

# Upgrading in Global Value Chains: The role of knowledge and technological capabilities

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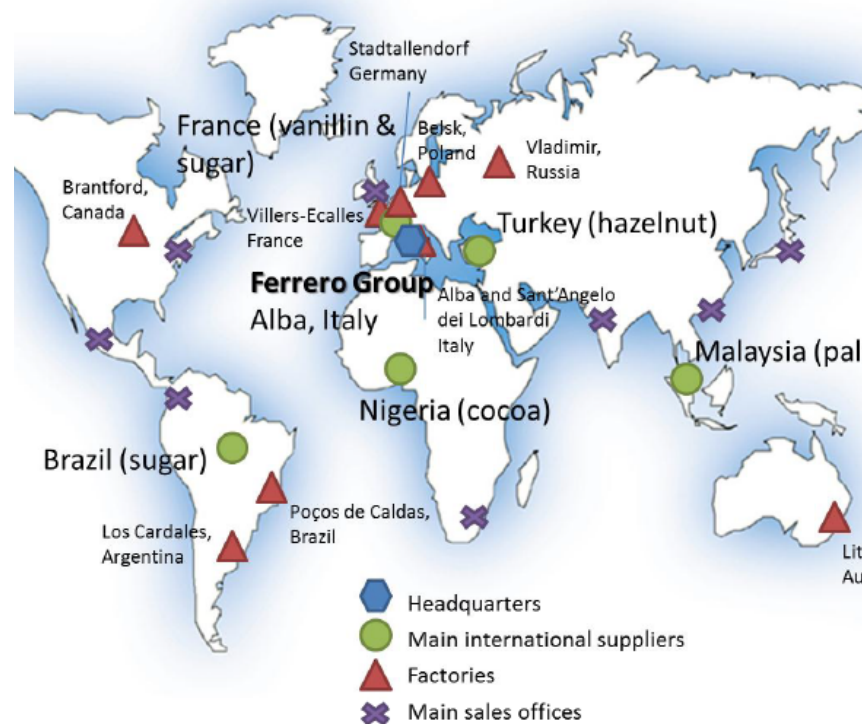
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# The Nutella GVC



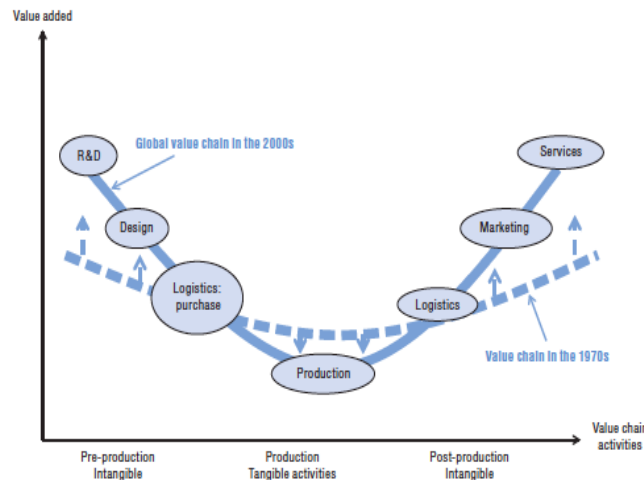
Figure 6. The Nutella® global value chain



Sourcemap and various on-line sources.

# Value Added along the GVC: The Smiling Curve:

- In GVC the most value creation is often found in:
  - **upstream activities** such as design, product development, R&D and manufacturing of key parts and components;
  - **downstream activities** such as marketing, branding and customer service;
- **Assembly**, often offshored, to emerging economies, **represents only a small part of value generation.**



Source: Based on Shih (1992), Dedrick and Kraemer (1999), and Baldwin (2012).

# Economic Upgrading in GVC

- Economic upgrading is **moving up the value chain** through:
  - the **efforts of companies**;
  - **conducive (national/regional/local) innovation and business systems**;
- There are four types of upgrading:
  - ① Process upgrading;
  - ② Product upgrading;
  - ③ Functional upgrading;
  - ④ Inter-sectoral/inter-chain upgrading.

# Process and Product Upgrading

- ① **Process upgrading** implies reduction in costs, productivity and flexibility increases by reorganizing the production system or investing in new or better equipment/technology;
- ② **Product upgrading** involves a shift to more sophisticated, complex, better quality products as well as producing a larger range of products.

### ③ Functional upgrading (and downgrading)

- Changing the mix of activities and **acquiring new skill intensive functions** (i.e. from manufacturing to design);
- Sometimes **downgrading** can be the right strategy: the case of the **South African Wine Industry** (Ponte & Ewert, WD 2009):
  - Grape growers **downgrade** to produce higher volumes of lower quality grapes (for brandy) to gain a **volume premium**;
  - Wholesalers, who used to have their own agencies in the UK, are divesting or entering in joint ventures with European based trading partners;
  - Much of product innovation, new packaging and styles are generated by UK/European agents: retailers are increasingly shelf-space providers.

## ④ **Intersectoral/inter-chain upgrading**

- Applying competences acquired in one function of a chain and using them in a different sector/chain;
- **Sinos Valley shoe producers** (Brazil) have functionally upgraded (moving up to design, branding and retailing) in the **domestic/regional value chain**:
  - Leveraging their production capabilities acquired in the US value chain;
  - ‘Made in Brazil’ program promoted by the local business association to create a local design capability and a brand.

# Upgrading in GVC is conditioned by governance

GVC governance depends on:

- The **complexity of the information** exchanged between actors in the chain;
- The **codification of the the information** into clearly defined rules, norms and standards;
- The level of **suppliers competence**.

