Challenges to IT and consumer electronics Industry

Bhanupong

Lecture 16

Main themes

- Industry characteristics
- Vulnerability and competitiveness
- International product fragmentation
- Challenges
- Strategic industrial policy
- Digital divided
- Impact of global recession and recovery

General profile in 2011

	IT and consumer electronics			Electronic components	
		value	rank	value	rank
	Number of exporting countries	128		141	
	Value of exports (in thousand US$)	24,183,149		22,134,414	
	Export growth in value, p.a. (%)	2%	57	3%	73
	Share in national exports (%)	10%		9%	
	Share in national imports (%)	6%		10%	
	Relative trade balance (%)	26%		-4%	
	Relative unit value (world average = 1)	1.6		1.7	

Position in 2011	IT and consumer Electronics	Rank in 2011 (141 countries)
	(Value)	(Rank)
Net exports (in thousand US$)	10,122,949	6
Per capita exports ($/inhabitant)	377.4	19
Share in world market	2.29%	11
Product diversification (N° of equivalent products)	**4**	**83**
Market diversification (N° of equivalent markets)	**10**	**33**
Relative change of world market share pa (%)	**0.07**	

Position in 2011	Electronics components	Rank in 2011 (141 countries)
	(Value)	(Rank)
Net exports (in thousand US$)	-2,149,375	117
Per capita exports US$/inhabitant)	345.4	27
Share in world market (%)	1.80%	13
Product diversification (N° of equivalent products)	**9**	**64**
Market diversification (N° of equivalent markets)	**12**	**16**
Relative change of world market share pa (%)	**-0.77**	

IT and consumer electronics: Change index (2007-2011)

	Value	Rank
Competitiveness effect, p.a. (%)	1.0	71
Initial geographic specialization, p.a. (%)	0.06	55
Initial product specialization, p.a. (%)	-1.2	45
Adaptation effect, p.a. (%)	0.22	62
Matching with dynamics of world demand		93
Absolute change of world market share (% points p.a)	0.0015	23

Electronic components: Change index (2007-2011)

	Value	Rank		
Competitiveness effect, p.a. (%)	-1.74	76		
Initial geographic specialization, p.a. (%)	0.03	85		
Initial product specialization, p.a. (%)	1.28	47		
Adaptation effect, p.a. (%)	-0.35	62		
Matching with dynamics of world demand		55		
Absolute change of world market share (% points p.a)	-0.014	124		

Average index (ranks among 141 exporting countries)

	Electronic components	IT and Consumer electronics
Average Index: Current Index	**34**	**11**
Average Index: Change Index	**50**	**90**

