Challenges to Thailand's Electronic Equipment and Electrical Appliances Industry

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Lecture 16

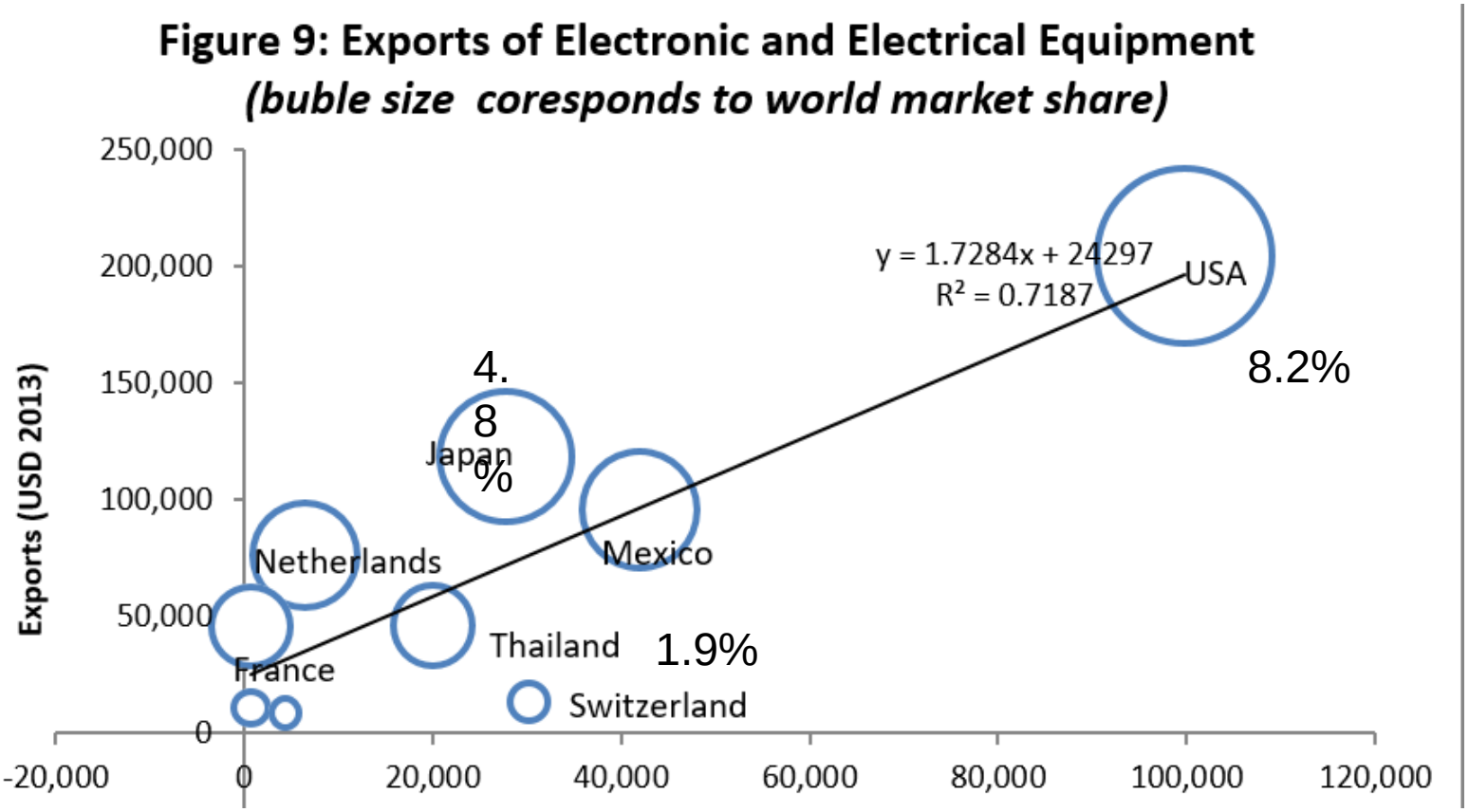
Course Syllabus
Lecture 16

- **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

- FDI and exports
- Vulnerability and competitiveness
- International product fragmentation
- Strategic industrial policy
- Digital divide
- Impact of global recession and China's slowdown
- Richard Thaler: Nudge

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."

How do we verify this hypothesis?

What are the caveats of this hypothesis?

