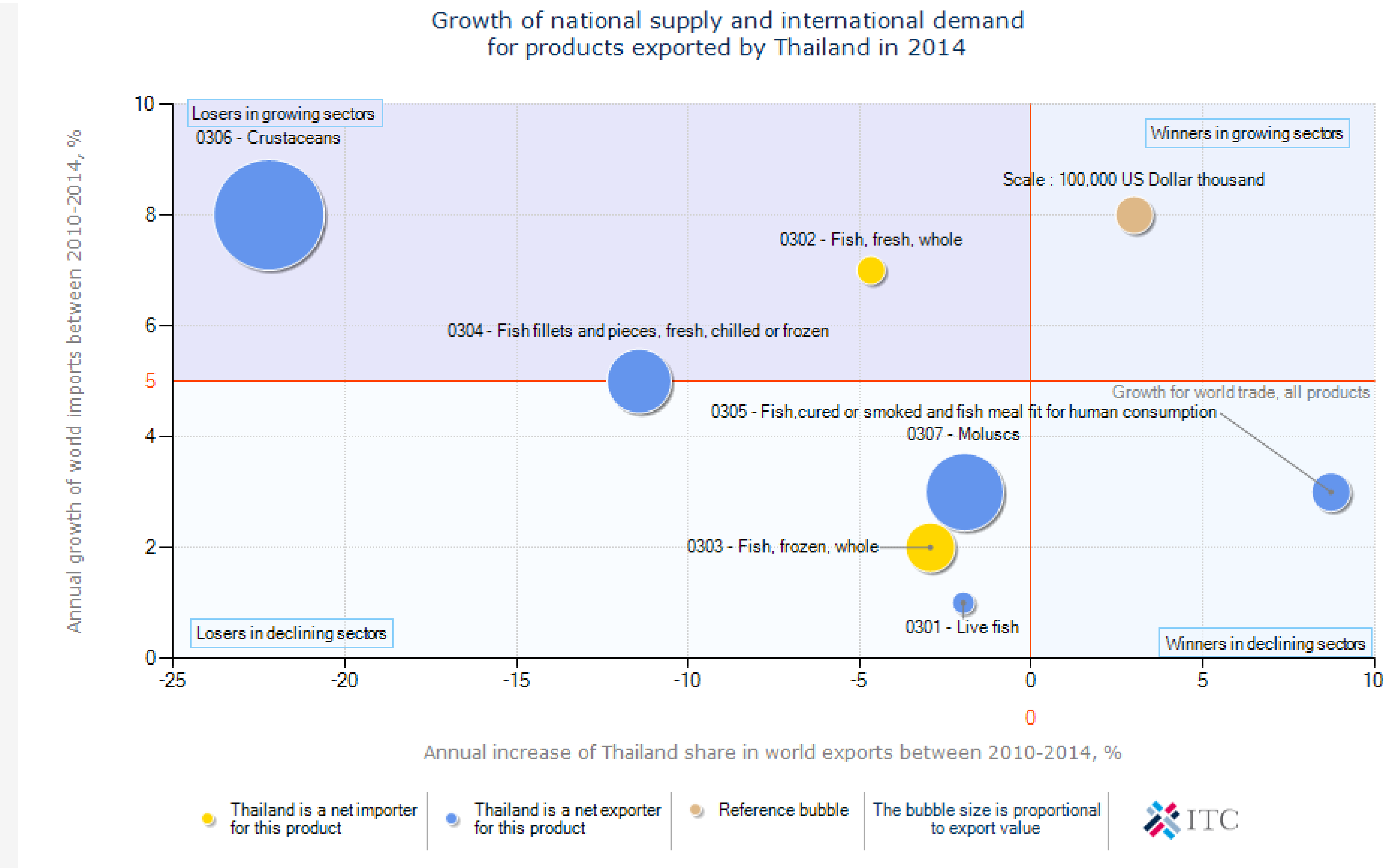
Challenges to Thailand's Electrical and Electronic Appliances Industry

