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Combining the GVC and NIS perspectives: A new approach for understanding innovation trajectories?

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Globelics Academy, Tampere, Finland

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Background and Objective

- Globelics was established almost 20 years ago to bring together scholars from two fields: **innovation studies** and **development studies**. The long term success depends on **interchange and cross-fertilization** between scholars from those two traditions
- In this work: How can we combine ideas from two fields of knowledge **innovation systems** and **global value chains**?
- The presentation is based on several years of work with workshops and activities in Globelics. I seek to bring together **key points** and assume familiarity with innovation systems and **LICS**



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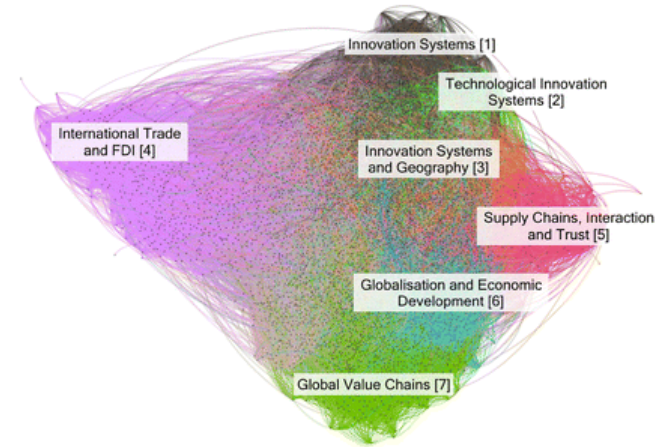
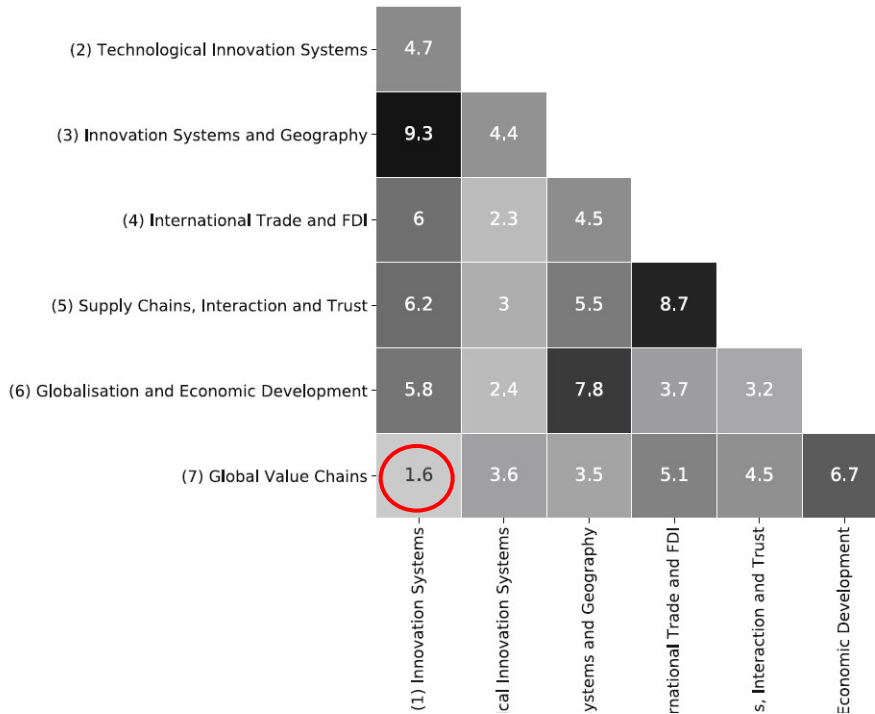
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Scientometric Analysis

Very little interaction between the research communities!



