



Global Value Chain Analysis

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Presentation Overview

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Introducing Global Value Chains

The Value Chain and Global Value Chains

(www.globalvaluechains.org)

- The value chain describes the full range of activities that firms and workers do to bring a product from its conception to its end use and beyond.
- This includes activities such as design, production, marketing, distribution and support to the final consumer.
- The activities that comprise a value chain can be contained within a single firm or divided among different firms.
- Value chain activities can produce goods or services, and can be contained within a single geographical location or spread over wider areas.
- Global Value Chains are value chains that can be divided among multiple firms and spread across wide swaths of geographic space, hence the term "*global value chain*."

The Global Value Chain (GVC)

(Suder et al, 2014)

- GVC approach concentrates on how different tasks, activities and types of operations positioned in the value-chain are distributed across locations.
- Higher volumes of intermediate products such as parts, components and intermediate services are being produced in stages or processes across different countries and then exported to other countries for further production.
- Today almost 60% of trade in goods is in intermediates and the average import content of exports is around 40% (Lamy, 2013)
- Given the increasing complexity and sophistication in GVCs, it has been difficult to identify who produces what kind of value for whom by what kind of activity in the chain.

GVC Flows – Basic Concepts

(Baldwin and Lopez-Gonzalez, 2014)

- I2P - Importing to Produce - encompasses all imported intermediate inputs including raw materials and services
- I2E – Importing to Export - foreign intermediates are used to produce goods and services that are subsequently exported
- Value-added Trade - I2E is a recursive concept so double counting is pervasive.
 - A nation's imported intermediates from a given partner usually contain intermediates from third nations and even from the nation itself.
 - When the recursion is fully worked out – so that the origin of all primary factor inputs in exports is identified – we have factor-content trade, which has been labelled ‘value-added trade’

Foreign Value Added in Nations' Total Exports, 2009 Source: TiVA database.



The World Economy

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<http://onlinelibrary.wiley.com/doi/10.1111/twec.12189/full#twec12189-fig-0010>

Implications of GVCs

The emergence of GVCs suggest major paradigm changes

(Cattaneo et al 2013):

- (1) The change of relevant strategic framework, from countries to firms and GVCs.
 - A country cannot develop a competitive offer of goods or services in isolation.
 - Imports are a means for firms to access the most efficient inputs and free resources to focus on core competences.
 - Following business practices, policy should treat trade and FDI, both inward and outward, in an integrated framework.

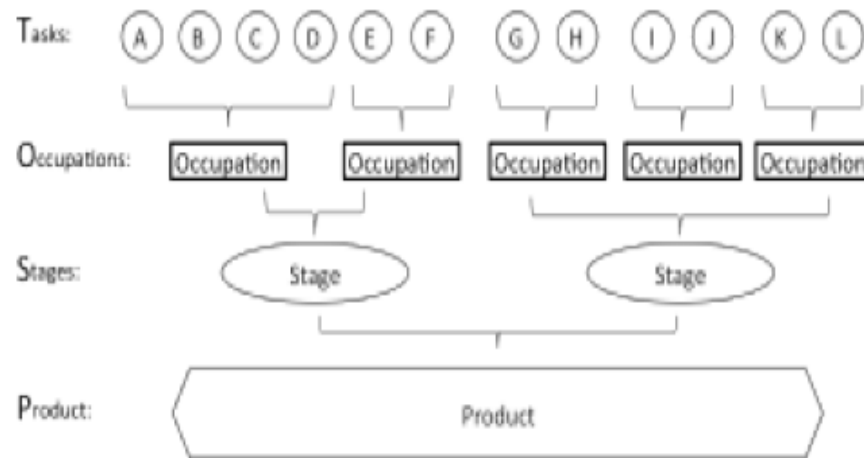
(2) The change of relevant economic framework, from industries to tasks and business functions. The objective is not to develop domestic industries that would capture all the segments of production or the whole value chain; it is to:

- o Identify the country's best position in the GVC and the most competitive supply of tasks or business functions;

- o Acknowledge that an efficient manufacturing sector requires efficient and competitive services as well as a skilled workforce and continuous innovation in products, processes and business models. Services such as financial intermediation, R&D, logistics, and marketing are necessary to produce higher value added manufactures.

