Challenges to Thailand's Electronic Equipment and Electrical Appliances Industry

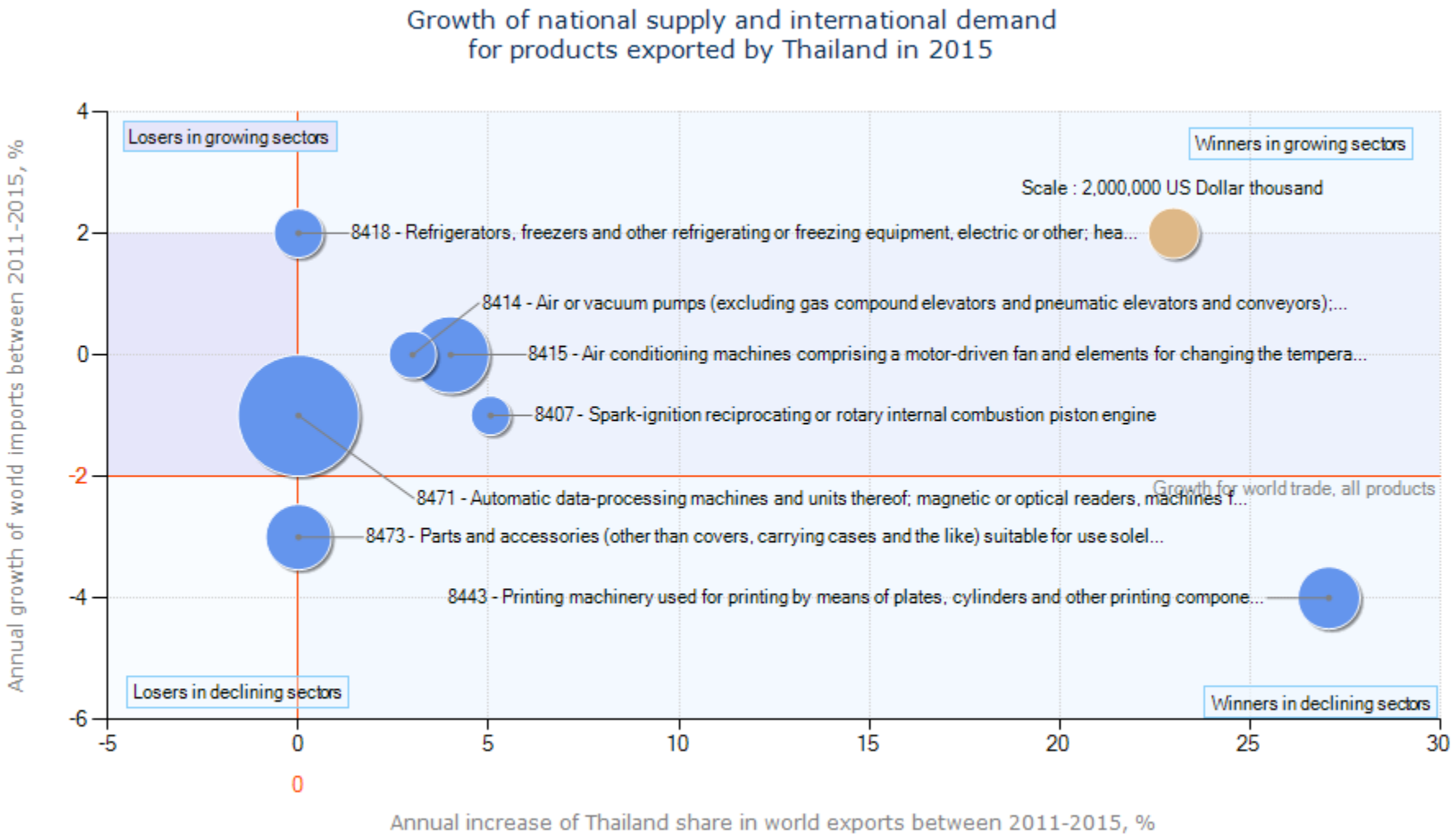
Bhanupong

Lecture 16

Main themes

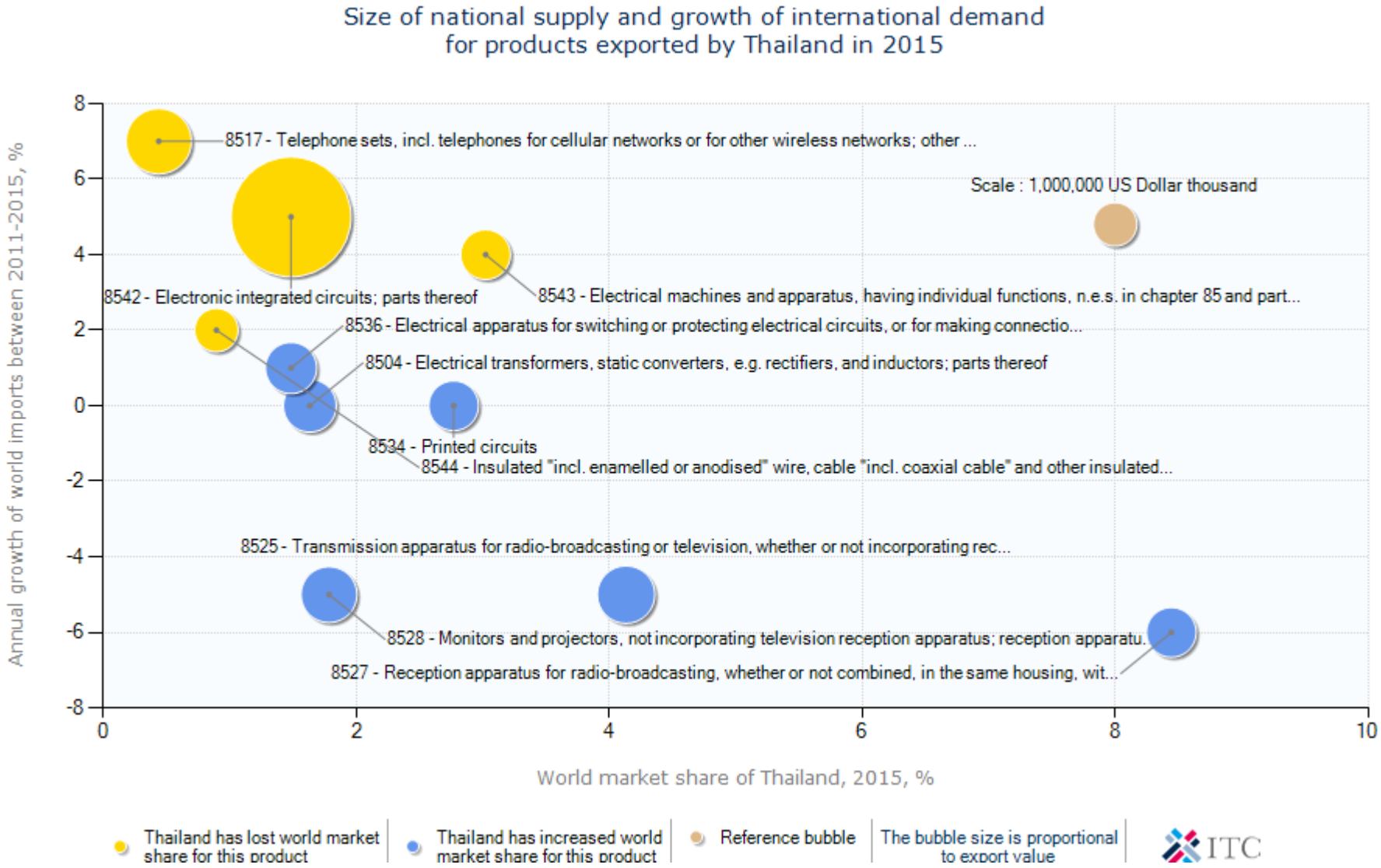
- Industry characteristics
- Vulnerability and competitiveness
- International product fragmentation
- Import dependency
- Strategic industrial policy
- Digital divide
- Impact of global recession and China's slowdown

