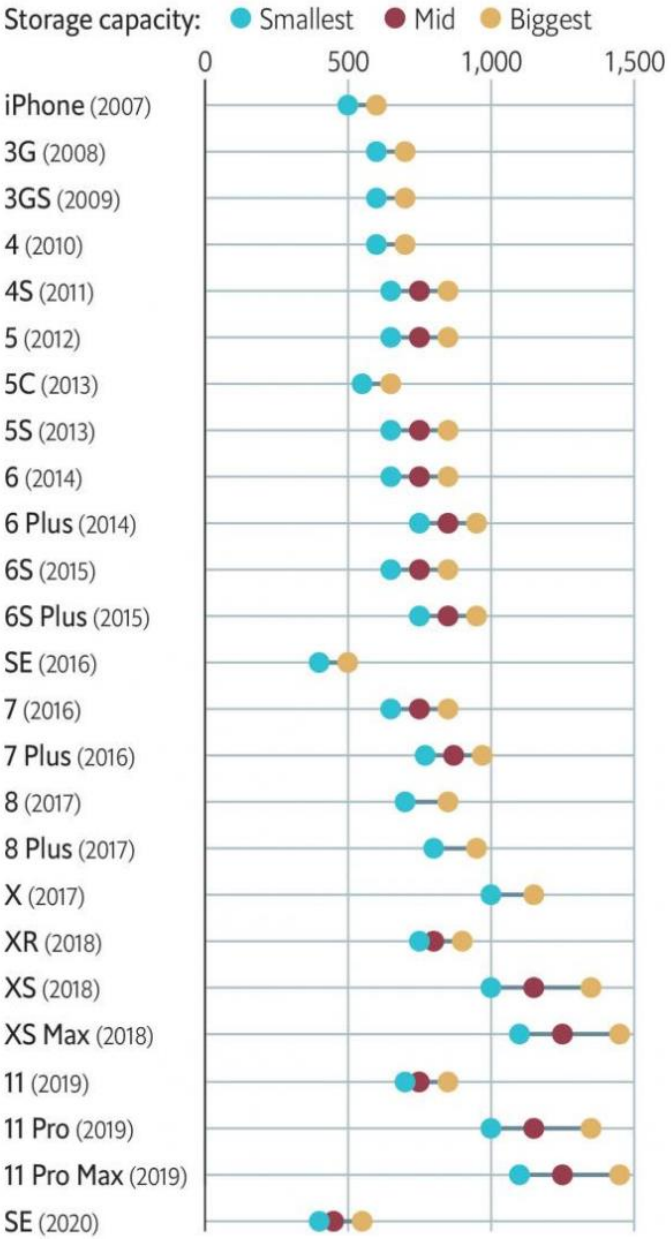
'***Fashion*** is a form of ugliness so intolerable that we have to alter it every six months.'