IT- led growth hypothesis

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

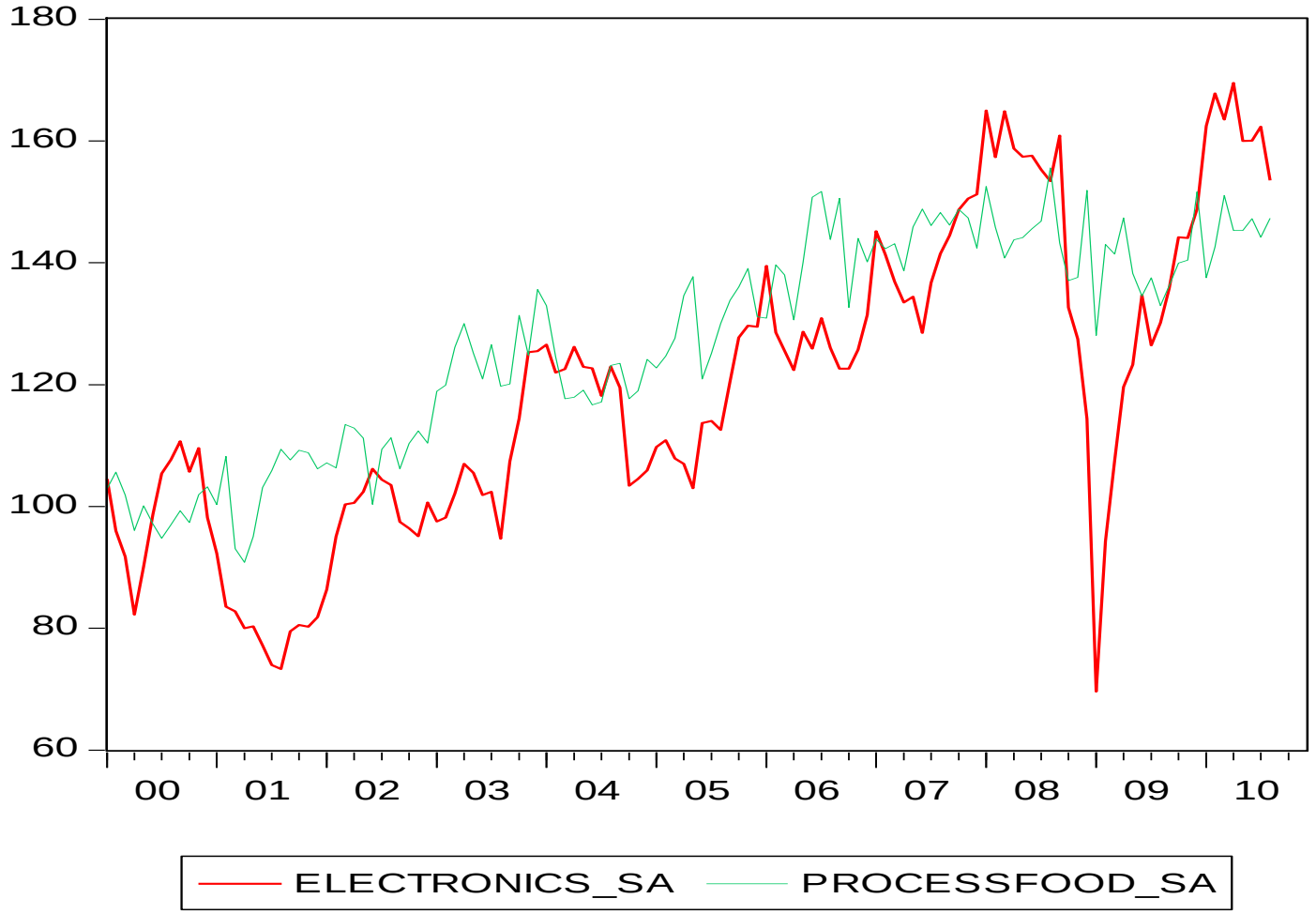
How do we verify this hypothesis?

What are the caveats of this hypothesis?

Domestic IT Market

- The domestic IT market in Thailand has been growing rapidly since the economic recovery in 1999.
- The *hardware* market is larger than the combined software and IT service sectors.
- These three sectors are complementary by nature.
- They move together closely in the same direction.

Manufacturing production index
Jan 2000-Aug 2010
Source: Office of Industrial Economics



The IT sector is extremely sensitive to business-cycle

- The year 2001 witnessed another poor performance of the Thai economy, when the GDP growth rate dropped to 2 percent.
- The IT industry suffered the same contractionary impact of slow world GDP growth.
- When the economy rebounded, the growth of the IT industry surpassed the GDP growth.
- We observed similar situation during the global recession in 2009 and the sharp rebound in 2010 of IT exports.

