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The Co-Evolution of Global Value Chains and Innovation Systems. Some evidence from developing countries.

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SASE – New York, June 2019

Innovation in developing countries

- Innovation is a **fundamental prerequisite** for sustainable development;
- Developing countries are faced with significant **challenges in building and deepening their innovative capabilities**;
- **Globalisation** has important implications on how developing countries build their innovative capabilities;
- **Involvement in GVCs** is generally considered as a key channel for accessing external knowledge and technology and for improving innovation capabilities in developing countries.

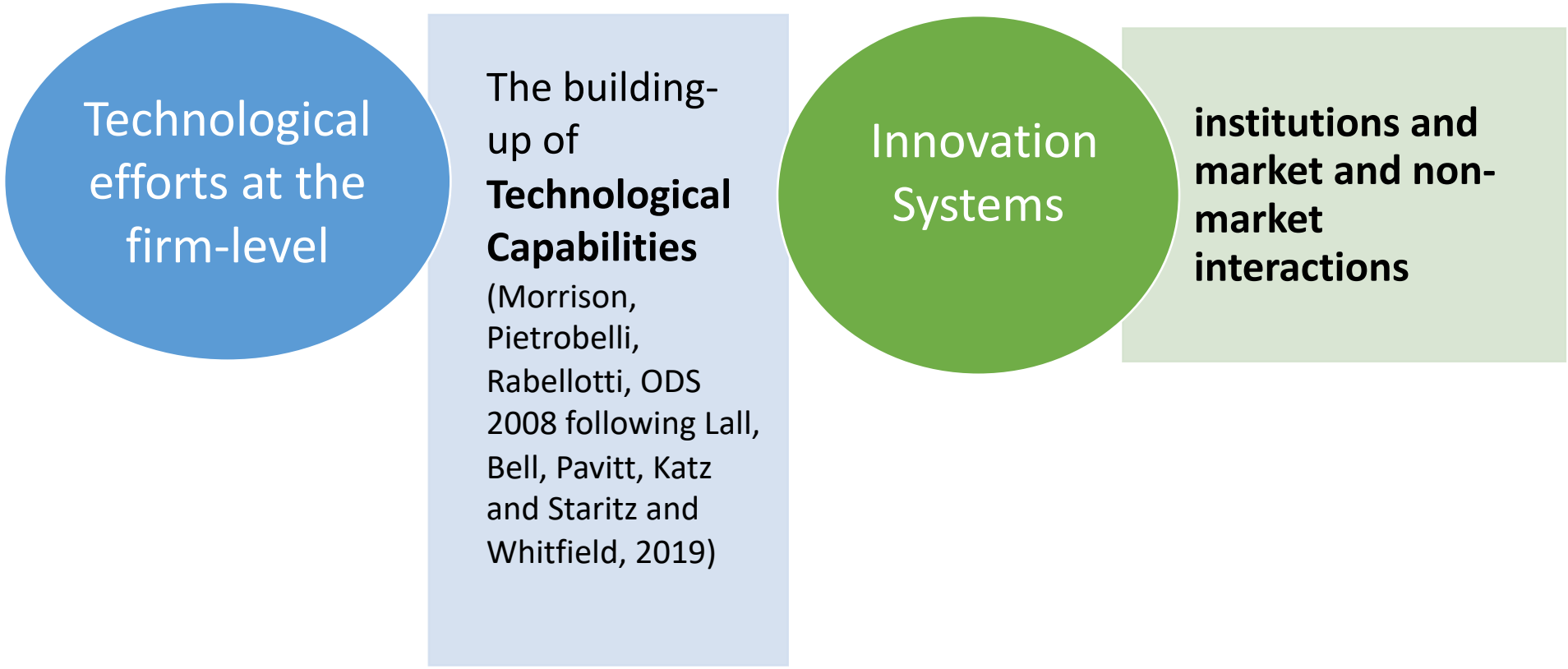
Research Question

- **Whether and under what circumstances does GVC involvement create new opportunities** for learning and innovation? Or conversely, may it be a **hindrance** for building up innovative capabilities?
  - How **global value chain** and **innovation system** co-evolve to influence the **trajectories** of learning and innovation in firms in developing countries?