Exports of machinery, data processing machines: Product 84

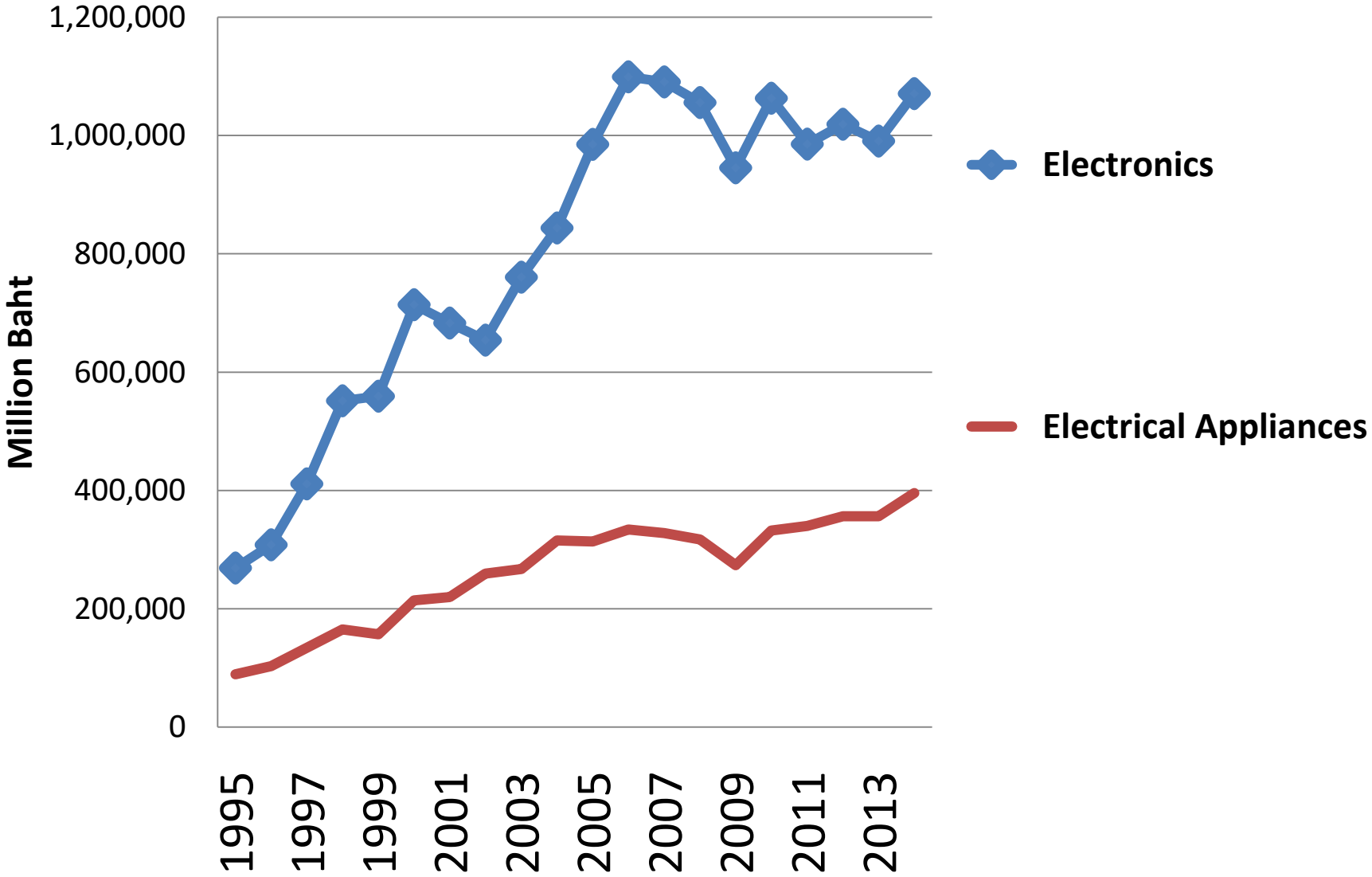


Electrical machinery: Product 85

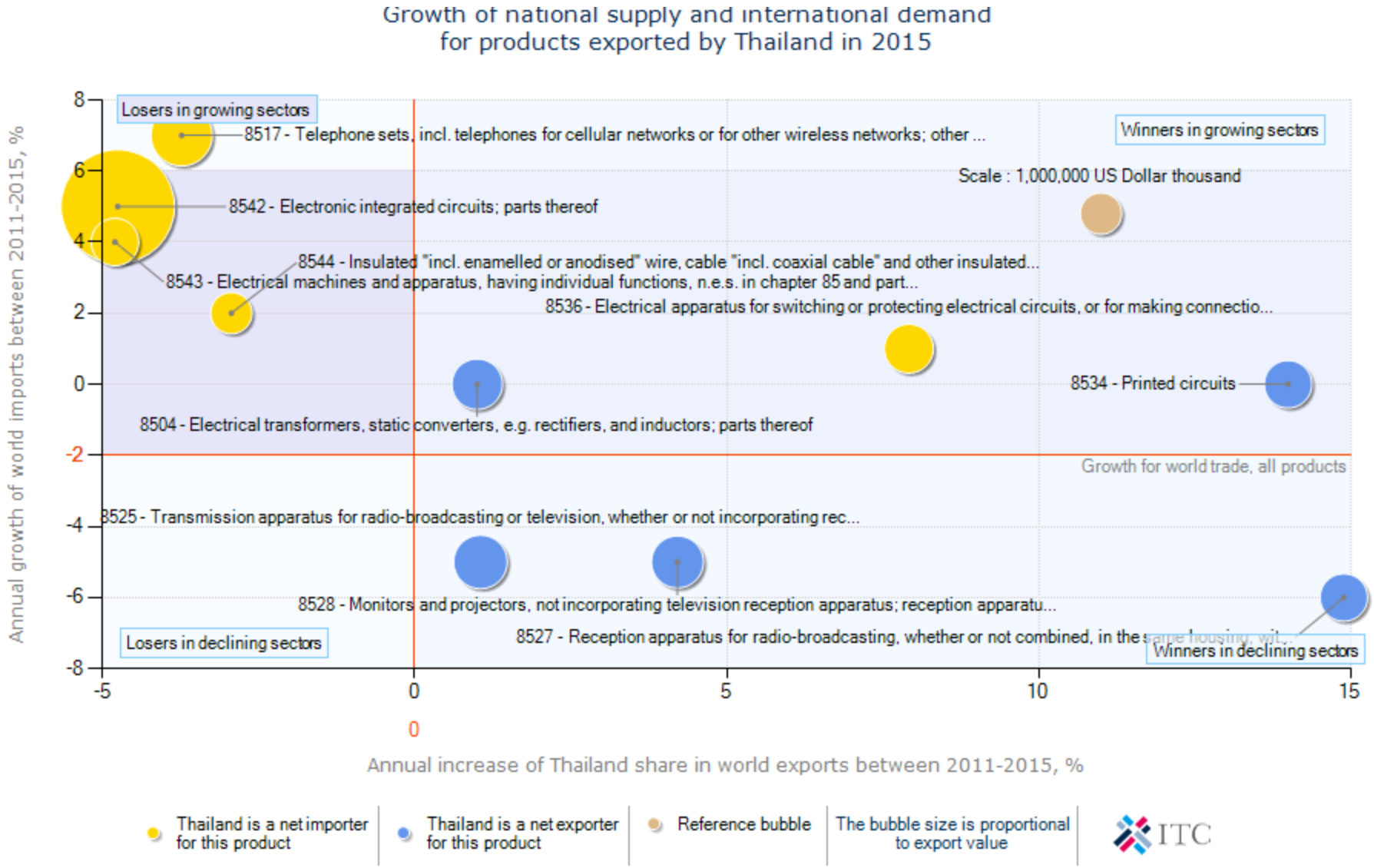
Thailand's world market share and world market growth