Bhanupong

Lecture 16

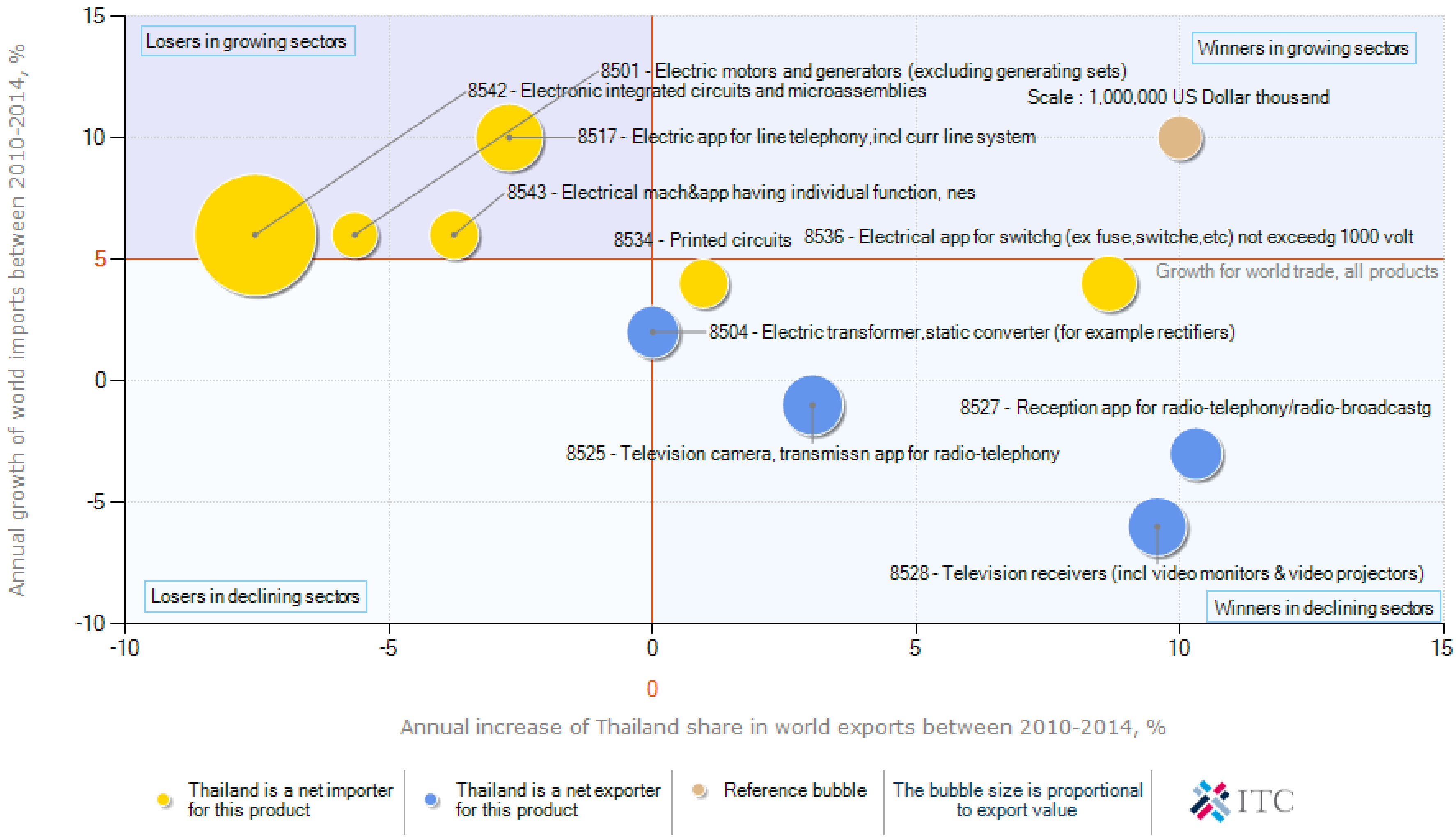
Main themes

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

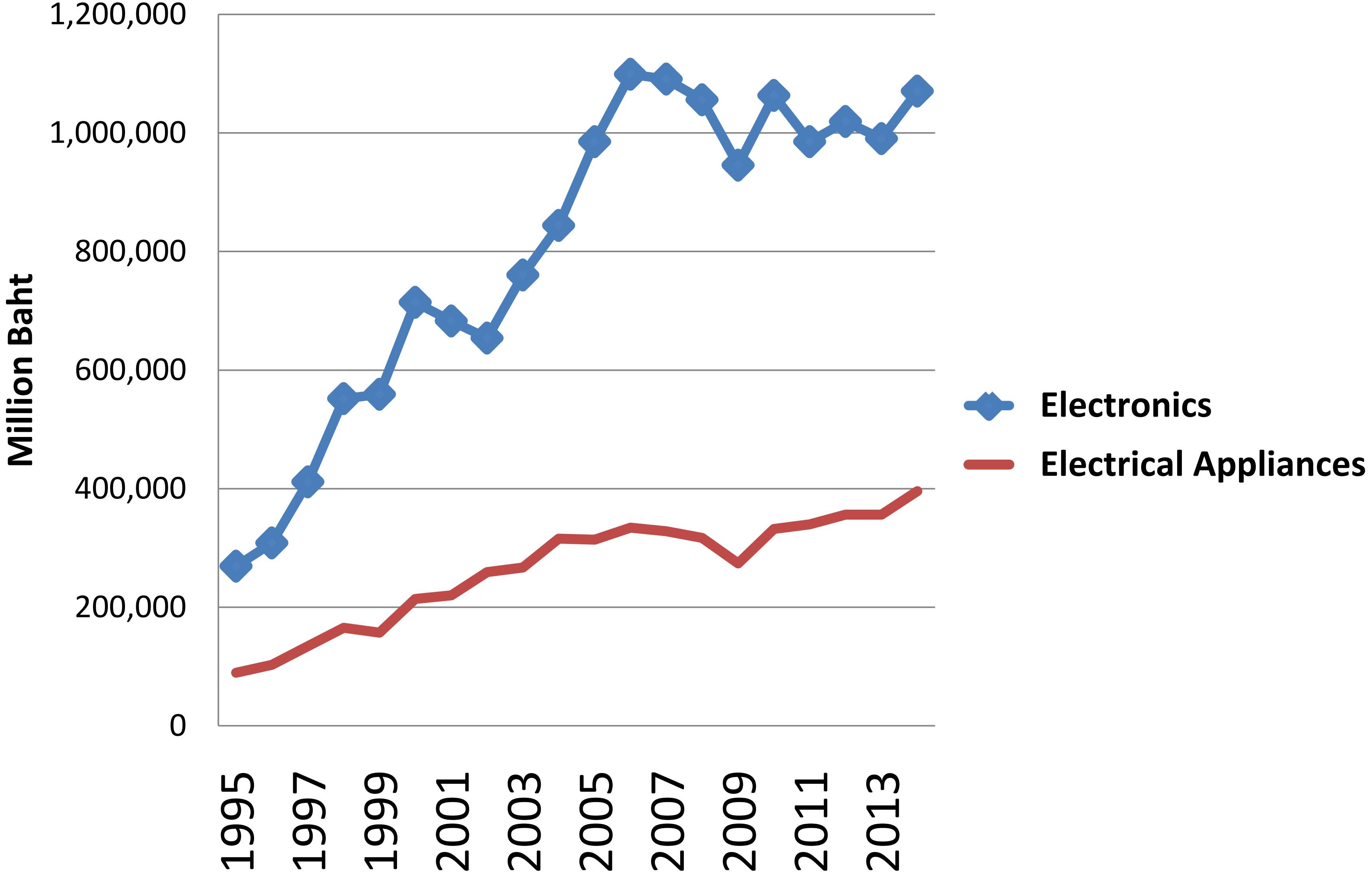


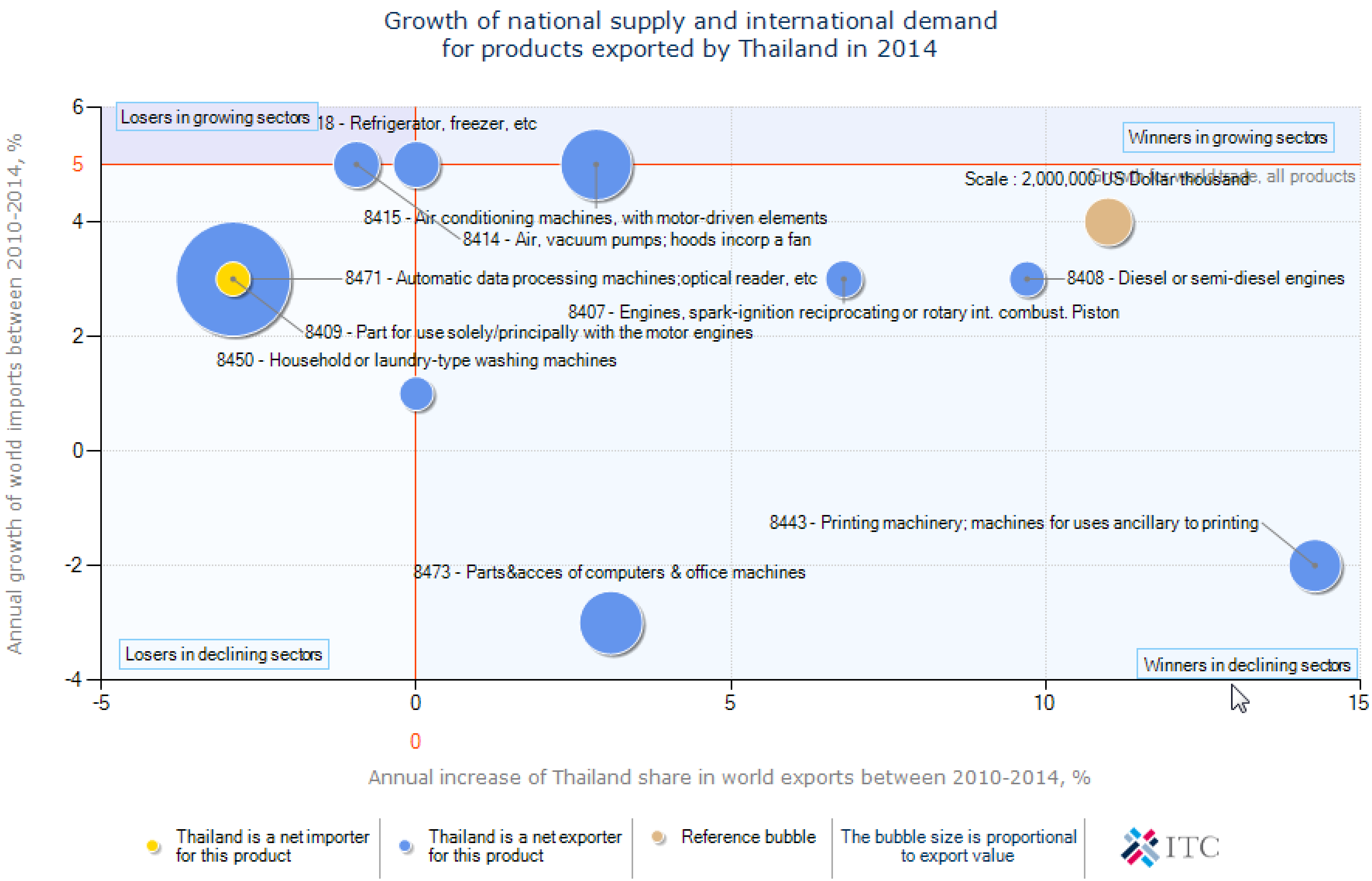
JN COMTRADE statistics.

Growth of national supply and international demand
for products exported by Thailand in 2014



Thailand's EEA Exports: Falling Stars?





Growth of national supply and international demand
for products exported by Thailand in 2014
Losers in growing sectors
8418 - Refrigerator, freezer, etc
Winners in growing sectors
Scale : 2,000,000 US Dollar thousand
Growth of world trade, all products
8415 - Air conditioning machines, with motor-driven elements
8414 - Air, vacuum pumps; hoods incorp a fan
8471 - Automatic data processing machines;optical reader, etc
8408 - Diesel or semi-diesel engines
8407 - Engines, spark-ignition reciprocating or rotary int. combust. Piston
8409 - Part for use solely/principally with the motor engines
8450 - Household or laundry-type washing machines
8443 - Printing machinery; machines for uses ancillary to printing
8473 - Parts&acces of computers & office machines
Losers in declining sectors
Winners in declining sectors
Annual growth of world imports between 2010-2014, %
Annual increase of Thailand share in world exports between 2010-2014, %
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