Samsung products amounted to 15 % of Korea's GDP

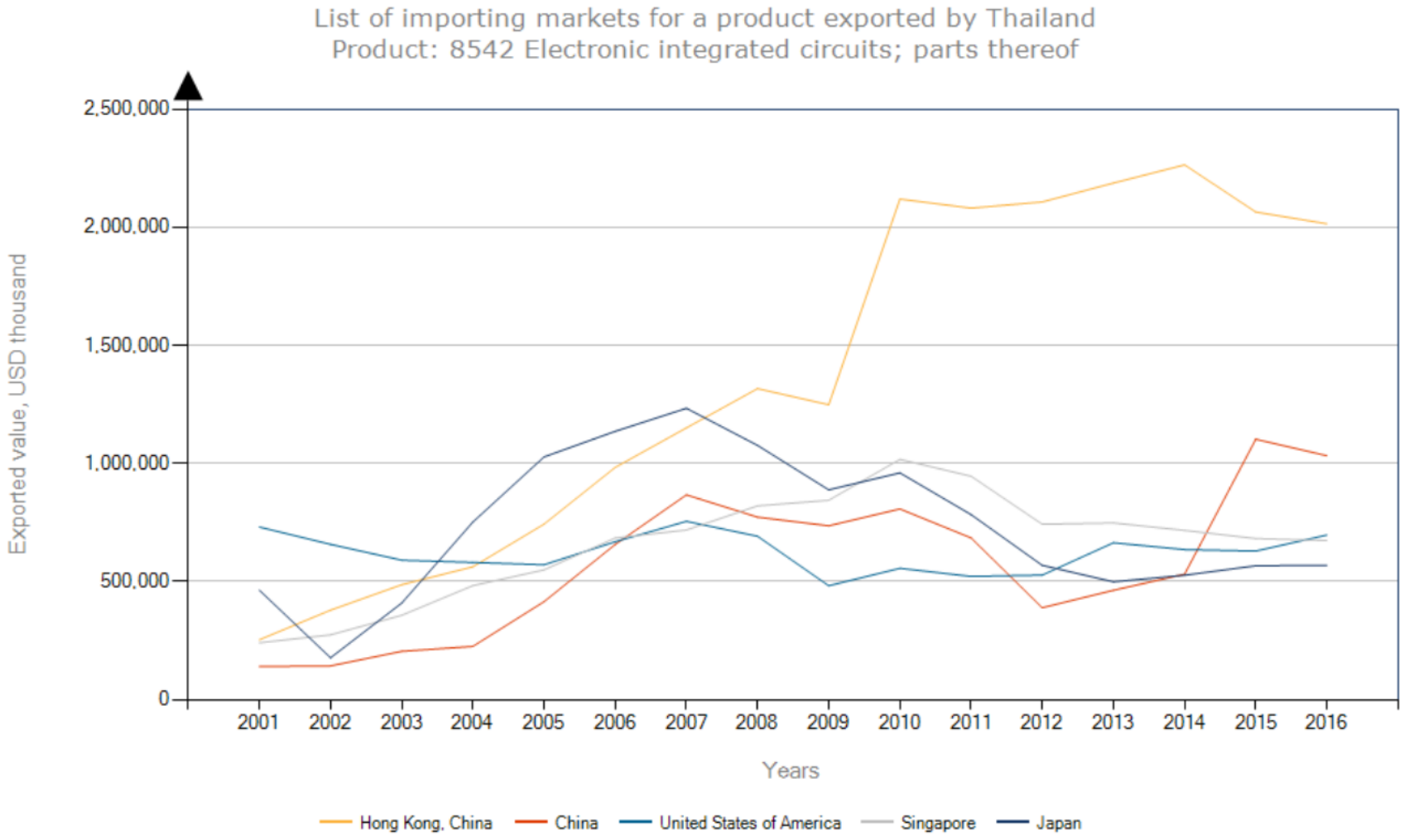
Samsung mobile phone has 22% of world market share, Ipone 12% in 2016..

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

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 2 percent.
- The 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 EEEA exports in 2010.
- **There has been a rebound of EEA exports after the world economy recovered in 2018**

Exports of electronic integrated circuits: *product 8542*



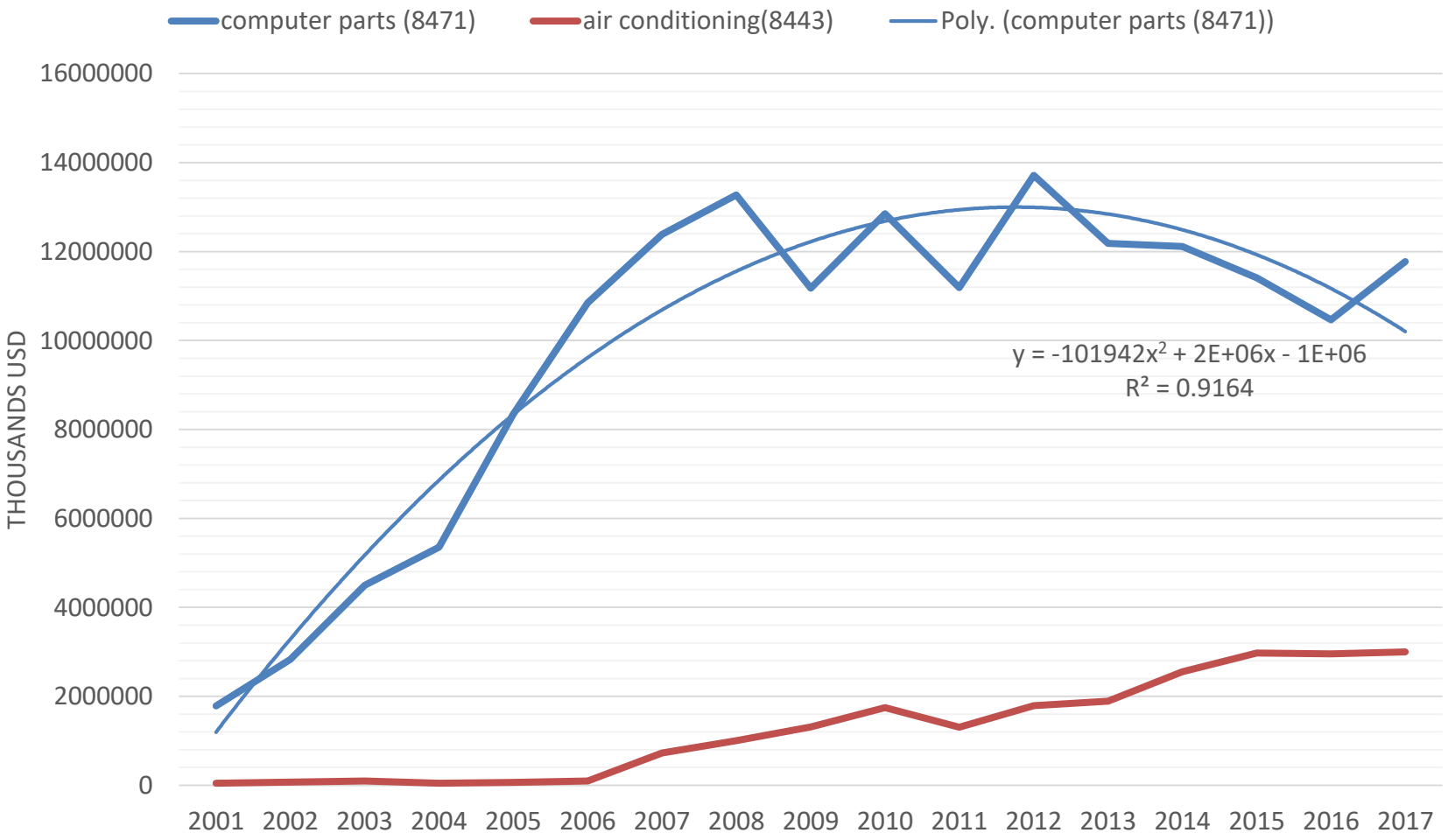
Changing comparative advantage and changing technology

