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Global value chain approach and micro-level analysis: a innovative framework of analytical elements and future research opportunities

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Abstract

Objective: This article proposes an innovative framework of elements for quantitative and micro-analytical investigations in the field of the Global Value Chain (GVC) approach. It also seeks to suggest some mutual benefits from bridging this approach with the Structure-Conduct-Performance (SCP) model.
Methodology: A literature review and bibliometric analysis were conducted on studies associated with the GVC and SCP approaches, using the Scopus and Google Scholar databases.
Originality/Relevance: In the literature related to the GVC approach, researchers recognize a gap in quantitative and micro-analytical studies. This research contributes to filling that gap. Moreover, it proposes a connection between the GVC and SCP approaches.
Main Results: It identifies the obstacles to the development of quantitative and/or micro-level research in the field of GVC and presents a framework of analytical elements.
Theoretical/Methodological Contributions: It discusses the limitations and capabilities of using these elements and the potential impacts of future research aimed at addressing gaps in the GVC field. Additionally, it summarizes some benefits of bringing the GVC and SCP paradigms closer together.
Social/Management Contributions: It highlights the mutual benefits of linking both approaches and underscores the importance of this for the greater consolidation and acceptance of GVC analysis in academic and political environments. Finally, it emphasizes the academic and political relevance of the studies it seeks to promote.

Keywords: analysis, GVC, research agenda, SCP

Abordagem de cadeia global de valor e análise em nível micro: um quadro inovador de elementos analíticos e oportunidades de pesquisas futuras

Resumo

Objetivo: Este artigo propõe uma estrutura inovadora de elementos para investigações quantitativas e micro analíticas no campo da abordagem de cadeia global de valor (CGV). Ele também procura sugerir alguns benefícios mútuos da aproximação dessa abordagem com o modelo de estrutura, conduta e desempenho (ECD).
Metodologia: Foi realizada uma revisão da literatura e análise bibliométrica de estudos associados às abordagens de CGV e ECD, a partir das bases Scopus e Google Scholar.
Originalidade e Relevância: Na literatura relacionada à abordagem de CGV, os pesquisadores reconhecem uma lacuna de estudos quantitativos e micro analíticos. Esta pesquisa contribui para preencher essa lacuna. Além disso, ela propõe uma aproximação entre as abordagens de CGV e ECD.
Principais resultados: Aponta os obstáculos para o desenvolvimento de pesquisas com viés quantitativo e/ou com unidades de microanálise no campo das CGVs e apresenta uma estrutura de elementos analíticos.
Contribuições teóricas/metodológicas: Discute as limitações e capacidades no uso desses elementos e os possíveis impactos de pesquisas futuras que buscam preencher lacunas no campo das CGVs. Adicionalmente, resume alguns benefícios da aproximação entre os paradigmas de CGV e ECD.
Contribuições Sociais/contribuições gerenciais: Aponta os benefícios mútuos de uma aproximação para ambas as abordagens e destaca a importância disso para uma maior consolidação e aceitação da análise de CGV em ambientes acadêmicos e políticos. Por fim, destaca a importância acadêmica e política dos estudos da natureza que busca estimular.

Palavras-chave: agenda de pesquisa, analises, CGV, ECD

Enfoque de las cadenas globales de valor y análisis a nivel micro: un marco innovador de elementos analíticos y oportunidades para futuras investigaciones

Resumen

Objetivo: Esta investigación propone una estructura innovadora de elementos para investigaciones cuantitativas y micro analíticas en el campo del enfoque de la cadena global de valor (CGV). También busca sugerir algunos beneficios mutuos de la aproximación de este enfoque con el modelo de estructura, conducta y desempeño (ECD).
Metodología: Se realizó una revisión de la literatura y un análisis bibliométrica de estudios asociados a los enfoques de CGV y ECD, a partir de las bases de datos Scopus y Google Scholar.
Originalidad y relevancia: En la literatura relacionada con el enfoque de CGV, los investigadores reconocen una falta de estudios cuantitativos y micro analíticos. Esta investigación contribuye a llenar ese vacío. Además, propone una aproximación entre los enfoques de CGV y ECD.
Principales resultados: Señala los obstáculos para el desarrollo de investigaciones con un enfoque cuantitativo y/o con unidades de microanálisis en el campo de las CGV y presenta una estructura de elementos analíticos.
Aportes teóricos/metodológicos: Discute las limitaciones y capacidades en el uso de estos elementos y los posibles impactos de investigaciones futuras que busquen llenar las lagunas en el campo de las CGV. Adicionalmente, resume algunos beneficios de la aproximación entre los paradigmas de CGV y ECD.
Contribuciones Sociales/Contribuciones de Gestión: Señala los beneficios mutuos de una aproximación entre ambos enfoques y destaca su importancia para una mayor consolidación y aceptación del análisis de CGV en entornos académicos y políticos. Por último, subraya la importancia académica y política de los estudios que buscan promover.