IT- led growth hypothesis

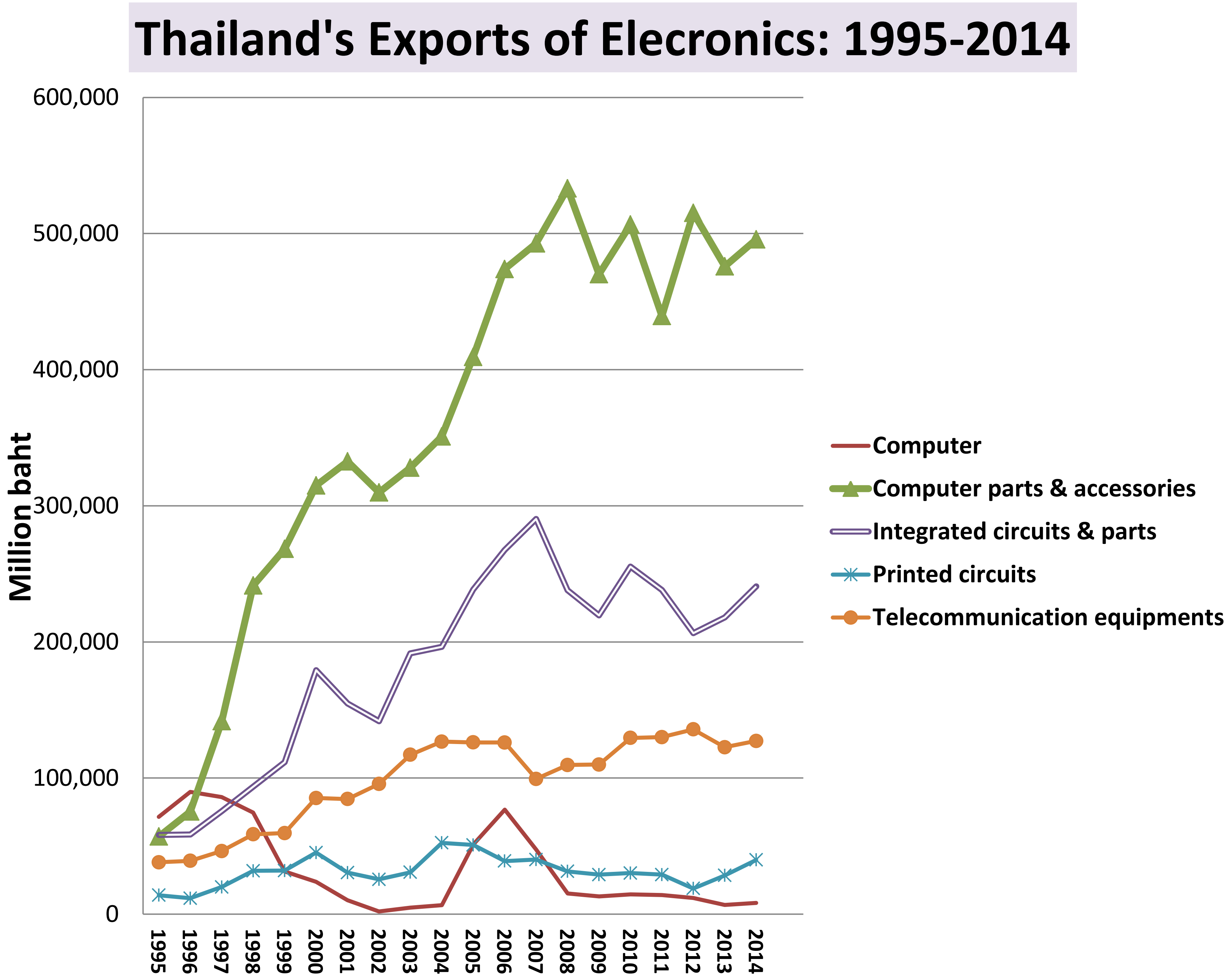
"Countries that invested more in Information Technology would achieve consistently higher productivity and income growth rates."

How do we verify this hypothesis?

What are the caveats of this hypothesis?

The EEE 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 EEE exports in 2010.


Thailand's Exports of Elecronics: 1995-2014
Million baht
600,000
500,000
400,000
300,000
200,000
100,000
0
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
Computer
Computer parts & accessories
Integrated circuits & parts
Printed circuits
Telecommunication equipments

Changing comparative advantage

- Computer and Hard Disc Drive (HDD) had the most promising trend.
- 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.

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.**

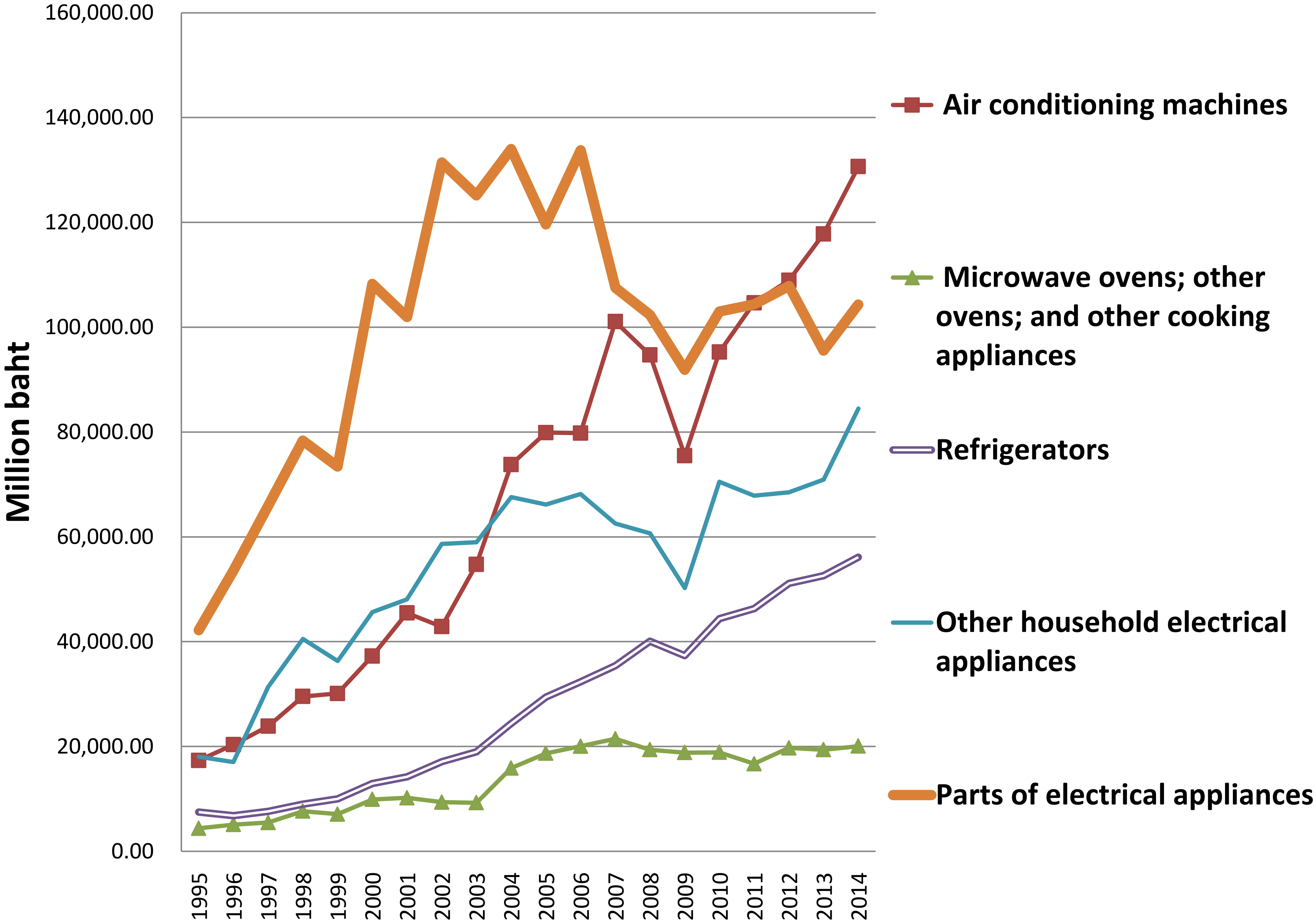
International product fragmentation

- 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**
- **Synchronization of World Business Cycle**

Trade fragmentation (Network Trade)

- Production and trade networks result from the strategies of firms which shifted from exports to international production to reduce costs and react to the market and technological change from capacity improvement.

