

# RIETI BBL Seminar Handout

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September 14, 2012

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<http://www.rieti.go.jp/jp/index.html>

# Exploiting Global-value Chains and Knowledge-Based Capital for Growth

Andy Wyckoff – RIETI BBL  
14 September 2012

# Outline of the presentation

1. The role of knowledge-based assets for growth:
  - What are they and why do they matter?
  - What are the main policy issues?
  - What is the OECD doing?
2. Global value chains and competitiveness
  - What are global value chains
  - What do we know, what measures do we have?
  - Improving measurement – trade in value added
  - Implications for trade policy
  - Upgrading value chains – policy issues
3. Conclusions and future work

# What is knowledge-based capital (KBC) ?

## Three main types of assets being examined

### **Computerised information**

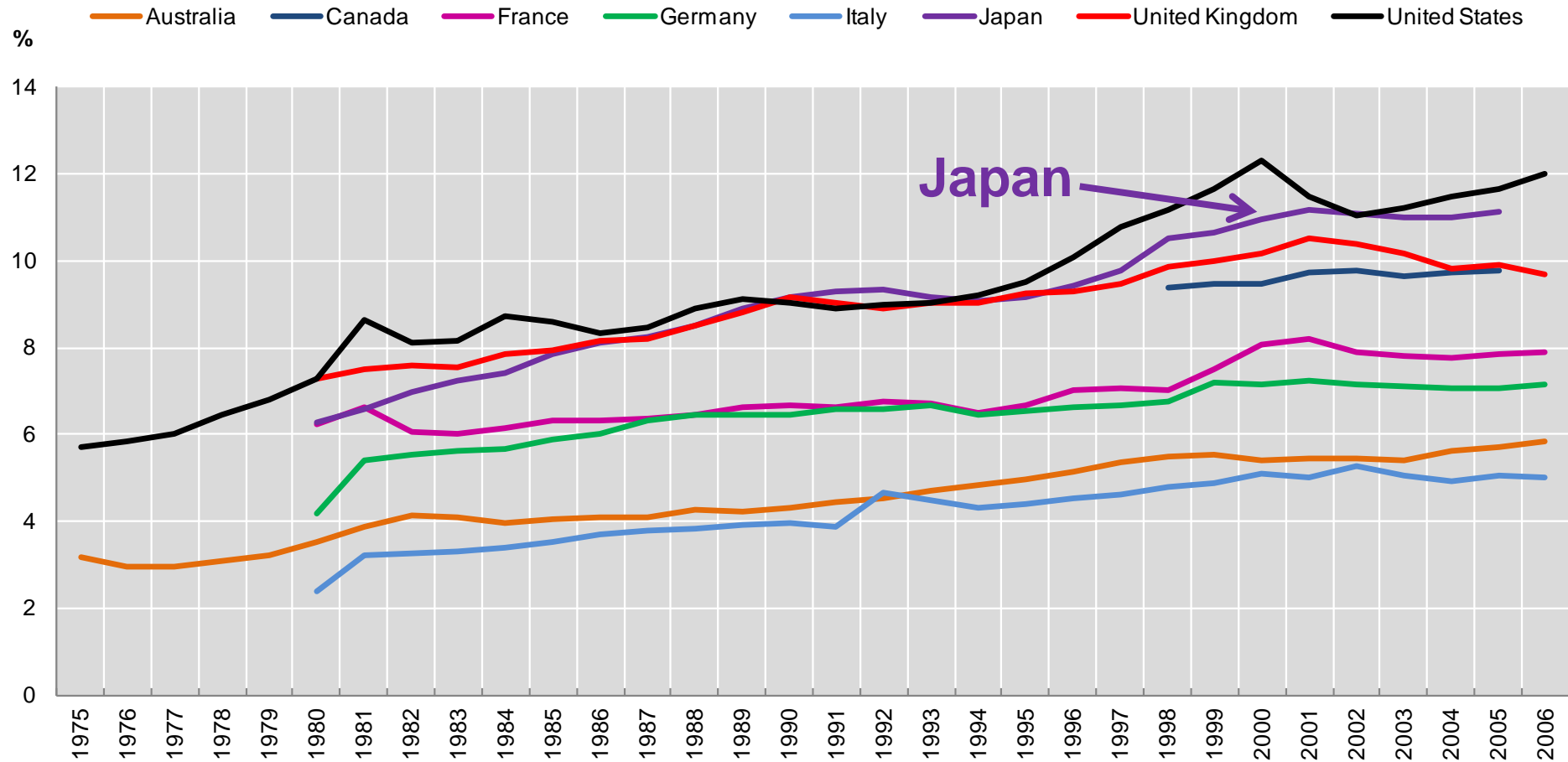
(software, databases)

**Innovative property** (patents, copyrights, trademarks, designs)

**Economic competencies** (brand equity, firm-specific human capital, business networks, organisational know-how that increases enterprise efficiency, etc.)

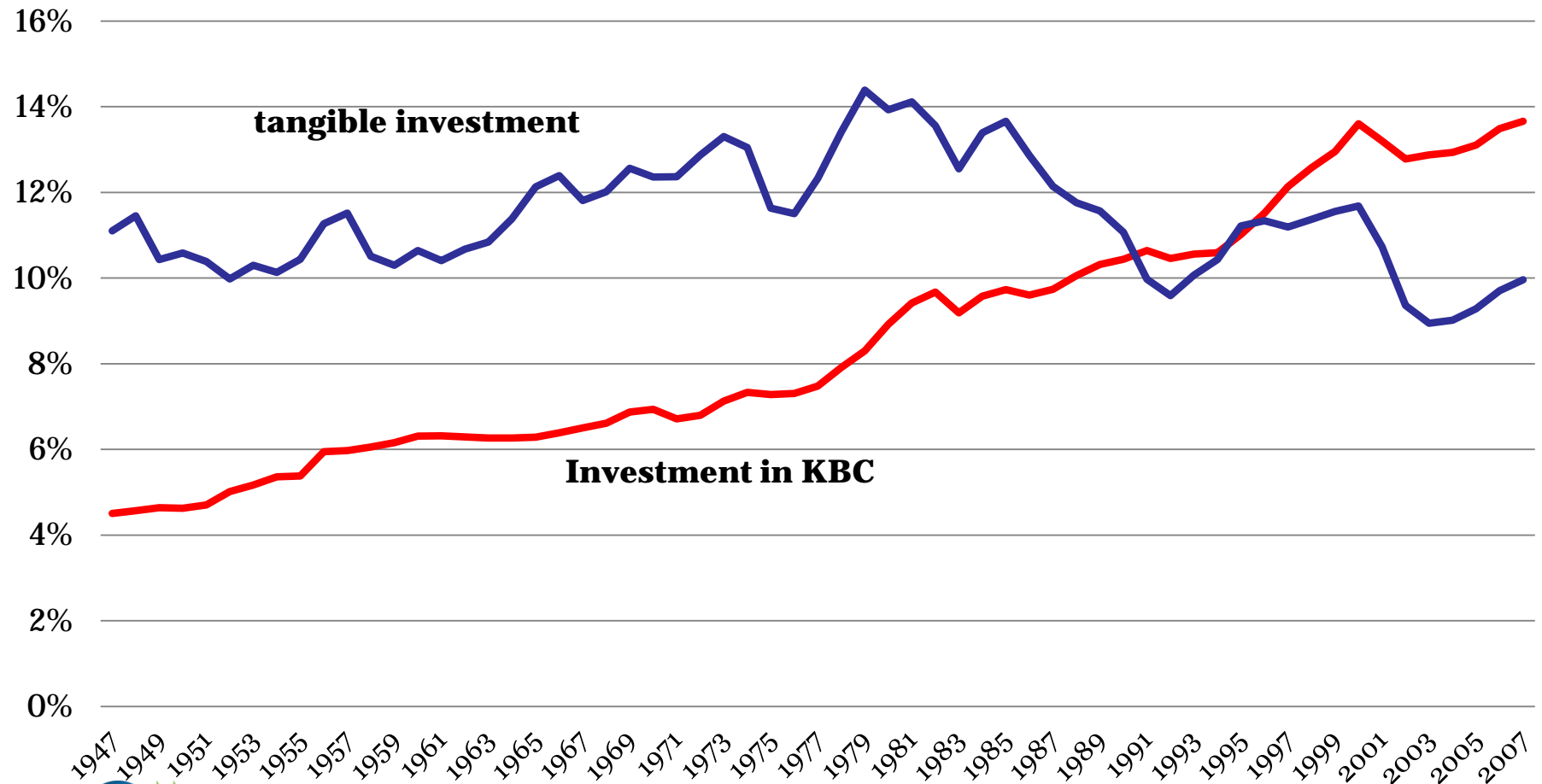
# Investment in KBC is growing in importance