- 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.
- Thailand cannot compete with cheap imports from low-cost countries.
- There is also a process of **creative destruction (Schumpeter)** driven new technological innovation
- A bulky desktop will soon be replaced by an ultrathin 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

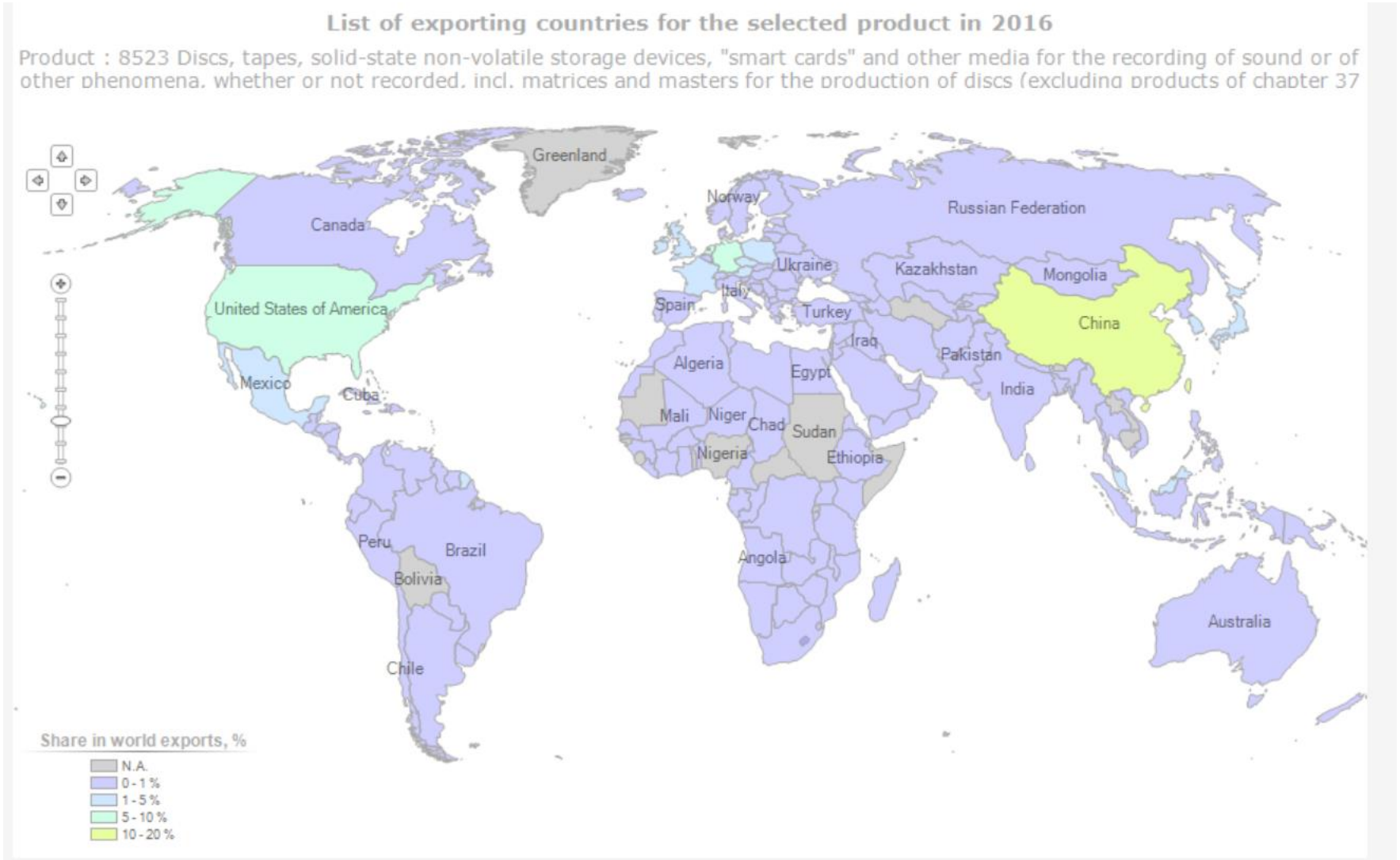


HDD vs SSD

- 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).
- While Seagate Technology and Western Digital Corp. hope that demand of HDDs will pick up in the coming quarters, a market analyst claims that it will decline again.
- Moreover, **in the long-term, HDD makers will have to lower the price of their products because of competition.**
- Total available market of hard disk drives dropped to 125 million units in Q1 2015 and to 111 million units in Q2 2015, according to estimates by Seagate and Western Digital.
- Scales of SSD increase at the expense of HDD.