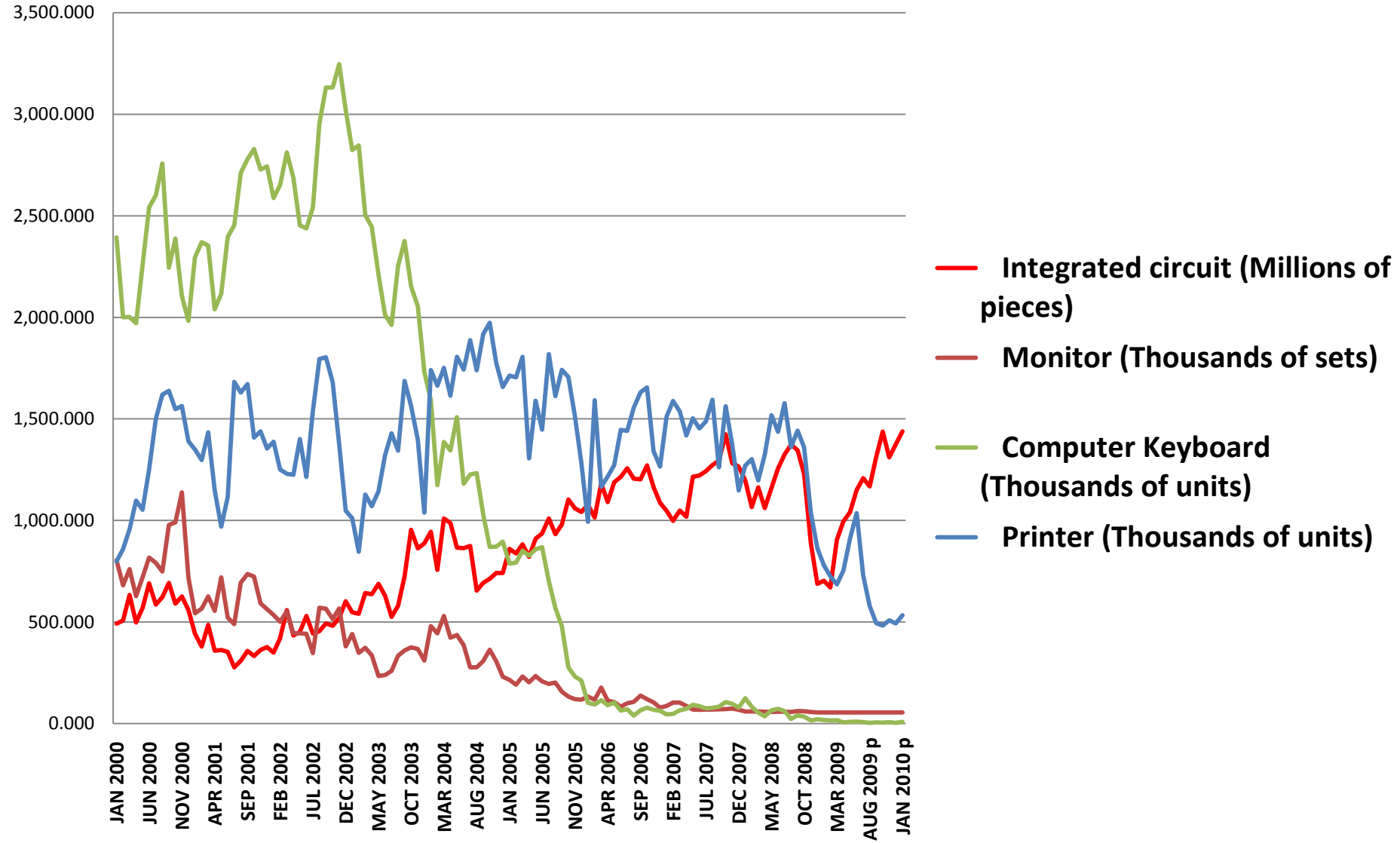
How to maintain a stable growth path

- Since shocks are random, the IT industry will still have a long-term prospect as long as the GDP can maintain its stable high growth path.
- Shocks like those in 1998, 2001, 2003, and 2009 would simply cause a *temporary deviation* from the stable growth path of the IT market.
- The IT growth is also consistently growing faster than the GDP growth during the boom and likewise it would fall faster during the GDP slump.

Changing comparative advantage

- Computer and Hard Disc Drive have 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 and printer has a moderate growth, while computer keyboard and monitor has been declining.
- Thailand cannot compete with cheap imports from low-cost countries.

Domestic production of IT products 2000-2010



Changing comparative advantage

- **The changing comparative advantage has made some of Thailand's IT 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.
- Deepening structural interdependence of the world economy
- 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.

