

The Global Value Chain Paradigm in Agriculture: Data Advances and Trade Policy Effects

Silvia Nenci¹ Ilaria Fusacchia²

¹Roma Tre University

²University of Basilicata

THE LEGACY OF LUCA SALVATICI

10 June 2026

ARA PACIS - Rome

Aim

- Not a presentation of an original research paper
- Not a review of the state of the art on GVCs in agriculture
- First and foremost, a **tribute** to Luca's academic contribution

Focus

- To recall some of Luca's **recent contributions** through:
 - research projects
 - publications
 - scientific collaborations

What we will discuss

- Research contributions in which we were directly involved
- **Global value chains analysis and trade policy effects**
- Focus on **agricultural and agri-food sectors**
- **Methodological, instrumental and data-related** contributions
- They represent **significant advances** in the relevant literature

- Strong focus on rigorous **empirical tools**
- **Methods supporting** economic **policy** analysis and **decision-making**
- **Collaborative contributions**, often **made available** to the academic community

Core idea

Academic work should be methodologically robust and relevant to society

- Luca's work was embedded in a wide **national and international network**, built over time through collaboration, exchange and mutual esteem.
- This network gave rise to a number of **research projects**, which provided the framework for:
 - developing methodologies;
 - applying empirical tools;
 - disseminating research outputs.
- We also wish to highlight the **projects promoted by Luca** in recent years in which he **genuinely involved** us along with other senior and junior colleagues.

Horizon Europe – BATMODEL Better agri-food trademodelling for policy analysis



Horizon Europe – ACT4CAP27 Analytical tools supporting the Common Agricultural Policy after 2027



National and European projects connected to this research agenda

The Context: Why analyse GVCs in agriculture?

GVCs in a changing world economy

- GVCs remain a **central feature** of the world economy.
- Recent shocks – pandemic, trade tensions and geopolitical fragmentation – have not reversed globalisation, but have contributed to **reshaping production networks** through regionalisation, diversification and digitalisation (Inomata and Hanaka, 2024; Yusuf, 2024).

Opportunities for agriculture

- Agricultural and agri-food GVCs can be an **important channel for agricultural growth**, especially in developing countries (Montalbano and Nenci, 2022; Lim, 2021).
- Participation may offer opportunities for:
 - **market access, higher prices and income gains** for farmers and rural communities (Rao and Qaim, 2011);
 - **technology transfer, knowledge diffusion and productivity growth** (Nguyen et al., 2024);
 - **specialisation, upgrading and competitiveness** (Crisciuolo and Timmis, 2017).

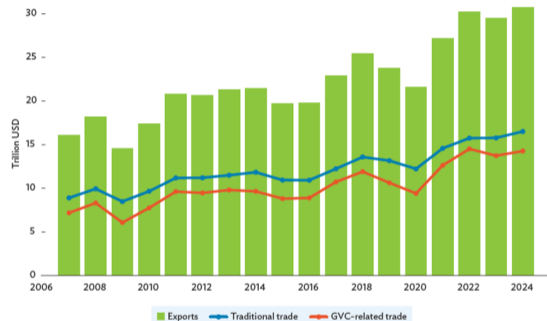
Risks and policy relevance

- However, the **benefits are not automatic or evenly distributed** across countries, sectors and producers (Scoppola, 2022; Greenville et al., 2019).
- Deeper integration may **also generate risks**, such as dependence on imported inputs or displacement of domestic production (Banga, 2016).
- Analysing agricultural GVCs is therefore **key to understanding** under what conditions participation can support sustainable and inclusive development.

Measuring GVCs

- Analysing agricultural GVCs requires **appropriate measurement tools**.
- A key approach is the **decomposition of gross trade into value-added components** (Koopman et al., 2014; Borin and Mancini, 2023).
- This allows us to distinguish between:
 - **traditional trade**, based on purely bilateral trade flows,
 - **GVC-related trade**, namely exports involving multiple border crossings, i.e. intermediate inputs.