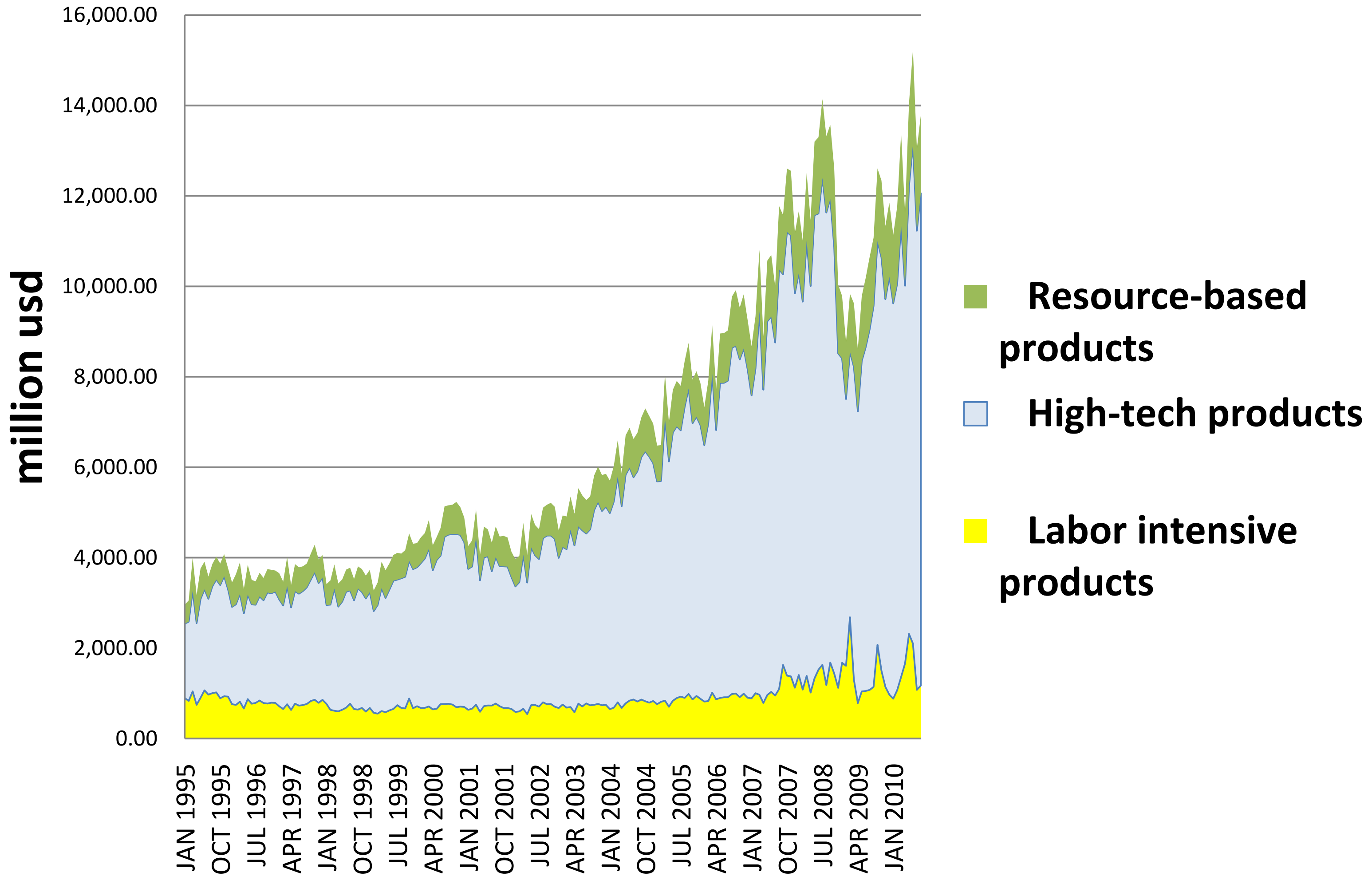
Thailand's Exports of Electrical Equipment