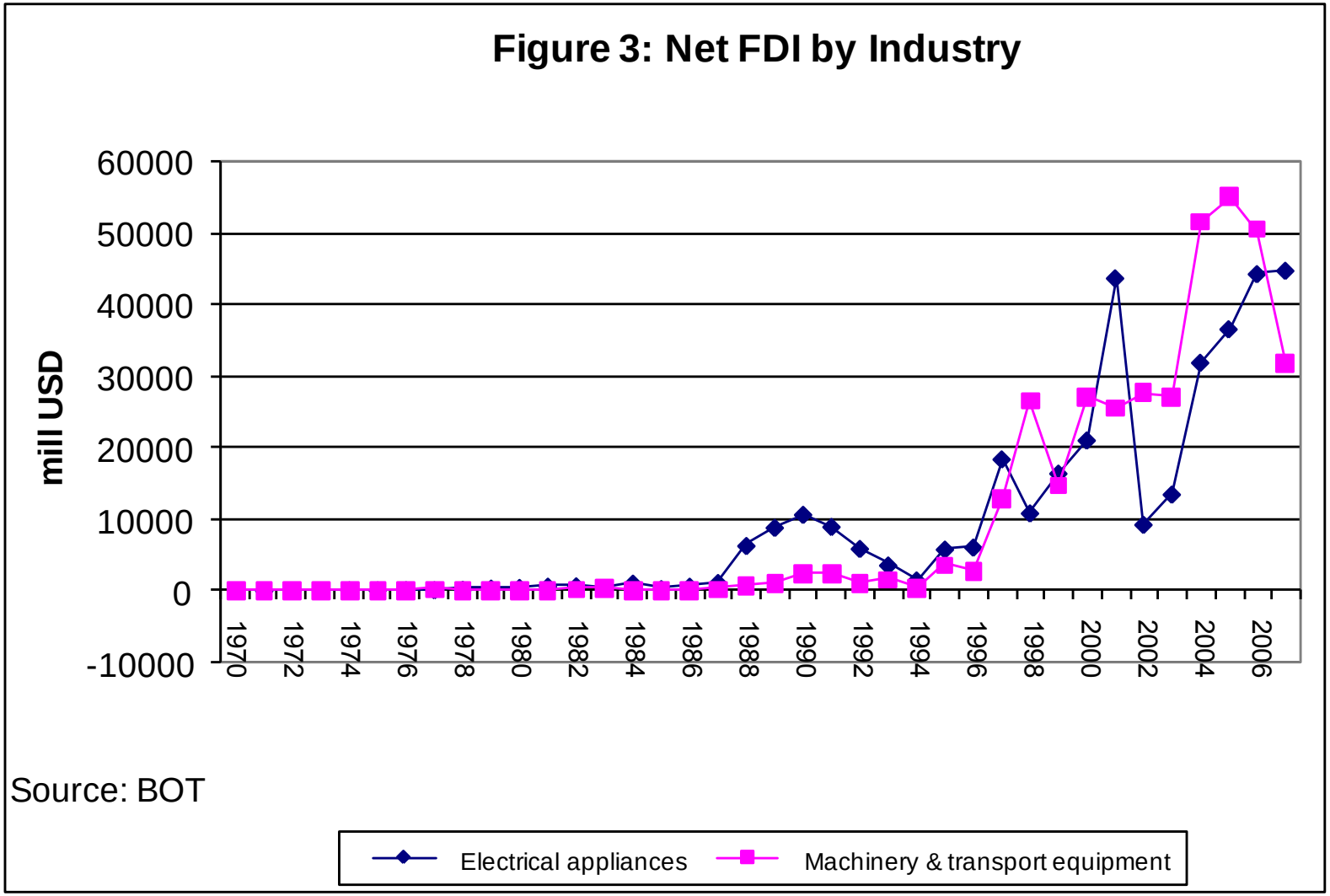
Trade fragmentation

- 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.

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.”

Yen appreciation and FDI?




Manufactured exports: 1995-2010
million usd
16,000.00
14,000.00
12,000.00
10,000.00
8,000.00
6,000.00
4,000.00
2,000.00
0.00
JAN 1995
SEP 1995
MAY 1996
JAN 1997
SEP 1997
MAY 1998
JAN 1999
SEP 1999
MAY 2000
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MAY 2002
JAN 2003
SEP 2003
MAY 2004
JAN 2005
SEP 2005
MAY 2006
JAN 2007
SEP 2007
MAY 2008
JAN 2009
SEP 2009
MAY 2010
Resource-based products
High-tech products
Labor intensive products

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.
- **Electronic products require only 13.6 percent of their input locally, resulting in heavily depending on imported raw materials.**