Sales of HDD drive dropped in 2016
Makers have to cut its prices

Share in world exports: SSD
Product 8523



Changing comparative advantage

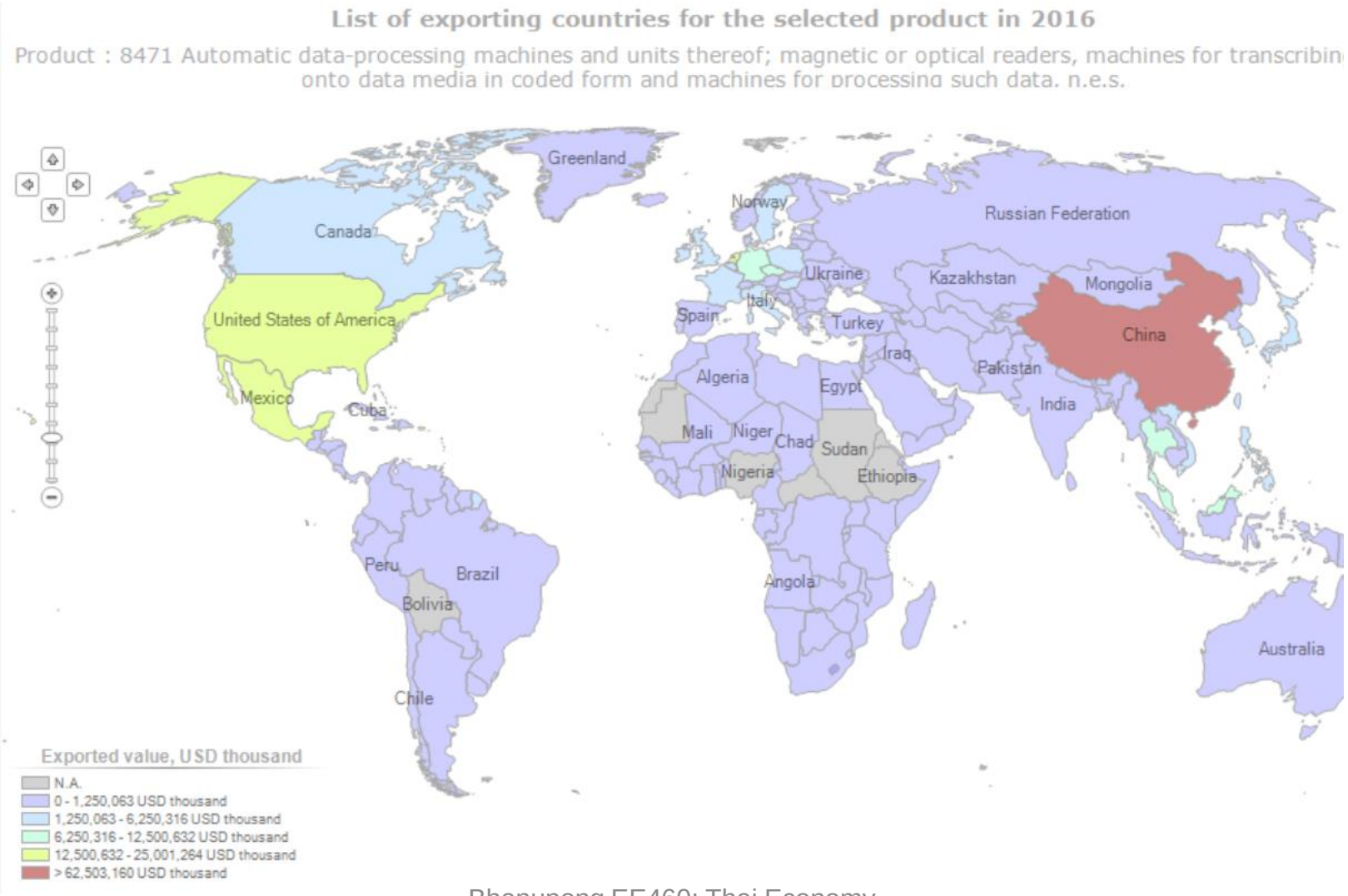
- The changing comparative advantage has made some of Thailand's EEEA products become less competitive.
- **Product fragmentation** in manufacturing process generates **intra-industry trade**, where firms in different countries engaging in trading parts and components.

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."

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 exceeding that of trade in final goods because a good crosses multiple borders while in the 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.