Innovation in GVCs

- Upgrading and innovation often used as interchangeable concepts;
  - Innovation is rarely investigated;
- GVC governance patterns shape opportunities, direction and speed for building innovative capabilities:
  - Learning can be facilitated by direct involvement of the value chain leaders or be the result of pressure to match international standards (Pietrobelli & Rabellotti, WD 2011);
- Main limitations:
  - No evidence on **micro knowledge mechanisms** at firm level: how do firms learn and innovate in GVCs ? how is knowledge accessed by firms involved in GVCs?
  - Limited attention on how institutional frameworks (i.e. Innovation Systems) contribute to shape innovative capabilities in firms involved in GVC.

Innovation in GVC does also depend on

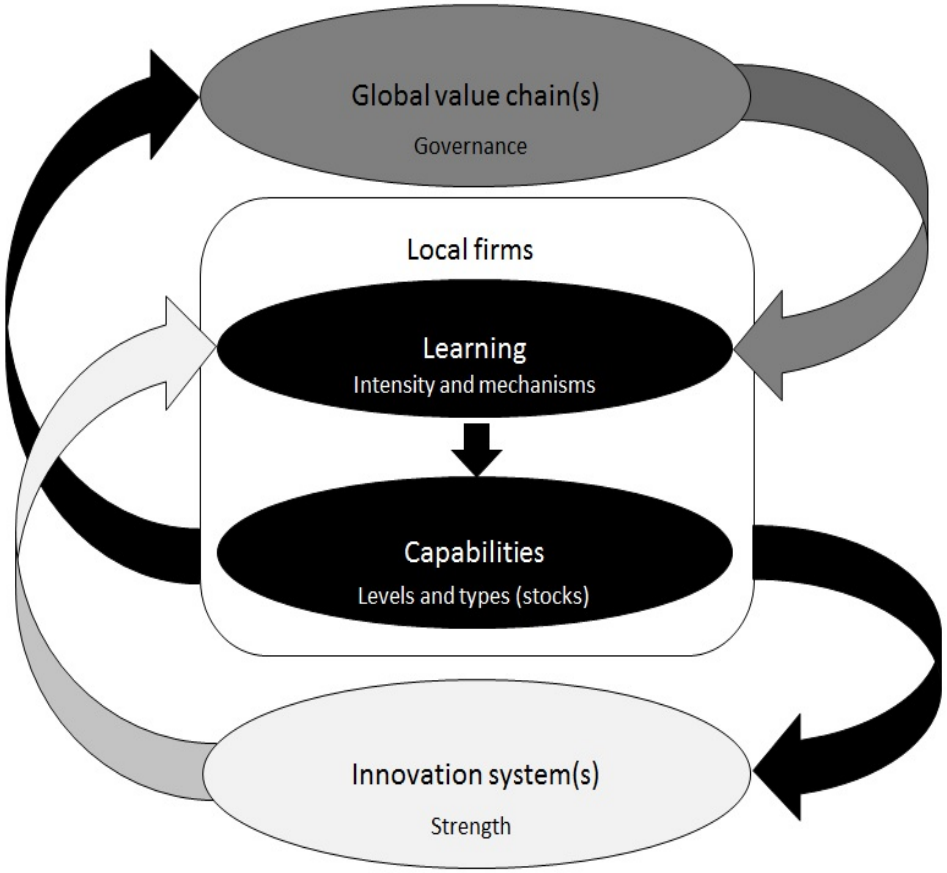


Innovation systems

- **Focus** on how interactions among enterprises, institutions, research bodies and policy makers contribute to learning and innovation within firms:
  - Innovative capacity at the firm level depends on the density and quality of the relationships within the IS;
- Main limitations:
  - Little understanding of systems building and dynamism (changes over time);
  - Limited attention to external linkages in the generation and diffusion of knowledge and innovation.