A big challenge

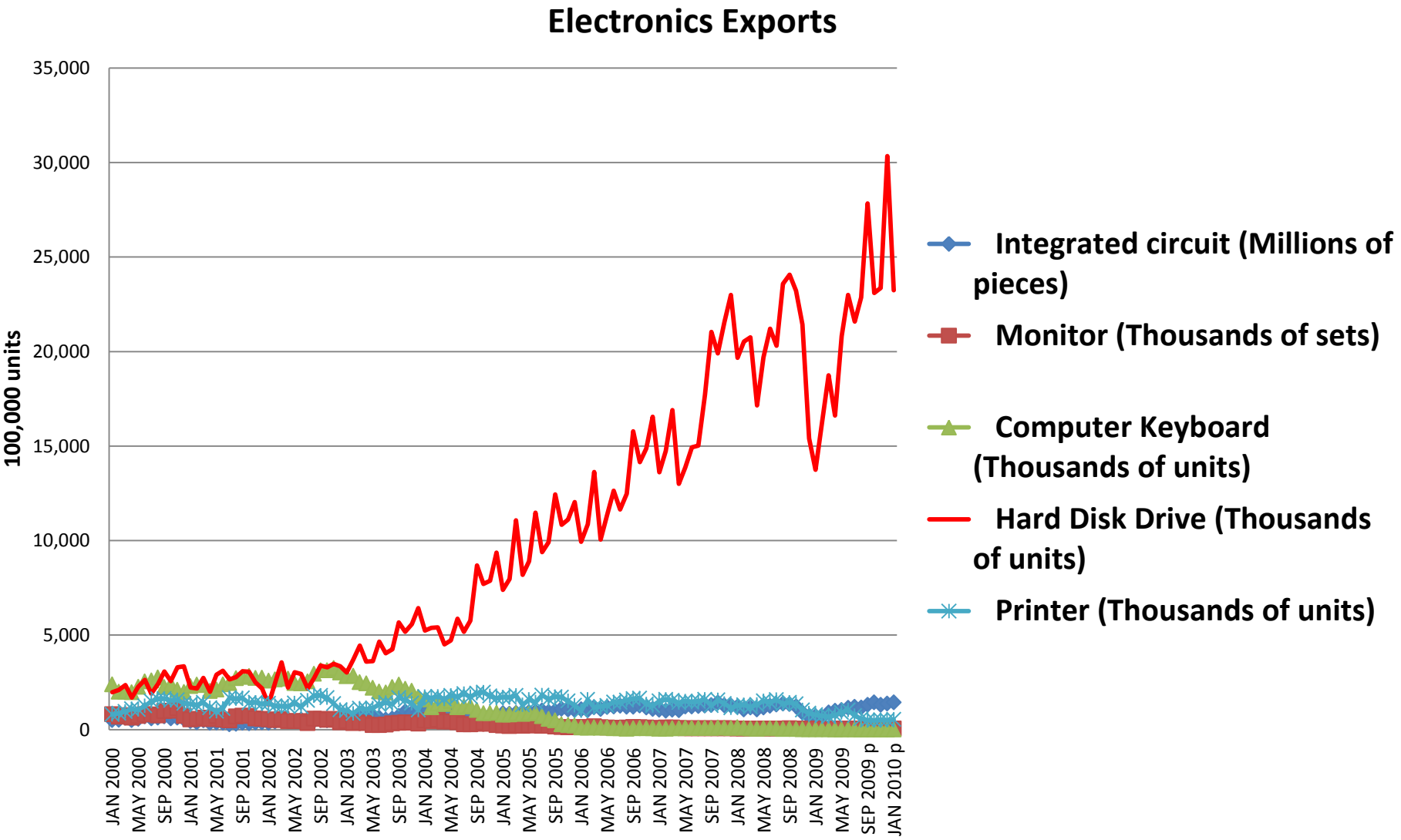
- Exports cannot take place without the flows of foreign direct investment in the IT industry.
- Since 2000, the rising trend of the high-tech products has been stabilized.
- Without continuing flows of foreign direct investment in to the IT sector, the trend might be reversed in the future.
- Another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

Can FTAs help?

- Will the formation of free trade agreements between Thailand and other countries win back some parts of FDI that might have gone to China?
- What are fundamental factors determining the inflows of FDI into the IT industry?

Greater volatility

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


Electronics Exports
100,000 units
35,000
30,000
25,000
20,000
15,000
10,000
5,000
0
JAN 2000
MAY 2000
SEP 2000
JAN 2001
MAY 2001
SEP 2001
JAN 2002
MAY 2002
SEP 2002
JAN 2003
MAY 2003
SEP 2003
JAN 2004
MAY 2004
SEP 2004
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MAY 2006
SEP 2006
JAN 2007
MAY 2007
SEP 2007
JAN 2008
MAY 2008
SEP 2008
JAN 2009
MAY 2009
SEP 2009 p
JAN 2010 p
Integrated circuit (Millions of pieces)
Monitor (Thousands of sets)
Computer Keyboard (Thousands of units)
Hard Disk Drive (Thousands of units)
Printer (Thousands of units)

export orientated products
60%> X/Q> 30%

- ***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 IT prices would return after the world glut of IT products.
- How to deal with temporary declining prices and excess supply: quantity adjustment is 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 IT 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 IT 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.

Just an assembler

- FDI in the IT 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 IT industry does 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 IT users and development.