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

Changing pattern of manufactured exports: 1995-2010

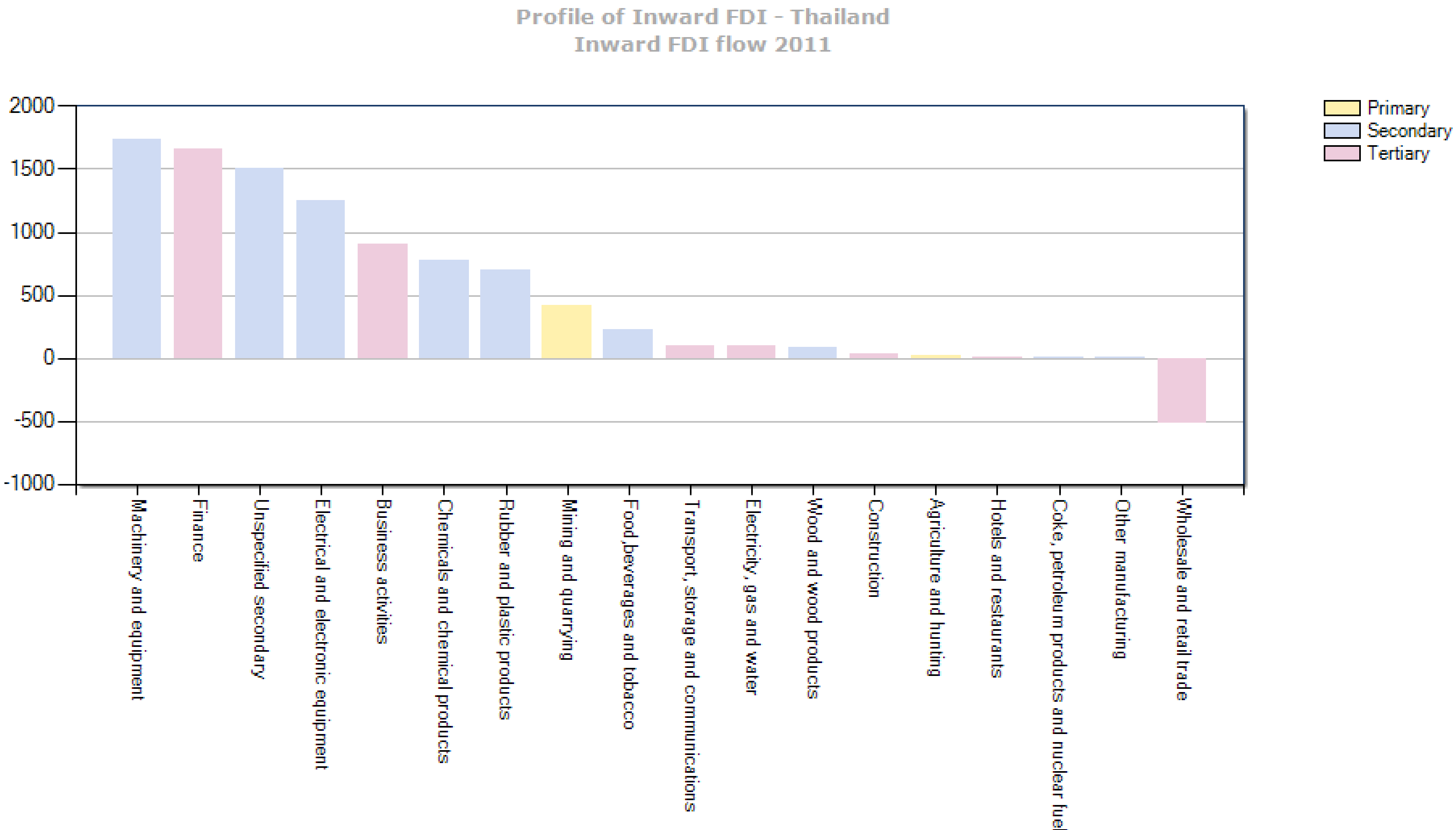


Changing pattern of exports

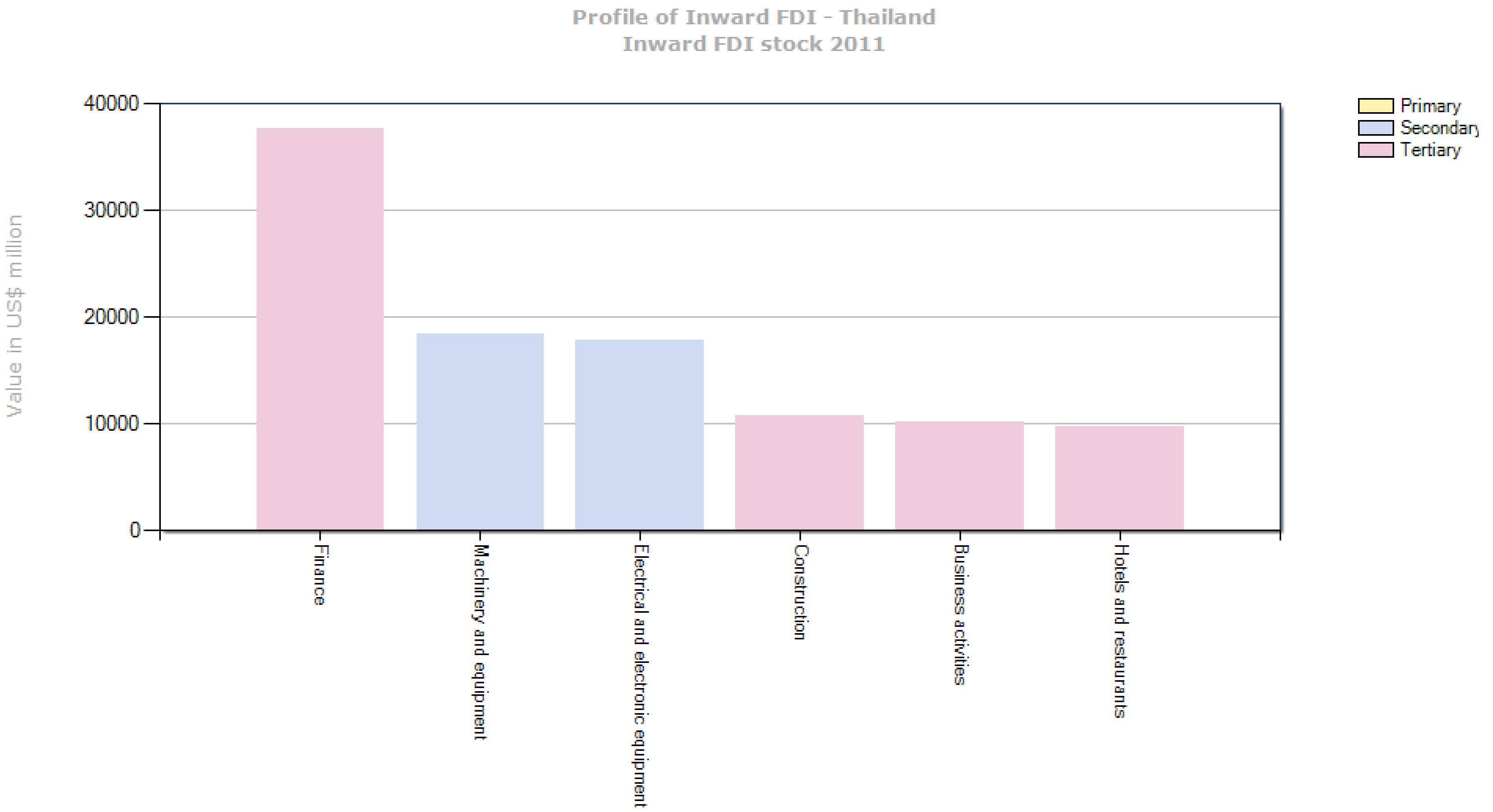
- The share of high-tech exports rose from 45 percent in 1993 to about 60 percent of total Thailand's exports in 2000.
- The rising share in total exports of the high-tech products and the declining importance of labor intensive products demonstrate the changing pattern of comparative advantage of Thailand's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


Profile of Inward FDI - Thailand
Inward FDI flow 2011
2000
1500
1000
500
0
-500
-1000
Primary
Secondary
Tertiary
Machinery and equipment
Finance
Unspecified secondary
Electrical and electronic equipment
Business activities
Chemicals and chemical products
Rubber and plastic products
Mining and quarrying
Food,beverages and tobacco
Transport, storage and communications
Electricity, gas and water
Wood and wood products
Construction
Agriculture and hunting
Hotels and restaurants
Coke, petroleum products and nuclear fuel
Other manufacturing
Wholesale and retail trade

2011 Inward FDI stock in Thailand



Greater volatility

- 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.

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 EEE prices would return after the world glut of EEE products.
- 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 E&EA 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.

Technical barriers to trade: WEEE and ROHS

- Among the top importers of EEE 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
- These kinds of regulations would raise the cost of production due to high *compliance cost.*
- They can be regarded as *non-tariff barriers* to EEE products from developing countries.

Thailand is 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 EEE 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.

Korea’s seven-second syndrome

- Should the government subsidize the EEE 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.

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.

Challenges

- The industry cannot rely on the *undervalued* baht to offset the dollar price disadvantage.
- When the dollar has to perform its role in correcting the US's huge current account deficit, the Electronic industry in Thailand might face another crisis as the baht would appreciate significantly against the dollar.
- But the dollar has gained strength since 2014

Quality of human capital

- Large parts of EEE 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 2015?

Population per patent

A proxy for innovation in science and technology

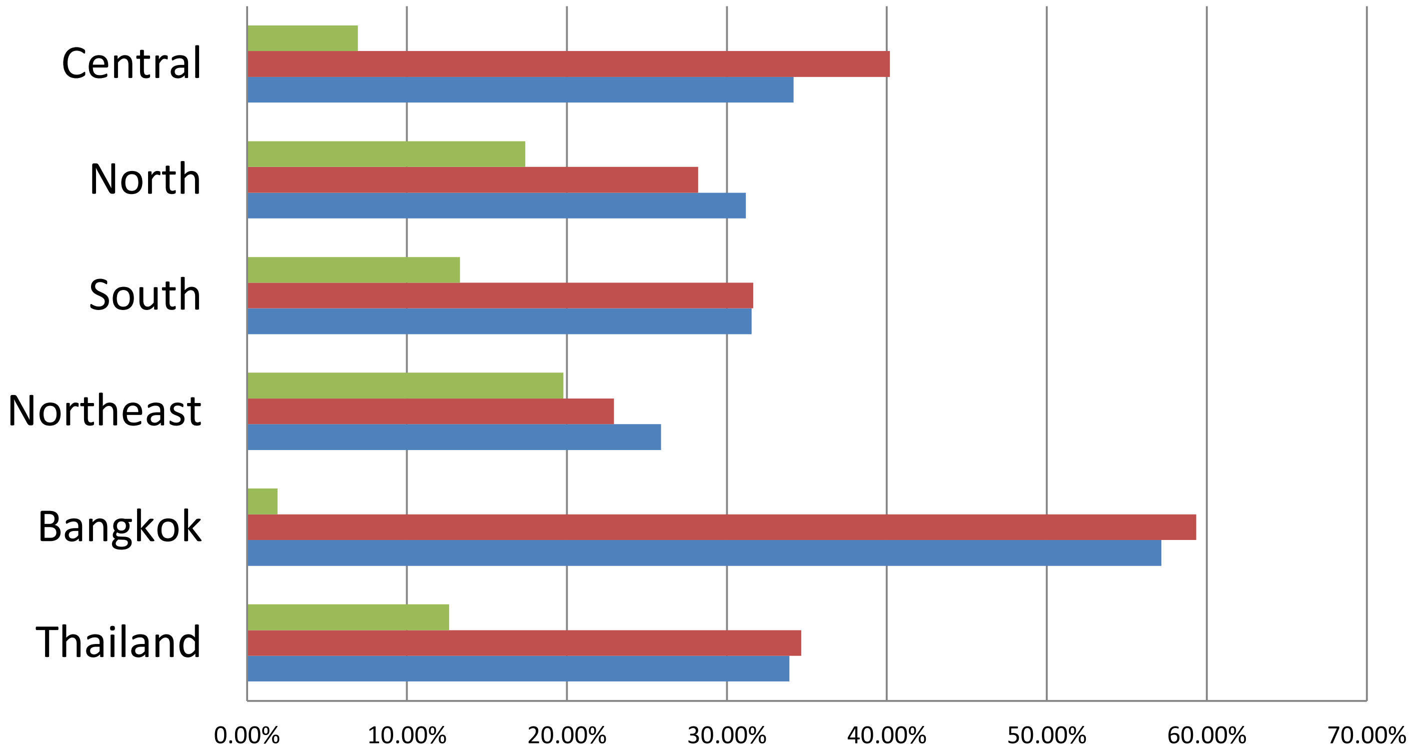
- Mexico 1,267,532
- **Thailand 340,000**
- Singapore 13,000
- Australia 18,000
- South Korea 6,000
- Japan 3,914
- USA 2,800