## Investment in intangible assets as a percentage of GDP



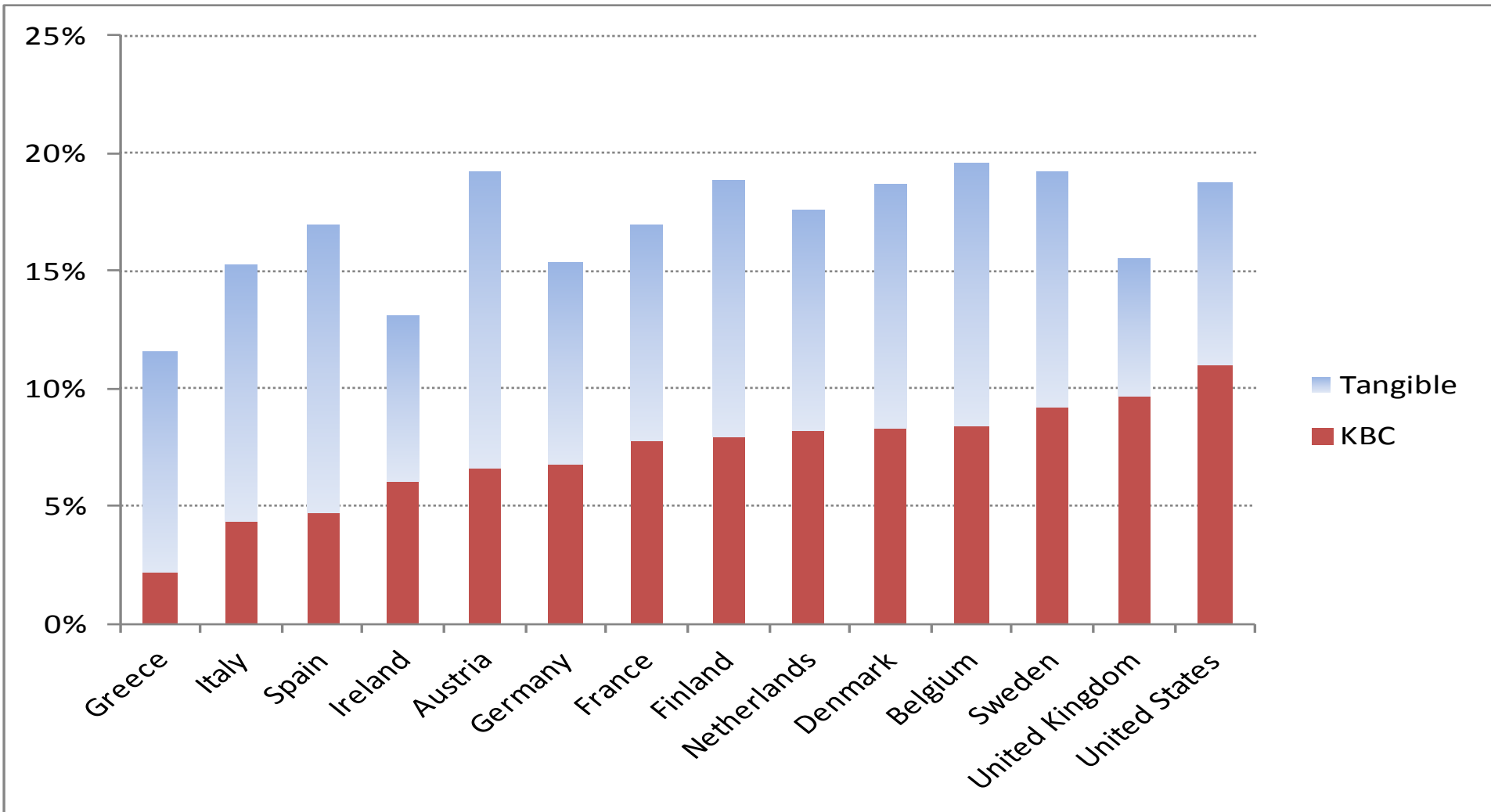
# And rising in importance compared to tangible assets

## U.S. non-farm business investment in KBC and tangible assets (% output)



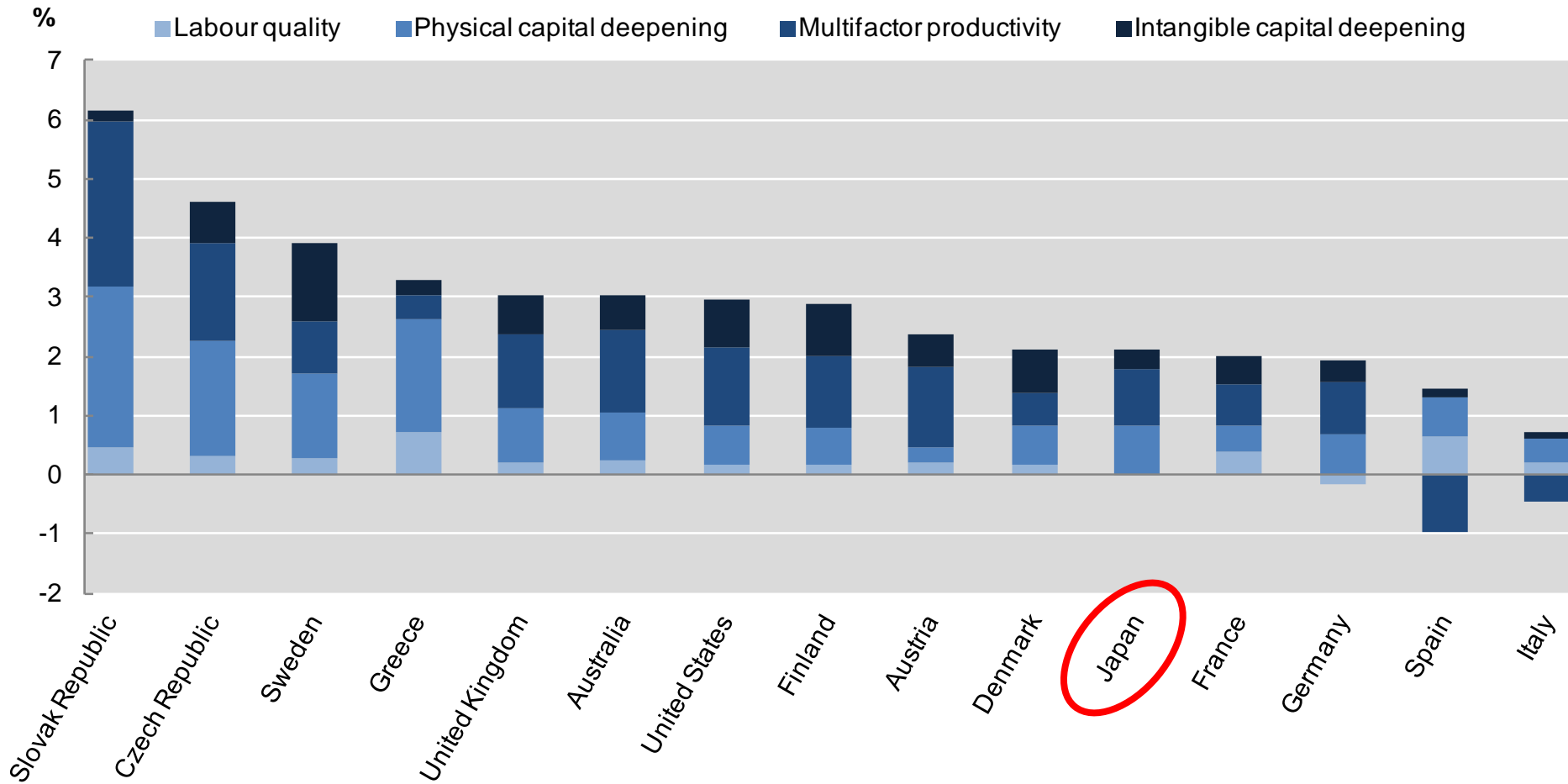
# KBC accounts for over half of all business investment in several countries ...