Palabras clave: agenda de investigación, análisis, CGV, ECD

Introduction

Due to the globalization of production, trade liberalization, and the reduction of logistical costs that intensified at the end of the 20th century, an analytical approach called Global Value Chains (GVC) was introduced in production chain studies. From this perspective, the functions of a value chain become fragmented and scattered around the globe. The merit of the GVC approach lies in the fact that the analysis does not focus solely on the stages of transforming inputs into goods and services, i.e., the concept of input-output, but rather on a broader context. It considers the value generation of the final product or service, taking into account aspects related to chain governance, technological development, institutional factors, geographical scope, and the roles of stakeholders (Gereffi, 2019; Fernández-Stark & Gereffi, 2019).

Since the 2000s, there has been growing interest in research related to the GVC framework across various fields such as sociology, economics, regional studies, geography, and technological innovation. However, firm-level studies with a quantitative approach are scarce and generally involve limited dimensions of analysis without advancing toward an integration of the many possible perspectives. Additionally, regardless of the unit of analysis (macro or micro), the discussions are strongly marked by a qualitative perspective (De Backer et al., 2018; Frederick, 2014; Sturgeon & Gereffi, 2009).

The Structure, Conduct, and Performance (SCP) model was an empirical framework that dominated economic thinking until the 1980s and was undoubtedly linked to the Industrial Organization (IO) school

(Lee, 2007; Panhans, 2023). However, the same cannot be said about the GVC paradigm, as its multidisciplinary origins and empirical studies make it a constant object of analysis in terms of its convergences and divergences with other theoretical schools[1].

In this context, this study addresses a research problem related to a gap in empirical GVC studies, as well as a weak synergy between the scientific approaches of GVC and SCP. Based on this, the article aims to propose an innovative framework of analytical elements that can be used in micro-level and quantitative research within the GVC field. The research also presents an initial scenario for bridging the gap between the GVC and SCP approaches and identifies points that could benefit both fields of study. While the research has limitations in terms of practical changes and advances in aligning these approaches, it innovates by proposing a framework of analytical elements that engages with the most recent literature in the GVC field.

The article is divided into six sections, the first being a general introduction to the topic. In the second section, the foundations of the GVC and SCP paradigms are briefly presented. The third section describes the research methodology, followed by the fourth section, which addresses the gap in empirical research on the GVC approach and reviews the literature focused on quantitative studies and/or micro-level analysis (firms and clusters). The fifth section discusses the possible root causes of this empirical gap and proposes a framework of elements to help minimize it. Additionally, this section includes reflections on integrating the two approaches. Finally, the sixth section presents the research's final considerations, as well as future limitations and expectations regarding the expansion of research that will address this gap from both academic and policy perspectives.

Theoretical Reference

The bases of GVCs and their dimensions of analysis

The origin of the GVC approach is rooted in the world-systems theory school, with the research of Hopkins and Wallerstein. The concept of the commodity chain[2] presented by these two authors was subsequently expanded to the global commodity chain (GCC) by the developmentalist Gereffi (1994), taking into account a growing academic interest in what was understood as a new and/or intense phase of globalization in the 1990s (Araki, 2007; Bair, 2014; Hopkins & Wallerstein, 1977; 1986).

In the context of the fragmentation of world production, the GVC framework arises from the confluence of three theories: world-systems theory, dependency theory, and development theory. In 1999, the GVC initiative was introduced in a workshop held in the United Kingdom (UK), driven by two distinct

[1] For example: International trade (Inomata, 2017; Antrás, 2020); international business (De Marchi et al., 2020; Humprey et al., 2019); business networks and strategy (Humprey et al., 2019); economic sociology, international economics, economic and regional development, economic geography, international political economy (Kano et al., 2019).