Figure 1 - World Gross Exports and GVC-related trade, 2007-2024



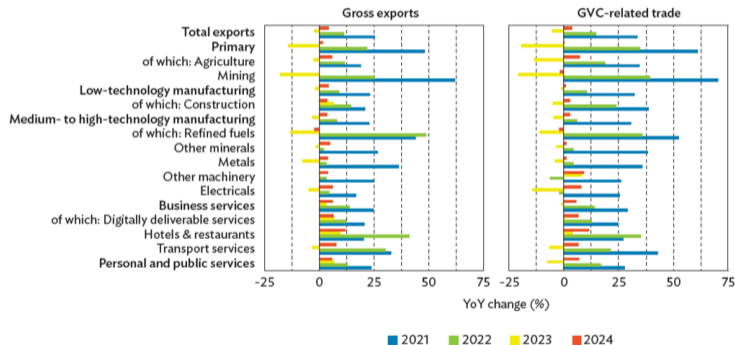
Note: Gross exports decomposition follows the framework of Borin and Mancini (2019). Traditional trade refers to the value of gross exports corresponding to purely bilateral trade. GVC-related trade refers to the value of gross exports involving multiple border crossings.

Source: Asian Development Bank Multiregional Input-Output Database; and Asian Development Bank estimates.

Measuring GVCs by sectors

- The evidence for recent years points to **strong heterogeneity** across sectors: primary sectors, including **agriculture**, display **higher volatility**, largely reflecting fluctuations in commodity prices and global demand.

Figure 2 - Trade Growth by Selected Sectors, 2021-2024



Note: GVC-related trade refers to the value of gross exports involving multiple border crossings.

Source: Asian Development Bank Multiregional Input-Output Database; and Asian Development Bank estimates.

Measuring GVC participation and positioning

- Moving beyond gross trade statistics requires value-added decomposition and multi-region input-output data.
- These tools identify the actual contribution of countries and sectors to internationally fragmented production.

GVC participation

- **Backward participation:** foreign value added embodied in imported inputs used for exports (Hummels et al., 2001).
- **Forward participation:** domestic value added embodied in intermediate exports re-exported by partners (Koopman et al., 2014; Borin and Mancini, 2023).

GVC positioning

- **Upstreamness:** distance from final demand (Fally, 2012; Antràs et al., 2012; Antràs and Chor, 2013).
 - **Downstreamness:** distance from primary factors of production, or sources of value added (Fally, 2012).
- These measures help assess countries' and sectors' participation, position, and exposure to trade policy effects along GVCs.

First contribution: the GTAP-VA module

One of Luca's first contributions on this topic, developed together with Ilaria Fusacchia and Alessandro Antimiani around ten years ago, was the construction of the **GTAP-VA module**.

- **What was done:** GTAP-VA extends the GTAP model and database to analyse global value chains in terms of value added.
- Compared with standard GTAP-based models, it decomposes gross trade flows to identify:
 - the country and sector origin of value added embodied in exports;
 - where this value added is absorbed or used;
 - backward and forward GVC linkages;
 - how value-added flows change after policy simulations.

- **Approach:** GVCs are viewed as a set of general equilibrium interdependencies between countries, reflecting preferences, technology, endowments and policy.
- **Model-integrated tool:** GTAP-VA integrates GVC indicators into a CGE model to assess policy shocks within global production networks.

What is involved in a policy simulation?



Trade policy shock in GTAP-VA:

- ① **Substitution and reallocation effects** (trade creation and trade diversion).
- ② **Chain effects** (impact on output across sectors and countries transmitted through supply-chain linkages).

Methodological

Formalises and operationalises value-added trade decomposition within the GTAP framework.

Instrumental

Provides an operational module for GVC, trade and environmental policy analysis.

Policy relevance

Allows for better assessment of the effects of tariffs, trade agreements and economic shocks.

Bridge

Links input-output approaches to GVC analysis with CGE-based policy simulation.

Journal of Global Economic Analysis, Volume 3 (2018), No. 2, pp. 69-105.