Publications with explicit mention of developing countries

Starting points

- Learning and innovation are **fundamental prerequisites** for sustainable economic growth and development – sustainable innovation trajectories
- But developing countries are faced with significant **challenges** in building and deepening their innovation capabilities, in forming appropriate skills and in strengthening the related supporting institutions
- **Globalisation** has important ramifications for the conditions for capability development – where and how developing country firms are inserted into GVCs is crucially important for development and opportunities, including **capability development**



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Key Questions

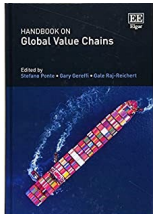
- ▶ Whether and **under what circumstances** globalisation (insertion into GVCs) creates **new opportunities** for learning and innovation in developing countries. Or conversely, whether and under what circumstances globalisation becomes a **hindrance** for the building up of innovation capabilities?
- ▶ Can a **combination** of the global value chain (GVC) and innovation system (IS) approaches help to foster an understanding of **trajectories** of learning and innovation in developing countries?
- ▶ What are the **conditions** and **dynamics** involved?



Special Issue

11 papers focusing on three main contributions:

- How learning and innovation occurs in GVCs
- The role of innovation systems (and policy) in determining benefits from participating in GVCs
- Trajectories of GVC and IS co-evolution



Also **Innovation in Global Value Chains** with Carlo Pietrobelli and Roberta Rabellotti in the *Handbook of Global Value Chains*, Cheltenham, UK and Lyme, US: Edward Elgar, 2020



The European Journal of Development Research
Volume 30, Issue 3, 2018
<https://doi.org/10.1057/s41287-018-0149-0>

Introduction to the special issue:

Original Article

Innovation Trajectories in Developing Countries: Co-evolution of Global Value Chains and Innovation Systems

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Abstract This article investigates how combining global value chain and innovation system approaches can help to foster an understanding of the possible trajectories that learning and innovation may take in developing countries. Based on the wealth of empirical evidence collected in the special issue, we introduce the notion of the co-evolution of global value chains and innovation systems and outline a framework for investigating the interaction between the two in a dynamic perspective with multiple trajectories. We find that, in some cases, there is an improvement in local innovation capabilities with potentially positive effects on overall competitiveness, while in others there is little progress or even a loss of previous innovation capacity.

Cet article explore comment la combinaison d'approches liées aux chaînes de valeur mondiale et aux systèmes d'innovation peut aider à comprendre les trajectoires possibles de l'apprentissage et de l'innovation dans les pays en développement. Sur la base d'une multitude de preuves empiriques collectées dans ce numéro spécial, nous introduisons la notion de co-évolution des chaînes de valeur mondiales et des systèmes d'innovation et décrivons un cadre pour étudier l'interaction entre les deux dans une perspective dynamique avec trajectoires multiples. Nous constatons que, dans certains cas, il y a une amélioration des capacités locales d'innovation avec des effets positifs potentiels sur la compétitivité globale, tandis que dans d'autres il y a peu de progrès ou même une perte de capacité d'innovation.

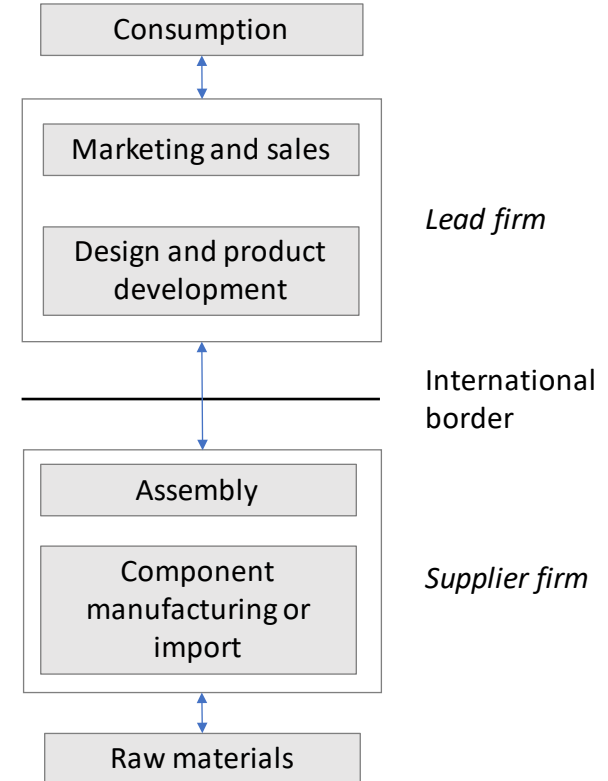
The European Journal of Development Research (2018). <https://doi.org/10.1057/s41287-018-0149-0>