[2] 'A network of labour and production processes whose end result is a finished commodity' Hopkins and Wallerstein (1986, p. 159).

research traditions: GCC and economic clusters. The aim was to create an integrated research framework that could link macro (global), meso (industry and countries), and micro (enterprises and communities) variables in response to economic globalization (Gereffi, 2019).

The effort to build a global chain analysis framework replaced the term "commodity" with a more neutral "industry," and incorporated Porter's (1989) idea of value, which gave rise to the concept of GVC. Theories from other disciplines, such as transaction cost economics (TCE), industrial cluster research, and convention theory, were introduced into global chain analysis (Lee, 2010; Sturgeon, 2008).

This trajectory gave the research field a multidisciplinary nature, thereby expanding its dimensions of analysis. The perspectives for analyzing research traditions in the late 1990s, i.e., top-down (GCC) and bottom-up (economic clusters), led to the formation of two main pillars of the GVC framework: governance structures and upgrading trajectories, respectively (Gereffi, 2019). More recently, Fernández-Stark and Gereffi (2019) identified the following basic dimensions of analysis for GVC: input–output structure, geographic scope, governance environment, institutional context, and upgrading.

The *Input–output* dimension focuses on identifying the main activities and segments linked to a GVC. Mapping the core activities of a chain is a key element for analysis in this dimension. Additionally, understanding the structure and dynamics of the chain by observing each firm and its role in its own evolution and trends is another key factor of this analysis (Fernández-Stark & Gereffi, 2019). The geographic scope dimension is based on global supply and demand, evolving toward the observation of international trade flows. This approach enables the analysis of the configuration and positioning of countries and firms in the GVC (Gereffi & Fernández-Stark, 2011; Fernández-Stark & Gereffi, 2019).

The *Governance* pillar allows for an understanding of how the chain is controlled and governed based on power asymmetries among players. Since the seminal study by Gereffi (1994), who defined governance as "authority and power relationships that determine how financial, material, and human resources are allocated and flow within a chain," GVC literature has expanded its outlook on governance. Moving beyond one-dimensional analysis, where power in the value chain is linked to a leading company, the modular governance theory of Ponte and Sturgeon (2014) suggests three escalating levels: (I) governance as driving, (II) governance as linking, and (III) governance as normalizing.

The first level emphasizes the role of lead companies and their power in relation to the other participants in the value chains, following Gereffi's (1994) contribution of 'producer-driven' or 'buyer-driven' chains. According to Ponte and Sturgeon (2014), the changes in the 1990s led Gereffi, Humphrey, and Sturgeon (2005) to propose a more dynamic model to present the new forms of connection between companies and activities in a value chain. In this context, the linking dimension focuses on the determinants of the level of transaction control and the five types of links between companies: Market, Modular, Relational, Captive, and Hierarchy.

Moving from micro to meso-level analysis, governance as normalizing "explores the discursive dimension that frames buyer-supplier relations and transmission mechanisms along the chain" (Ponte & Sturgeon, 2014:206). Governance as normalizing is related to convention theory and the six ideal-type 'orders of worth' proposed by Boltanski and Thévenot (2006).

Governance as normalizing involves the adjustment of conduct according to norms. It discusses how coordination between firms occurs based on six quality conventions: market, industrial, domestic, civic, inspirational, and optional. These conventions define specific normative frameworks that coordinate the actions of actors in a value chain (Gibbon et al., 2008; Karlsen, 2018).

The other key pillar of GVC literature, alongside governance, is *upgrading*. The upgrading dimension analyzes the dynamics of how firms or countries advance to higher value positions in global chains and examines the economic, social, and environmental impacts. The literature addresses upgrading under three typologies: economic, social (e.g., better working conditions, social protection, gender equity, labor rights, wage levels, etc.), and environmental (e.g., reducing environmental damage through water and energy consumption reduction, pollution control, and waste reduction, etc.).

This research focuses on economic—or industrial—upgrading, defined by Gereffi (2005:171) as "the process by which economic actors—nations, firms, and workers—move from low-value to relatively high-value activities in global production networks." Humphrey and Schmitz (2002) proposed four trajectories of economic upgrading: Process upgrading—adding value by reorganizing internal processes or introducing new technologies; Product upgrading—moving into more sophisticated product lines, producing new products, or improving existing ones; Functional upgrading—taking on higher value-added roles in the chain; and Inter-sectoral or chain upgrading—shifting to new value chains with higher value-added potential. This research focuses specifically on process and functional upgrading.