GVCs offer an alternative outward-looking development model driven by trade and competitiveness. Countries do not need to develop vertically integrated industries to participate in global trade; it is enough to develop capacities in specific segments (stages of production, tasks or business functions) of the value chain. (Cattaneo et al., 2013)

The TOSP framework: tasks, occupations, stages, and products



Source: Baldwin and Evenett, 2012

Analysing GVCs

Trade in Value-Added (TiVA) indicators

(OECD/WTO, 2013)

- Focus on the estimation of the source(s) of value (domestic vs. foreign and/or by country and industry) that is added in producing goods and services for export.
- Growing global value chains means that a country's exports can increasingly rely on significant intermediate imports (i.e. value added by industries in upstream countries).
- However, the broad sectoral classification deployed hides important supply-chain specialisation occurring within sectors. It also makes sectoral comparisons between countries somewhat problematic.
- For example, the chemical sector in the TiVA tables can combine both base chemicals and pharmaceutical products. These subsectors differ in their use of intermediate products as well as their skill intensity.

(1) The country's participation in GVCs

- The question is to what extent the country is involved in vertically fragmented production, both as a user of foreign inputs for its own exports (measured as the value of imported inputs in the overall exports of a country) and as a supplier of intermediate goods or services used in other countries' exports (measured as the percentage of exported goods and services used as inputs to produce other countries' exports).