## Business investment in KBC and tangible assets as a share of GDP, 2009



# And KBC a driver of productivity growth

## Contributions to labour productivity growth, 1995-2006, in %





# Why this increased business investment in KBC ?

- **Rising educational attainment** in OECD economies; many products becoming more knowledge intensive.
- With **globalisation and deregulation**, competitive advantage increasingly driven by innovation...in turn driven by investments in intangibles.
- **New ICTs** increase the value of some intangibles to firms.
- **Growth of the services sector:** services rely highly on the use of intangibles.
- **Fragmentation of value chains** – and increasing sophistication of production in many industries – increase the importance of KBC, particularly organisational capital.

# Why this increased business investment in KBC ?

Rising educational attainment in OECD economies.

**KBC is based fundamentally on human capital (skills, knowledge, creativity).**

intangibles.

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New ICTs may itself increase the value of some intangibles to firms.

Growth of the services sector, as many service sector firms rely highly on the use of intangibles.

Fragmentation of value chains – and increasing sophistication of production in many industries – increase the importance of intangibles, particularly organisational capital.

# Why this increased business investment in KBC?

Rising educational attainment in OECD economies.

Many products becoming more knowledge intensive.

With  
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**Automotive manufacturers view  
leadership in control software as vital**



**Chevrolet Volt has  
10,000,000 lines of code.**

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Growth of the services sector, as many service sector firms rely highly on the use of intangibles.

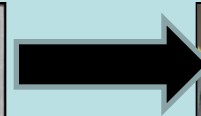
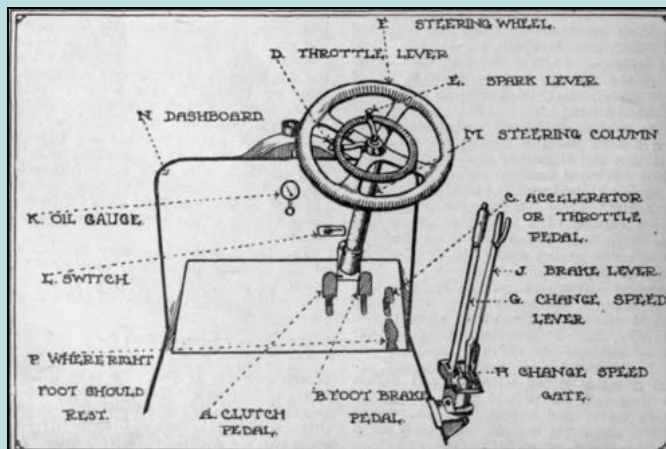
# Why this increased business investment in KBC?

Rising educational attainment in OECD economies.

Many products becoming more knowledge intensive.

With global deregulation competitive advantage

Approx 40% of development costs in cars today are software and electronics related.



# Why this increased business investment in KBC?

“Our clothes are Italian, French and German, so the profits are all leaving China...We need to create brands, and fast”.

SG, China Industrial Overseas  
Development and Planning Assoc.

With globalisation and deregulation, competitive advantage increasingly driven by innovation...in turn driven by investments in intangibles...and not just R&D.

New ICTs may itself increase the value of

Growth of the services sector, as many  
on the use of intangibles.

Fragmentation of value chains – and increasing sophistication of production in many industries – increase the importance of intangibles, particularly organisational capital.

E.g. patentable technology  
is only about 25% of the  
value of the iPhone  
(Korkeamaki and Takalo (2010))

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Growth of  
on the use

99% of the time, at least one Internet bookseller offers a lower price than Amazon ! But Amazon retains a large market share due to reputation for customer service.

rely highly

Fragmenta  
production  
particularly

(Brynjolfsson and Smith, 2000).

organisational capital.

ification of  
intangibles,

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Growth of the services sector, as many service sector firms rely highly on the use of intangibles.

Fragmentation of value chains – and increasing sophistication of production in many industries – particularly organisational

E.g. Wal-Mart's computerised supply chains; Merck's multiple R&D alliances; 100s of subcontractors in aerospace.

# Some of the key policy issues?

## **Redefining “framework” conditions**

- Tax
- Competition
- Property Rights
- Finance
- Skills
- Corporate Accounting



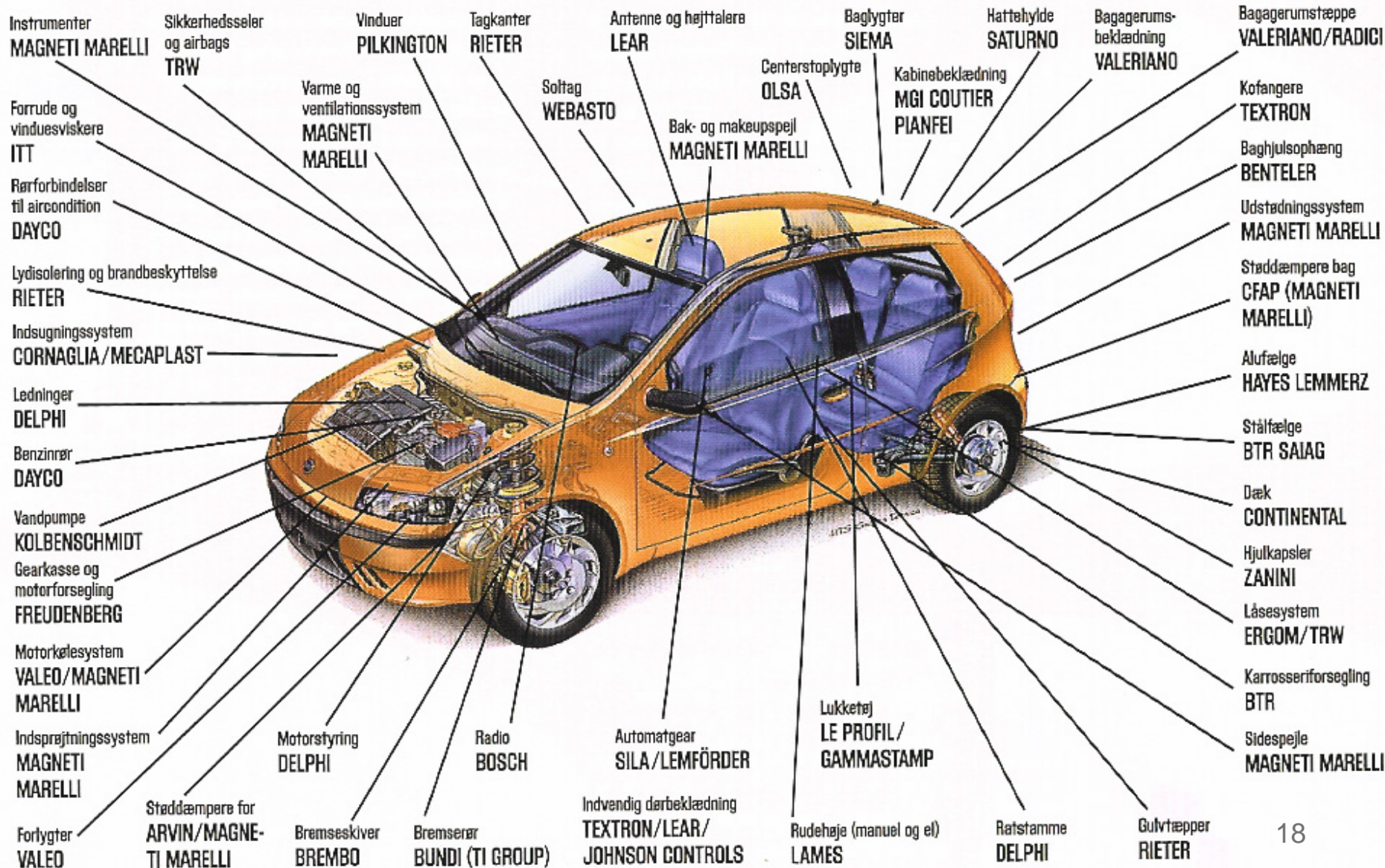
# The rise of Global Value Chains: what?

