The Governance of Global Value Chains; Implications for Industrial Upgrading

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Global Value Chains Workshop
“Industrial Upgrading, Offshore Production, and Labor”

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Social Science Research Institute, Duke University
Frame of Reference — Key Trends for Firm-level Analysis of Globalization

- Increased outsourcing
- Computerization of product design
- Computerization of process technology
- Formalization and segmentation of work tasks (services offshoring)
- Increasing market volatility and industry clock-speed (Fine)
- Increasing geographic scope of production systems
- Better integration of geographically dispersed production systems
- The rise of a new, global-scale supply-base

✓ The **global value chains framework** is an overarching rubric that can help to tie these trends together

✓ New features are **global suppliers**, **global buyers**, and **value chain modularity**, which eases coordination between the two.
The governance of global value chains: an analytic framework

Based on a paper by:
Gary Gereffi, Duke University
John Humphrey, IDS
Timothy Sturgeon, MIT

Published in:
Review of International Political Economy, 12(1) 2005

Summary of approach with related literature can be found at the Global Value Chains Initiative website:
www.globalvaluechains.org
Why we felt we needed to move beyond the GCC framework (other than confusion over the connotations of the word “commodity”): convergence in global value chain structure toward external networks demanded more network types than *Buyer Driven*

The GCC typology was based on a static view of technology and barriers to network entry, but both are dynamic because of technological change and learning.
Theoretical Underpinnings
(starting point: industrial organization)

1. Transaction Costs Economics
   Key concept: Asset specificity
   Academic field: Institutional economics

2. Production Network Theory
   Key concepts: Trust, reputation, repeat transactions, social networks, geographic proximity, power
   Academic fields: Economic sociology, economic geography

3. Complementary Competencies
   Key concepts: Resource view of the firm, learning, core competence, co-evolution (buyer-supplier and industry)
   Academic fields: Strategic management, operations management, evolutionary economics
Three Variables

1. **Complexity** of information required for a transaction

2. Extent to which this information can be **codified**

3. **Supplier capabilities** in relation to a transaction’s requirements
• Three variables
• Two options for each - High or Low
• Eight possible outcomes
## The Matrix

<table>
<thead>
<tr>
<th>Complexity of transactions</th>
<th>Ability to codify transactions</th>
<th>Capabilities in the supply-base</th>
<th>Outcome: Value Chain Governance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
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</table>
Discard Three Combinations

<table>
<thead>
<tr>
<th>Complexity of transactions</th>
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<th>Capabilities in the supply-base</th>
<th>Outcome: Value Chain Governance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>High</td>
<td>Low</td>
<td>Excluded from chain</td>
</tr>
<tr>
<td>Low</td>
<td>Low</td>
<td>Low or High</td>
<td>Unlikely to occur</td>
</tr>
<tr>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Unlikely to occur</td>
</tr>
</tbody>
</table>
# Five GVC Governance Types

<table>
<thead>
<tr>
<th>Governance Type</th>
<th>Complexity of transactions</th>
<th>Ability to codify transactions</th>
<th>Capabilities in the supply-base</th>
<th>Degree of explicit coordination and power asymmetry</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market</td>
<td>Low</td>
<td>High</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>Modular</td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Relational</td>
<td>High</td>
<td>Low</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Captive</td>
<td>High</td>
<td>High</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>Hierarchy</td>
<td>High</td>
<td>Low</td>
<td>Low</td>
<td>High</td>
</tr>
</tbody>
</table>

Network org. forms
Five GVC Governance Types

- Market
- Modular
- Relational
- Captive
- Hierarchy

Value Chain

End Use

Degree of Explicit Coordination
Degree of Power Asymmetry

Low
High

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Global value chain dynamics: Opposing forces

• Codification vs. innovation

• Increasing supplier competence vs new suppliers and new requirements

• Stable value chain roles (process upgrading) vs. competitive bundling and re-bundling (functional upgrading)
### Some Dynamics in Global Value Chain Governance

<table>
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<th>Ability to codify transactions</th>
<th>Capabilities in the supply-base</th>
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</thead>
<tbody>
<tr>
<td>Market</td>
<td>Low</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Modular</td>
<td>① High</td>
<td>② High</td>
<td>④ High</td>
</tr>
<tr>
<td>Relational</td>
<td>High</td>
<td>③ Low</td>
<td>⑤ High ⑥ High</td>
</tr>
<tr>
<td>Captive</td>
<td>High</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>Hierarchy</td>
<td>High</td>
<td>Low</td>
<td>Low</td>
</tr>
</tbody>
</table>

① increasing complexity of transactions (harder to codify transactions; effective decrease in supplier competence)
② decreasing complexity of transactions (easier to codify transactions; effective increase in supplier competence)
③ better codification of transactions (open or *de facto* standards, computerization)
④ de-codification of transactions (technological change, new products, new processes)
⑤ increasing supplier competence (decreased complexity, better codification, learning)
⑥ decreasing supplier competence (increased complexity, new technologies, new entrants)
New product introduction in electronics manufacturing

IC Design House

Chip design  Circuit geometry

(GDS2 file)

Foundry

Lithography  Deposition  Test  Dicing

Product Firm

Industrial design  System design  Circuit board layout

(Gerber file)

Contract Manufacturer

SMT placement  Solder Re-flow  Test  Final Assembly

Contractor push for co-design (re)DFx

• Design for manufacturability (yield)
• Design for cost reduction
• Design for test
• Design for reliability (quality) and repair
• Design for supply chain availability
• Design for environmental compliance and recycling