Global Value Chain: 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.
- ***Apple earned 11.8 %*** of the operating margin
- ***Samsung*** (Korea) provided primary memory ***9.4%***

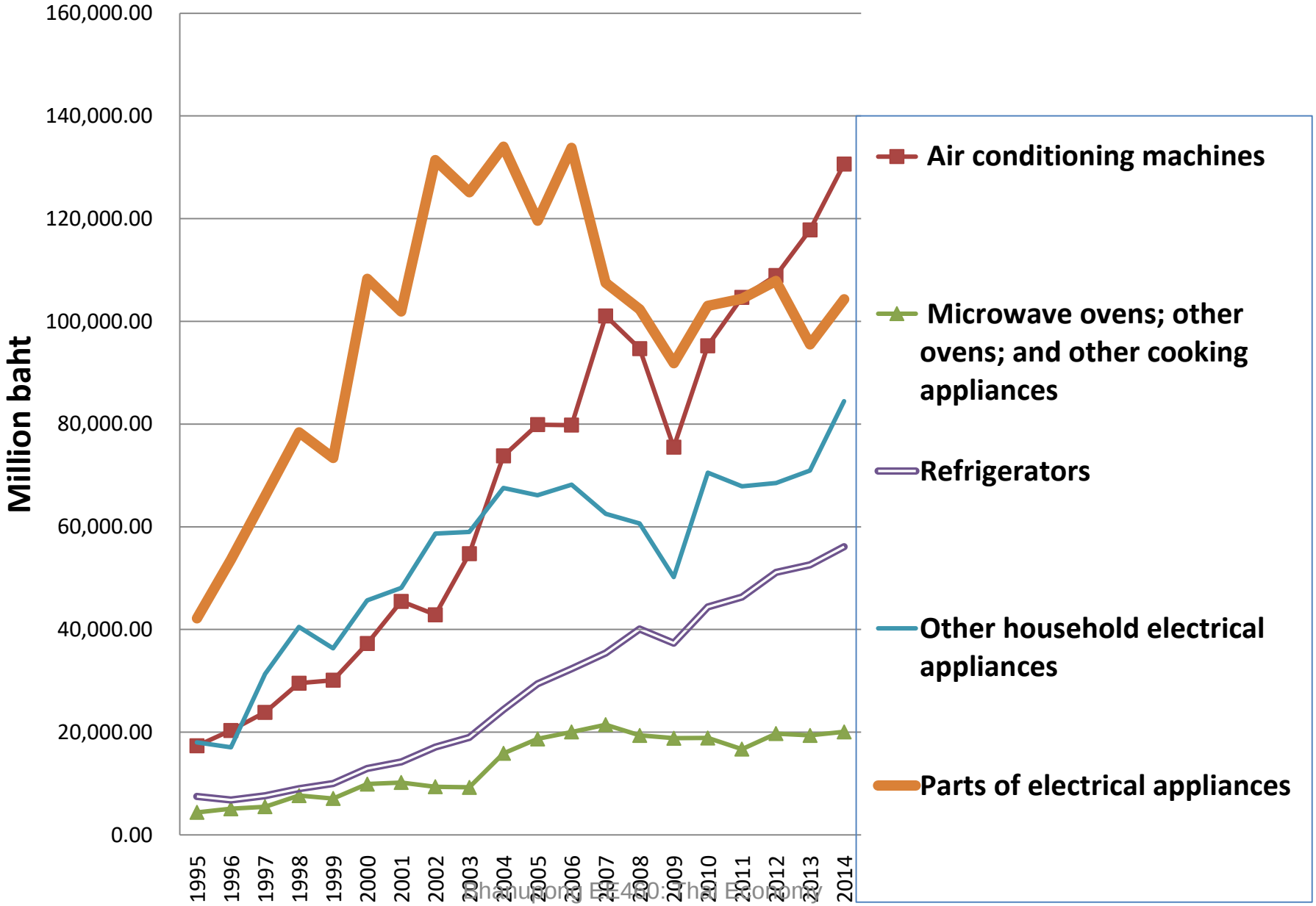
Global Value Chain: The case of iPod

- TDK (Japan) provided the battery and earned **7.6%**
- Toshiba-Matsushita Display (Japan) provided the display: **3.9%**
- Toshiba in Japan provided the hard drive: **3.8%**
- The value-added in China is very low even though iPod was assembled there.
- The large export share in the world ***does not mean*** that industry has a large value-added if its main production process of simple **assembly activities**, based on imported intermediate inputs

iPhone 4

- 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%)***
- How about iPhone X?
- Samsung Galaxy 9?

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.
- 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.**

High fluctuations in world 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.
- Their volatility is ***far greater*** than the volatility of the world trade growth.