GTAP-VA: an Integrated Tool for Global Value Chain Analysis

ALESSANDRO ANTIMIANI¹, ILARIA FUSACCHIA¹

AND LUCA SALVATICI¹

Economia Politica
<https://doi.org/10.1007/s40888-020-00202-8>

ORIGINAL PAPER

An assessment of import tariff costs for Italian exporting firms

Ilaria Fusacchia¹ · Alessandro Antimiani² · Luca Salvatici¹

Received: 31 December 2019 / Accepted: 28 September 2020

European Review of Agricultural Economics Vol 49 (1) (2022) pp. 237–284
doi:<https://doi.org/10.1093/erae/fbab046>
Advance Access Publication 18 October 2021

The AfCFTA impact on agricultural and food trade: a value added perspective

Ilaria Fusacchia[†], Jean Balié[‡] and Luca Salvatici^{†,*}

[†]Roma Tre University, Rome, Italy; [‡]International Rice Research Institute, Los Baños, Philippines

Oxford Review of Economic Policy, Volume 38, Number 1, 2022, pp. 27–49

The consequences of the Trade and Cooperation Agreement for the UK's international trade

Ilaria Fusacchia,^{*} Luca Salvatici,^{**} and L. Alan Winters^{***}

This contribution concerns the micro-foundation of ICIO databases through the integration of firm-level data, with applications to Italy and France.

- **What was done:**

- firm-level trade data were integrated into the ICIO framework to build a more granular and empirically grounded database for measuring GVC participation and trade in value added.
- More specifically, firm-level import data were combined with the GTAP-MRIO framework to identify actual sourcing patterns of imported intermediate inputs.

Micro-foundation: why it matters

Main limitation addressed

Standard ICIO tables often rely on the proportionality assumption, allocating imported inputs uniformly across sectors and users without fully capturing the heterogeneity of sourcing behaviour.

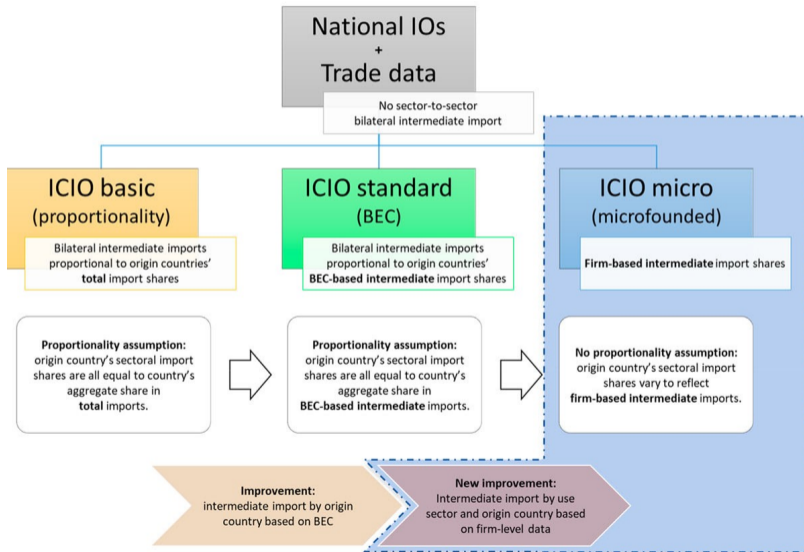
Improvement

Firm-level import data allow imported intermediate inputs to be attributed more accurately to user sectors and countries of origin.