The Hand-off

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Framework strengths

• **Industry-independent**
  – Began with research on electronics, autos, and apparel, but has worked well with research on horticulture and services
  – Highlights industry differences within a unified framework

• **Focus on roles played by firms in the chain**
  – Fragmentation and functional specialization
  – Bundling and re-bundling of functions

• **Focus on power in the chain**
  – Market power
  – Coordination power, fishbone (captive) vs. web (relational)

• **Operational model**
  – Predicts outcomes based on variable characteristics

• **Interdisciplinary approach**
  – Has hooks for economists, sociologists, geographers, and management
  – Builds on inter-disciplinary debate over modularity, which includes engineers and business historians as well

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Framework limitations

• Institutional context and path dependence matter
  – Local, national, regional

• Corporate strategy and culture matter
  – “Open pathways” at the firm level (Berger, 2005)

• International regulations matter
  – National, bi-lateral, multi-lateral; agreements between states and multi-lateral institutions can influence global value chain patterns

• Underdeveloped view of consumption (productionist approach)
  – Advanced users have power in the chain
  – Consumer cultures and geographies

• Multiple, overlapping, and dynamic value chain governance forms are the norm
  – Pragmatic collaboration (Helper, MacDuffie, and Sabel)
  – Sustained contingent collaboration (Herrigel and Wittke)
  – Hybrid collaboration (MacDuffie and Helper)
  – Massive coordination (Murtha et al)
## Comparison with other industrial organization frameworks

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Modular</td>
<td>Contract manufacturing</td>
<td>Modular</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Network/community/trust</td>
<td>Relational</td>
<td>Collaborative manufacturing</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Relational</td>
<td>Captive</td>
<td>Autocratic or captive</td>
</tr>
<tr>
<td>Hierarchy</td>
<td>Producer-driven</td>
<td>Hierarchy/authority</td>
<td>Hierarchy</td>
<td>[Assumed]</td>
<td>Hierarchy</td>
</tr>
</tbody>
</table>

### Network org. forms

- **Market**
- **Modular**
- **Relational**
- **Captive**

### Sustained contingent collaboration
- Sustained contingent collaboration (variation over time)

### Massive coordination of differentiated networks
- Massive coordination of differentiated networks (simultaneous variation)

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Upgrading in Global Value Chains
(Humphrey and Schmitz, 2002)

1. Process Upgrading. When firms improve their existing systems to be more efficient, responsive, or quality-aware. Functions may be added or subtracted to achieve these goals, but the central value chain activity carried out by the firm remains the same. An example is the introduction of better quality control systems (e.g., statistical process control) or new production equipment (e.g., injection moulding equipment for outsoles) for the production of shoes.

2. Product Upgrading. When firms shift to higher value added products within the same sector. Production processes may (or may not) stay the same, but the firm shifts to new, more profitable product segments of the same industry. An example is when a footwear producer shifts from mass-produced, low cost shoes to more fashion-intensive footwear produced in smaller lots and sold for high prices.

3. Functional Upgrading. When firms change their position in the chain of value-added activities by taking on a new activity, either as a substitute for existing activities, or as a compliment in a process that can be referred to as “bundling.” Unlike process upgrading, the central focus of the firm shifts to a new value chain activity. An example is when a shoe manufacturer shifts its focus from the production of shoes to the sale of shoe production equipment (e.g., moulds sold to other footwear manufacturers).

4. Chain, or Inter-sectoral Upgrading. When firms move from one value chain to another. Processes and functions may also change, or they may not, but both immediate and final customers are in new sectors. The basic processes of the firm may stay the same, but inter-sectoral shifts come with new customers and requirements. An example is when a firm shifts from the production of leather footwear to the production of interior parts for motor vehicles. Both may include fabrication in leather and plastic, but the end markets are clearly very different.
Supplier Upgrading (and Downgrading) in Global Value Chains

Few customers
Few capabilities

CAPTIVE

More abilities
- Process upgrading
- Functional upgrading
- Functional bundling

RELATIONAL

De-codification and reduced competence
through technological change, new requirements, and new competitors

FULL PACKAGE SUPPLIER

Many customers
Many capabilities

More customers
- Product upgrading
- Inter-sectoral upgrading
- Base process focus
## GVC Governance Types

**Links to Industrial Upgrading and Policy**

<table>
<thead>
<tr>
<th>Governance Type</th>
<th>Linkage mechanism</th>
<th>Firm roles and competencies</th>
<th>Policy emphasis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market</td>
<td>Arms-length exports</td>
<td>Branded exporter and importer of standardized goods and services</td>
<td>Brand and product development, market research and access, import substitution and export promotion</td>
</tr>
<tr>
<td>Modular</td>
<td>Buyer-supplier complimentary specialization in cross-border value chains</td>
<td>“Deverticalized” lead firms and full package suppliers with generic, base process competencies, and a global footprint</td>
<td>Knowledge of global standards, process- and information technology upgrading</td>
</tr>
<tr>
<td>Relational</td>
<td>Collaboration with co-location or in cross-border value chains with lots of air travel</td>
<td>Clusters of specialists buyers and suppliers with process and/or domain-specific competencies</td>
<td>Competence building, support of clusters and districts, focus on building tacit domain knowledge</td>
</tr>
<tr>
<td>Captive</td>
<td>Foreign direct investment</td>
<td>Dependent supplier, customer-specific competencies</td>
<td>Recruitment of MNC affiliates and suppliers, local content rules</td>
</tr>
<tr>
<td>Hierarchy</td>
<td>Foreign direct investment</td>
<td>Lower tier supplier</td>
<td>Recruitment of MNC affiliates, education and training, infrastructure development, local content rules</td>
</tr>
</tbody>
</table>

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