The seven-second syndrome

- Should the government subsidize the IT industry?
- Any room for market intervention?
- Is there any justification by market failures and strategic intervention?
- Say goodbye to the 3G system..

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.

Overrated

- 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.

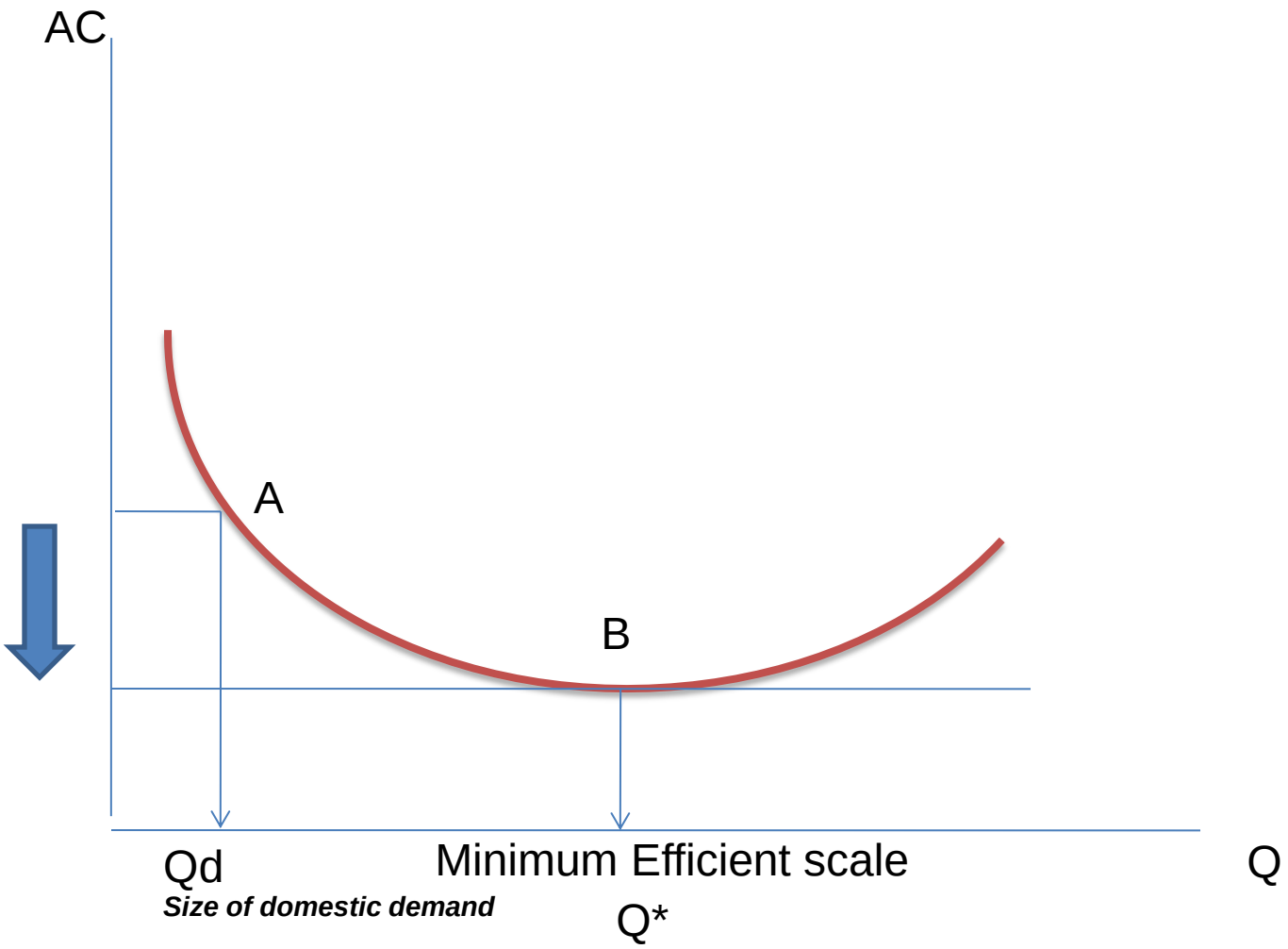
Challenges

- 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 IT industry in Thailand might face another crisis as the baht would appreciate significantly against the dollar.
- The industry must prepare for the strengthening of the baht as a result of the weakening of the dollar in the future (29 baht?).