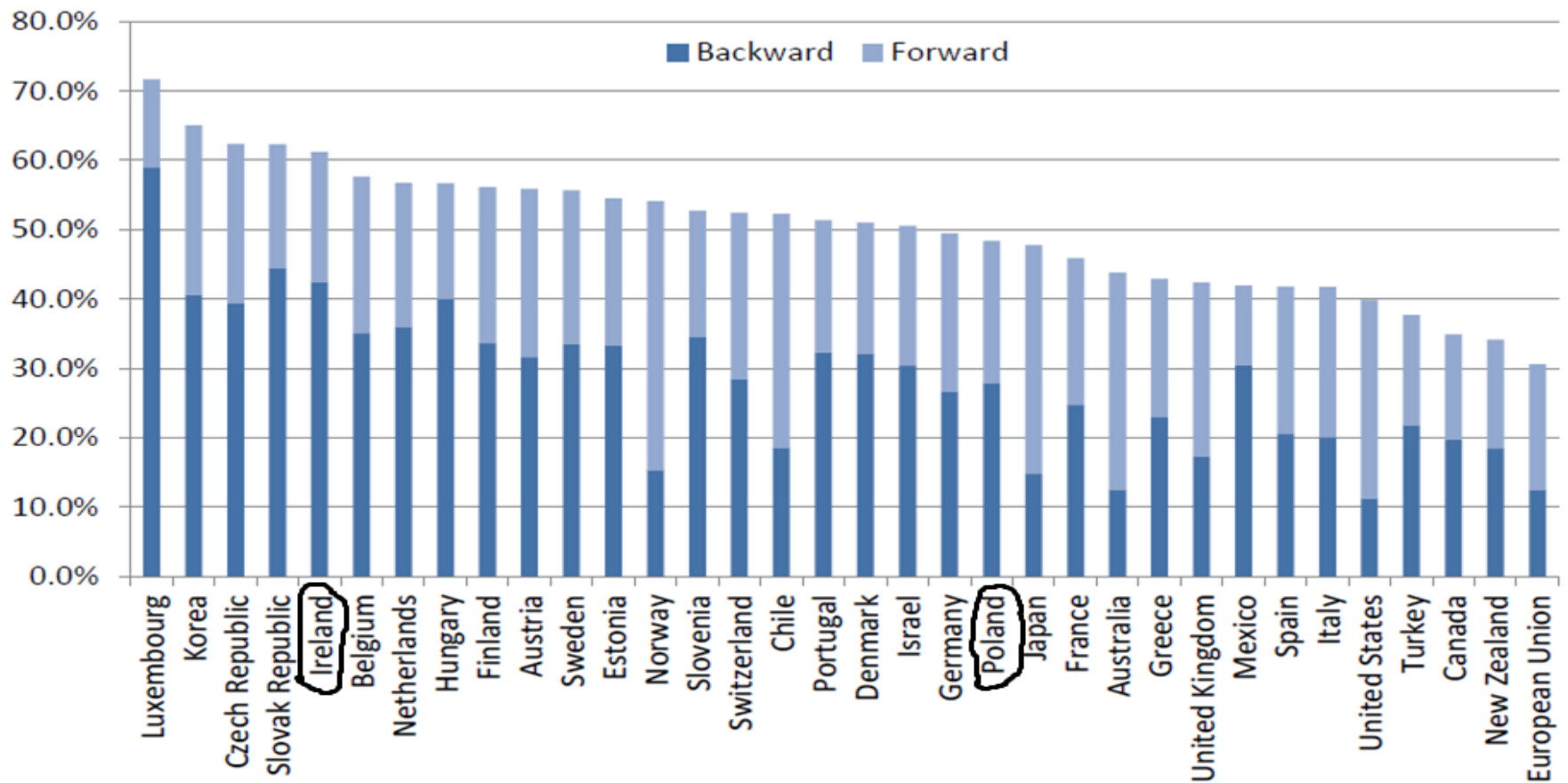
The GVC Participation Index

The higher the foreign value-added embodied in gross exports and the higher the value of inputs exported to third countries and used in their exports, the higher the participation of a given country in the value chain.

GVC participation index in OECD countries (2009)