- International production networks; **dispersion of production stages** across countries and corresponding (intra-industry trade)
- **Networks of activities**, firms (MNEs and local firms), industries and countries
- **Reallocation of resources** across a growing number of countries: e.g. low skilled labor
- **More specialisation**, complex production relationships, profound changes in countries' competitiveness
- **Global flows of goods** (final and inputs), services, capital, people, technology...

# Airline industry: Boeing 787 Dreamliner



# Automotive industry: Renault Clio



# Toys: Barbie doll

*Design: California,  
USA*

*Moulds, paint  
pigments: USA*

*Assembly:  
Indonesia and  
Malaysia*



*Nylon hair: Japan*

*Body material:  
Chinese Taipei*

*Clothing:  
China*

*Quality testing:  
USA*

*Marketing: USA*

# Apple's iPod

**The Apple iPod = 299\$ of Chinese exports to US**

**Distribution of the value added**

- 299 US\$
  - 75\$ profit to US (Apple)
  - 73\$ whls/retail US (Apple)
  - 75\$ to Japan (Toshiba)
  - 60\$ 400 parts from Asia
  - 15\$ 16 parts from the US
  - 2\$ assembly by China
- iTunes Music Store (2003)
  - 70% digital market share
  - Platform for everything
  - Data flow to the consumer



# Policy issues

- GVCs are not a new phenomenon, but the scale, speed and complexity raises several policy issues

## 5 Policy Issue Areas

1. **Measurement** of GVCs: Trade in Value Added (TiVA)
2. GVCs and **trade policy**
3. GVCs and **national competitiveness**... the recurring discussion on industrial policy
4. GVCs and **global systemic risk**
5. GVCs and **upgrading** –  
knowledge based assets

# 1. Measurement: Issues with current trade statistics

- Three issues:

1. **Multiple counting** of intermediate goods and services

2. Tends to **conceal** the actual **patterns of trade & beneficiaries**

3. Incomplete picture as **knowledge and income flows** are not measured.

# An alternative measure: Trade in value added (TiVA)

- **Objectives**

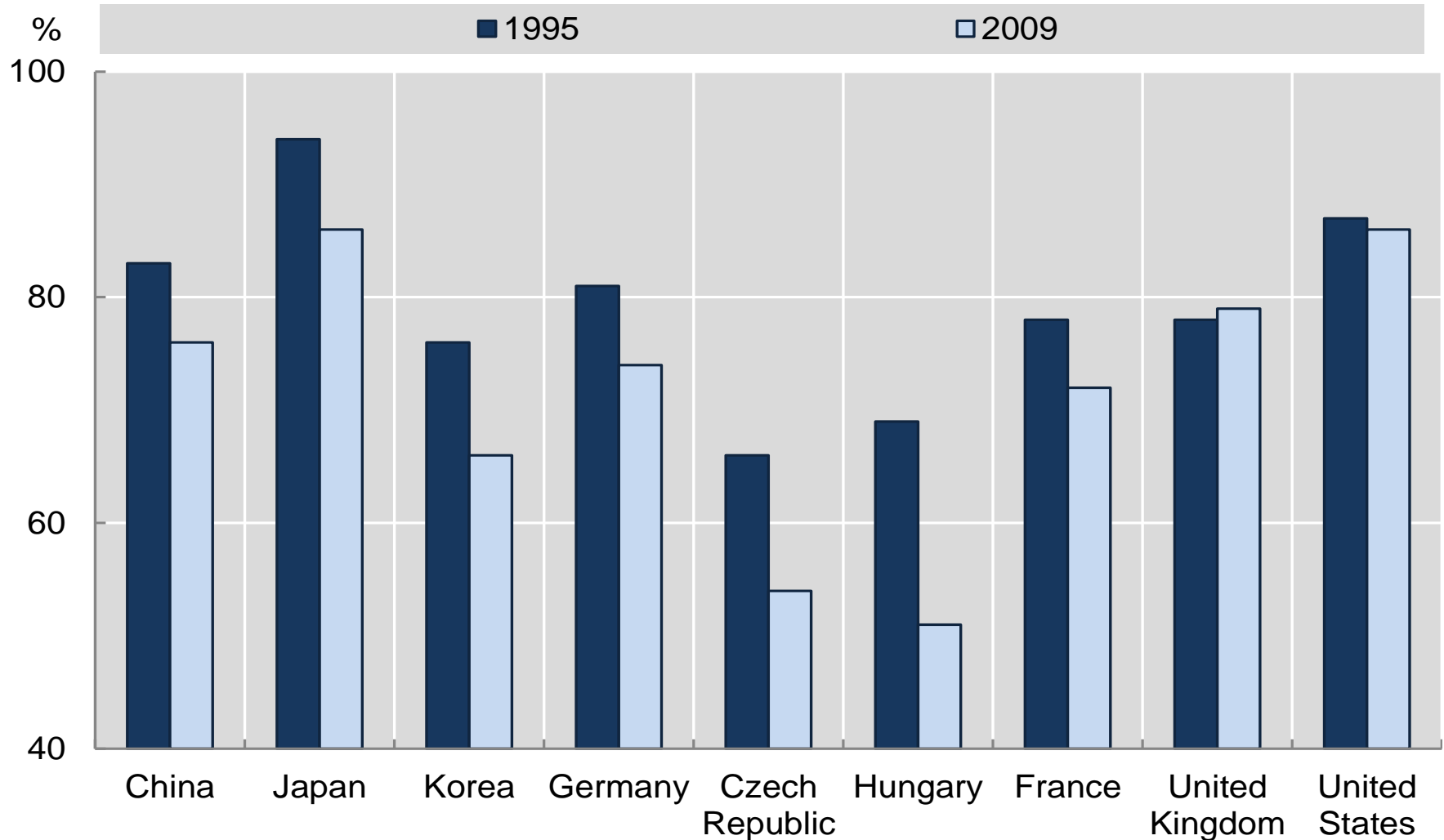
- Reduce multiple counting of intermediate goods and services
- Properly account for the country of origin of each intermediate input
- Identify who (country/sectors) contributes to the value chain in terms of income and employment
- Foster a closer integration between trade, business, balance of payments statistics and national accounts.

- **OECD-WTO collaboration**

- Cooperation with IDE-JETRO, USITC, academic experts, etc.
- Produce and disseminate trade statistics in value added
- Promote evidence-based policy making
- Support and sustain research in the related fields