Keywords: global value chain; innovation system; co-evolution; trajectories; innovation; learning; developing countries

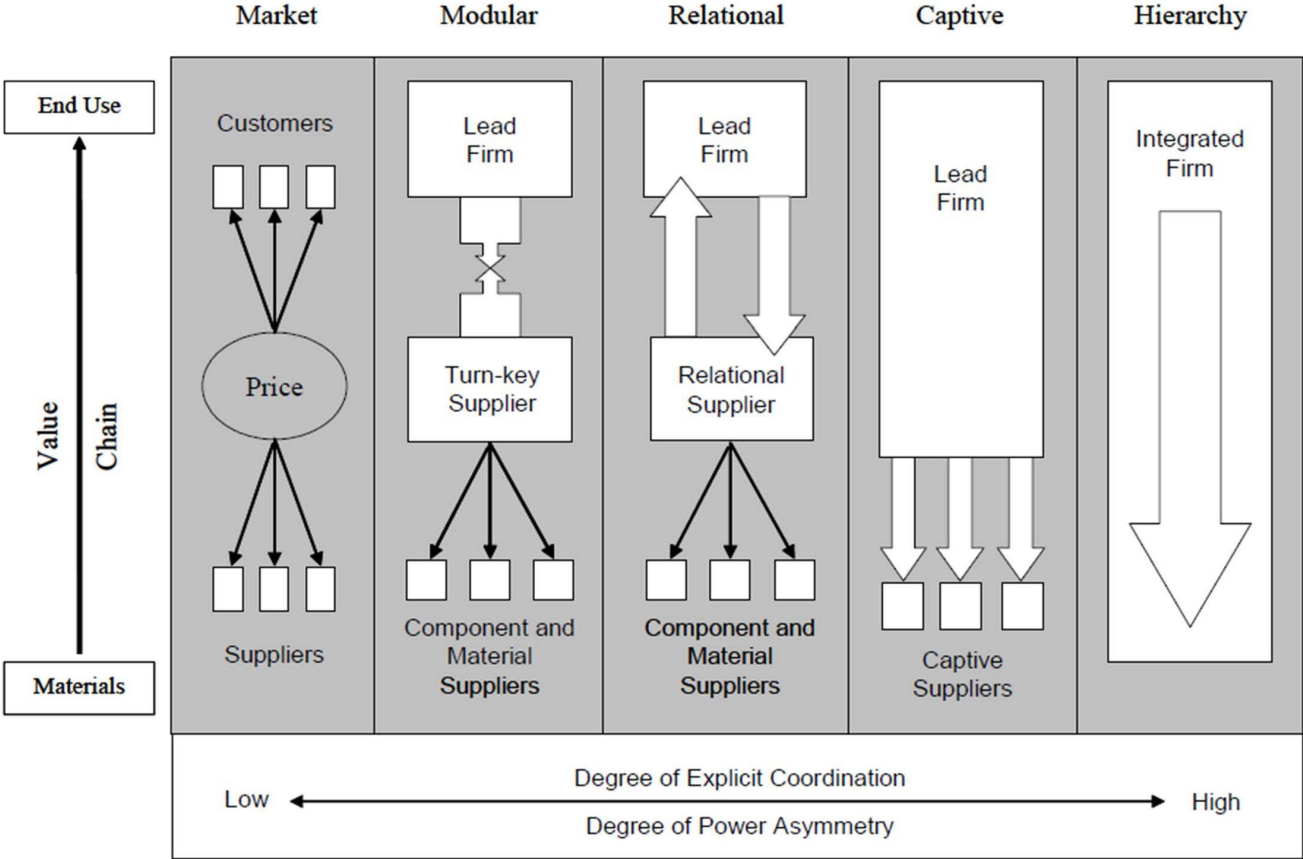
The Global Value Chain Approach

- **Focus:** The role of **leading firms** and inter-firm **networks** in firms upgrading.
- **Key point:** Opportunities for building production and innovation capabilities in domestic enterprises are structured by **governance patterns** in GVCs.