(Backer, K. D. and S. Miroudot (2013), "Mapping Global Value Chains", *OECD Trade Policy Papers*, No. 159, OECD)

Foreign inputs (backward participation) and domestically-produced inputs used in third countries' exports (forward participation), as a share of gross exports (%)



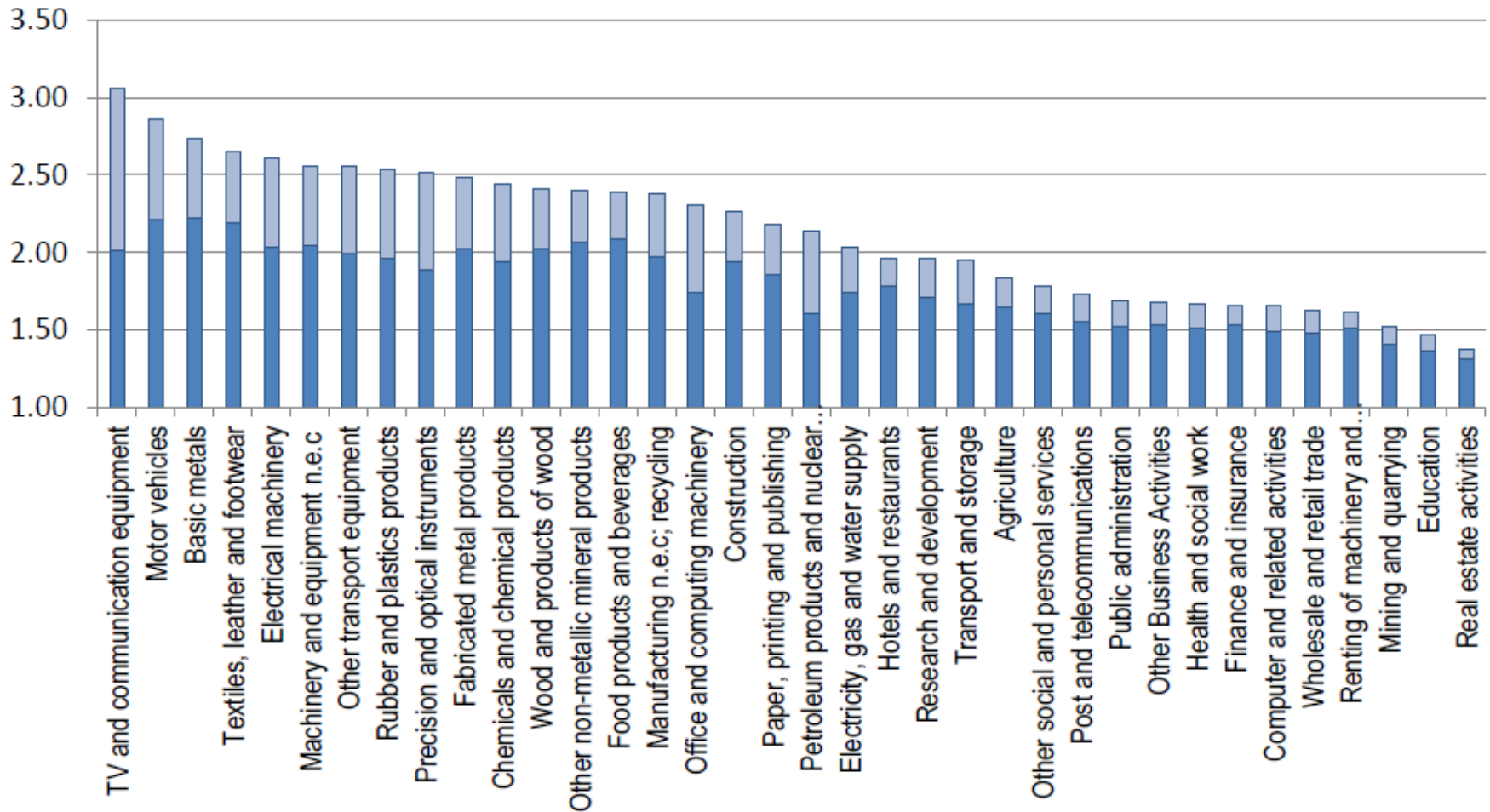
Source: Authors' calculations using the OECD ICIO model, May 2013 release.