Thailand's EEA Exports: Falling Stars?



Electrical machinery, equipment and parts: Product 85



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?

Sumsung products amonted to 15 % of Korean GDP

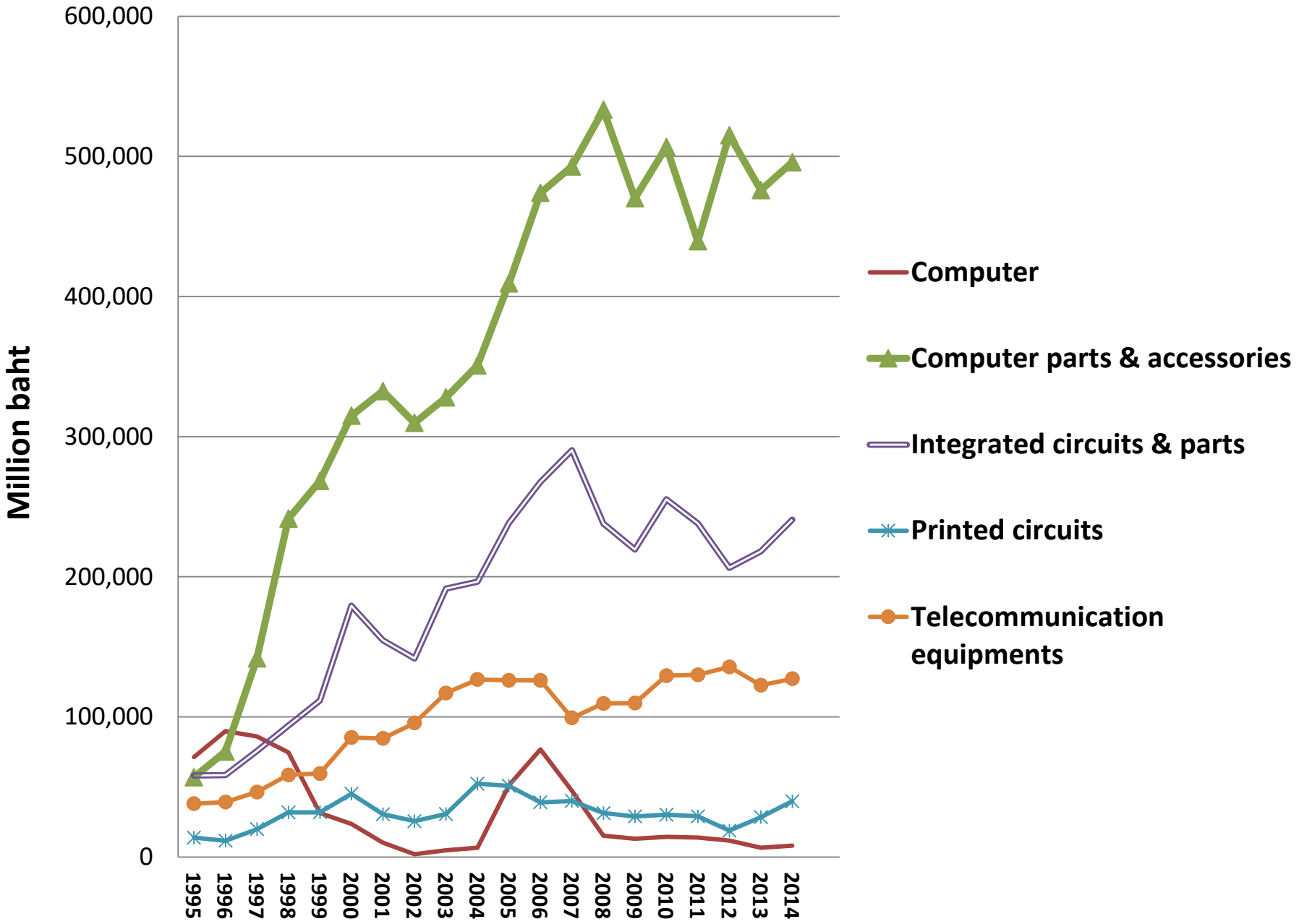
Sumsung moble phone has 22% of world market share, Ipone 12% in 2016..

(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.
- **Will there be such a rebound after the world economy experience recovery in 2018?**

Thailand's Exports of Elecronics: 1995-2014



Changing comparative advantage

- Computer and Hard Disc Drive (HDD) had the most promising trend (note the past tense).
- Output of computer tripled within 5 yeas, where as 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
- Desktop will soon be replaced by ultrathin lap top.

Major producers of HDD in Thailand

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

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

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 (eg. garment and textile).
- Electronics and electrical machinery industries can be **fragmented** because they are manufacturing industries which the technology allow “slicing the value chain.”

International product fragmentation and 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 costs and quickly react to market and technological changes from capacity improvement.