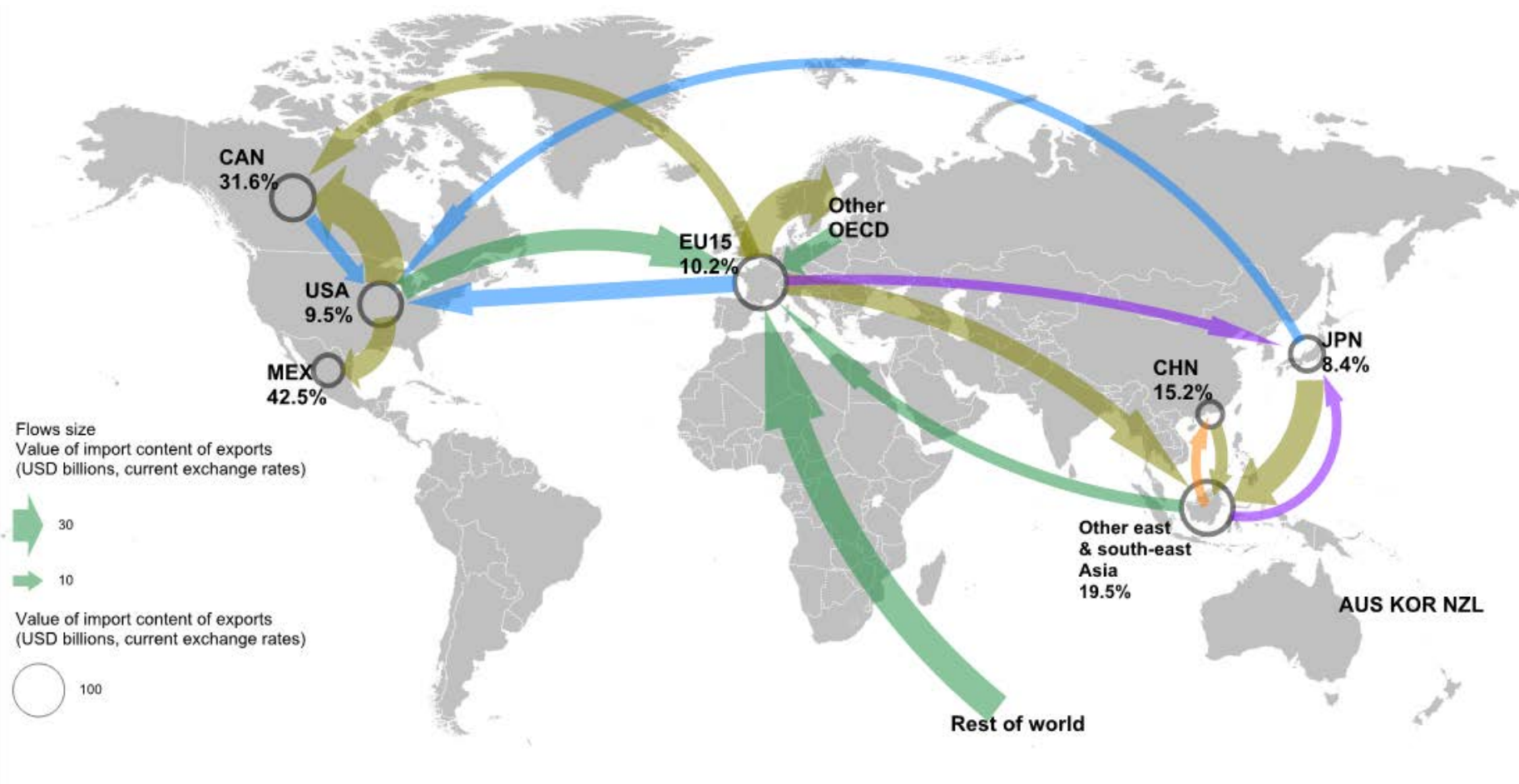


# Exported Value-Added: % of Gross Exports



# Imports increasingly important in exports, and thus national competitiveness (1)

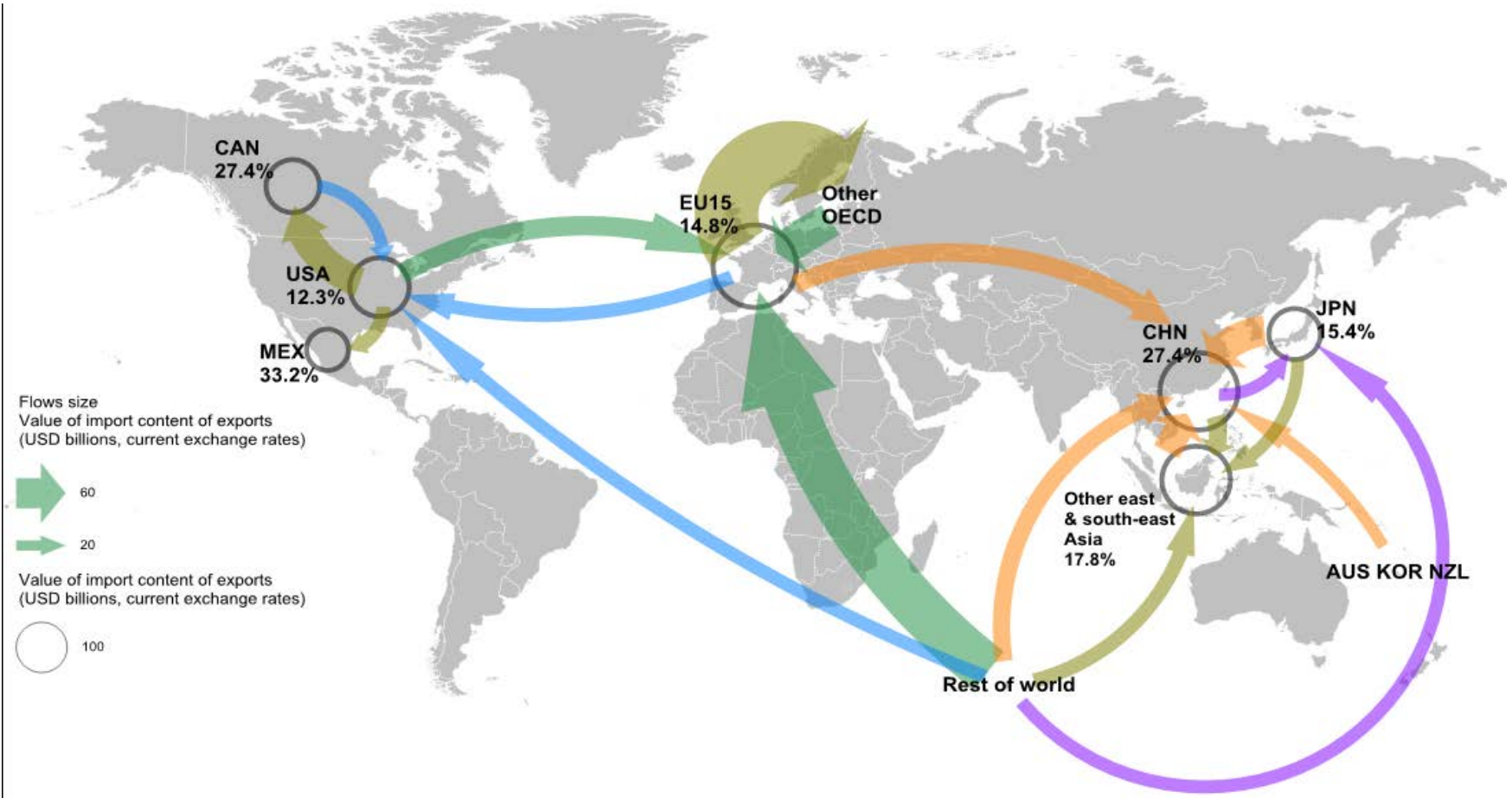
Import content of exports, 1995



Source: OECD (2011)

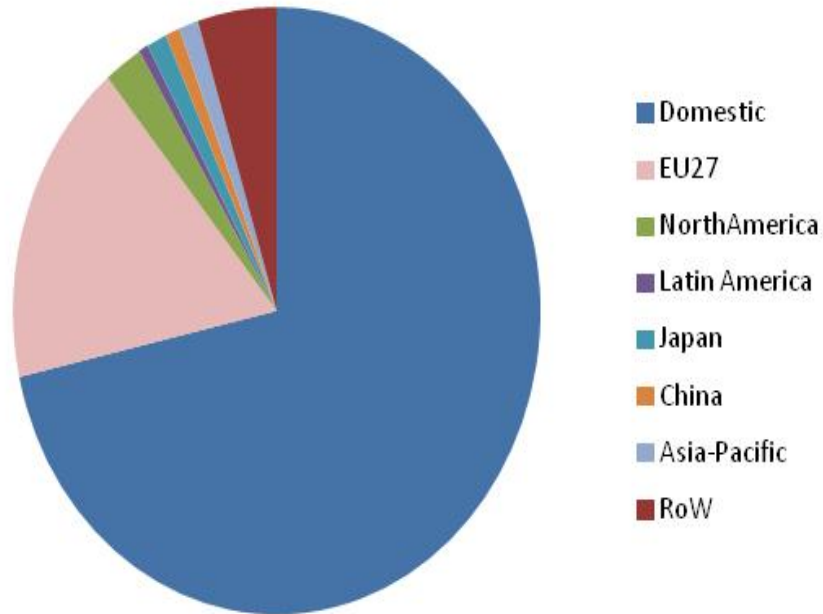
# Imports increasingly important in exports, and thus national competitiveness (2)