(2) The length of GVCs

- The participation index does not provide information about the length of the value chain, i.e., the number of stages of production involved.
- Therefore, additional indicators were developed (Fally, 2011) to measure the actual fragmentation of the production process and identify the domestic and international parts of the GVCs.
- The value of the index could be interpreted as the actual number of production stages if it was calculated based on plant-level information. When calculated at the aggregate level, the value is only an index but still reflects the length of the value chain.
- The five industries with the highest level of fragmentation are: television and communication equipment, motor vehicles, basic metals, electrical machinery and textiles, leather and footwear; services have on average shorter value chains, with notable exceptions like transport and storage.
- This dimension may also give an indication of the scope for countries upgrading within GVCs, assuming that one can argue that longer (more fragmented) value chains provide more opportunities.

Length of GVCs by industry, 2008

Backer, K. D. and S. Miroudot (2013), "Mapping Global Value Chains", *OECD Trade Policy Papers*, No. 159, OECD)



Source: Authors' calculations based on the OECD ICIO model, May 2013 release. The minimum value of the index is 1 when no intermediate inputs are used to produce a final good or service.

(3) GVC Distance to final demand

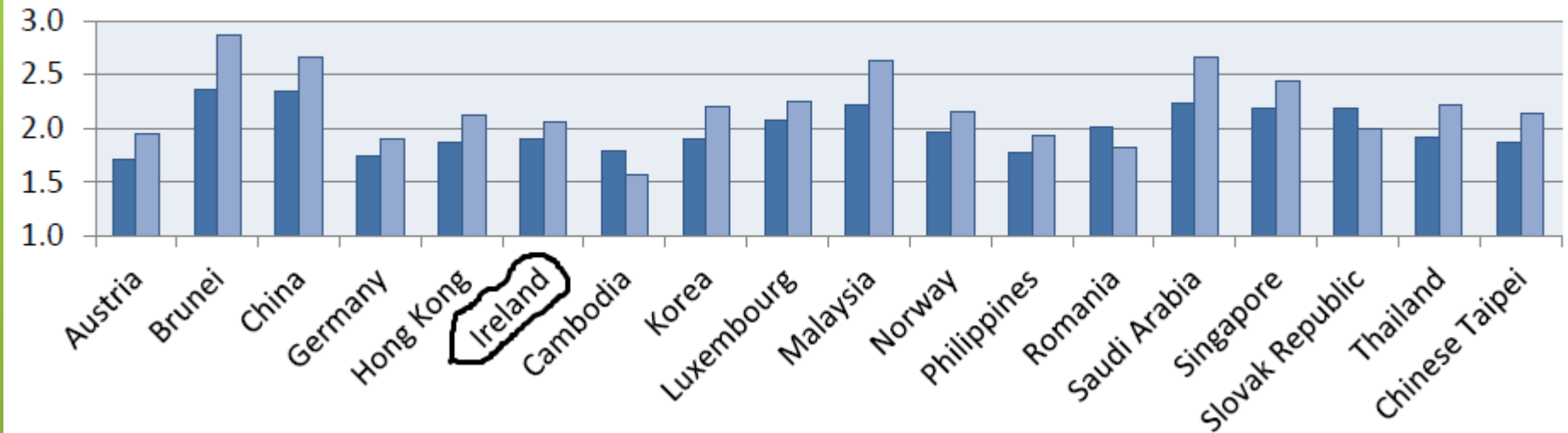
Starting from one industry in a given country, the index measures how many stages of production are left before the goods or services produced by this industry reach final consumers.

Distance to final demand, selected economies, 1995 and 2009

(Backer et al, 2013)

(Countries included are those where the distance to final demand changed by more than 8% between 1995 and 2009)

■ 1995 ■ 2009



GVCs and Smart Specialization

(Cattaneo et al, 2013)

- Trade and participation in GVCs are just intermediary objectives. The question is how much value is captured by the country in terms of jobs, income, technology diffusion, sustainable development, etc.
- The ability of a country to participate in global trade and benefit from the transfers that will generate growth and development is now partially linked to its ability to join major GVCs.
- Competitiveness is not measured in terms of a country's capacity to develop an integrated industry, but its capacity to identify its best position in GVCs. A country's competitiveness is measured at three levels:
 - *the capacity to join GVCs;*
 - *the capacity to remain part of GVCs; and*
 - *the capacity to move up the value chain within*

GVCs.

Note: Not addressed here the development and disruption of GVCs from within the region. These require a somewhat different set of considerations

Joining GVCs

- (1) Ensuring cost competitiveness
- (2) Improving the connectivity with international markets
- (3) Improving business and investment climates
- (4) Fostering innovation and building capacity

Preserving participation in GVCs

- *(1) Identifying the threats and opportunities*
- *(2) Responding to business priorities and strategies*
- *(3) Designing long-term strategies*

Moving up the value chain

(1) Upgrading

- Process upgrading
- Product upgrading
- Functional upgrading
- Chain or inter-sectoral upgrading