Global Value Chain: The case of iPod

- iPod was designed by Apple in the US and assembled by Inventec Appliances in China, its intermediate goods 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%

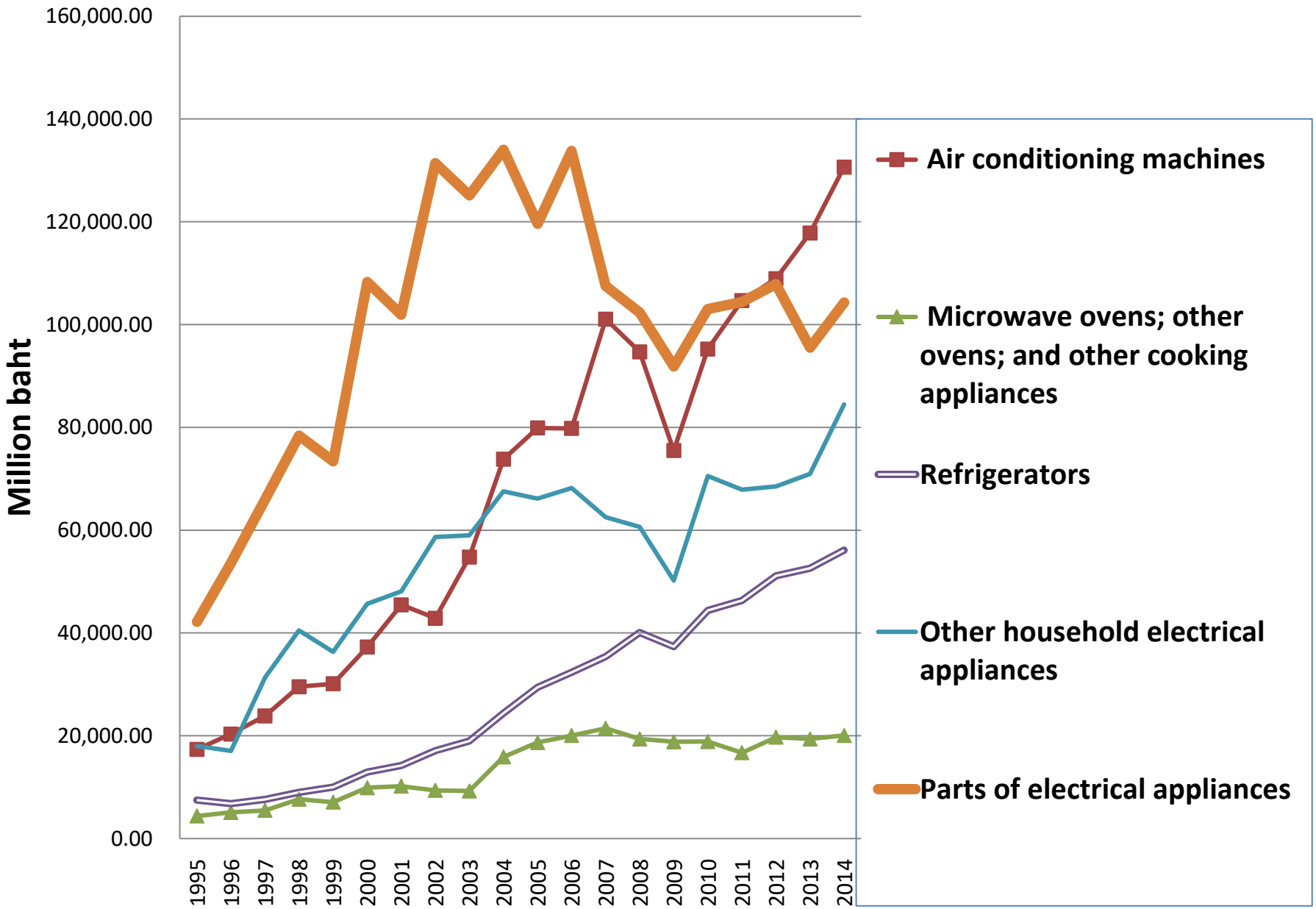
Global Value Chain: The case of iPod

- 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

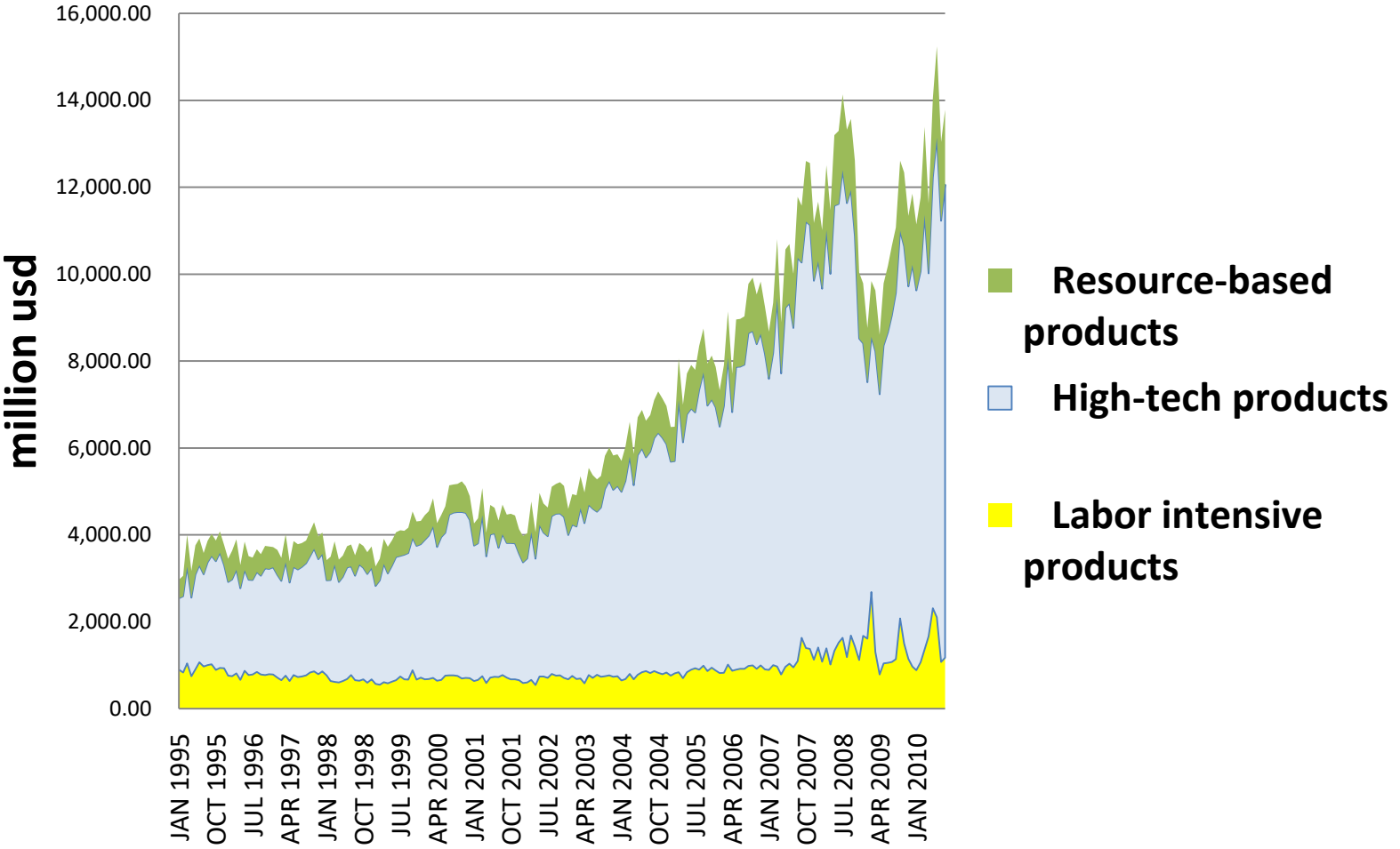
- Even though the retail price of iPhone 4 was $549 in 2010, the value captured through assembly in China was around $10 (1.8%), whereas the value captured by Apple was $312 (58.5%)

Thailand's Exports of Electrical Appliances



Changing pattern of manufactured exports: 1995-2010

No sign of resource curse



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.**

A big challenge

- Exports cannot take place without the flows of foreign direct investment in the EEA industry.
- Since 2000, the rising trend of the high-tech products has been stabilized.
- Without continuing flows of foreign direct investment in to the EEA sector, the trend might be reversed in the future.
- Another challenge in the EEA industry: how to attract flows of foreign investment when large parts of FDI have been diverted to other countries in Asia.