Import content of exports, 2005

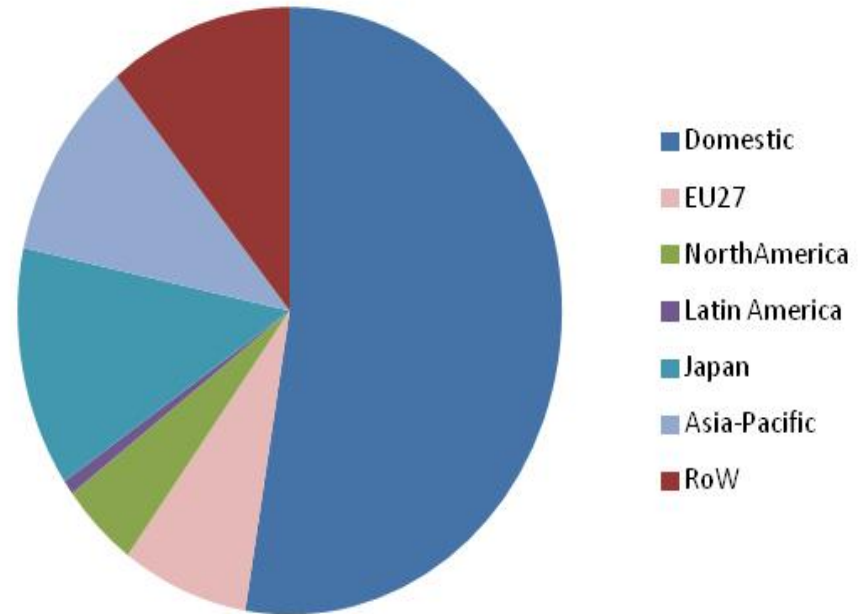


# TiVA: Value-added chains (by product)

## Germany- automotive



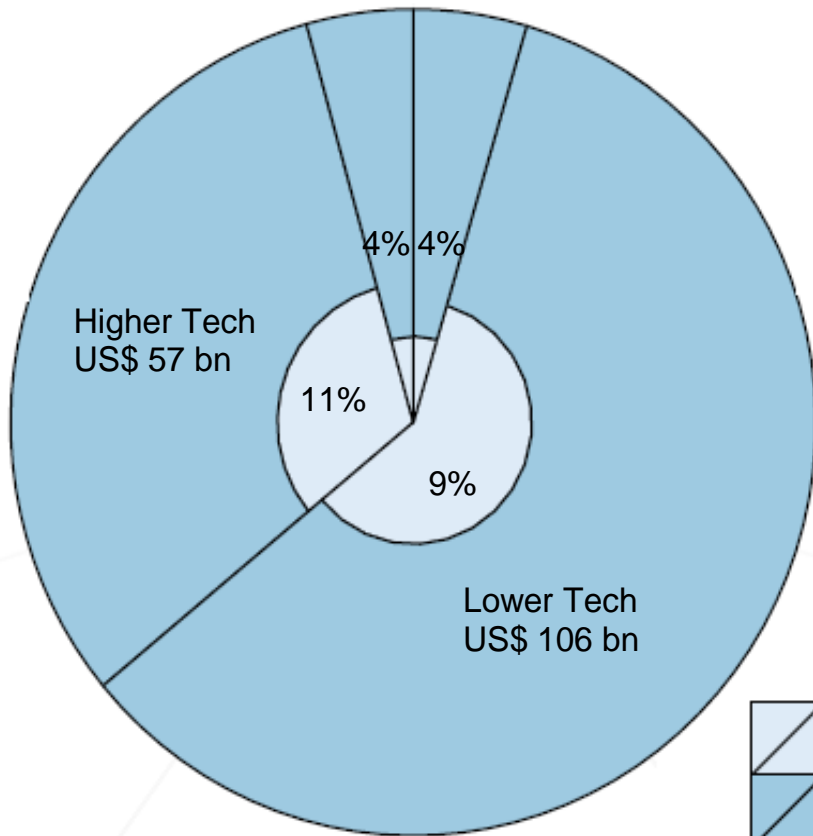
## China - electronics



# Foreign content share of China's exports

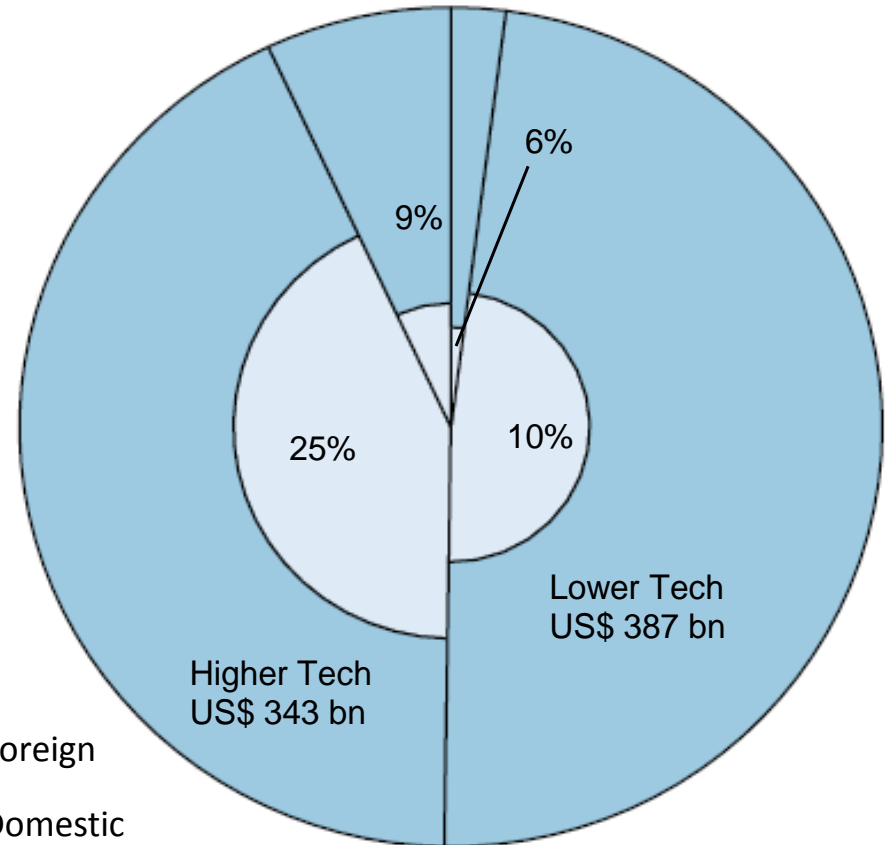
1995

Services US\$ 8 bn  
Primary US\$ 8 bn



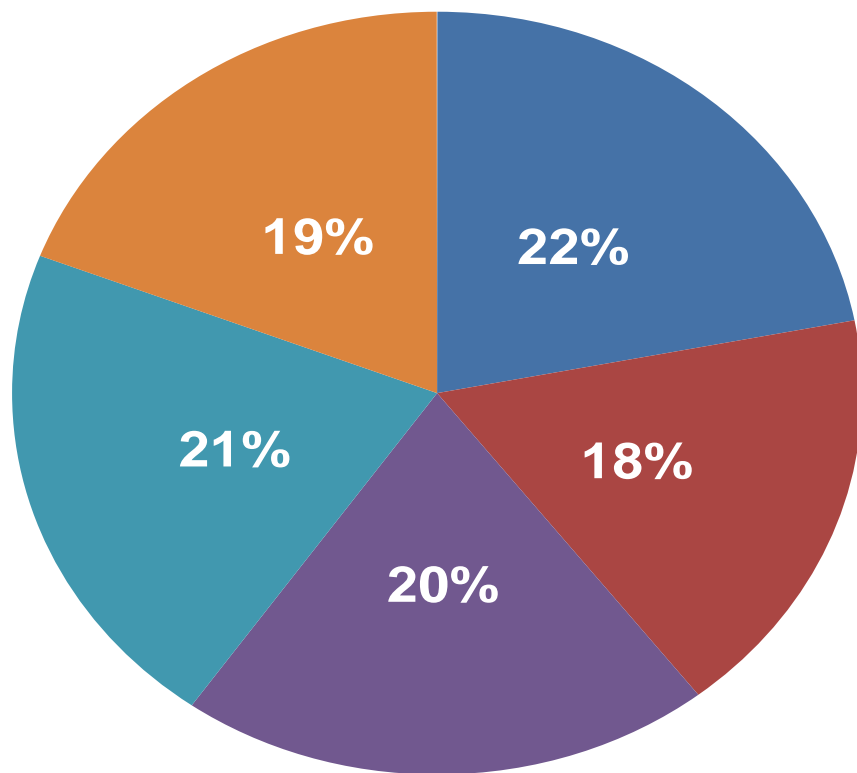
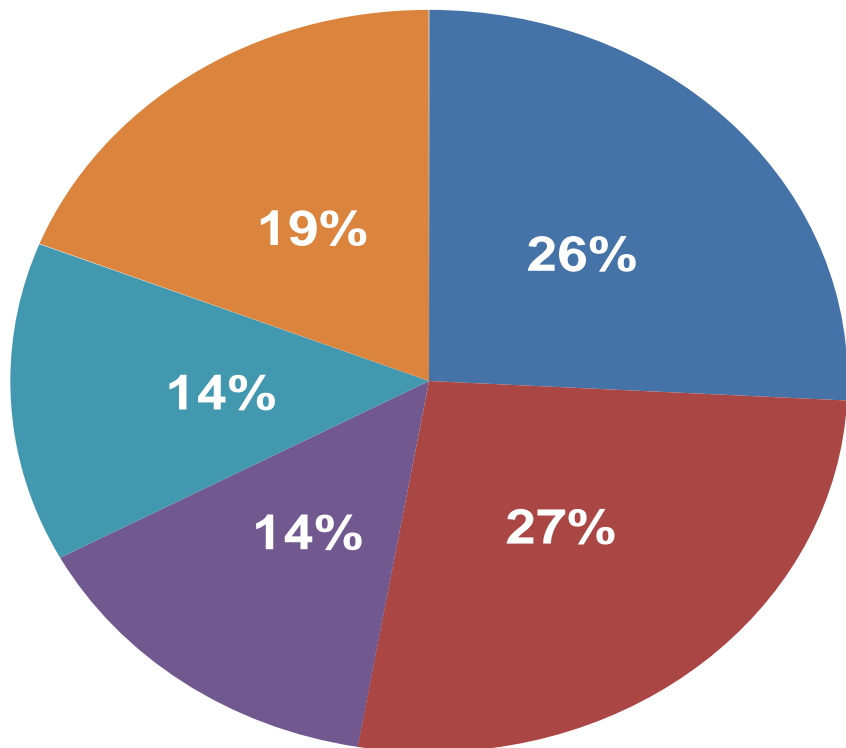
2005

Services US\$ 56 bn  
Primary US\$ 16 bn



# Japan's exports by region, 2009

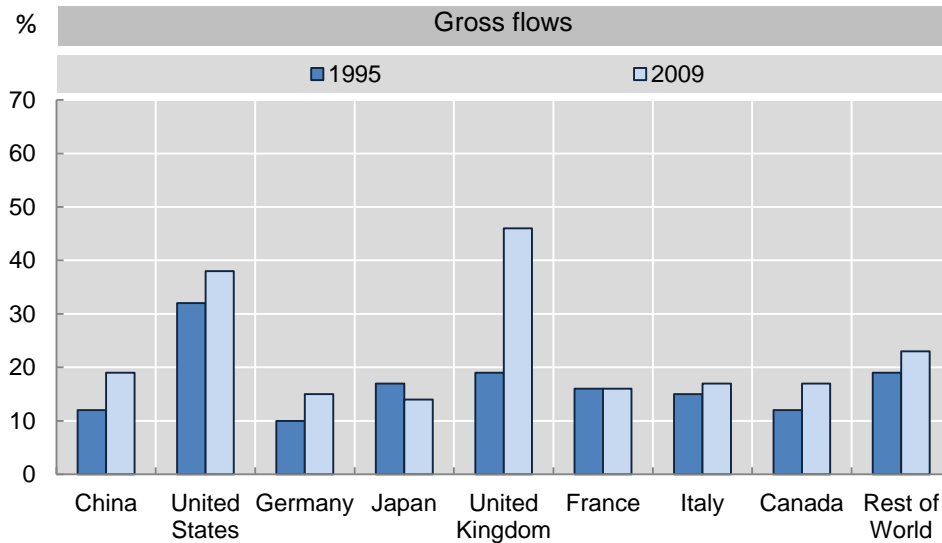
Export partner share (gross)    Export partner share (VA)



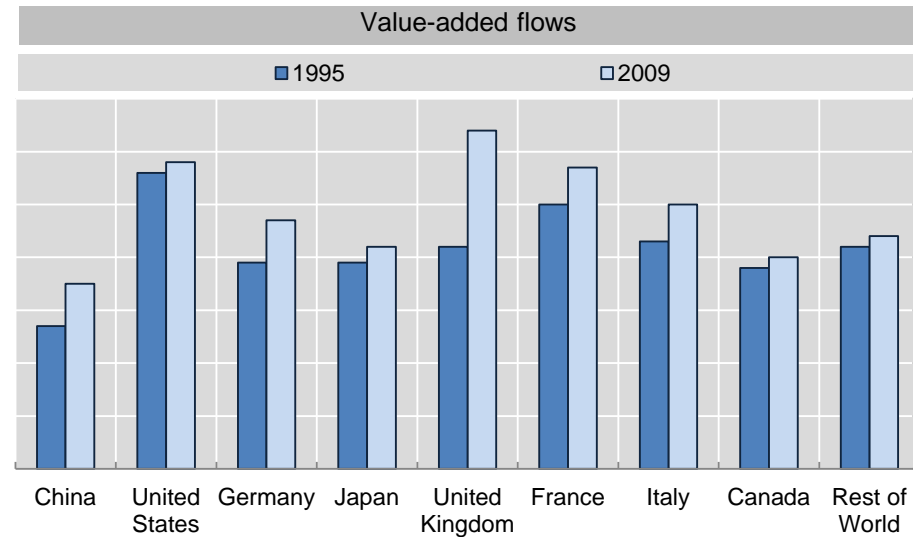
■ China   ■ Other Asia   ■ Japan   ■ United States   ■ Europe   ■ Rest of World

# Trade in Services: Gross vs. Value Added

## % total exports of gross flows



## % total exports of value-added



# GVCs and trade policy

- **Bilateral trade balances misrepresented...**

...currency valuations put in new light...

... may give rise to trade disputes: who is 'us' and who is 'them' in a world of GVCs?

- Calls into question « anti-dumping » measures and more generally **the extra-costs of protectionist policies** (import tariffs, rules of origin, etc)...

...‘beggar thyself’ instead of ‘beggar thy neighbour’



# GVCs and national competitiveness

- **Imports increasingly important for exports** (no mercantilistic approach: ‘exports are good, imports are bad’)
- Better understanding the direct **link between trade and income & jobs**
- Better understanding the **link between manufacturing and services;**
- Questions about **the link between R&D, design and production.**