(2) Task bundling

(3) Workforce development and innovation

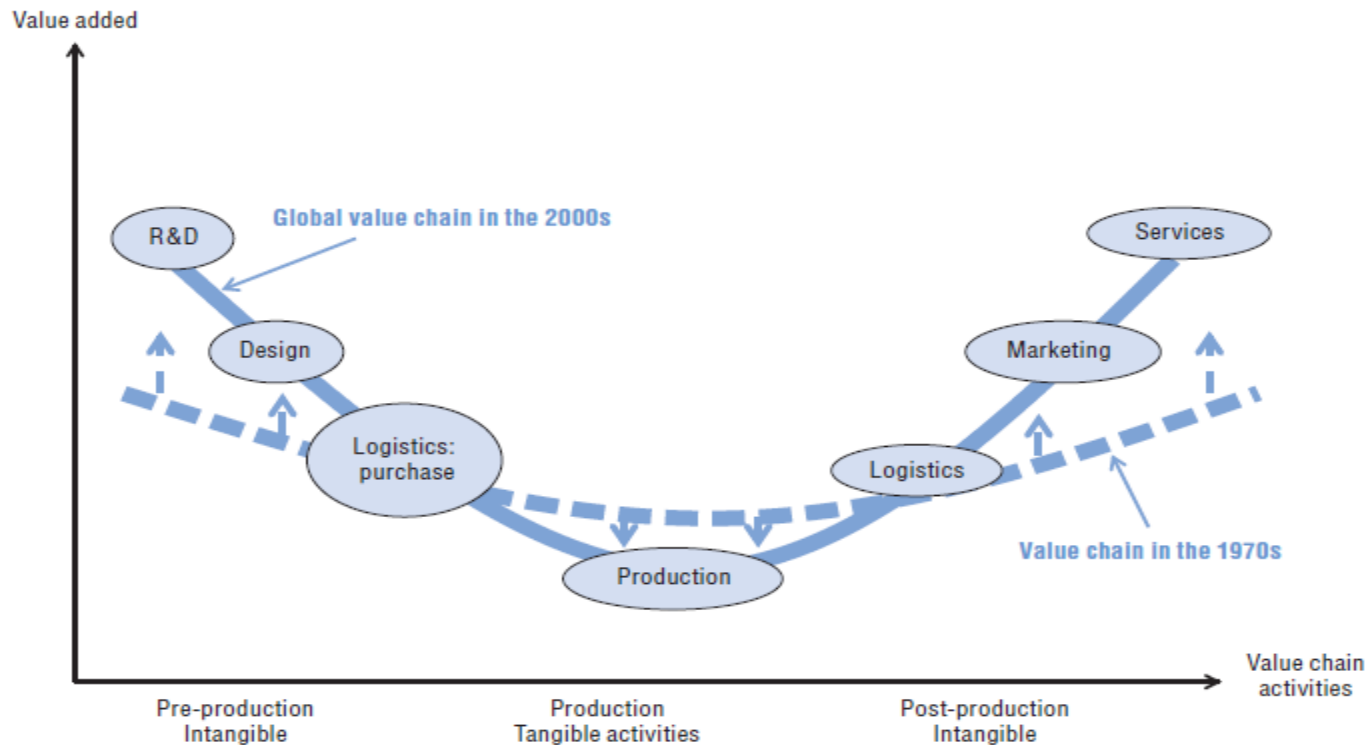
Upgrading of GVC activity and relevant intangibles

(OECD, 2013)

Type of upgrading	Essential knowledge-based capital	Replicability	Value created from upgrading
Chain upgrading	Firm-specific management skill (acquired from entrepreneurial trial and error), Flexible organisational structure	Low	High
Functional upgrading	Sophisticated technology and design, Recognised brand, marketing ability, Retail and collaboration networks	↓	↑
Product upgrading	Advanced production technology and quality management skill, good design, "Big data" on consumer preference		
Process upgrading	Rich know-how in process management, Efficient procurement network, software and other ICT processing complex tasks	High	Low

Source: Based on Kaplinski and Morris (2002).

The smiling curve: Value added along the GVC (OECD, 2013)



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

GVCs and Europe

- The regional dimension is essential when it comes to GVCs. Trade in integrated regions are more attractive to GVC lead firms for a number of practical reasons. These include (Cattaneo et al, 2013);
 - the reduction of the cumulative value of tariffs within free-trade areas;
 - the reduction of the administrative burden associated with rules of origin and the traceability of products;
 - the harmonization/mutual recognition of standards along the production chain; and
 - the reduction of the thickness of the border at large, including customs and trade facilitation procedures.
- The objective is not necessarily to develop an integrated industry, but to capture an important part of the chain's value-added by providing a regional bundle of tasks or services at pinch points of the GVC



The BioPharmaceutical Industry in Ireland

The evolution of the biopharma sector in Ireland over the last 30 years, and its projected future development

(Strategy in Action, Pharmachemical Ireland)