Co-evolution of IS and GVC

- Both IS and GVC contribute to *firm's* learning processes and innovation capability building and co-evolve because of changes in firms' capabilities ;
- Forward-feeding linkages (grey arrows); Feedback linkages (black arrows):
  - GVCs: changes in firms' capabilities influence whether and how lead firms interact with domestic suppliers and can influence GVC governance patterns;
  - ISs: changes in firms' capabilities generate demand for different types of knowledge, resources, services (i.e. international certifications; specific training programs)
  - ISs: spillover effects such as demonstration and imitation, labour turnover etc.



Some illustrative trajectories of firms' innovative capabilities

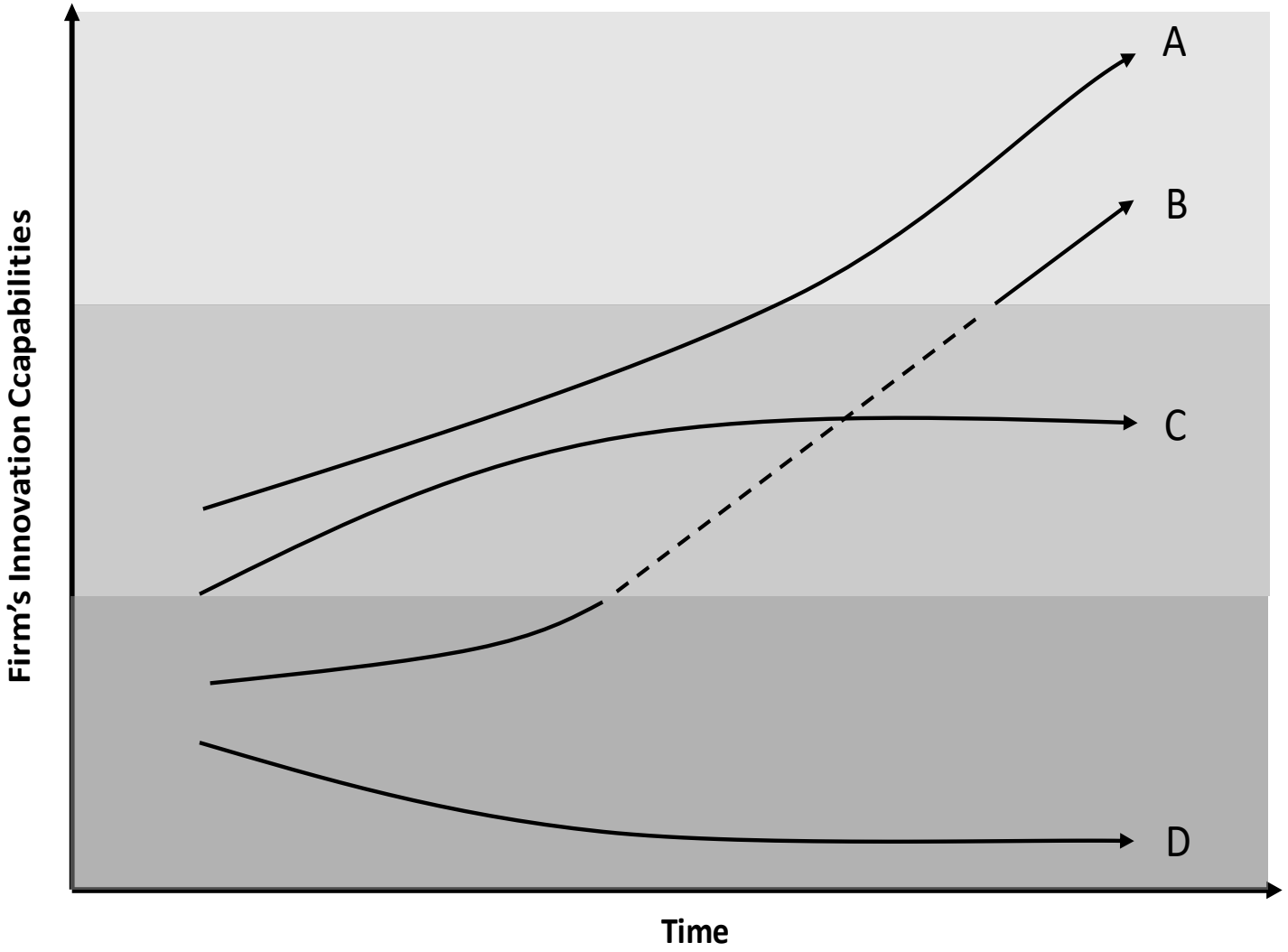
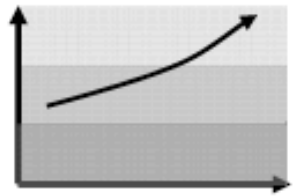
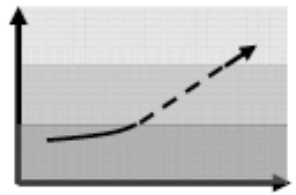
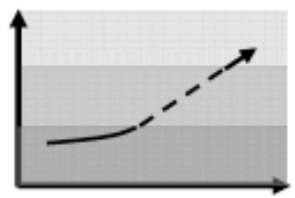
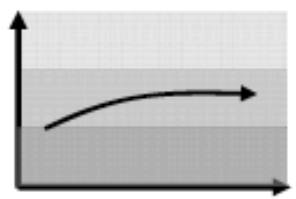
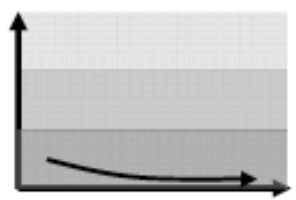