The *institutional* context identifies how local, national, and international conditions and policies shape a country's participation at each stage of the value chain. There are three sub-contexts in this dimension: economic, social, and local institutional. The first covers labor and infrastructure costs, as well as access to financial resources. The second includes aspects related to the availability of skilled labor, access to and quality of formal and informal education, women's participation in the workforce, etc. The third deals with elements related to labor laws, tax regulations, international trade policies, and science and technology innovation policies (Gereffi & Fernández-Stark, 2011; Fernández-Stark & Gereffi, 2019).

The stakeholders dimension proposes mapping the agents involved in the chain, explaining their roles, and going beyond the identification of the input–output dimension. Since it considers all players involved, it goes beyond firms directly linked to production processes. It also analyzes how relationships between these players are governed at the local level and which institutions are in a position to drive change (Fernández-Stark & Gereffi, 2019).

Although the first three dimensions are closer to a macro context and the last three closer to a micro context, the richness of analytical elements in GVCs allows research to approach these dimensions in an isolated or integrated way, whether top-down or bottom-up. This enables a better understanding of the role, dynamics, and organization of productive and commercial processes from the perspectives of firms and countries in a scenario of value generation and production fragmentation.

The SCP paradigm

The SCP paradigm originates from the tradition of research in industrial organization, particularly in neoclassical economics, and is often used in studies on industrial competitiveness. The paradigm traces back to the research of Bain (1959) and Mason (1939), who postulated the existence of causal relationships between the structure of a market in which a firm operates, its conduct, and its performance (Lelissa & Kuhil, 2018; Lopes, 2016).

In this framework, the industry structure determines a firm's strategies, which, in turn, determine its performance, establishing a causal link from structure to performance. Generally speaking, structural variables (such as a company's market power) influence conduct variables (such as collusion or competition), which in turn affect performance variables (such as profits) (Laribi & Guy, 2018).

In the early 1980s, Michael Porter raised two important criticisms of the model. First, he argued that the model was stochastic, failing to account for the dynamics a structure undergoes over time, such as changes in concentration, barriers to entry/out, and product differentiation. The second point was that this structure was seen as an exogenous element that firms could not change, making them its hostages. Since then, new approaches have modified the model, treating structure as an endogenous element that is influenced by feedback from conduct and performance, as well as by public policies that affect market rules (Laribi & Guy, 2018).

Notably, Ferguson's (1988) observations remain relevant regarding the use of this research tool in the field of industrial organization. He noted that the relationships between structure, conduct, and performance were more complex than initially anticipated and that a limited understanding of market operations could be risky when formulating public policies based on the model.

Over the years, the SCP model has become a widely used tool for analyzing industrial structures, firm competitiveness, and market power, despite competing research from the NEIO school within industrial organization. One example of the paradigm's use in empirical research is the analysis of the relationship between market concentration and bank performance, either by comparing methodologies or by testing the basic hypothesis that collusion leads to higher profits.

In this field, the results regarding this hypothesis are ambiguous. As Ajlouni (2010) observed when analyzing 49 studies on the banking sector conducted between 1960 and 1980, 20 studies reported a

significant impact of market structure on banking performance, 14 studies found completely insignificant relationships, and 15 studies produced varied results—sometimes positive, sometimes not—depending on the data used or different measures of structure and performance.

Method

A literature review was conducted using the Scopus and Google Scholar databases to identify studies associated with the GVC and SCP approaches. Scopus is the largest abstract and citation database in the world provided by Elsevier that cover peer-reviewed literature. Google Scholar, on the other hand, although less scientifically rigorous, covers a large number of technical reports, working papers, thesis/dissertations, books or book chapters, unpublished materials (such as preprints), and other document types across different fields (Martín-Martín et al., 2018a).

We followed three steps to build our study base. In the first stage, we used Scopus to select articles or reviews in English with the term “global value chain” in the title, abstract, or keywords, and published until 2019. After applying this query string, we obtained 1,461 articles and reviews. From this, we identified the top five most cited authors and selected the 63 articles or reviews that were authored by them (Table 1).