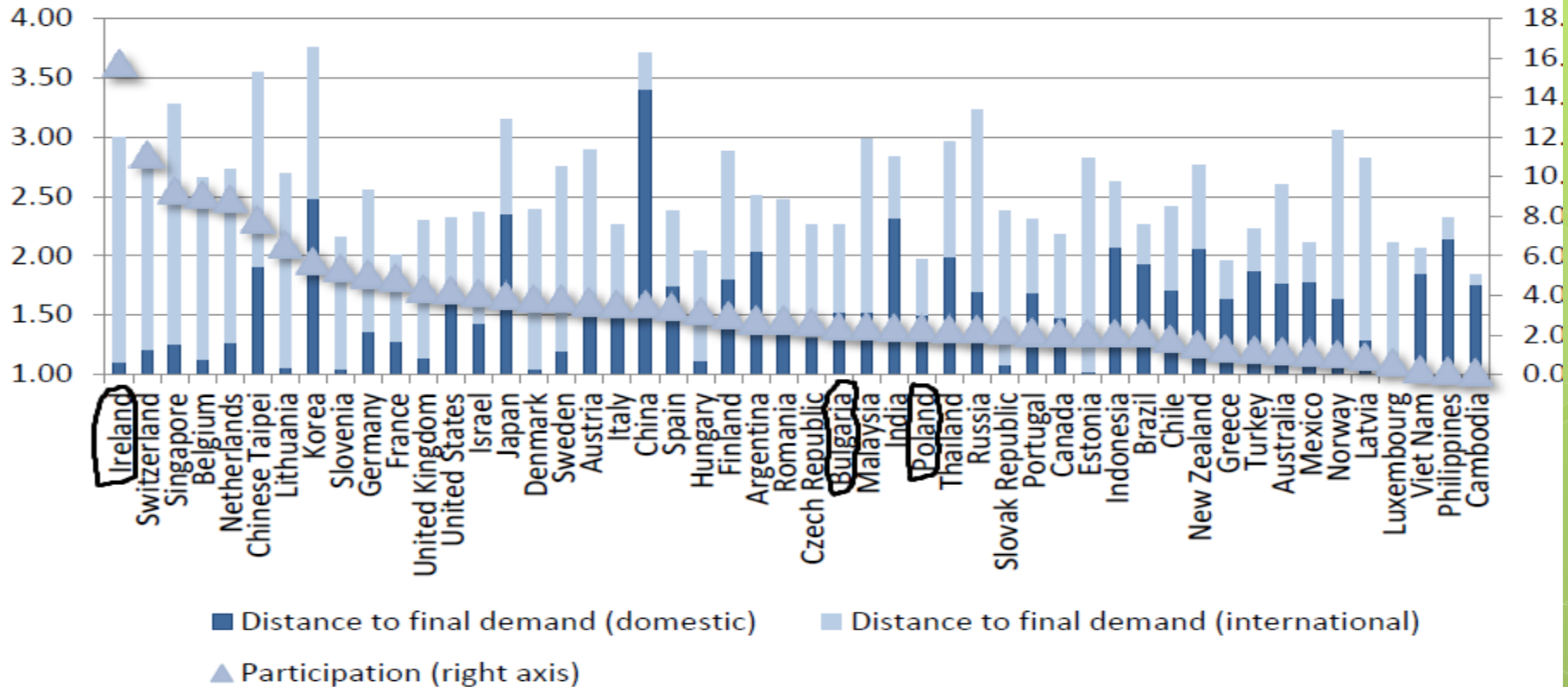
1960s -1980s	1980s- 1990s	2000s	2015s
Single platform technologies	Manufacturing of Liquids Tableting Patches Creams	Biopharma Regional HQ status	Value added generic pharmaceuticals
APIs manufacturing	Molecular diagnostics	Shared services- supply chain, regulatory, finance operation excellence process and product development	Convergent medical technologies
Q&A labs		Manufacture for clinical trails Pharma contract services	Personal medicines Combination medical products

Revealed Comparative Advantage (RCA) for Ireland's Chemical Sector

Year	RCA
1995	1.0749
2000	1.8244
2005	1.7271
2008	2.0509
2009	2.4839

Participation and distance to final demand – Chemicals – By country including Ireland (2009)