Table 1: Illustrative trajectories of innovation capabilities

	Trajectory	Firms' capabilities	ISs	GVCs	GVC–IS co-evolution
Gradually increasing trajectory (A) *Chile*: salmon *China and India*: electronics, cars, space technologies *China*: mobile phones and electric two-wheelers		Firms' capabilities gradually and cumulatively strengthen.	IS strengthens sufficiently due to GVC involvement.	Value chains play a learning-intensive role.	GVC and IS exhibit complementarity and positive interactions.
Leap-wise increasing trajectory (B1) *Brazil*: footwear *India*: pharmaceuticals *Korea*: toys, musical instruments, and helmets		Firms' capabilities strengthen in successive jumps; firms oscillate between GVC and IS as alternate sources of knowledge and capability building.	Initially weak IS eventually develops to support value-chain development.	GVCs provide initial learning opportunities; local firms exit the chain; and the value chains move from local to global.	IS and GVC have sequential one-way relationships (each playing the stronger role in turn).
(B2) *India*: software *East Asia*: apparel		Firms' capabilities increase but are biased towards export-demand preferences until IS grows.	Absent or weak IS fails to support enterprise capabilities.	GVCs provide sustained learning opportunities that eventually feed back into IS development.	A one-way relationship is followed by a two-way interaction.
Stagnating trajectory (C) *Bangladesh*: aquaculture *Kenya, Lesotho and Swaziland*: textiles		Firms' capabilities remain unchanged (stagnant) or develop only marginally.	IS becomes fragmented and thus cannot support value-chain development, leading to limited absorptive capacity.	Value-chain participation remains stagnant, leading to limited learning in key tasks.	Initial efforts at mutual support are followed by disjunction or ineffective interaction.
Declining trajectory (D) *Gabon*: timber *Thailand*: cassava		Firms shift to lower-value-added stages or exit from the value chain.	Absent or very weak IS fails to support value-chain development.	Lead firms with strong bargaining power play a negative role.	GVC and IS have disjointed and/or negative interactions.