Simplified Global Value Chain Model



Types of GVC Governance



Upgrading of suppliers

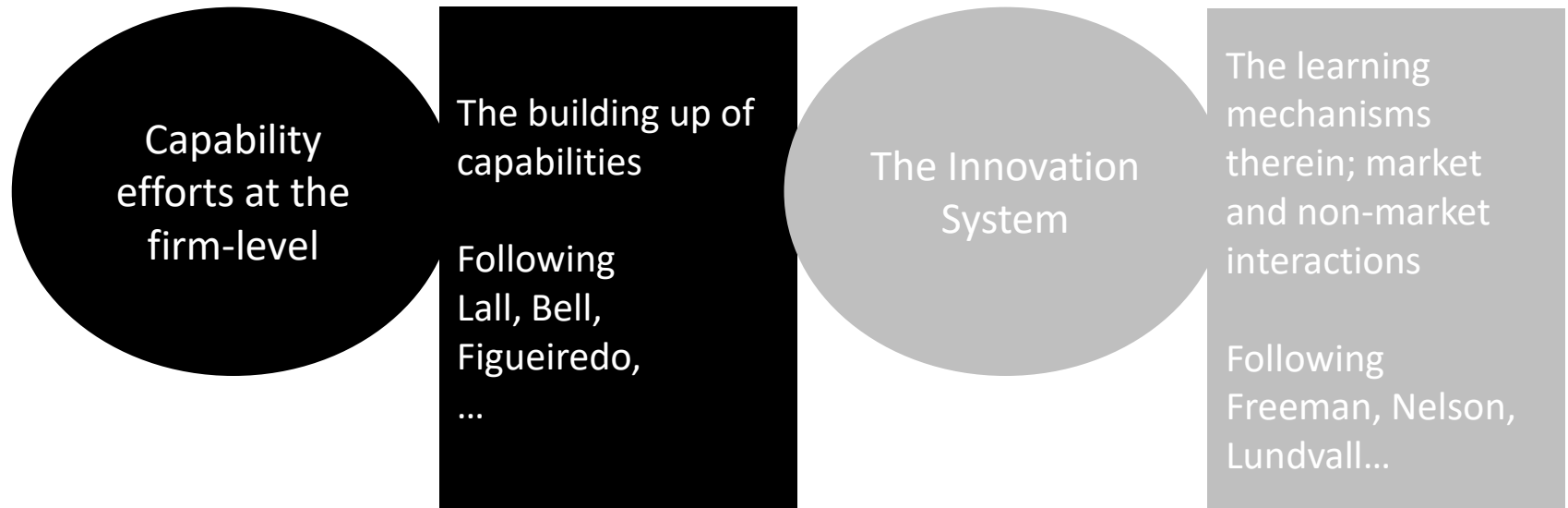
- **Process upgrading:** Increasing the efficiency of internal processes such that these are significantly better than those of rivals
- **Product upgrading:** Introducing new products or improving old products faster than rivals.
- **Functional upgrading:** Taking on new core activities in the value chain. Increasing value added by changing the mix of activities conducted within the firm.
- **Chain upgrading:** Moving to a new value chain (e.g. from transistor radios to TVs, to computer monitors, to laptops to smartphones)



Limitations of the GVC approach

- ▶ Little attention to understanding the upgrading process itself
- ▶ How is knowledge accessed?
- ▶ How can firms in GVCs learn and innovate?
- ▶ Do lead firms hinder/foster suppliers' learning?
- ▶ Little attention to the institutional framework which structure opportunities for upgrading

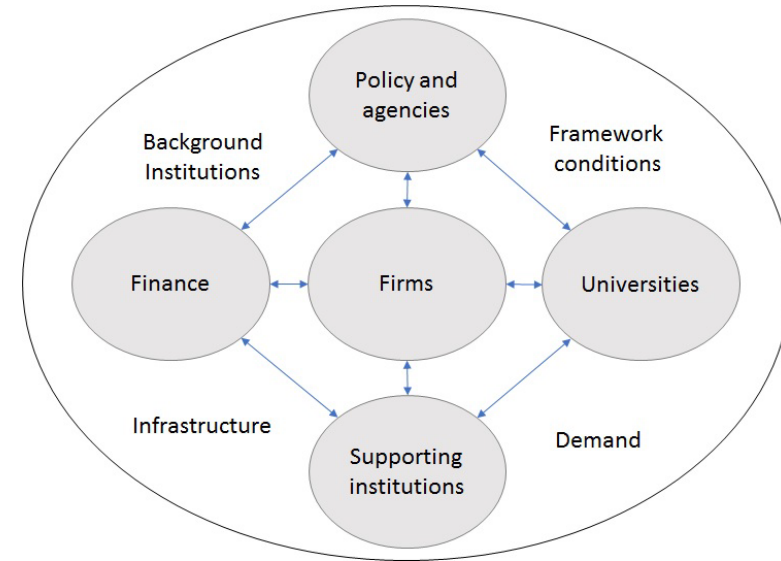
Is governance the only explanation of upgrading and innovation



