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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
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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
### Three main types of assets being examined

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Computerised information</strong></td>
<td>(software, databases)</td>
</tr>
<tr>
<td><strong>Innovative property</strong></td>
<td>(patents, copyrights, trademarks, designs)</td>
</tr>
<tr>
<td><strong>Economic competencies</strong></td>
<td>(brand equity, firm-specific human capital, business networks, organisational know-how that increases enterprise efficiency, etc.)</td>
</tr>
</tbody>
</table>
Investment in KBC is growing in importance

Investment in intangible assets as a percentage of GDP

Source: COINVEST [www.coinvest.org.uk] and research papers, 2009.
U.S. non-farm business investment in KBC and tangible assets (\% output)

And rising in importance compared to tangible assets

Source: Corrado and Hulten (2010)
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

Source: Corrado et al (2012, forthcoming)
And KBC a driver of productivity growth

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

Source: Data on intangible investment are based on COINVEST [www.coinvest.org.uk] and research papers, 2009.
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.
Rising educational attainment in OECD economies.

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

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.

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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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Approx 40% of development costs in cars today are software and electronics related.
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Fragmentation of value chains – and increasing sophistication of production in many industries – increase the importance of intangibles, particularly organisational capital.

“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.

E.g. patentable technology is only about 25% of the value of the iPhone (Korkeamaki and Takalo (2010))
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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. (Brynjolfsson and Smith, 2000).
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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 – also lead to the importance of intangibles, 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

- **Wing box:** Mitsubishi Heavy Industries (Japan)
- **Wing ice protection:** GKN Aerospace (UK)
- **Vertical Stabiliser:** Boeing Commercial Airplanes (USA)
- **Horizontal Stabiliser:** Alenia Aeronautica (Italy)
- **Escape slides:** Air Cruisers (USA)
- **Centre fuselage:** Alenia Aeronautica (Italy)
- **Rear fuselage:** Boeing South Carolina (USA)
- **Raked wing tips:** Korean Airlines Aerospace division (Korea)
- **Centre wing box:** Fuji Heavy Industries (Japan)
- **Doors & windows:** Zodiac Aerospace (USA), PPG Aerospace (USA)
- **Lavatories:** Jamco (Japan)
- **Vertical Stabiliser:** Boeing Commercial Airplanes (USA)
- **Landing gear:** Messier-Dowti (France), Electric brakes: Messier-Bugatti (France)
- **Tires:** Bridgestone Tires (Japan)
- **Aux. power unit:** Hamilton Sundstrand (USA)
- **Prepreg composites:** Toray (Japan)
- **Cargo doors:** Saab (Sweden)
- **Passenger doors:** Latécoère Aéroservices (France)
- **Engine nacelles:** Goodrich (USA)
- **Escape slides:** Air Cruisers (USA)
- **Flight deck seats:** Ipeco (UK)
- **Lavatories:** Jamco (Japan)
- **Flight deck seats:** Ipeco (UK)
- **Final assembly:** Boeing Commercial Airplanes (USA)

**Source:** www.newairplane.com
Toys: Barbie doll

- **Design:** California, USA
- **Nylon hair:** Japan
- **Body material:** Chinese Taipei
- **Clothing:** China
- **Assembly:** Indonesia and Malaysia
- **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

  - 70% digital market share
  - Platform for everything
  - Data flow to the consumer
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
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)

Source: OECD (2011)
TiVA: Value-added chains (by product)

**Germany - automotive**

**China - electronics**
Foreign content share of China's exports

**1995**

- Higher Tech: US$ 57 bn
  - Foreign: 11%
  - Domestic: 9%
- Lower Tech: US$ 106 bn
  - Foreign: 4%
  - Domestic: 4%

**2005**

- Higher Tech: US$ 343 bn
  - Foreign: 25%
  - Domestic: 6%
- Lower Tech: US$ 387 bn
  - Foreign: 9%
  - Domestic: 10%

*Services: US$ 8 bn*  
*Primary: US$ 8 bn*  

*Services: US$ 56 bn*  
*Primary: US$ 16 bn*
Trade in Services: Gross vs. Value Added

% total exports of gross flows

% total exports of value-added

Gross flows

<table>
<thead>
<tr>
<th>Country</th>
<th>1995</th>
<th>2009</th>
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<tbody>
<tr>
<td>China</td>
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<tr>
<td>United States</td>
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Value-added flows

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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

Value-Adding Activities

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

<table>
<thead>
<tr>
<th>Types of Upgrading</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Process Upgrading</td>
<td>Improving the efficiency of internal processes significantly better than rivals (faster processing, lower scrap and defection, higher ability to process complex order (frequent and small batch))</td>
</tr>
<tr>
<td>Product Upgrading</td>
<td>Introducing new products or improving old products faster than rivals. Developing novel products with highly superior function and quality than that of rivals.</td>
</tr>
<tr>
<td>Functional Upgrading</td>
<td>Establishing competitiveness in higher value added activities by acquisition of new function or moving the locus of activities to different stages in the value chain (ex: from production to R&amp;D)</td>
</tr>
<tr>
<td>Chain Upgrading</td>
<td>Shifting part of or whole activity to other value chain rewarding higher value-added</td>
</tr>
</tbody>
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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