Higher fluctuation 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

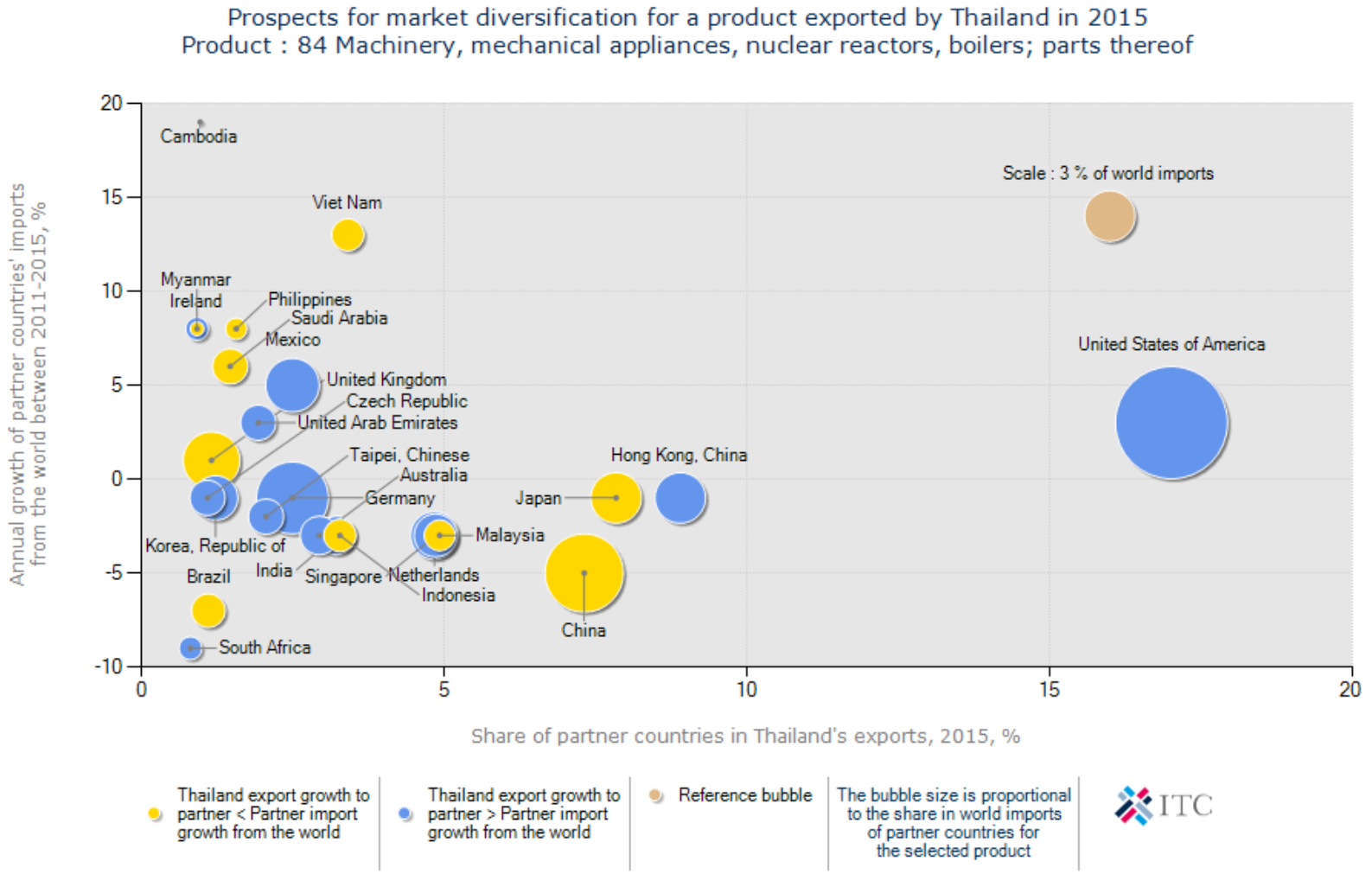
As a price taker

- 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.