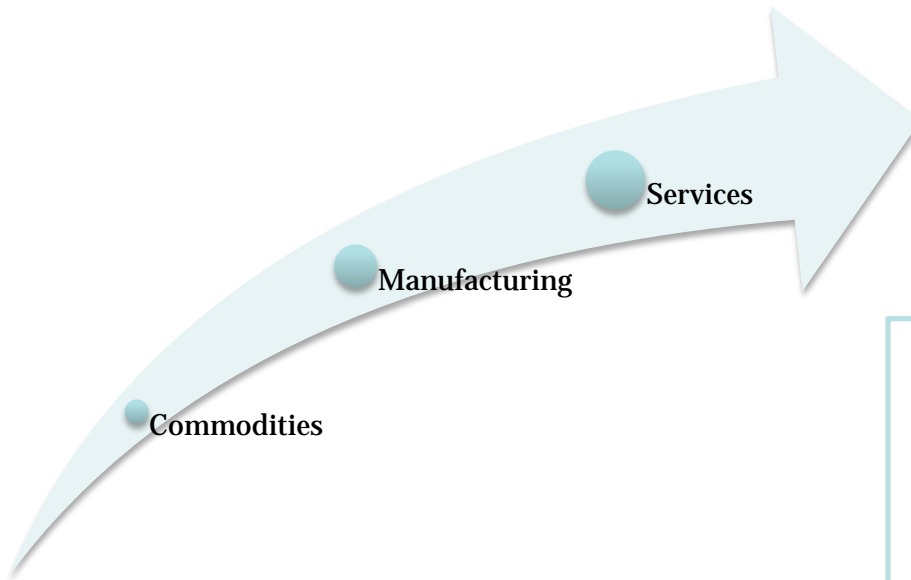
# GVCs and upgrading/innovation

- Exports and imports are not value added
- Being stuck in the middle: value created upstream and downstream – moving up the value chain
- Challenge for emerging economies: making sure that value ‘sticks’ as developed economies retain value creation
- Importance of knowledge based capital

# A GVC perspective is also important for upgrading, i.e. increasing value creation

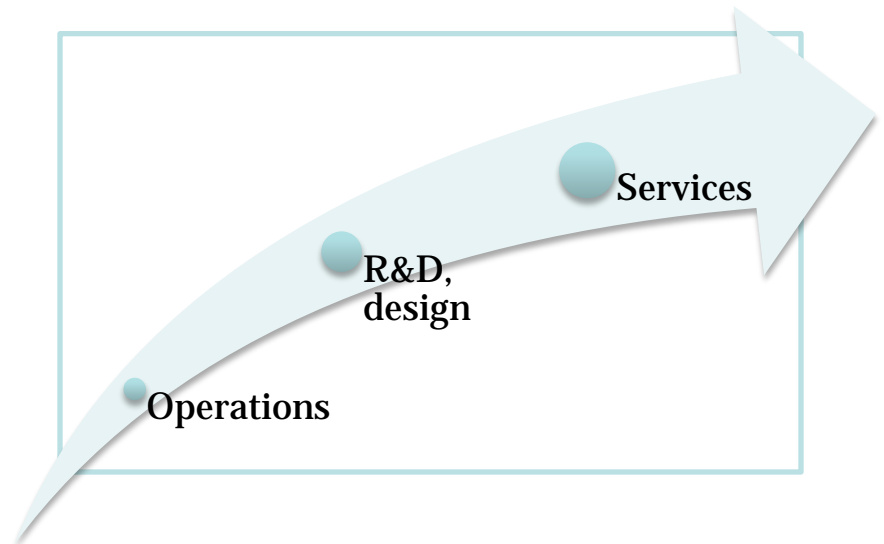
## Old paradigm:

From low to high value-added sectors



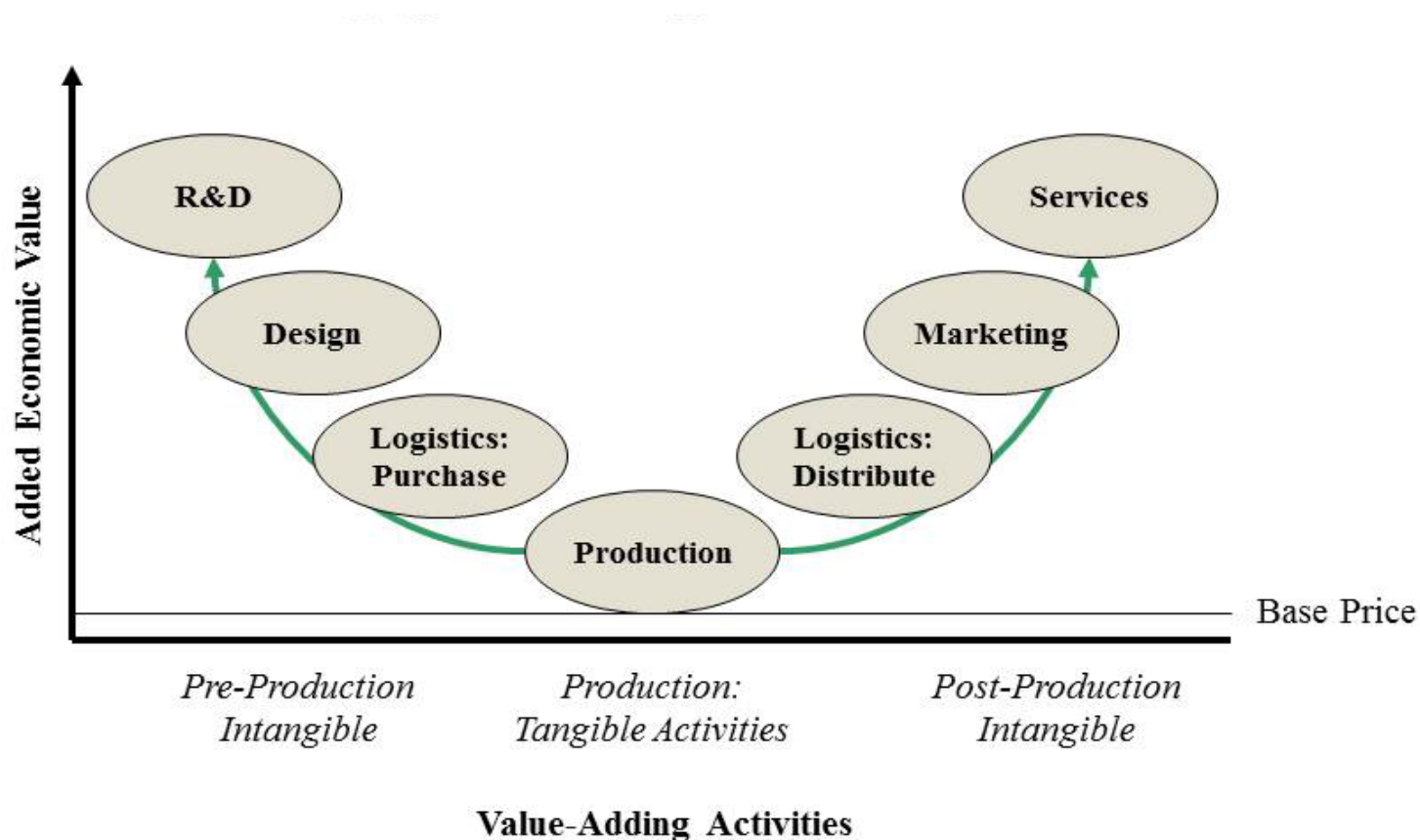
## New paradigm:

From low to high value-added activities **within** sectors



# Moving up the value chain – capturing more value

Value creation along the value chain



# Upgrading is not always a shift to upstream activities but also about strengthening technological capabilities

Types of Upgrading	Example
Process Upgrading	Hon Hai Precision Industry (World's largest OEM firms )
Product Upgrading	ASUSTek (inventor of netbook), Mabuchi Motors (micromotors), Karcher (high-pressure cleaner)
Functional Upgrading	Dell, Hewlet-Packard (acquisition of cloud-computing business), Lenovo (acquisition of IBM's R&D capability and brand)
Chain Upgrading	Samsung (from flat panel TV to semiconductor to solar cell)



# What is the OECD doing? Next Steps

- Wide-ranging work on GVCs and KBC “horizontally” across the OECD.
- KBC Conference planned in February; GVC Workshop in March 2013
- Separate reports to OECD Ministerial in May/June 2013
- Deepening and further work planned in 2013/2014

# In sum

- **Knowledge-based assets:**

- The nature of investment is changing; the policy agenda still needs to adapt, e.g.:
  - Tax and competition policy
  - IPR policies
- New opportunities for growth and value creation, e.g. data
- Measurement a challenge

- **Global Value Chains:**

- Need to better understand who creates value in trade
- Can contribute a new trade narrative
- Upgrading is increasingly linked to specific functions, rather than sectors, and is often based on knowledge-based assets.
- Requires broad-ranging policy agenda, including trade policy, innovation, skills and structural policy