Innovation Systems Framework

- **Focus:** How **interactions** among enterprises, institutions, research bodies and policy making agencies contribute to learning and innovation within firms
- **Key point:** Innovative capacity at the firm level depends on the **density and quality of the relationships** among enterprises and between enterprises and supporting institutions.

Simplified Innovation System Model



Limitations of the Innovation Systems approach

- Origin in developed country context.
- Most attention originally given to relatively mature innovation systems.
- Weak understanding of systems building and dynamism (changes over time).
- Less attention to external linkages in the generation and diffusion of knowledge and innovation.

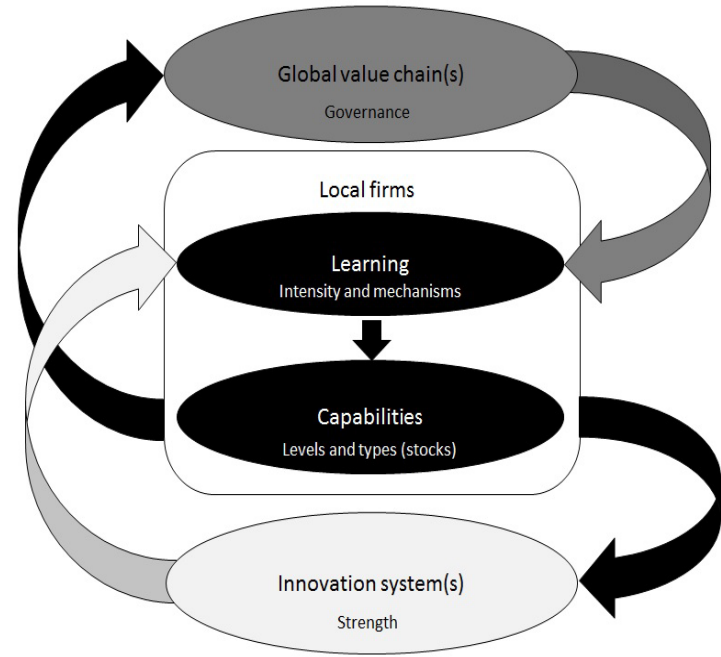
Comparing the two approaches

	Global value chains	National innovation systems
Unit of analysis	Relationships and exchange of goods and services between buyers and suppliers in the global economy	Relationships within and between firms, institutions and socioeconomic structures at national level
Dimensions of variability	<ul style="list-style-type: none"> • Value chain governance • Corporate power • Upgrading 	<ul style="list-style-type: none"> • Coherence/fragmentation of the system • Science- and experienced-based learning • Rate and direction of innovation
Level of technological/activity sophistication (in empirical cases)	<ul style="list-style-type: none"> • Mainly simple manufacturing (e.g. textiles) • Use of (technological) capital goods 	<ul style="list-style-type: none"> • Middle and high-tech • Focus on creation and diffusion of technology
Acquisition of capabilities	Learning from lead firms and buyers	Local interactive learning
Policy focus	Joining and upgrading in global value chains	Building and strengthening innovation systems
Methodological approach	<ul style="list-style-type: none"> • Case studies • International trade statistics 	<ul style="list-style-type: none"> • Community innovation surveys • Analyses using indicators such as patents, R&D • Case studies
Disciplinary foundation	Economic sociology	Evolutionary economics