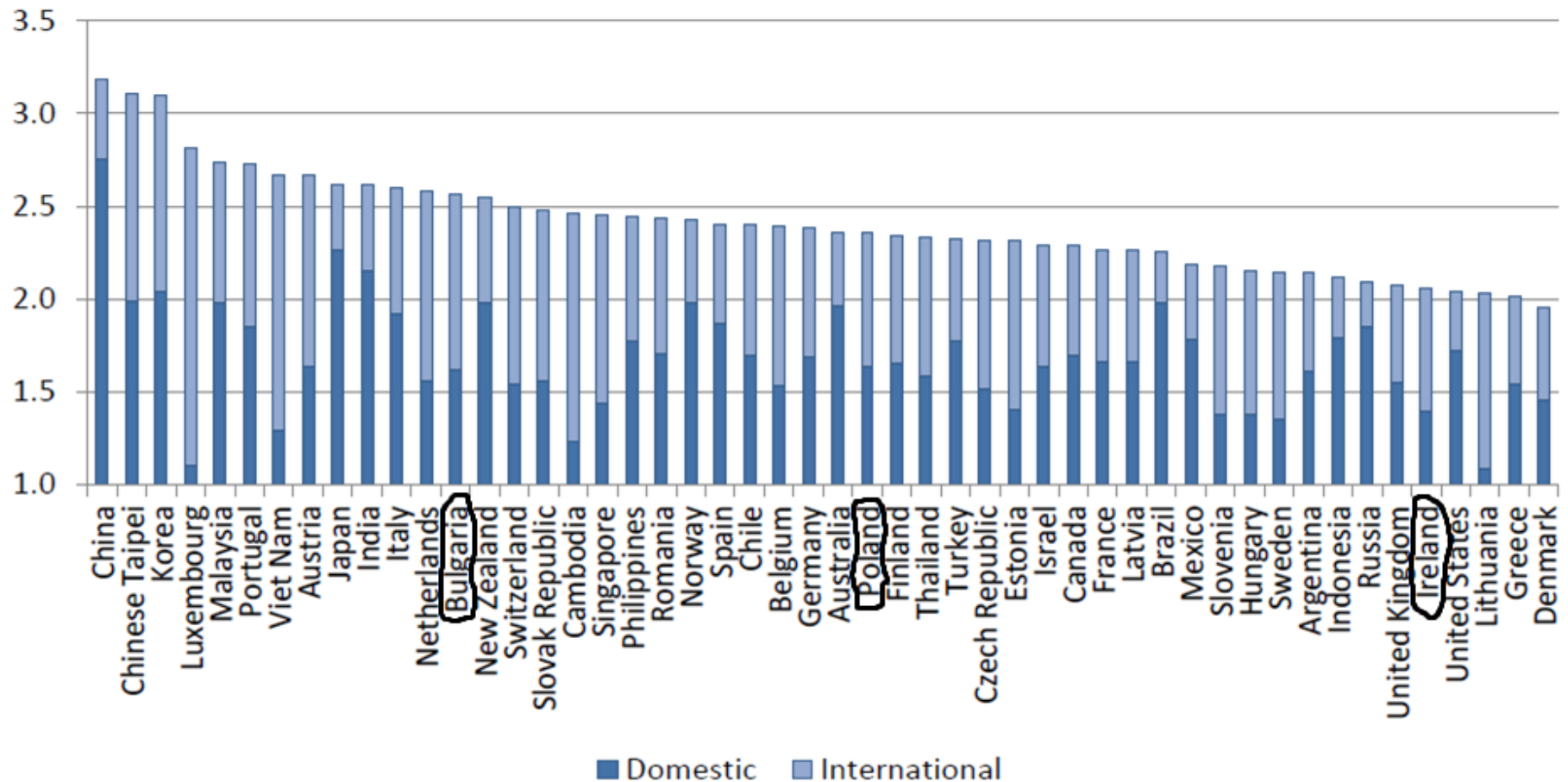
(Backer and Miroudot, 2013)



Source: Authors' calculations using the OECD ICIO model, May 2013 release.

Length index – Chemicals – By country including Ireland (2009)

(Backer and Miroudot, 2013)



Source: Authors' calculations using the OECD ICIO model, May 2013 release.

Ireland's Biopharma industry and Smart Specialization

- Instructive demonstration of smart specialization in Action via GVC specialization and embracing a holistic approach to development
- Links with the KETs and Ireland's own Research Prioritization
- Offers lessons for other regions



Thank you