Liquidity injection

- The industry must focus also on creating domestic demand to generate their income to partially mitigate the impact of global recession in 2009.
- How to deal with a temporary demand shock?
- Is there a limit to relying on domestic demand?

Inward-looking and self-sufficiency policy



Quality of human capital

- Large parts of ICT 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 IT success.
- 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 IT researchers was only 750 persons in 2001.
- What is the corresponding figure in 2009?

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

Innovation

- Patents are a crude but useful measure of innovation.
- The chart shows that Chinese inventors are developing a stake in intellectual-property protection.
- And because national patents protect the technologies of foreign firms too, the trend reflects how global companies are ploughing into China as a market and a manufacturing base.
- Even Japanese firms have increased their patent filings in China but decreased them at home.

Poverty and Digital Divide

- Poverty and access to IT 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.

Figure 8: Digital Divided by Poverty

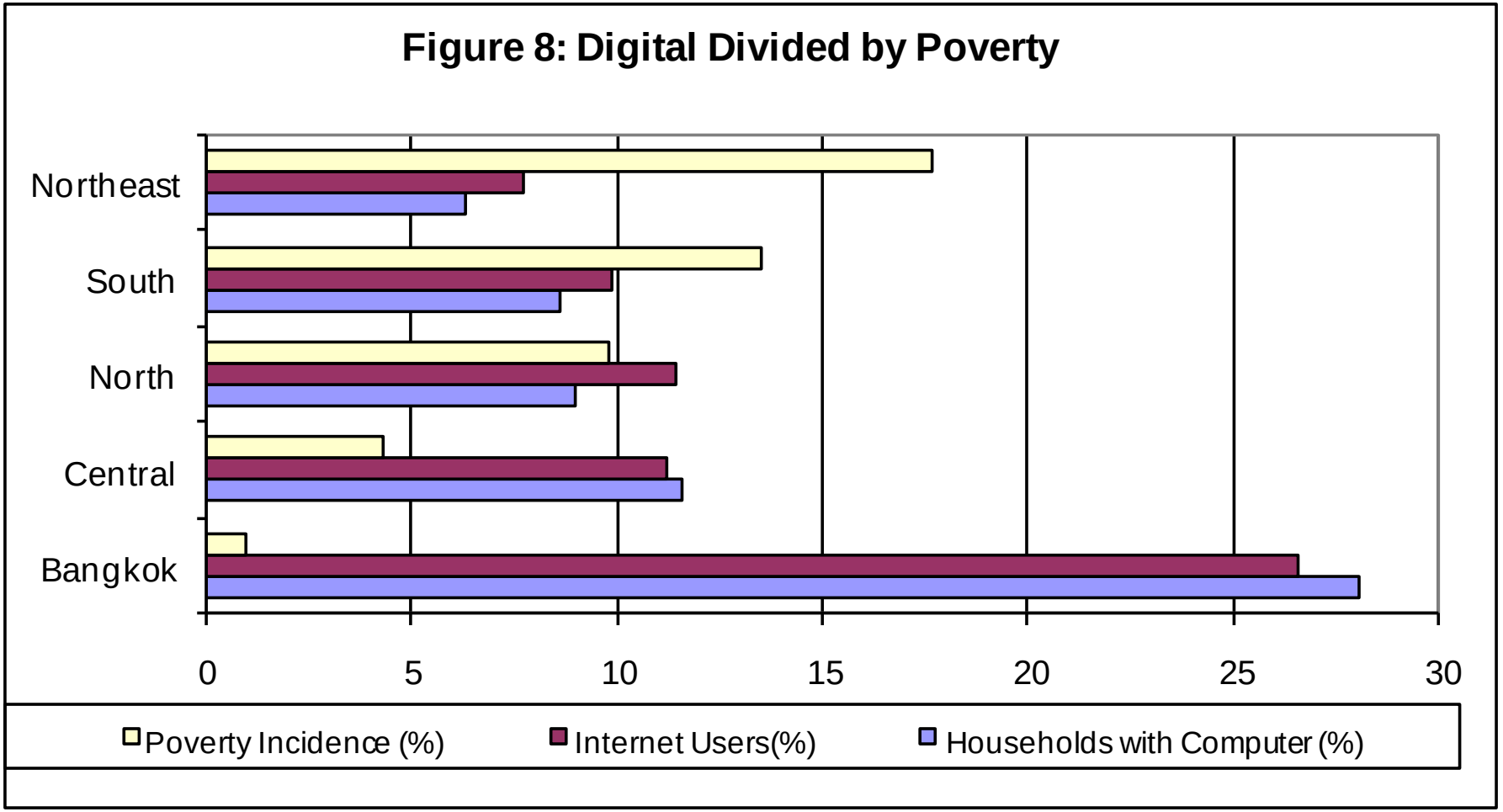
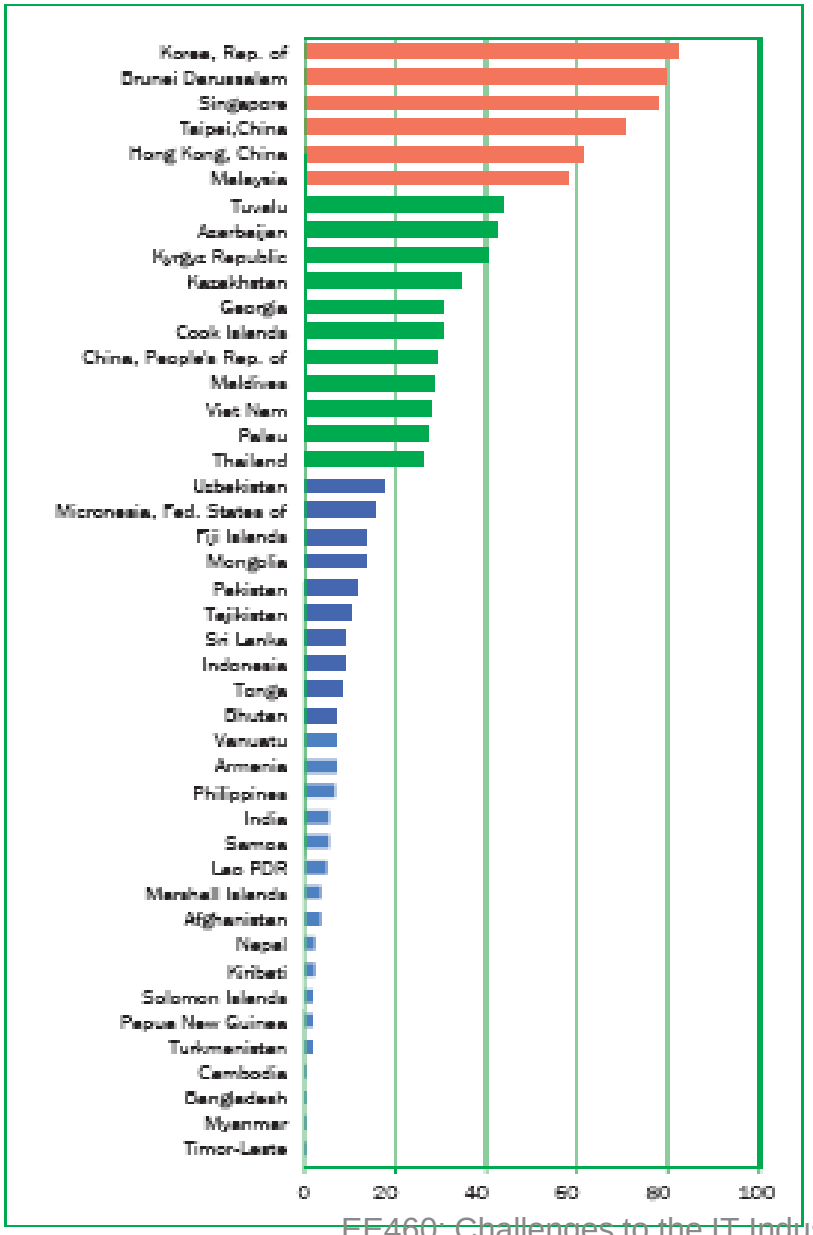


Figure H8 **Number of Internet Users, 2009 (per 100 population)**



The digital divide is a three-way split in developing economies. Six relatively rich economies have between 58 and 82 internet users; 11 economies in the middle group have between 26 and 43; and the remaining majority, 27 economies, below 17 per 100 population.

Conclusion

- Policy must foster the expansion of the domestic demand for IT investment at all potential segments of society to bridge the digital gap between urban and rural areas.
- Both external and internal liberalization of the IT industry is necessary for Thailand to reap the benefit of the fast changing trend in the IT technology
- Remember the 3G fallout?
- The global recession in 2009 adversely affected IT exports, but its resilience has been demonstrated by the sharp rebound in 2010.