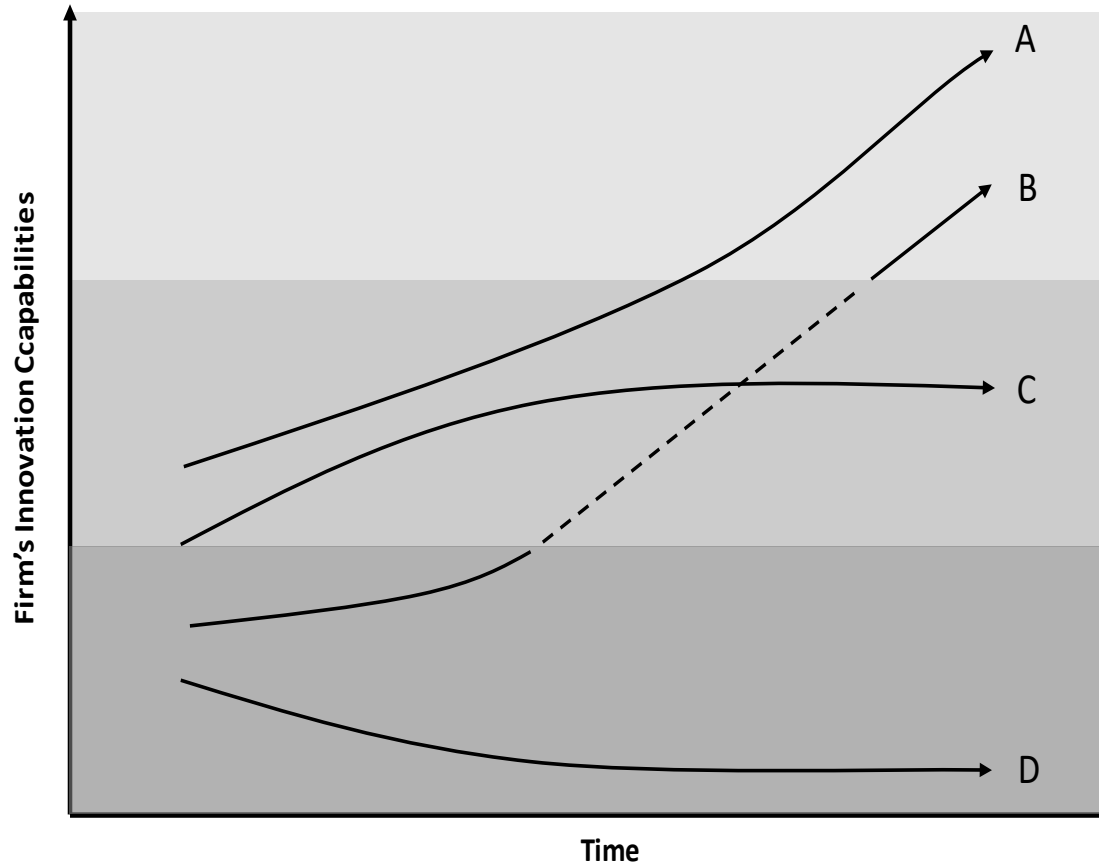
The starting points for a combined framework

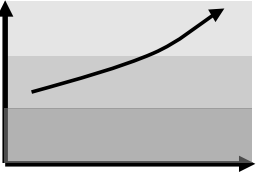
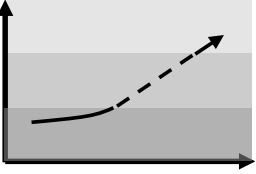
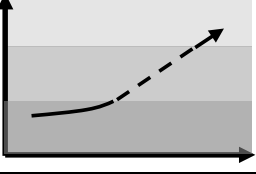
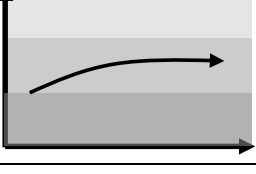
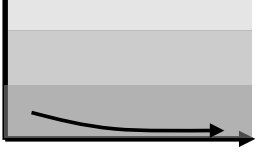
- Both IS and GVC contribute to *firm's* learning processes and innovation capability building and co-evolve because of changes in firms' capabilities ;
- Forward-feeding linkages (grey arrows); Feedback linkages (black arrows):
 - **GVCs**: changes in firms' capabilities influence whether and how lead 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.