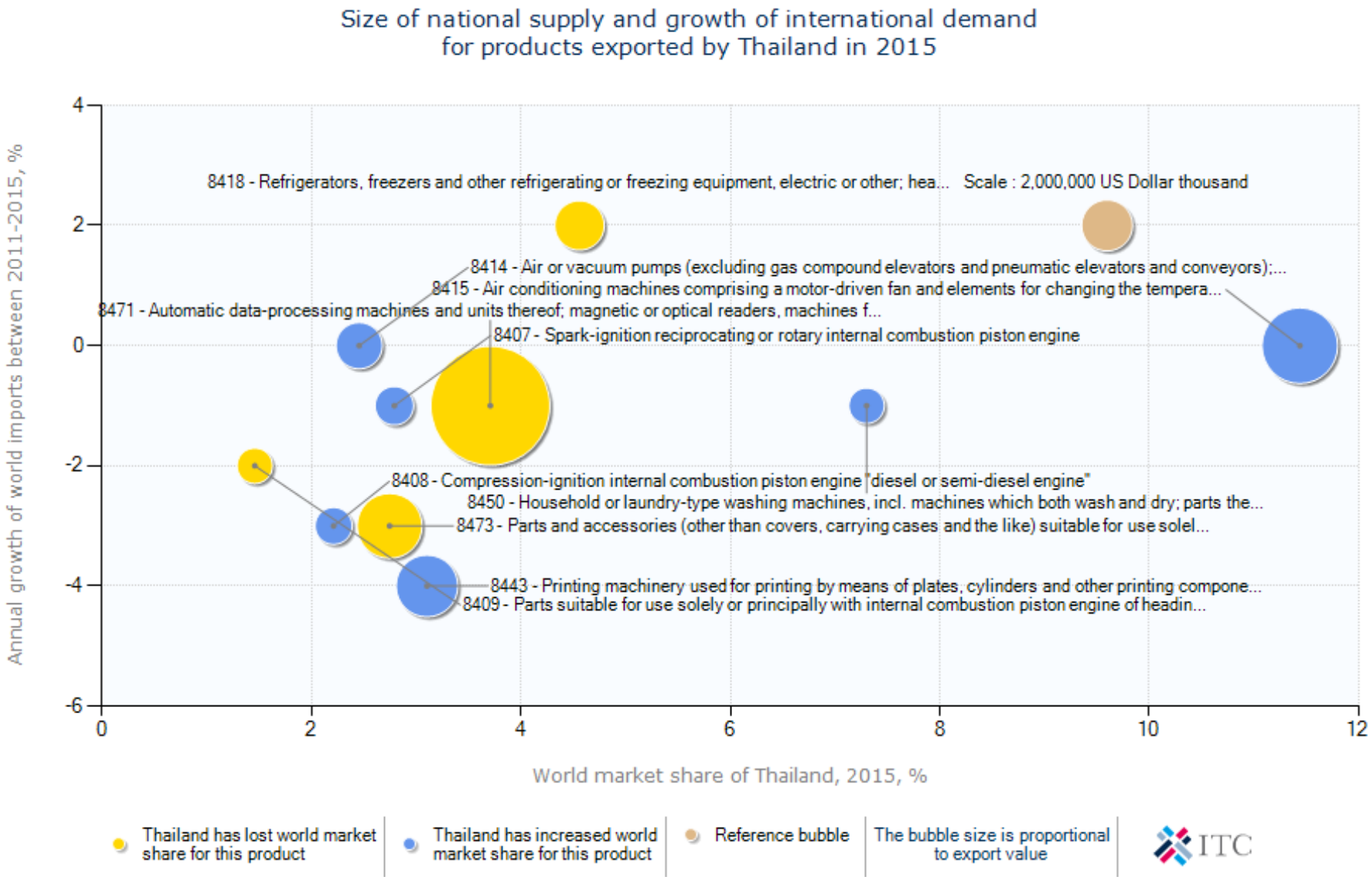
Synchronization Problem

- The three major export markets whose shares exceed 10 percent of total exports are: USA, Singapore, and Japan.
- Thailand has already exported EEA products to more than 200 countries in the world.
- Market diversification **cannot** solve the problem of market fluctuations as long as those exports markets are interrelated and subject to the same business and technology cycles.
- But India and China were growing rapidly during the global slowdown in 2009.
- A new normal growth for China in 2016.

Market diversification of Product 84



World market share and world market growth of product 84



Air conditioning, diesel engine, washing machine, refrigerator

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)

How to REACH Europe

- Registration, Evaluation, Authorization and Restriction of Chemicals (REACH)
- REACH contains regulations that control the manufacture and use of chemicals in goods imported into Europe.
- These products need to be registered, evaluated, and authorized for production or use within the EU (European Union) without harming human health or the environment.

REACH

has been in effect since June 2007

- Producers and importers must seek permission from the European Chemical Agency (ECHA) to produce and use chemicals
- Similar to SPS standards, these kinds of regulations would raise the cost of production due to high *compliance cost.*
- They can be regarded as *non-tariff barriers* to EEEA products from developing countries.

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.

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
- Give a girl the right shoes and she can conquer the world.' - Marilyn Monroe

Korea's seven-second syndrome

- Should the government subsidize the EEEA industry?
- Any room for market intervention?
- Is there any justification by market failures and strategic intervention?

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 industrial policy

- 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.

An Overrated Selective Industrial Policy

- Actual impact of industrial policies may not have been large, according to 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.
- 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.
- Most of these countries have made great strides in **public education**.
- 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.

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 2016?

Population per patent

A proxy for innovation in science and technology

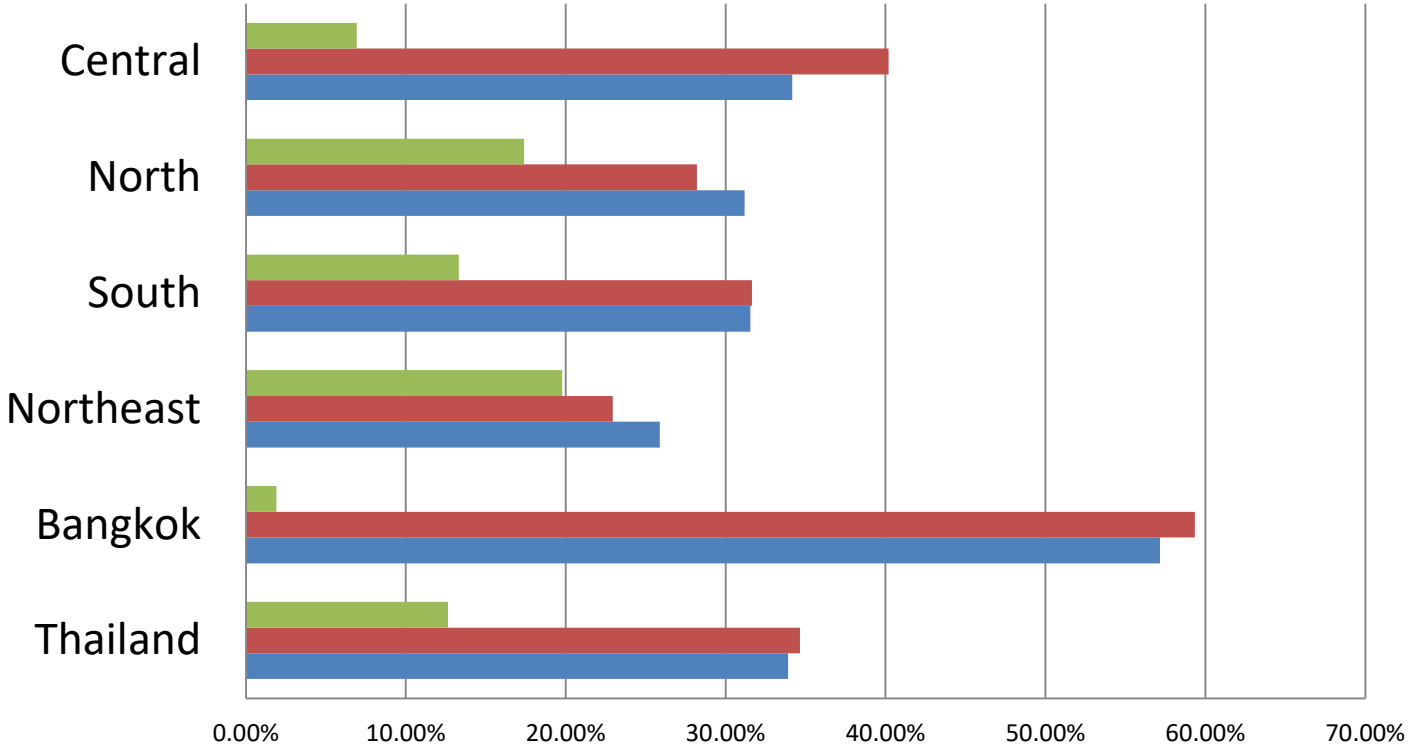
- Mexico 1,267,532
- **Thailand 340,000**
- Singapore 13,000
- Australia 18,000
- South Korea 6,000
- Japan 3,914
- USA 2,800