EEA are export-orientated products

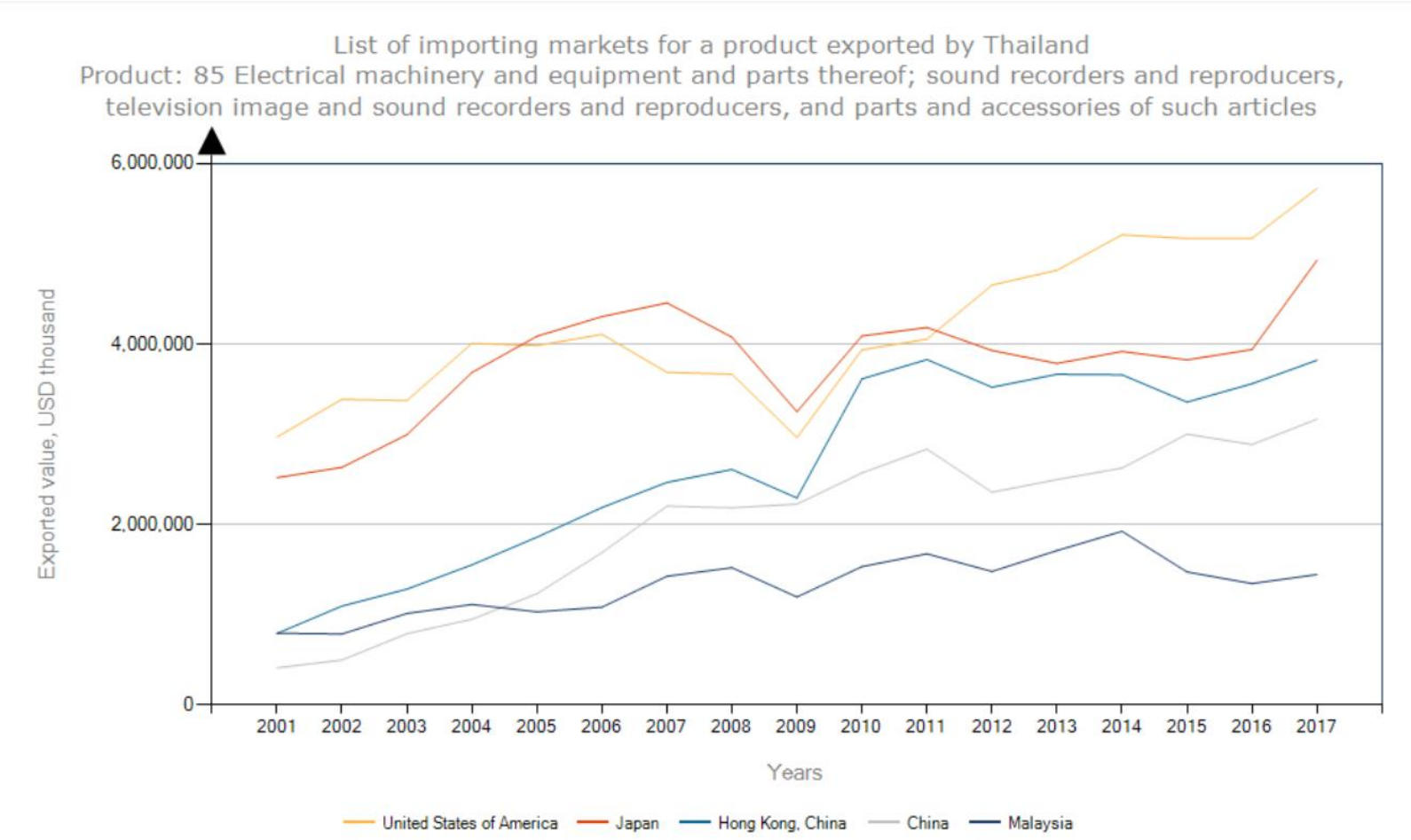
60%> X/Q> 30%

- ***Integrated Circuit, 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 (Indeed 2016).
- How to deal with ***temporary*** declining prices and excess supply?
- Quantity adjustment and market reorientation are required.

Exports of Electrical Machinery and Equipment: Product 85



Technical barriers to trade: 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),

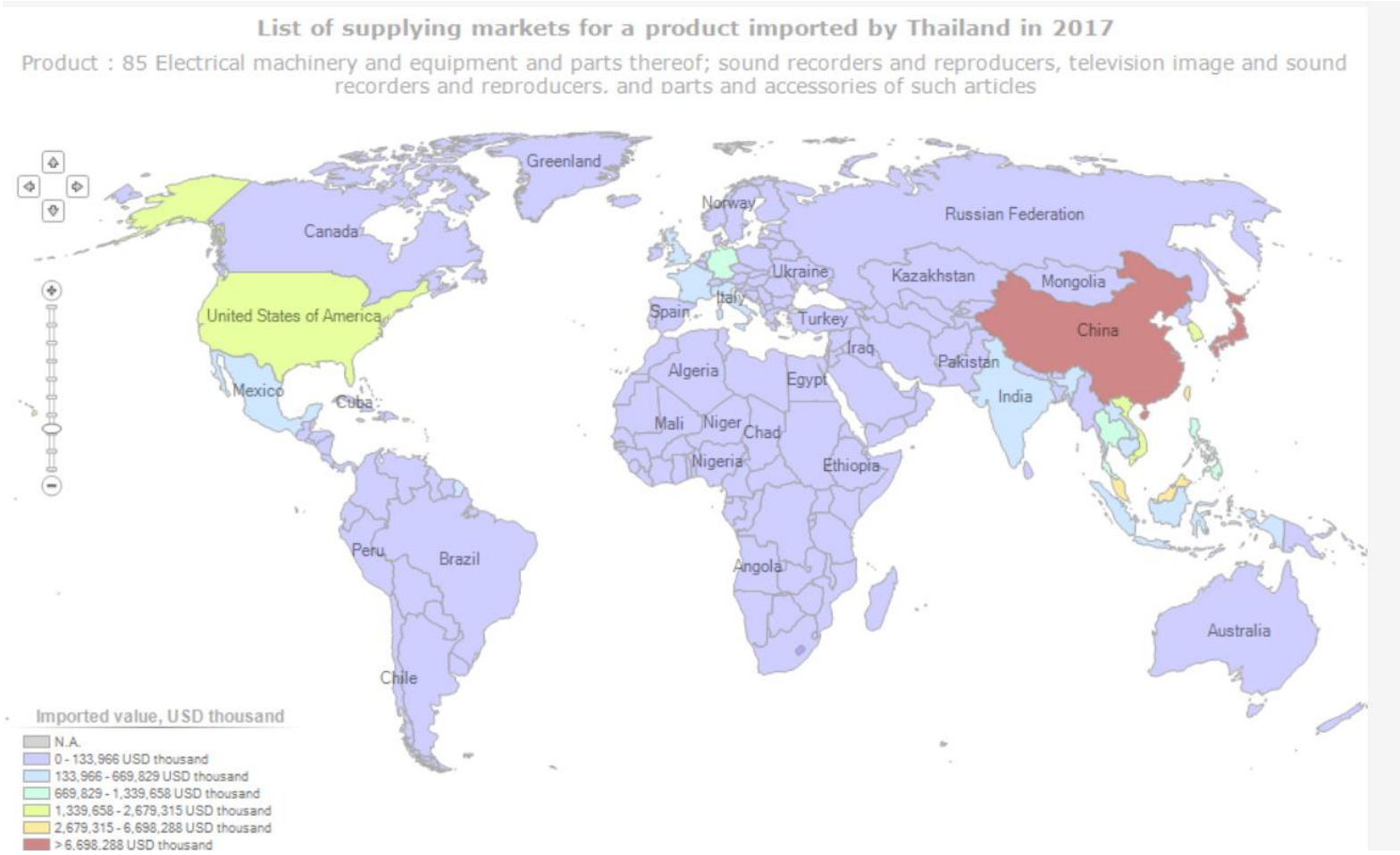
(2) Waste Electrical and Electronic Equipment (WEEE)

