Intangible Capital in Global Value Chains

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Overview

- The rise of global value chains
- What return accrues to intangible capital?
- Case studies
  - Coffee
  - Solar panels
  - Smartphones
- How will global value chains further evolve?
THE RISE OF GLOBAL VALUE CHAINS
Two waves of globalization

■ First wave (18\textsuperscript{th} to early 20\textsuperscript{th} century)
  ➢ Trade in commodities and finished manufactured products

■ Second wave (since second half of 20\textsuperscript{th} century)
  ➢ Unbundling of production process and spreading of production locations
  ➢ Key driving forces: falling transport costs, more liberal trade policies and advances in information and communication technologies (ICTs)
  ➢ Trade in intermediary goods within particular industries
World trade growing faster than output

Note: Trade is defined as exports plus imports.

Source: World Bank World Development Indicators.
Domestic VA still dominates, but decreasing
WHAT RETURN ACCRUES TO INTANGIBLE CAPITAL?
Macroeconomic measurement

- Database on value added in global production by Groningen University research team:
  - Based on national accounts, input-output tables and international trade statistics
  - Global coverage
  - 19 manufacturing global value chains, around one-quarter of global output
  - Database entry: value added of a particular economy for a particular product at different production stages
Slicing up global value chains

<table>
<thead>
<tr>
<th>Purchaser's price</th>
<th>Taxes</th>
<th>Taxes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Intangible capital</td>
</tr>
<tr>
<td>Distribution</td>
<td></td>
<td>Tangible capital</td>
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<td></td>
<td>Value added</td>
<td>Labor</td>
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<tr>
<td>Basic price</td>
<td></td>
<td>Intangible capital</td>
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<tr>
<td></td>
<td></td>
<td>Tangible capital</td>
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<tr>
<td>Final assembly</td>
<td>Value added</td>
<td>Labor</td>
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<td>Intangible capital</td>
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<td></td>
<td></td>
<td>Tangible capital</td>
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<tr>
<td>Other stages</td>
<td>Value added</td>
<td>Labor</td>
</tr>
</tbody>
</table>

Source: Chen et al. (2017).

One third of the value of the products you buy comes from intangibles such as technology and branding.
Intangible capital accounts for twice the tangible capital
Returns by product group

Income shares by manufacturing product group, 2014

<table>
<thead>
<tr>
<th>Product group name</th>
<th>Intangible income share (%)</th>
<th>Tangible income share (%)</th>
<th>Labor share (%)</th>
<th>Global output (USD bn)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food, beverages, and tobacco products</td>
<td>31.0</td>
<td>16.4</td>
<td>52.6</td>
<td>4,926</td>
</tr>
<tr>
<td>Motor vehicles and trailers</td>
<td>29.7</td>
<td>19.0</td>
<td>51.3</td>
<td>2,559</td>
</tr>
<tr>
<td>Textiles, apparel and leather products</td>
<td>29.9</td>
<td>17.7</td>
<td>52.4</td>
<td>1,974</td>
</tr>
<tr>
<td>Other machinery and equipment</td>
<td>27.2</td>
<td>18.8</td>
<td>53.9</td>
<td>1,834</td>
</tr>
<tr>
<td>Computer, electronic and optical products</td>
<td>31.3</td>
<td>18.6</td>
<td>50.0</td>
<td>1,452</td>
</tr>
</tbody>
</table>

Source: Chen et al. (2017).
Caveats

- Measurement challenges
- Broad concept of intangible capital
- Difficult to tell which economies harvest returns to intangibles

Profit-shifting as part of tax minimization strategies:
  - Relies heavily on intangible capital and IP
  - Redistributes value added along the value chain
COFFEE: HOW CONSUMER CHOICES ARE RESHAPING THE GLOBAL VALUE CHAIN
What are the coffee intangibles?

