Rethinking Global Value Chains (GVC) During COVID-19

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What are GVC?

- "Made in the World": Production has become globalized (fragmented) across the world

- GVC is a series of stages in the production of a good or service involving at least two countries
  - BMW works with 12,000 suppliers in 70 countries
  - Apple’s iPhone is made with hundreds of parts sourced in 43 countries, and assembled in China
  - Pfizer/BioNTech vaccine: 280 different components, manufactured in 86 different sites in 19 countries
GVC have become more important over time

**Source:** World Development Report 2020, World Bank

GVC trade includes: (i) transactions in which a country’s exports embody value added previously imported from abroad (backward GVC participation), and (ii) transactions in which a country’s exports are not fully absorbed in the importing country, but embodied in the importing country’s exports to third countries (forward GVC participation)
GVC Benefits and Risks

- GVC are characterized by
  1. Hyper-specialization
  2. Long-term relations between firms involved

- GVC benefit from comparative advantage
  - Specialization brings productivity gains and lower prices

- But there are risks...
  - Propagate shocks across industries and countries
  - Shocks: trade barriers, natural disasters, pandemics, ...
The current debate on GVC

The COVID-19 crisis has revived a debate about the international fragmentation of production

- Shipping costs have increased (shortages of containers, limited staffing, pandemic-related delays)
- Export curbs on essential medical goods (Leibovici and Santacreu, 2021)
- Global lockdowns have impacted disproportionately more those industries that rely heavily on GVC (Santacreu, Leibovici and LaBelle, 2021)
Shipping Costs

- March 23rd: Giant container ship Ever Given gets stuck in Suez Canal
- By March 29th: Hundreds of ships waiting to pass through
- Global supply chains disruptions
Shipping Costs

Freightos Baltic Index (FBX) Global Container Index

FBX Global Container Freight Index

07-May-21 / $4,619

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The current debate on GVC

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  - Shipping costs have increased (shortages of containers, limited staffing, pandemic-related delays)
  - Export curbs on essential medical goods (Leibovici and Santacreu, 2021)
  - Global lockdowns have had a disproportionately higher impact on those industries that rely heavily on GVC (Santacreu, Leibovici and LaBelle, 2021)
Temporary trade restrictions caused supply shortages of active pharmaceutical ingredients and essential medical equipment.

Source: Leibovici and Santacreu, 2020. Data from Global Trade Alert.
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In Santacreu, Leibovici and LaBelle (2021), we measure an industry’s exposure to foreign shocks via GVC with:

- **Intensity of GVC**: What percentage of an industry’s exports are composed of foreign value added?
  - Raw materials (e.g., aluminum); intermediate inputs (e.g., car parts); tasks (e.g., back-office services)

- **Concentration of GVC**: What is the market share of the suppliers of foreign value added? (Herfindahl index)
  - Are GVC diversified across many suppliers or concentrated in a few of them?
An Example: Foreign Value Added Content in Motor Vehicle Industry

- 24% of exports embody foreign value added
- Main suppliers: China, Mexico, Japan and Canada (Herfindahl > 900)

Source: OECD, TIVA
Intensity and Diversification of GVC

A. Intensity

- Coke and refined
- Motor vehicles
- Machinery and equipment
- Basic metals
- Electrical equipment
- Textiles
- Metal products
- Other transport equipment
- Rubber and plastic
- Wood
- Paper and printing
- Other manufacturing
- Chemicals and Pharmaceutical
- Food products
- Other non-metallic mineral
- Computer and electronic

B. Concentration

- Coke and refined
- Textiles
- Computer and electronic
- Wood
- Other manufacturing
- Other non-metallic mineral
- Electrical equipment
- Motor vehicles
- Paper and printing
- Machinery and equipment
- Rubber and plastic
- Other transport equipment
- Metal products
- Chemicals and Pharmaceutical
- Basic metals
- Food products

Source: Santacreu, Leibovici and LaBelle (2021). Data from OECD, TIVA
Global Lockdowns During COVID-19

A. Employment and foreign exposure

Employment growth January to June 2020 (percent)

Exposure to global lockdowns through GVC (percent)

Source: Santacreu, Leibovici and LaBelle (2021). Construct and index of exposure to global lockdowns through GVC.
Rethinking GVC

▶ How can the stability and resilience of GVC increase without losing efficiency gains?

1. Perfect diversification to hedge the risks

2. Re-shoring or re-nationalization

▶ Re-structuring GVC is costly

► High fixed costs of establishing relationships between firms

► Some imported inputs are specific to particular suppliers or regions (rare metals from China needed for semiconductors)

► It may be difficult to scale-up production quickly
The policy challenge to ensure robustness and resilience is complex

- **Short-term solutions.** When a crisis hits...
  1. Temporary measures in times of crisis (Defense Production Act to scale-up production of essential medical equipment)
  2. International cooperation

- **Medium-term solutions.** Before a crisis hits...
  1. Stockpiling: having a local or global reserve of essential goods
  2. Build-up domestic supply chains of critical sectors
  3. International cooperation