Source: The Economist

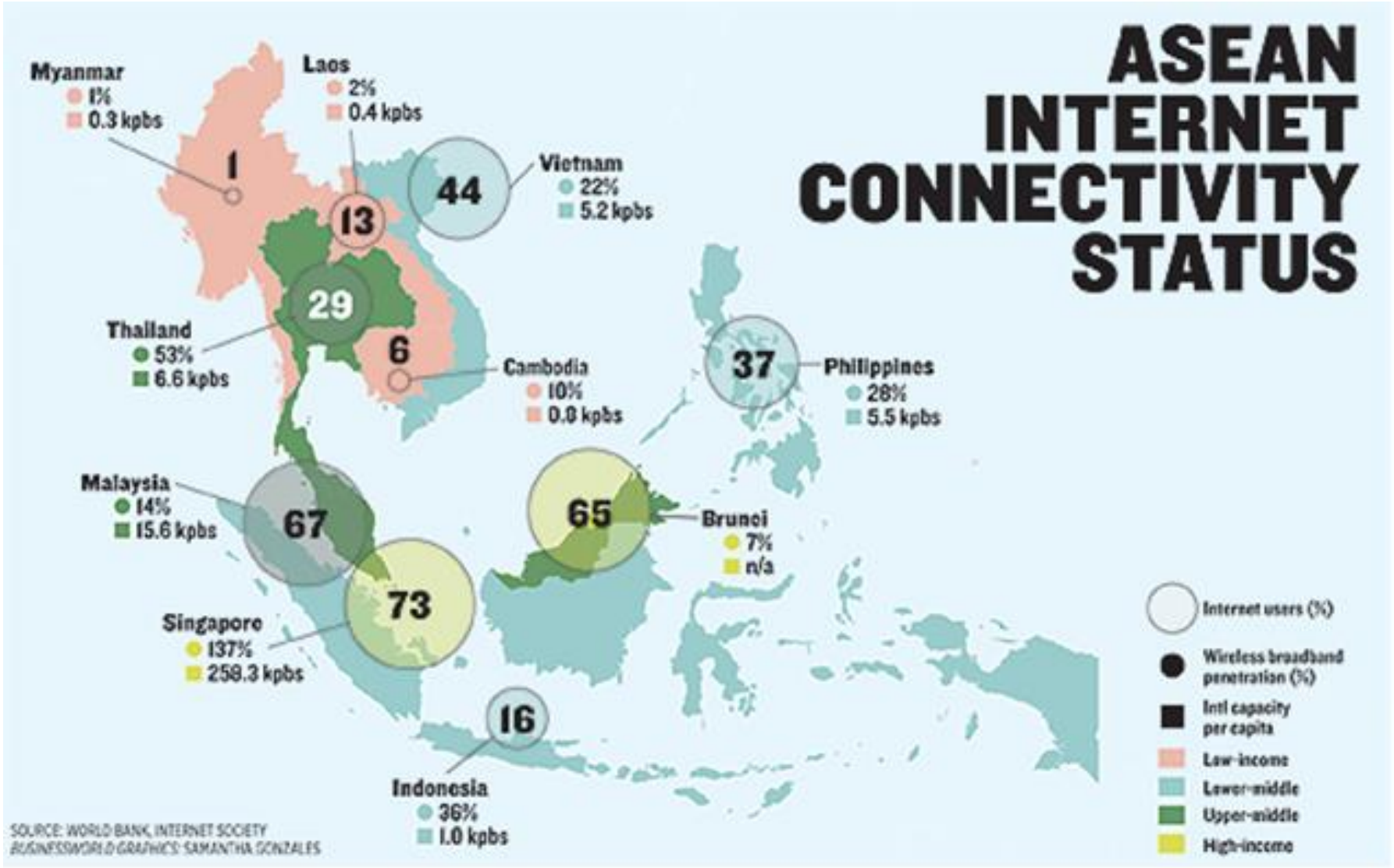
Poverty and Digital Divide

- 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%


ASEAN INTERNET CONNECTIVITY STATUS
Myanmar
1%
0.3 kpbs
1
Laos
2%
0.4 kpbs
13
44
Vietnam
22%
5.2 kpbs
29
Thailand
53%
6.6 kpbs
6
Cambodia
10%
0.0 kpbs
37
Philippines
28%
5.5 kpbs
Malaysia
14%
15.6 kpbs
67
65
Brunei
7%
n/a
73
Singapore
137%
258.3 kpbs
16
Indonesia
36%
1.0 kpbs
Internet users (%)
Wireless broadband penetration (%)
Intl capacity per capita
Low-income
Lower-middle
Upper-middle
High-income
SOURCE: WORLD BANK, INTERNET SOCIETY
BUSINESSWORLD GRAPHICS: SAMANTHA GONZALES

We are in the second tier

By Internet penetration rates, the ASEAN countries can be divided into three groups:

Cluster 1 (above 60%) consists of Singapore, Brunei, and Malaysia;

Cluster 2 (25%-50%) consists of Thailand, the Philippines, Vietnam, and

Cluster 3 (1%-20%) consists of Indonesia, Lao PDR, Cambodia, and Myanmar.