- Brand reputation and image, which allow companies to differentiate their offering from those of their competitors

- Technology associated with coffee farming and with turning coffee into a high-quality and appealing consumer product.
Innovation occurs close to the consumer

Percentage share of firms in the coffee industry and share of coffee-related patent applications by value chain segment

- **Coffee farming**
- **Harvesting and post-harvesting**
- **Raw material storage and transportation**
- **Bean processing**
- **Final distribution**

**FIRMS**

**PATENTS**

Source: WIPO based on PATSTAT and Ukers (2017); see technical notes. The classification of value chain segments is based on Samper et al. (2017).

Note: The bars in light blue represent the share of all firms in the coffee industry operating in each particular segment of the value chain. The dark blue bars indicate the share of coffee-related patents attributable to each chain segment. The share of coffee participants for the coffee-farming segment is likely an underestimate as the list of coffee participants retrieved from the Ukers directory only includes registered firms.
Shifting consumer tastes

First wave: coffee brewed at home
- Standardized products; competitive market with prices reflecting differences in the quality of blends

Second wave: coffee in a social setting
- Coffeehouses offer distinct ambiance to attract consumers, higher quality coffee beans, voluntary sustainability standards

Third wave: specialty coffee
- Superior quality; consumers interested in origin of coffee, how it was farmed and how best to brew the beans
Third wave coffee commands highest price

Farmers can boost their earnings by selling premium coffees. That means upgrading their farms and investing in branding.

Coffee sales prices (in USD/lb)

- Roaster sales price: $4.11
- Roaster sales price: $8.50
- Roaster sales price: $17.45

35.3% 34.0% 29.5%
SOLAR PANELS: TECHNOLOGICAL CATCH-UP AND COMPETITION IN THE GLOBAL VALUE CHAIN
Innovation shapes competitive dynamics

- Intangible capital of value chain participants consists of advanced technology, which often requires specific know-how which is held secret.

- Technological progress has led to a dramatic reduction in the price of photovoltaic (PV) modules – by 80 percent between 2008 and 2015 alone.

- Chinese companies have come to dominate PV global value chain, resulting in bankruptcies and acquisitions in the traditional manufacturing locations (U.S., Europe, Japan).
How did Chinese producers acquire intangible capital?

- Purchase of state-of-the-art production equipment – initially, from international suppliers
- Inflow of skilled engineers and executives from abroad, bringing technological knowledge, capital and professional networks to China
Global decline in PV patenting

But: surviving firms in Europe, Japan and U.S. have stepped up their R&D and patenting activities

Source: WIPO based on PATSTAT; see technical notes.
SMARTPHONES: WHAT’S INSIDE THE BOX?
Estimating returns to intangible capital

- Key intangible assets: cutting edge technology, hardware and software design, brand reputation and image
- Case study of three smartphone models offered by Apple, Huawei and Samsung
- Rely on so-called “tear down” reports
- Estimate “value capture” which approximates the return to intangible capital accruing to the lead firms
Value Capture

- **Apple iPhone 7**
  - Global average price: $809
  - Cost of materials: 22%
  - Distribution and retail: 15%
  - Other: 21%
  - Apple's value capture: 42%

- **Samsung Galaxy S7**
  - Cost of materials: 23%
  - Distribution and retail: 20%
  - Other: 23%
  - Samsung's value capture: 34%

- **Huawei P9**
  - Cost of materials: 20%
  - Distribution and retail: 15%
  - Other: 23%
  - Huawei's value capture: 42%
Other value chain participants

- Certain component makers in the U.S. and Asia generate substantial returns to intangible capital — for example, the producer of the iPhone’s Gorilla glass (Corning)

- So do providers of patented technologies such as Nokia and Qualcomm

- Contract manufacturers performing assembly realize low margins, but benefit from high-volume activity
THE FUTURE OF GLOBAL VALUE CHAINS
Some initial thoughts

- Stagnant trade-to-GDP ratio: are there diminished opportunities for value chains to spread further? If so, is that a problem?

- How will new technologies and business innovations transform global production?

- How should policymakers respond to the shifting demand for workers at different skills levels prompted by transforming global value chains?
Thank you!

Questions?