“Innovation distinguishes between a leader and a follower.”
—
Steve Jobs

Apple's cart

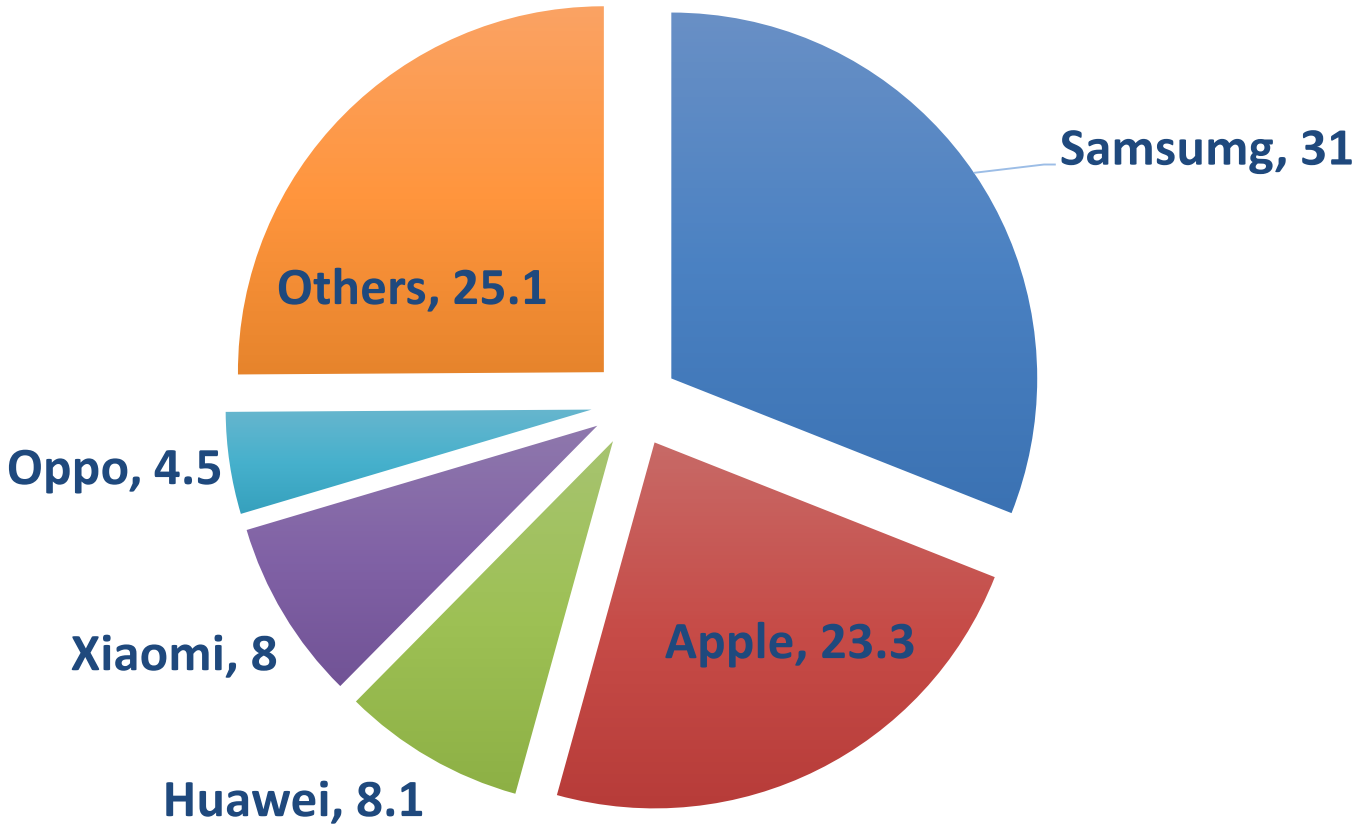
United States, Apple iPhone price at launch, $



Sources: Company reports; news reports

Period:	Generation	Maximum mobile network bandwidths
1980s	1G	First mobile call (14kps maximum bandwidths)
1990s	2G	Short message service (SMS)
2000s	3G	Internet, Video calls, multimedia messaging
2010s	4G	High-speed internet, HD video calls, the "internet of things"
2020s	5G	Virtual reality, holograms, autonomous vehicles (20 Gbps)

Worldwide Market Share of smartphones
Feb 2019



What is so unique about Samsung?

- 'In order to be irreplaceable one must always be different.' **Coco Chanel**
- **The Korean suffer from a four-second syndrome.**

Samsung electronic corporation's mantra

- Korean speed
- American rationality
- Japanese precision

Interactive robots

- The world's fastest internet speeds leads to an era of interactive robots.
- South Korea switched on 5G networks nationwide in April 2019.
- ***The highest speeds enable companies to connect devices with vehicles, home appliances, and building***.
- South Korea is the world' highest robot density.

4. How far should the government support any particular industry?

- Should the government subsidize the EEA industry?
- Any room for market intervention?
- Is there any justification for such selective policy by market failures and strategic intervention?
- "The Thai government has come up with a list of the *S-curved industry* to support". Discuss the validity of this policy.

Sophisticated interventionism

- *"Industrial polices in High Asian Performing Economies are* **responsible** *for successful performance: policies that favor particular industries over others"*. Discuss.
- These policies include: ***protective tariffs, import restrictions, and export subsidies, low-interest loans, and government support for R&D***.

Skeptical views on the intervention

A wide range of successful industrial policy in the four Asian Tigers

- **Singapore**: detailed government direction
- Virtual laissez-faire in **Hong Kong**
- **South Korea**: large industrial firms
- **Taiwan**: small and family-run companies

- With different emphasis on industry, yet these economies have achieved similar high growth rates.
- There is ***no one-size-fits-all formula*** for successful industrial policy

Overrated Industrial Policy

- Actual impact of industrial policies may not have been large (The World Bank).
- *Little evidence* showing that countries with explicit industrial polices have moved into the targeted industries any faster than those which have not.
- From 1973 to 1979, *Korea* followed a policy for promoting heavy and *chemical industries*, which were proved to be costly and judged to be premature and was later abandoned.