Governance Type	Complexity of transactions	Ability to codify transactions	Capabilities in the supply-base	Degree of explicit coordination and power asymmetry
Market	Low	High	High	<div>Low</div> <div>↑</div> <div>↓</div> <div>High</div>
Modular	High	High	High	
Relational	High	Low	High	
Captive	High	High	Low	
Hierarchy	High	Low	Low	




**Table IV.9. Learning mechanisms within GVCs**

Governance type	Technology/knowledge-related determinants of governance types			Predominant learning mechanisms
	Complexity of transactions	Codification of transactions	Competence of suppliers	
FDI (ownership hierarchy)	High	Low	Low	<ul style="list-style-type: none"> <li>• Imitation</li> <li>• Turnover of skilled managers and workers</li> <li>• Training by foreign leader/owner</li> <li>• Knowledge spillovers</li> </ul>
NEMs:				
- Modular	High	High	High	<ul style="list-style-type: none"> <li>• Learning through pressure to accomplish international standards</li> <li>• Transfer of knowledge embodied in standards, codes, technical definitions</li> </ul>
- Relational	High	Low	High	<ul style="list-style-type: none"> <li>• Mutual learning from face-to-face interactions</li> </ul>
- Captive	High	High	Low	<ul style="list-style-type: none"> <li>• Learning through deliberate knowledge transfer from lead firms; confined to a narrow range of tasks – e.g. simple assembly</li> </ul>
Trade (market)	Low	High	High	<ul style="list-style-type: none"> <li>• Learning from exporting or importing</li> <li>• Imitation</li> </ul>

Source: Adapted from Pietrobelli, C. and R. Rabellotti (2010) "Global Value Chains Meet Innovation Systems: Are There Learning Opportunities for Developing Countries?", *World Development*, 39:1261-9.

# How can policy support upgrading within GVC?

## The role of business and innovation systems

	Governance Type	Determinants	Innovation Systems	
1	Market	Low complexity		<p>A well-structured, complete, smooth system makes <b>1-2-3</b> more likely to occur. <b>4-5</b> may prevail also with 'poorer', fragmented systems. The chain leader may compensate system weaknesses, but upgrading is restricted.</p> <p><b>Possible Dynamics</b></p>  <ul style="list-style-type: none"> <li>▪ <b>From 5 and 4 to 2:</b> thanks to improvement in MSTQ</li> <li>▪ <b>From 5 and 4 to 3:</b> thanks to improvement in "local" systems</li> <li>▪ <b>From 5 and 4 to 2 and 3:</b> thanks to IS supporting the co-evolution of suppliers and GVC competences</li> </ul>
		High codification	MSTQ organizations matter	
		High supplier competence	Education, training organizations matter	
2	Modular	High complexity		
		High codification	MSTQ organizations matter	
		High supplier competence	Education, training organizations matter	
3	Relational	High complexity	"Local" systems and complementary knowledge matter	
		Low codification	MSTQ are perhaps less crucial	
		High supplier competence	Education, training organizations matter	
4	Captive	High complexity		
		High codification	MSTQ organizations matter	
		Low supplier competence		
5	Hierarchy	High complexity	Local R&D organizations may benefit from interaction	
		Low codification		
		Low supplier competence	GVC is expected to improve human technical skills	

Source: authors' elaboration

# Well functioning ISs facilitate relational forms of governance

- **Active technical bodies** where the chain leaders and their local partners can meet, ease the exchange of knowledge and reduce the complexity of transactions.  
**This is common in clusters;**
- **Electronics in Jalisco (Mexico):** the development of an efficient IS has supported the transition from hierarchy and captive chains led by foreign leaders to the creation of a local innovation capacity and functional upgrading undertaken by domestic firms;
  - **Policy instruments:** training programs, high tech incubators, Science and Technology program co-developed by the State and the private sector.

# Codification of transactions & IS

- Well functioning standards and metrology organizations facilitate the handling of complex transactions and modular chains are more likely to prevail;
- **Salmon in Chile:** learning to comply with standards it has achieved the involvement of local firms both as value chain leaders and qualified suppliers in foreign-led chains.
  - **Policy implications:** a meso-level institution, the Association of Salmon Industries, has played a crucial role in supporting local firms to upgrade their capabilities (Pietrobelli and Rabellotti, 2007).

# Suppliers' competence & IS

- Increasing capabilities in the supply-base help to push the architecture of GVC away from hierarchy and captive networks and towards more relational and modular chains;
- **Wine in Chile and South Africa** (Giuliani, Morrison and Rabellotti, 2011):
  - **Public-private partnership** in research consortia involving companies, business associations and universities have facilitated the upgrade of the local wine producers;
  - In SA, WINETECH has implemented a **participatory mechanism** involving wine companies and researchers to set up the research agenda.

# Summing up the policy implications

- Promote and sustain the **identification of new alternative GVC** in which functional upgrading could be possible (the Sinos Valley case);
- Support SMEs in **complying with international standards**. This is key in the agro-food industry (the salmon case in Chile);
- Sustain the **upgrading of local suppliers** through a well functioning IS (the Jalisco case);
- Experiment with **new forms of private-public partnerships** (participatory systems for setting research agendas, intermediary organizations linking small firms with universities) (the wine case in Chile and SA).

# Thank you

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For related papers

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Giuliani E., Morrison A., Rabellotti R., 2011, *Innovation and Catching Up: The changing geography of wine production*, Cheltenham: Edward Elgar.

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Morrison A., Pietrobelli C., Rabellotti R., 2008, "Global Value Chains and Technological Capabilities: A Framework to Study Industrial Innovation in Developing Countries", *Oxford Development Studies*, 36 (1): 39-58

Pietrobelli C. Rabellotti R., 2007, (ed.), *Upgrading to Compete: SMEs, Clusters and Value Chains in Latin America*, Cambridge Mass.: Harvard University Press.