Source: The Economist

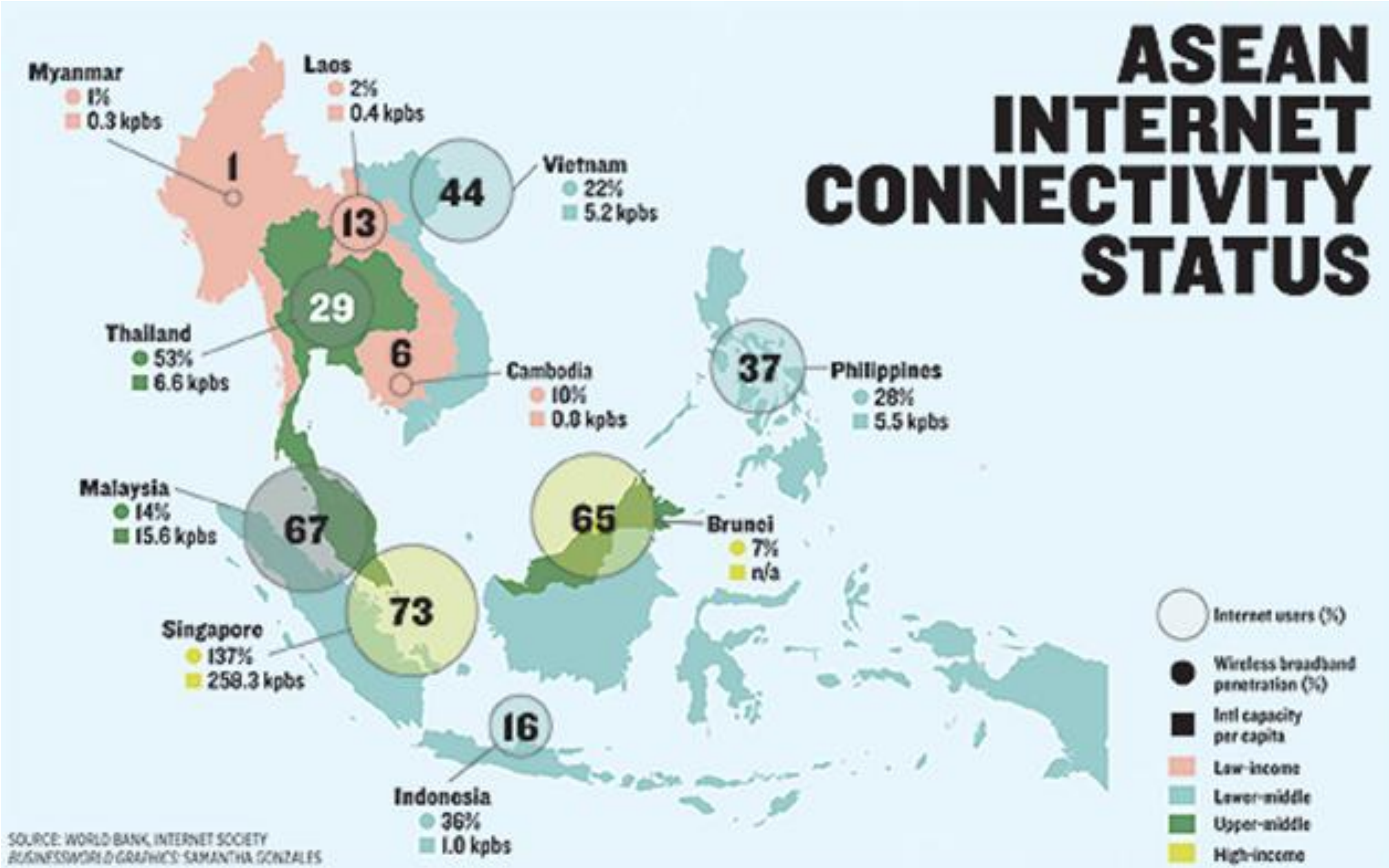
Poverty and Digital Divide

- 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
Vietnam
22%
5.2 kpbs
44
Thailand
53%
6.6 kpbs
29
Cambodia
10%
0.8 kpbs
6
Philippines
28%
5.5 kpbs
37
Malaysia
14%
15.6 kpbs
67
Brunei
7%
n/a
65
Singapore
137%
258.3 kpbs
73
Indonesia
36%
1.0 kpbs
16
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

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,”

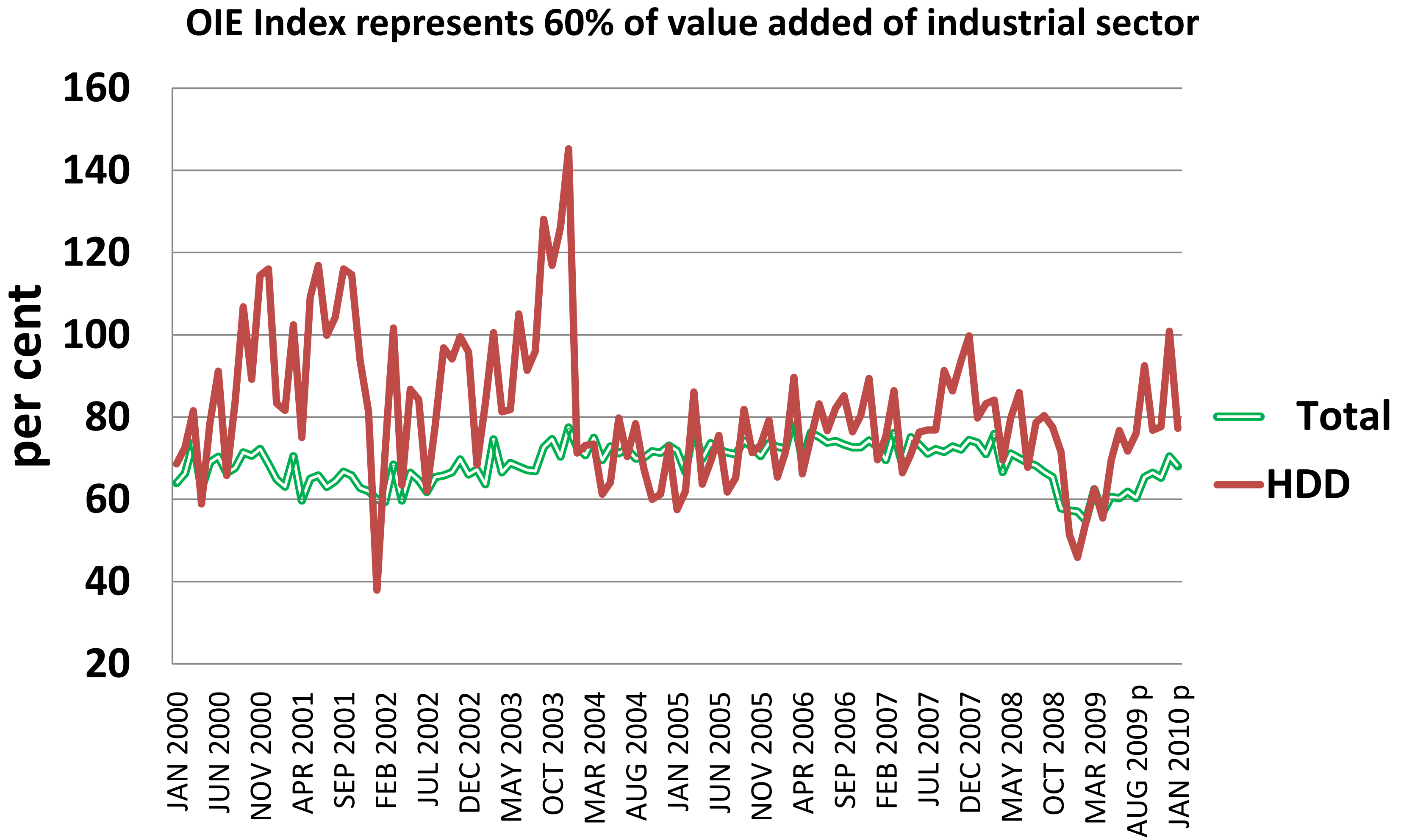
Hitachi HDD maker to invest another B15.5bn