Growth drivers

- Successful Asian economies have very ***high saving*** rates which can be used to finance high rates of investment. (Recall Solow's growth model)
- But high saving alone won't help if it is not channeled to productive investment, which requires high quality human capital.
- Most of these countries have made great strides in **public education**. (Recall Schultz's human capital and economic development)

Growth drivers

- The combination of high investment and rapidly improving education levels explains a large part of the rapid growth in East Asia.
- Trade policy has ***permitted rapid growth***, but it is *overstating* the importance of trade policy if we say that it caused growth. (True or False?)

Selective Industrial policy by the Thai governments

- Industrial policy was ***not*** a key driving force behind Asian success.
- ***This brings us to questioning the virtue of 10 supported industries in Thailand under the Industry 4.0 Model.***
- ***Do we need to subsidize the EV industry?***
- ***Recall the sage advice: intervene only if there is positive externality.***

Quality of human capital

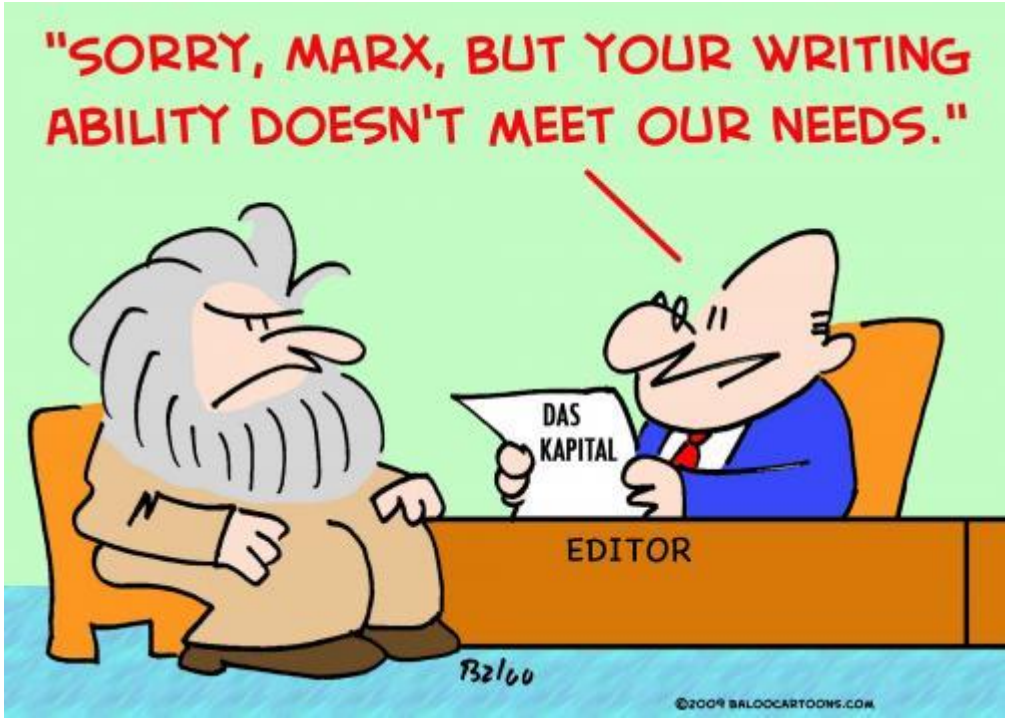
- Large parts of EEA workforce are in low skilled labors such as technicians, while the percentage of high-skilled computer professional is very small.
- **The average years of schooling for the Thais above 15 years old is only 7.8 years**.
- The enrolment for the tertiary education is low (35 %)compared to countries with electronics success.
- Thai government spends 5.5% of GDP on education

A Thai firm's innovation
To combat the pandemic impact
Bangkok Post: 29 September 2020

- Trane Thailand launches new solutions in existing air-conditioning systems to help hotels and shopping malls combat the pandemic impact
- Trane air cleaning systems use PCO + UVGI – Photocatalytic Oxidation and Ultraviolet Germicidal Irradiation to improve indoor air quality in buildings, such as hotels, shopping malls and office towers.
- Hotels have been among the first sector to apply the technology as they recover from a pandemic-driven downturn.
- Trane's unique solution uses a combination of technologies called PCO+UVGI, which *can control and reduce contaminants in the air, including particles, gases and viruses,"*