(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.

Imports of Electrical Machinery and Equipment: Product 85



Innovation and originality is needed

- Similar to the automobile industry, the Thai EEA industry do not have its 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.

On innovation, fashion, and originality

- 'In order to be irreplaceable one must always be different.' Coco Chanel

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

Samsung electronic corporation's mantra

- American rationality
- Japanese precision
- Korean speed

  (Korean four-second syndrome)

How far should the government support the 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.

Sophisticated interventionism

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

Skeptical view on industrial policy

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

Selective Industrial Policy: Overrated

- Actual impact of industrial policies may not have been large (The World Bank).
- Little evidence 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.

Selective Industrial Policy: Overrated

- Industrial policy was ***not*** a key driving force behind Asian success.
- ***This brings us to questioning the virtue of 10 supported industry in Thailand under Industry 4.0 Model.***

Growth drivers

- These successful Asian economies have very ***high saving*** rates which can be used to finance high rates of investment. (Remember Solow's growth model?)
- Most of these countries have made great strides in **public education**. (Remember 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?)

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

Science and Technology vs. Social science

- Thai universities produce only 32 percent of graduates in the filed of science and technology.
- More social science and humanities are produced because of their lower unit cost.
- The total number of electronic researchers was only 750 persons in 2001.
- What is the corresponding figure in 2017?