Digital divided among nations in the region

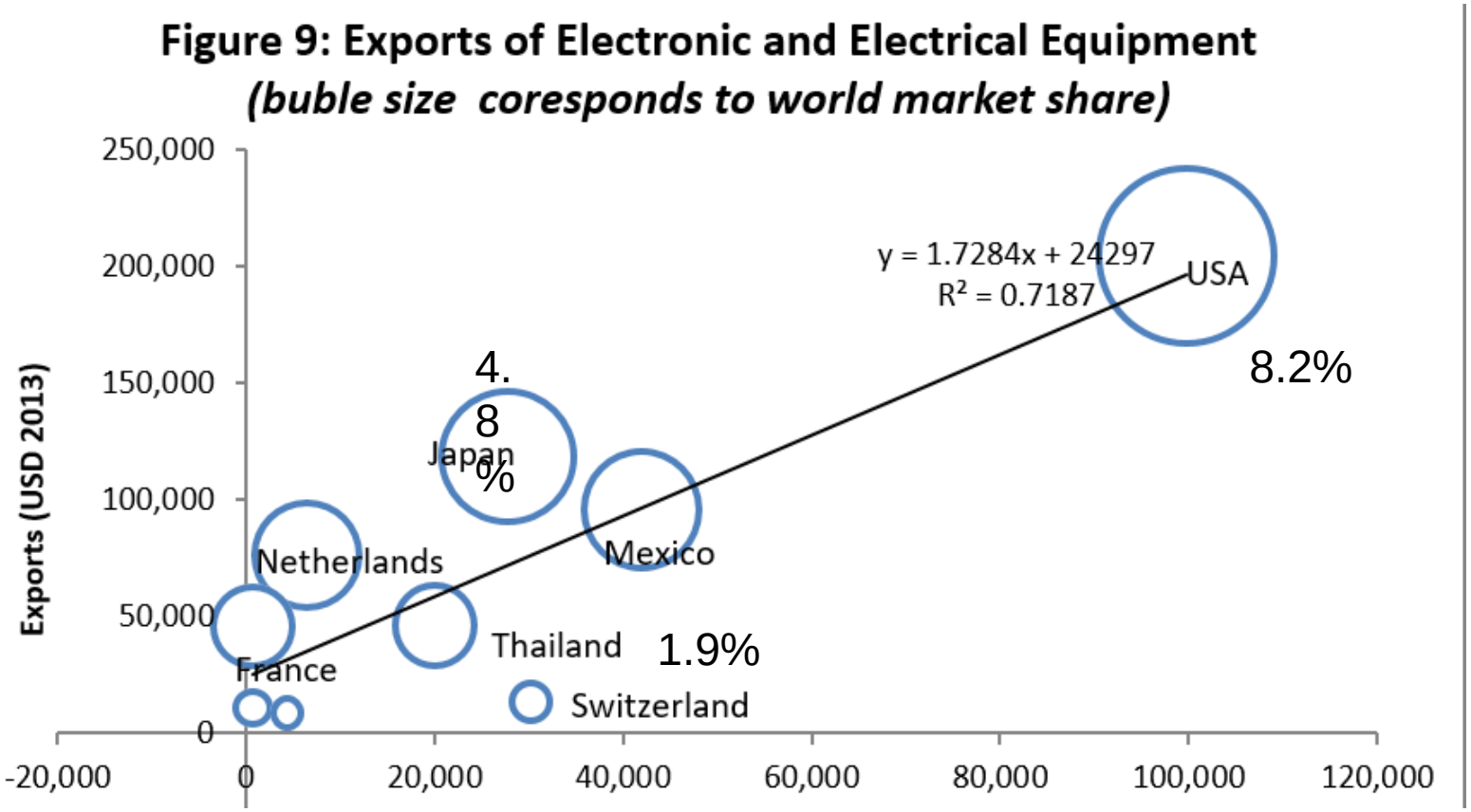
- Note the extreme case between Singapore which has a 73% penetration rate as opposed to Myanmar which only has 1%.
- This case, among others, demonstrates that the region has a digital divide between the ‘‘haves’’ and ‘‘have-nots’’ in terms of Internet connectivity and affordable usage.

  “The digital divide between nations is about bandwidth (capacity) and transmission speeds (usage), so not only do the lower-income countries of ASEAN suffer from poor coverage, they suffer from low bandwidths, latency, network congestion and other service quality issues,”

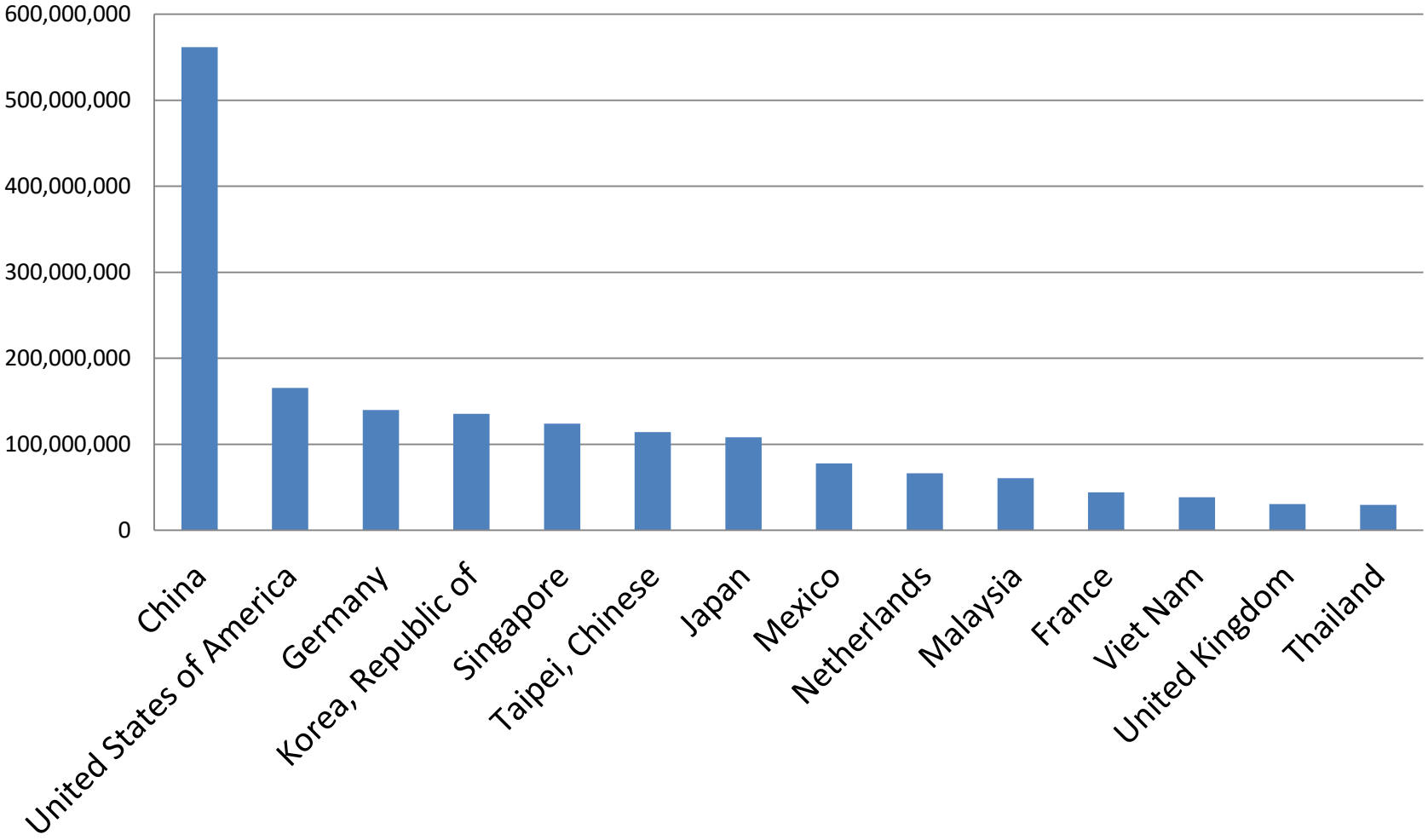
In 2010: Hitachi HDD maker to invest another B15.5bn

- BKK Post Published: 9/08/2010
- ***Hitachi*** Global Storage Technologies (HGST), the world's third largest hard-disk drive manufacturer, invested 15.53 billion baht in Thailand where the data-storage industry aims for continuous annual export growth of 10-15%.
- **Hitachi** is among the world's top four HDD players operating in Thailand. With the presence of **Seagate Technology, Western Digital (WD) and Toshiba Storage Devices**, the kingdom accounts for 90% of HDD production worldwide.
- The sector, which employs **200,000** people, expects record-high exports of 500 billion baht in 2010, an increase of 15% over 2009.
- In 2014, Samsung employed 100,000 people for its electronic plants in Hanoi, where Galaxi note 7 were produced.

Thailand's Inward FDI stock and exports



Thailand's Export Markets of Electrical and Electronic equipment 2013 (million USD)



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