Summary of key concepts

Industry characteristics: Vulnerability and competitiveness
Product fragmentation
Network trade
Global Value Chain
Strategic industrial policy


"SORRY, MARX, BUT YOUR WRITING ABILITY DOESN'T MEET OUR NEEDS."
DAS KAPITAL
EDITOR
Bz/oo
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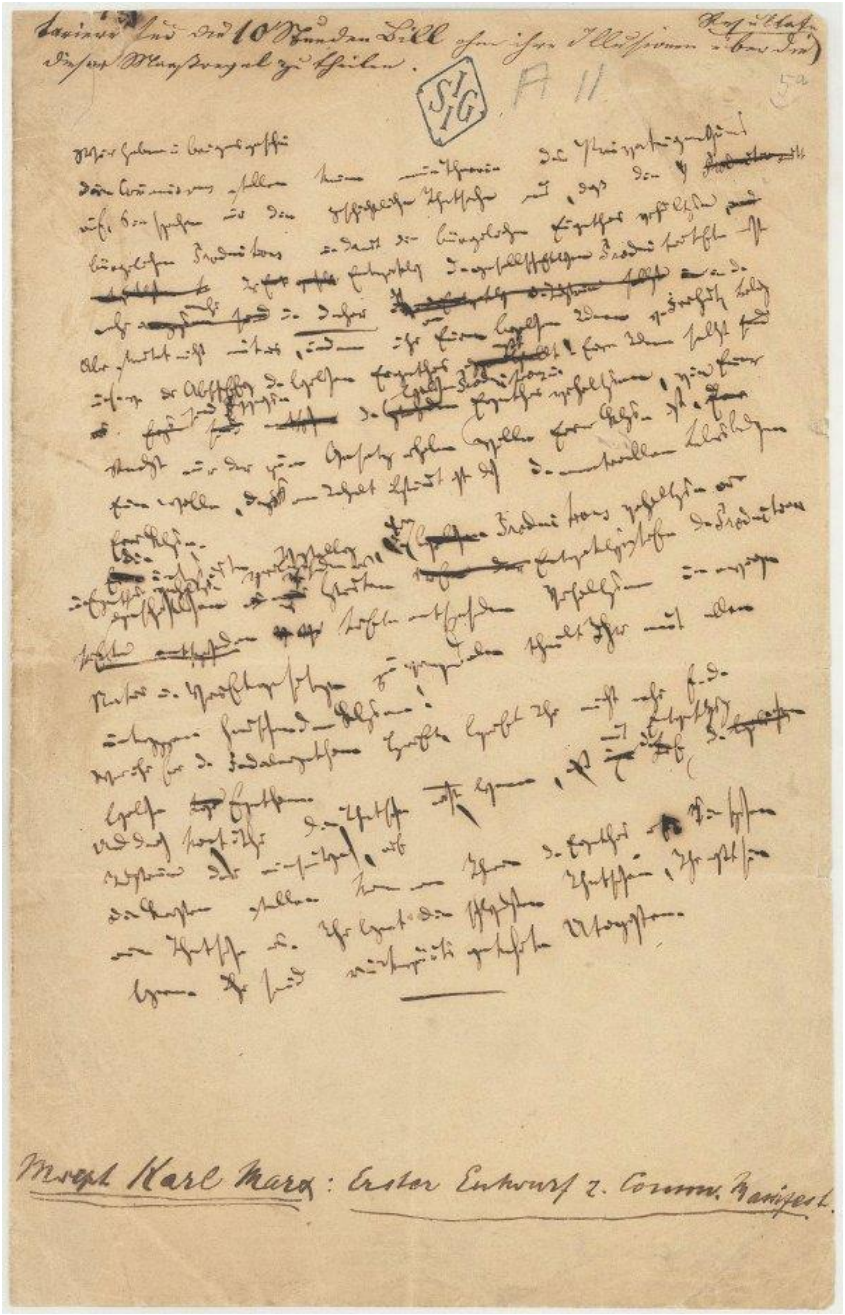

Mrzgst Karl Marx: Erster Entwurf z. Comm. Manifest.