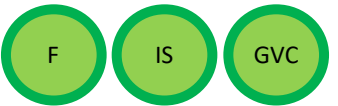

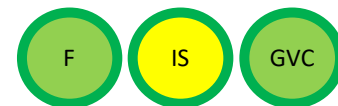
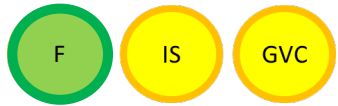
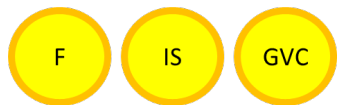
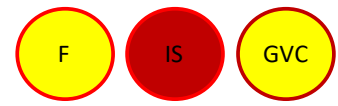
Co-evolution of IS and GVC



Firm innovative capabilities: Illustrative trajectories



	Trajectory	Firms' capabilities	ISs	GVCs	GVC-IS co-evolution
<p>Gradually increasing trajectory (A) <i>Chile:</i> salmon <i>China and India:</i> electronics, cars, space technologies <i>China:</i> mobile phones and electric two-wheelers</p>		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.
<p>Leap-wise increasing trajectory (B1) <i>Brazil:</i> footwear <i>India:</i> pharmaceuticals <i>Korea:</i> toys, musical instruments, and helmets</p>		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).
<p>(B2) <i>India:</i> software <i>East Asia:</i> apparel</p>		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.
<p>Stagnating trajectory (C) <i>Bangladesh:</i> aquaculture <i>Kenya, Lesotho and Swaziland:</i> textiles</p>		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.
<p>Declining trajectory (D) <i>Gabon:</i> timber <i>Thailand:</i> cassava</p>		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.

<p>Gradual:</p> <p>Electronics, auto, space in India and China, salmon in Chile</p>		<ul style="list-style-type: none"> ▪ Firm capabilities gradually and cumulatively strengthened ▪ IS sufficiently strong and strengthened by GVC ▪ GVC strengthened with more rewarding and learning-intensive roles
<p>Leaping A:</p> <p>Korea (toys, musical instruments); Brazil: (footwear)</p>		<ul style="list-style-type: none"> ▪ Firm capabilities strengthened in jumps; GVC & IS as alternate sources of knowledge and capabilities ▪ IS sufficiently strong to support GVC development ▪ GVC fail to provide learning opportunities; ▪ Interrupted value chain development; sequencing of local and global value chains (re-entering from a stronger position)
<p>Leaping B</p> <p>India in software; East Asia in apparel</p>		<ul style="list-style-type: none"> ▪ Firms' capabilities increase but are biased towards export-demand preferences until IS grows. ▪ GVCs provide sustained learning opportunities that eventually feed back into IS development. ▪ A one-way relationship is followed by a two-way interaction.
<p>Forging ahead</p> <p>Coffee in the Philippines</p>		<ul style="list-style-type: none"> ▪ Select firms' capabilities strong and increasing – extra GVC global learning mechanisms – substantial upgrading ▪ Few learning opportunities in GVC market based GVCs and weak system
<p>Stagnating:</p> <p>Aquaculture chains in Bangladesh</p>		<ul style="list-style-type: none"> ▪ Firm capabilities unchanged/developed marginally (stuck) ▪ IS fragmented and unable to support GVC; ▪ Limited absorptive capacity ▪ GVC participation stagnant; limited learning
<p>D: Declining:</p> <p>Cassava in Thailand, timber in Gabon</p>		<ul style="list-style-type: none"> ▪ Firms' capabilities weakened. ▪ Very weak IS unable to support GVC development ▪ Negative influence of lead firms in GVCs ▪ Influence of China's entry, product downgrading

Final takeaways

- ▶ The GVC and IS approaches **complement** each other.
- ▶ GVCs and IS interact – a **co-evolutionary relationship** with implications for the speed and direction of innovative capability accumulation at firm level;
- ▶ Virtuous process not automatic: needs **strategic intent and effort**. GVCs participation need to interact with firm-level efforts and IS support.
- ▶ More research needed on trajectories in different sectors, local **contexts** and countries at different levels of development – it is an emerging research track
- ▶ New role for **policies** – cannot assume an automatic and positive effect of GVC involvement for learning and capabilities building.





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