Source: Adapted from Lema et al. (2018)

The leap-wise trajectory
(Lee, Szapiro and Mao, EJDR 2018)

- GVC & IS as alternate sources for building knowledge and capabilities in firms (IN-OUT-IN strategy):
  - **IN**: in the **preliminary development** stage GVC participation is necessary to acquire foreign knowledge and production skills;
  - **OUT**: in the **intermediate stage** separation and independence from existing foreign-dominated GVCs and a strong IS are required for functional upgrading (i.e. building capabilities in design, R&D, marketing);
  - **IN**: in the **maturity stage the** latecomer firms build and lead their own GVC, different from the one they started from.

Case illustrations of the leap-wise trajectory

- **South Korea:** From OEM to ODM to OBM (*Aurora World, Shimro Musical Instruments, HJC Helmets, Hyundai Motors)*

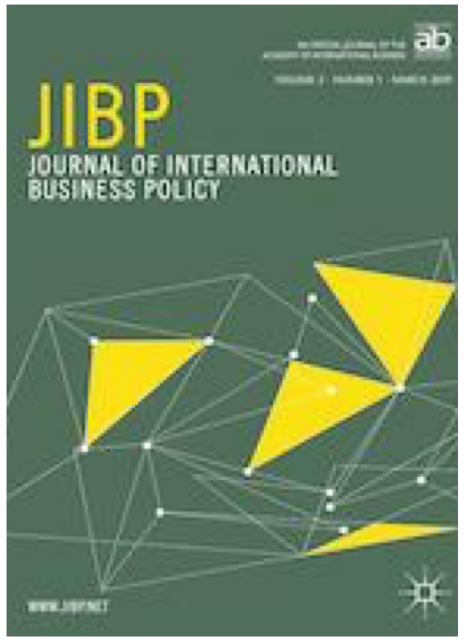
- **Brazil:** *Footwear industry in Rio Grande do Sul cluster*
  - From 1970s to mid-80s growth through integration in GVC led by US buyers (IN);
  - In mid-1990s some firms (i.e. *Arezzo, Alpargatas, Grendene*) step OUT from the US GVC and target domestic (and then regional) markets, developing local learning mechanisms in design and creating their own GVCs (IN);
  - Other firms remain in the US GVC with low price products, passive learning, low interactions with other actors and only product upgrading.

Other illustrative trajectories

- *Gradually increasing trajectory*: GVC and IS exhibit positive complementarities
  - Salmon industry in Chile, where involvement in the GVC created a demand for technicians with knowledge in biochemistry and engineering, successfully addressed by the local IS.
  - A key policy role was also played by the government to address an environmental crisis occurring in the industry;
  - Bicycle industry in Taiwan (Hsieh; 2019);
- *Stagnating trajectory:* IS is weak and fragmented and GVC does not provide access to key knowledge, so local firms fail to increase their innovation capacities (aquaculture in Bangladesh);
- *Declining trajectory:* IS is too weak to maintain previously attained competitiveness in GVCs when changes in GVCs and global demand arise
  - Timber industry in Gabon from exporting processed logs to the EU to shipping of unprocessed logs to China.

Final takeaways

- **GVCs and IS co-evolution** has implications on the speed and direction of innovative capability accumulation at firm level;
- More micro-level evidence is needed for enriching the list of trajectories in different sectors, local contexts and countries at different levels of development;
- **GVC policies** are popular in developing countries. Besides attracting GVC leaders they should aim at **capturing value** within GVCs with measures aimed at **strengthening and deepening IS** (e.g. matching-grant programs to support collaborative innovation involving firms and universities; training programs to create skills needed for integration of local firms in GVCs; technology services in the areas of standards, metrology, testing, and certification).



Journal of International Business Policy

Special Issue

Global Value Chain-Oriented Policies

co-edited by Carlo Pietrobelli, Roberta Rabellotti & Ari Van Assche

http://resource-cms.springernature.com/springer-cms/rest/v1/content/16526132/data/v1

Submission deadline
September 1, 2019

Thank you

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