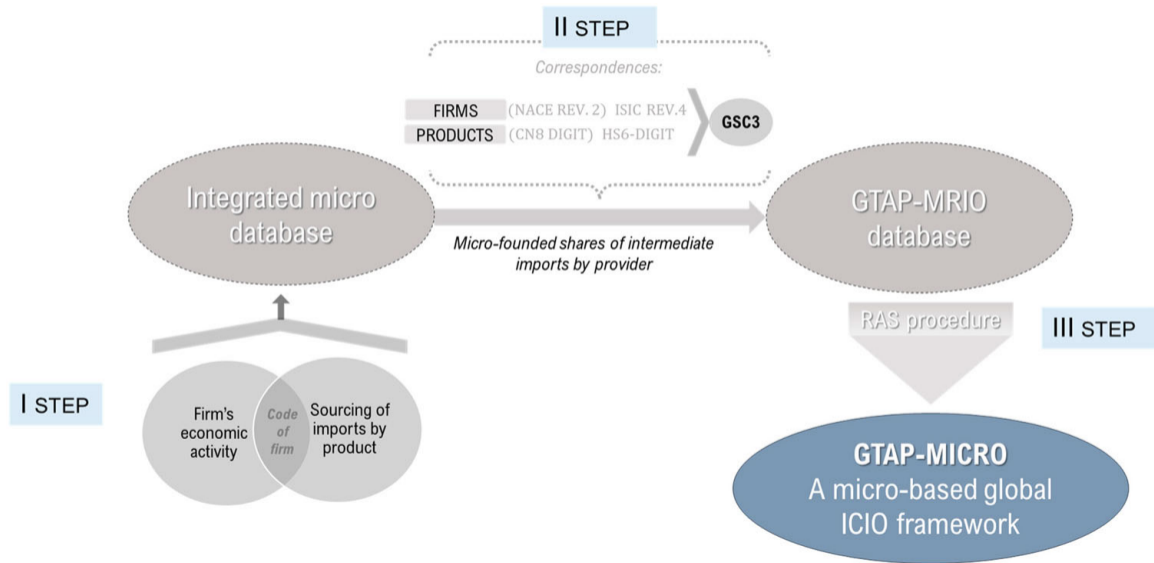
Result

A more precise representation of production linkages and a more accurate computation of GVC indicators.

From Standard ICIO Assumptions to Micro-Foundation



Workflow for building GTAP-micro database



Micro-founded ICIO databases: value and novelty

Methodological

Develops a micro-founded ICIO framework integrating firm-level import data to improve the allocation of imported intermediate inputs across sectors and trading partners.

Empirical

Enhances country-specific information while preserving the internal and global consistency of the GTAP database.

Research and policy relevance

Supports the computation of more accurate GVC indicators and policy simulations based on a richer representation of production linkages.

Replicability and collaboration

Designed to be transferable to other countries whenever suitable firm-level data are available, fostering the progressive micro-foundation of global ICIO databases and international research collaboration.



Economic Systems Research

ISSN: 0953-5314 (Print) 1469-5758 (Online) Journal homepage: www.tandfonline.com/journals/cesr20

From micro to macro: integrating firm-level data to enhance global production systems analysis

Ilaria Fusacchia, Enrico Marvasi, Silvia Nenci, Federico Sallusti & Luca Salvatici



Ilaria Fusacchia, Anna Giunta,
Marianne Mantuano, Enrico
Marvasi, Silvia Nenci, Luca
Salvatici and Davide Vurchio

MICROFOUNDATION OF
ICIO TABLES THROUGH
FIRM-LEVEL DATA:
ENHANCING GVC
PARTICIPATION AND
POSITIONING INDICATORS



Reshaping Global Value Chains

Approaches and Insights from Economics

Editors: [Randolph Luca Bruno](#), University College London and Catholic University of the Sacred Heart
[Maria Cipollina](#), Università degli Studi del Molise, Italy

Randolph Luca Bruno, Maria Cipollina, Ilaria Fusacchia, Kossi Messanh Agbekponou, Silvia Nenci, Luca Salvatici, Pieter Woltjer, Bart Losb, Marcel P. Timmer, Peter Egger, Katharina Erhardt, Gerard Masllorens, Roman Stöllinger, Sébastien Miroudot, Carolina Castaldi, Narula Rajneesh, Irina Surdu-Nardella, Wonsub Eum, Taewon Kang, Luca De Benedictis, Lucia Tajoli, Stefano Costa, Federico Sallusti, Claudio Vicarelli, Socrates Majune, Roberta Piermartini, Victor Stolzenburg, Leila Baghdadi, Insaf Guedidi, Inmaculada Martínez-Zarzoso, Anca M. Voicu, Sunny Li Sun, Yue Lu, William C. Zhou, Nora Aboushady, Chahir Zaki, Wei Liang, Andrea Coveri, Elena Paglialunga, Antonello Zanfei, Lorenzo Cresti, Giovanni Dosi, Federico Riccio, Maria Enrica Virgillito, Giorgia Giovannetti, Luca Lodi, Enrico Marvasi, Anna Fedyunina, Yuri Simachev, Natalia Volgina, Marcus Bansah, Navpreet Singh, Joshua Preiss