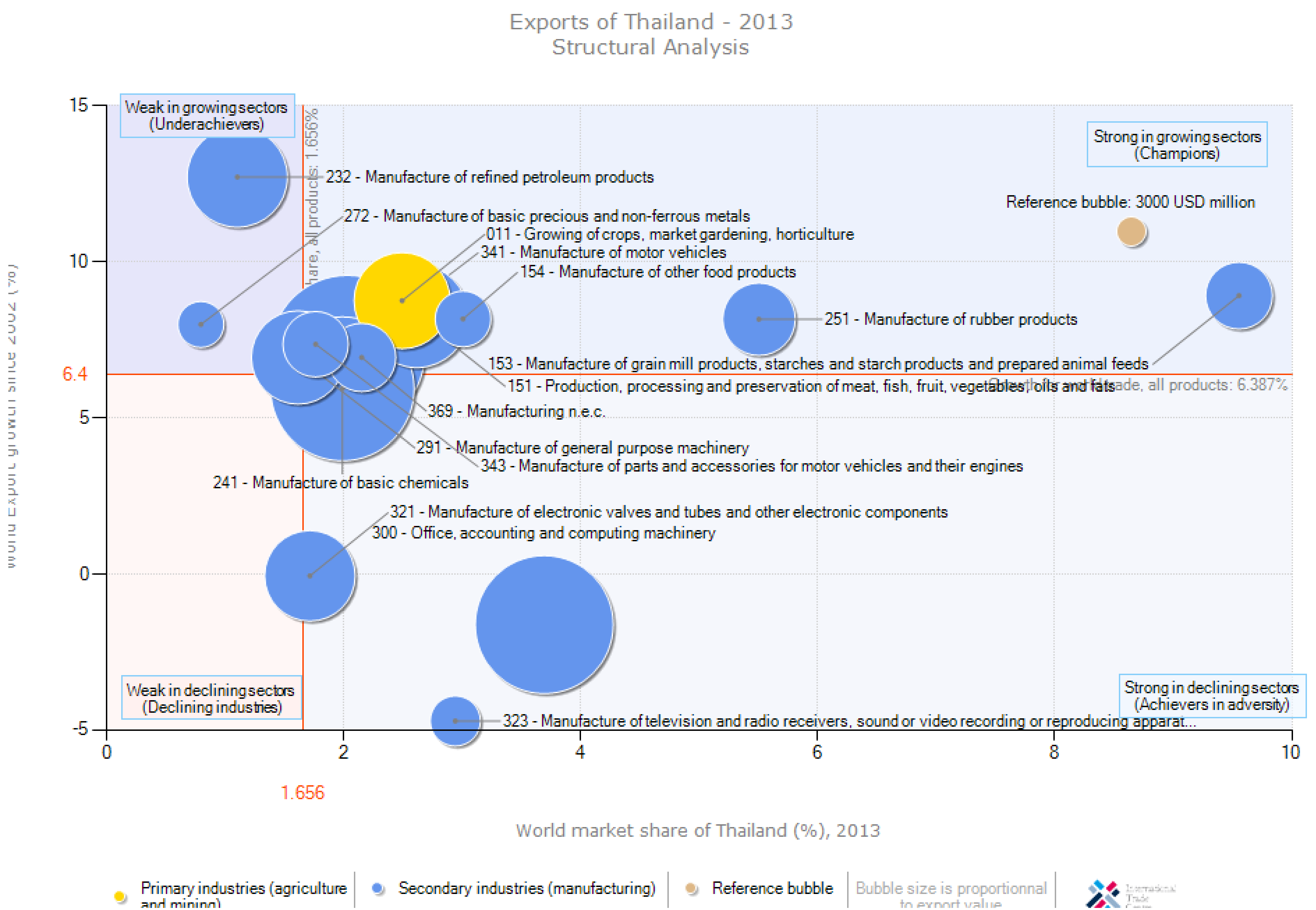
- BKK Post Published: 9/08/2010
- ***Hitachi*** Global Storage Technologies (HGST), the world's third largest hard-disk drive manufacturer, invested 15.53 billion baht in Thailand where the data-storage industry aims for continuous annual export growth of 10-15%.
- **Hitachi** is among the world's top 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.

FDI on the rise in Thailand?

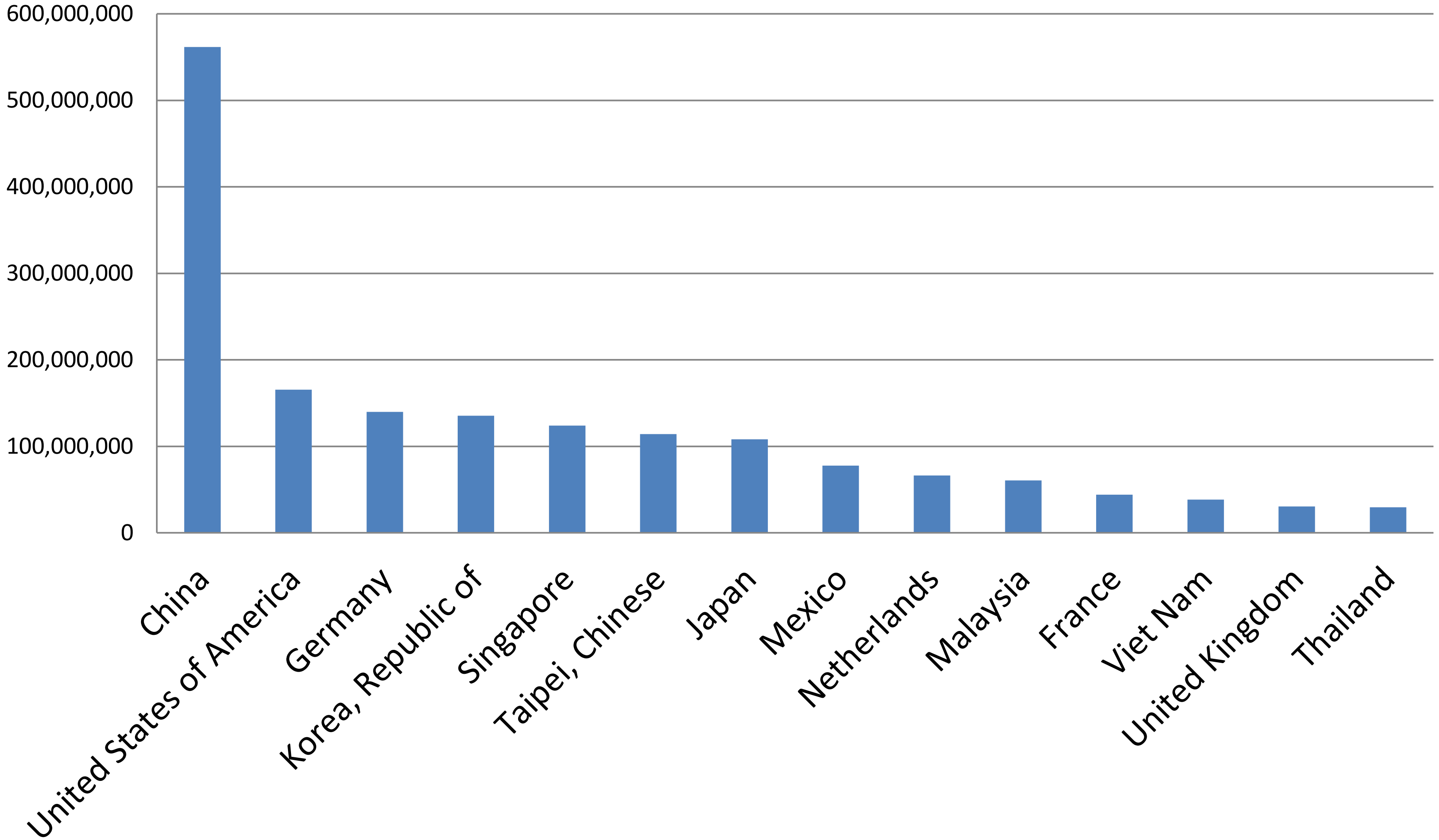
- Apart from Hitachi, Seagate and WD are also planning to expand the production in Thailand.
- Moreover, the world's top two HDD makers had been in the process of moving their research and development (R&D) operations to Thailand.
- "To support the industry's dynamic growth, the government is recommended to help develop the required human resources including PhD personnel in the area, and other skilled labor."
- According to the international research firm IDC, the global HDD industry is expected to have average annual revenue growth of 9% from 2009 to 2012 to close to 800 million units valued at $40 billion.