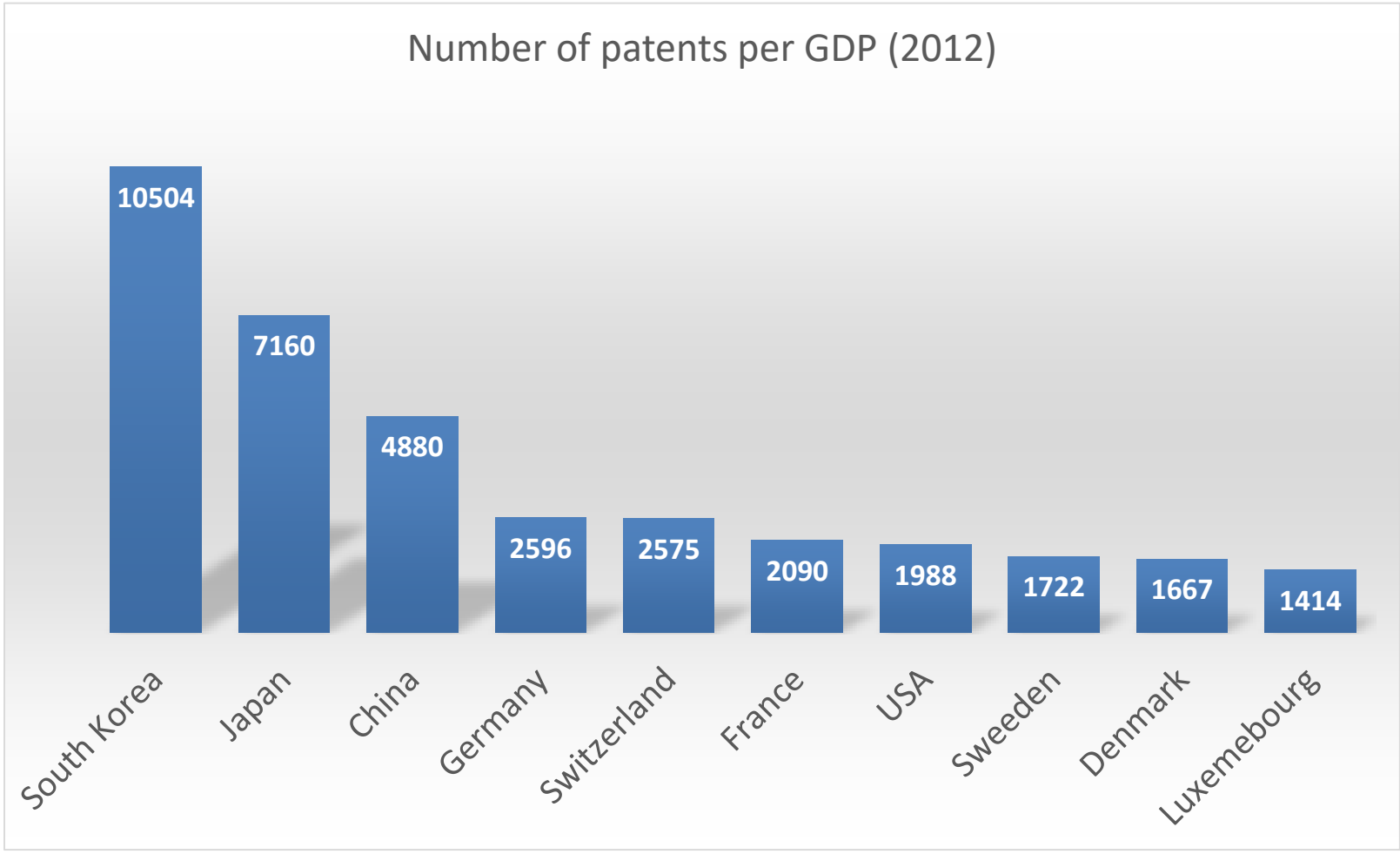
Population per patent

A proxy for innovation in science and technology

- Mexico 1,267,532
- **Thailand 340,000**
- Singapore 13,000
- Australia 18,000
- South Korea 6,000
- Japan 3,914
- USA 2,800

Source: The Economist

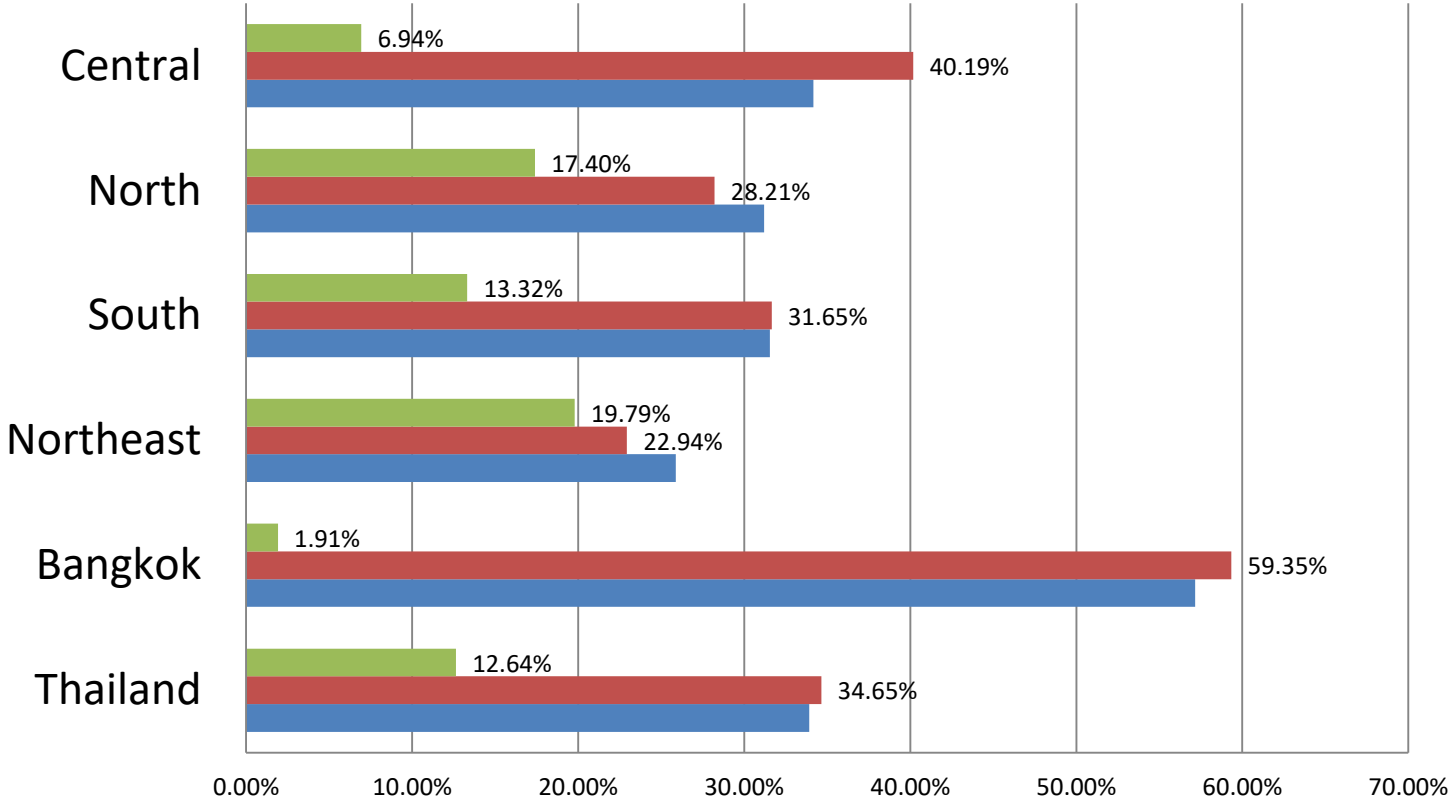
Proxy for innovation



Poverty and Digital Divide

- Poverty and access to internet and computer products are negatively correlated.
- Since education and labor productivity are related, solving the problem of digital divide requires a long-term solution through providing equal opportunities for education for the whole country.

Digital Divided By Poverty: 2014



	Thailand	Bangkok	Northeast	South	North	Central
Headcount Ratio	12.64%	1.91%	19.79%	13.32%	17.40%	6.94%
Households with internet(%)	34.65%	59.35%	22.94%	31.65%	28.21%	40.19%
Households with computer(%)	33.91%	57.17%	25.88%	31.55%	31.20%	34.16%

Summary of key concepts

Industry characteristics: Vulnerability and competitiveness
International product fragmentation
Import dependency
Strategic industrial policy
Digital divide
Impact of global recession and China's slowdown