Published: September 2026

Availability: Not yet published - available from September 2026

Format: Hardback

ISBN: 9781009541619

Table of Contents

Part I. GVCs – Measurement, Innovation, and Technology:
1. What's in a GVC trade flow? Global databases and micro-evidence

Third contribution: Trade-policy elasticities for GVC-based simulations

What we are currently doing

- This contribution refines the **trade-policy elasticities** used in CGE models with a GVC dimension, focusing on **tariffs, non-tariff measures and their effects on global value chains**.
- The aim is to provide **empirically grounded parameters** to improve the representation of trade-policy shocks in models such as MAGNET and GTAP-VA.

Tariffs

Estimates substitution elasticities across foreign sources using a tariff-based gravity identification strategy at the GTAP sectoral level. The estimates are mapped from HS6 products to GTAP sectors and organised for the MAGNET GVC module by sector, agent – intermediate versus final demand – and region.

Non-tariff measures

Estimates sector-specific NTM elasticities through a gravity model, distinguishing between intermediate and final goods and between different types of measures, such as SPS and TBT. The estimated elasticities are introduced into GTAP-VA to simulate effects on gross trade, domestic and foreign value added, and GVC linkages.

Trade-policy elasticities: value and novelty

Methodological

Replaces ad hoc or highly aggregated parameters with econometrically estimated elasticities, tailored to the structure of CGE models with a GVC dimension.

Novelty

Introduces heterogeneity across sectors, regions, agents – intermediate versus final users – and stages of production, going beyond standard specifications.

Policy relevance

Improves the simulation of tariff and non-tariff shocks, allowing a more accurate assessment of their effects on value-added trade and GVC participation.

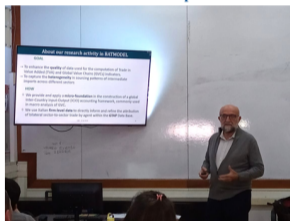
Replicability

Provides structured parameter datasets for model implementation, built from trade data, tariff and NTM information, gravity variables, product classifications and GTAP concordances.

Research projects as outcomes and drivers

These research activities were both shaped by, and contributed to, a broad network of **national and European projects**, which supported the development, application and dissemination of the methodologies discussed so far, while strengthening **collaboration across researchers and institutions**.

Horizon Europe Batmodel Project



Horizon Europe ACT4CAP Project



ACT4CAP is funded by the European Union Horizon Europe Grant Agreement No. 101120876. Views and opinions expressed are however those of the authors only and do not necessarily reflect those of the European Union or the European Commission. Neither the European Union nor the granting authority can be held responsible for them.



- Luca firmly believed in an **evidence-based approach**: academic research should be methodologically robust and useful to society.
- His work aimed to provide concrete knowledge to **inform the design of public policies**.
- This perspective shaped several **studies** on the **impact of free trade agreements** and **trade-policy shocks**.

- Here are just some recent reports aimed at providing **evidence-based policy guidelines**



Recent policy-oriented reports

Luca's intellectual legacy

- Finally, after highlighting the richness and relevance of Luca's research legacy, we wish to remember Luca's great **intellectual curiosity** and **generosity**.
- He was always ready to encourage **new reflections** and to open up **new lines of research** on these topics.
- He cared deeply about **involving colleagues, students, PhD candidates and early-career researchers** in many activities.
- He did so with **enthusiasm** and with a **natural ability to bring people together**, both in formal contexts and through more informal occasions (such as the memorable dinners he hosted at his home with his family!).

A community of friends, colleagues and students



A community built through research, collaboration and friendship

A living legacy

- Students, PhD candidates and early-career researchers found in Luca an **attentive and available point of reference**.
- He was able to **transmit knowledge, stimulate critical thinking** and **foster active participation in academic life**.
- Many of those **people** – some of whom are here today – have become a **community**, now active in universities, research centres and institutions.
- They are **Luca's true legacy: the seed that has grown into a plant and put down roots**.

It is they, it is we, who have the burden and the honour of continuing to cultivate those ideas, that sense of community, and that passion.

Thank you

To Luca, and to the community he helped to build