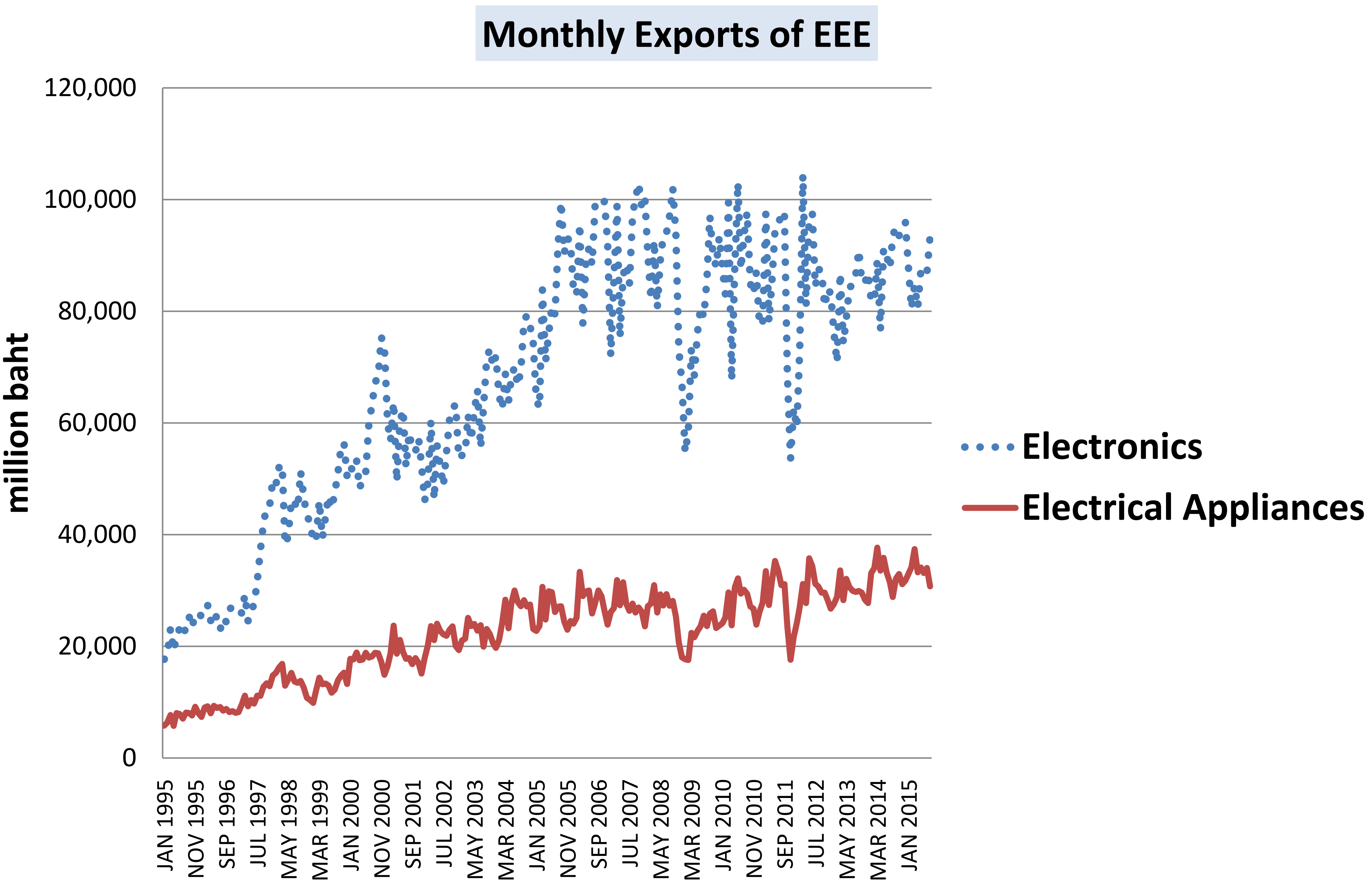
Impact of the 2001 and 2009 global recessions (Capacity Utilization Rate)



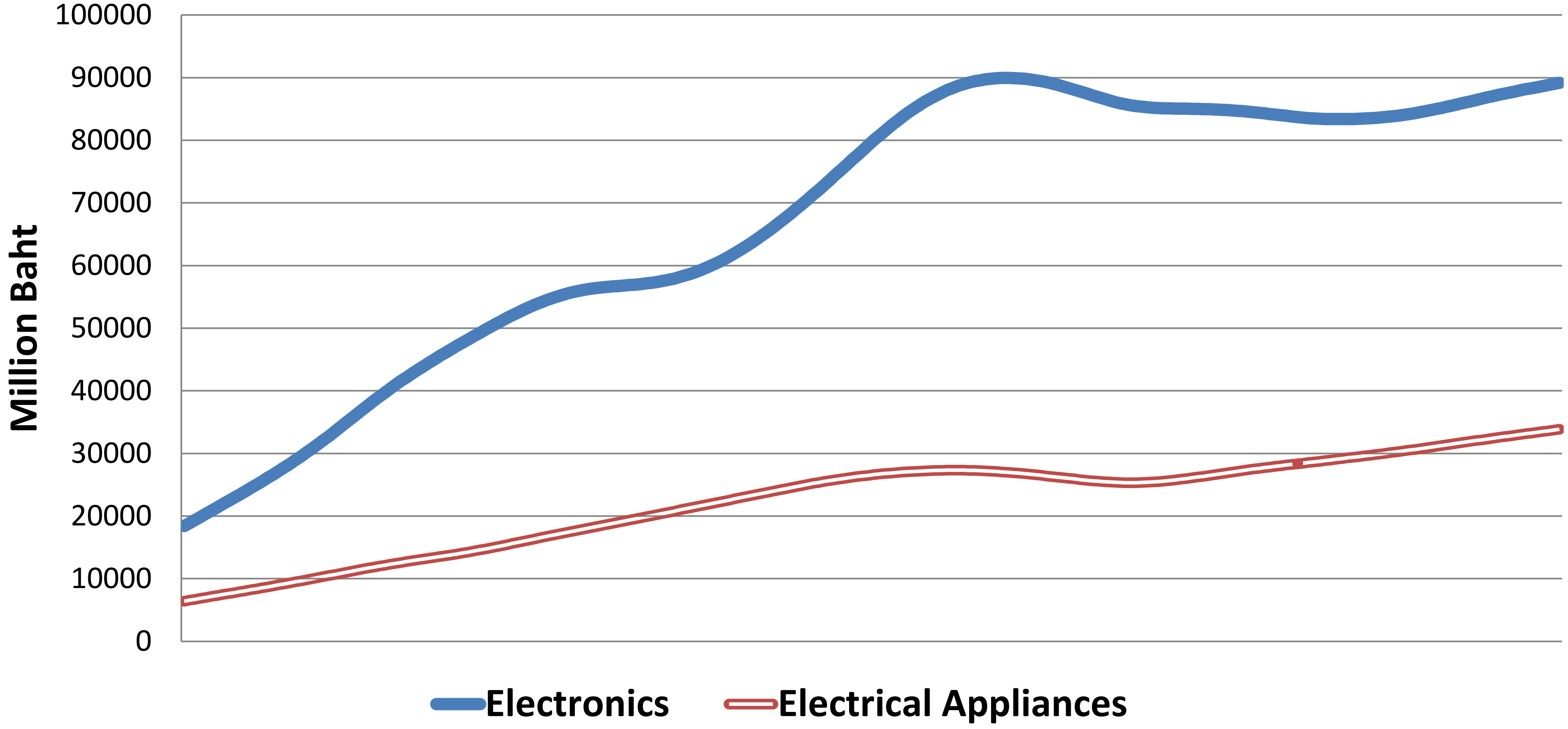

Exports of Thailand - 2013
Structural Analysis
Weak in growing sectors (Underachievers)
Strong in growing sectors (Champions)
Weak in declining sectors (Declining industries)
Strong in declining sectors (Achievers in adversity)
Reference bubble: 3000 USD million
232 - Manufacture of refined petroleum products
272 - Manufacture of basic precious and non-ferrous metals
011 - Growing of crops, market gardening, horticulture
341 - Manufacture of motor vehicles
154 - Manufacture of other food products
251 - Manufacture of rubber products
153 - Manufacture of grain mill products, starches and starch products and prepared animal feeds
151 - Production, processing and preservation of meat, fish, fruit, vegetables, oils and fats
369 - Manufacturing n.e.c.
291 - Manufacture of general purpose machinery
343 - Manufacture of parts and accessories for motor vehicles and their engines
241 - Manufacture of basic chemicals
321 - Manufacture of electronic valves and tubes and other electronic components
300 - Office, accounting and computing machinery
323 - Manufacture of television and radio receivers, sound or video recording or reproducing apparat...
Growth of world trade, all products: 6.387%
Share, all products: 1.656%
15
10
6.4
5
0
-5
0
2
4
6
8
10
1.656
World market share of Thailand (%), 2013
Primary industries (agriculture and mining)
Secondary industries (manufacturing)
Reference bubble
Bubble size is proportionnal to export value

Exports of Electrical and Electronic equipment 2013 (million USD)




Monthly Exports of EEE
million baht
120,000
100,000
80,000
60,000
40,000
20,000
0
JAN 1995
NOV 1995
SEP 1996
JUL 1997
MAY 1998
MAR 1999
JAN 2000
NOV 2000
SEP 2001
JUL 2002
MAY 2003
MAR 2004
JAN 2005
NOV 2005
SEP 2006
JUL 2007
MAY 2008
MAR 2009
JAN 2010
NOV 2010
SEP 2011
JUL 2012
MAY 2013
MAR 2014
JAN 2015
Electronics
Electrical Appliances

Export Trends of Electronics and Electrical Equipment
January 1995-August 2015



Summary

Industry characteristics: Vulnerability and competitiveness

International product fragmentation

Import dependency

Strategic industrial policy

Digital divided

Impact of global recession and China’s slowdown