Table 1

Summary of Top 5 most cited authors in GVC literature

Author	Main filiation	Numbers until 2019				Mains Subject area
		Total citations (all docs)	Documents		GVC reviews or articles	
			All	GVC		
Gereffi, Gary	Duke University, USA	7,743	70	29	20	SOS; BMA; EFF
Humphrey, John	University of Sussex Business School, UK	6,051	44	11	10	SOS; EFF; BMA
Schmitz, Hubert	University of Sussex Business School, UK	4,769	59	8	7	SOS; EFF; BMA and ENV
Sturgeon, Timothy	Massachusetts Institute of Technology, USA	4,458	21	11	9	SOS; BMA; EFF
Ponte, Stefano	Copenhagen Business School, DEN	3,962	72	20	17	SOS; BMA; ENV
Total		**26,983**	**266**	**79**	**63**	

Source: Authors based on Scopus. Notes: The number of authors' citations refers to all types of documents, i.e. in addition to articles and reviews include books or chapters, conference papers, editorials, etc. The criteria for classifying documents and articles or reviews as GVC studies was the same described by the query string of step 1 ("global value chain" in the title, abstract, or keywords). The number of documents published sorts the three main areas of publication. SOS- Social Sciences; EEF - Economics, Econometrics and Finance; BMA- Business, Management and Accounting; ENV - Environmental Science.

In the second step, in order to address the objective of building a group of elements for firm-level and quantitative analysis, we have added the following terms to the query string of the first step:

- "firm-level" or "cluster"; AND "analysis" or "analyze"
- "quantitative" or "measuring" or "measurement"; AND "analysis" or "analyze"

With this, we created two study groups and added 133 new sources, totaling a database of 196 manuscripts. Table 2 presents some characteristics of these studies from the two new query strings.

Table 2

Characteristics of the articles and reviews selected in step 2

Approach of GVC studies	Total	Publication period					Top subject areas (total)	Top Journals (total)
		2019	2018	2017	2016	<2015		
Micro-level	89	21%	10%	12%	12%	44%	Social Sciences (48) Business, Management and Accounting (28) Economics, Econometrics and Finance (27) Environmental Science (21)	Eur. Plan. Stud. (6) Entrep. Region. Dev. (5) Sustainability (4) Reg. Stud. (3)
Quantitative	44	25%	27%	18%	5%	25%	Economics, Econometrics and Finance (19) Social Sciences (16) Business, Management and Accounting (11) Environmental Science (7) Agricultural and Biological Sciences (4)	Physica A Stat. Mech. Appl. (3) Econ. Syst. Res. (2) Plos One (2) Rev. Dev. Econ. (2) Rev. Int. Polit. Econ. (2)
Total	133	23%	16%	14%	5%	42%		

Source: Authors based on Scopus. Note: An article or review may belong to more than one subject area.

At the end of the second step, we used the query string described in step 1 to search manuscripts associated with SCP, replacing the initial search term "global value chain" for "structure conduct and performance". The 10 most cited articles and reviews were selected from the 78 found. Thus, we constituted an initial collection of 206 researches, 196 of them related to GVC and 10 to SCP. Considering this relatively larger number of research outputs related to GVC, a complementary bibliometric analysis of keyword co-occurrence was carried out using VosViewer®.

In step 3, we used Google Scholar to consult additional documents associated with the same Scopus search terms for the title, abstract, and keywords, without delimiting the language or year of publication. In this database, special attention was given to highly cited documents and/or authors frequently mentioned in studies of both approaches. We chose Google Scholar because it has wider coverage than Web of Science and Scopus for subject categories such as Social Sciences, and Business, Economics, and Management, which contain most of the GVC-related publications. Furthermore, this database is more practical and

efficient in identifying highly cited manuscripts across nearly all subject areas (Harzing & Alakangas, 2016; Martín-Martín et al., 2018a; 2018b).

With this final addition of sources, the literature review of this research included more than 300 articles, reviews and documents of other nature. These studies were classified according to their characteristics of basic or applied research. The basic ones were evaluated for their relevance and theoretical basis, the most important ones served for a brief characterization and conceptualization of the main elements of GVC and SCP paradigms. The applied research studies associated with the terms formed the basis for diagnosing the main topics, key elements and analytical biases of the two approaches.

The proposed framework of elements of analysis was derived from the deductive reasoning developed throughout the literature review, while reflections on the synergistic contributions of the two approaches took an inductive methodological path.

Results

The tradition of GVC research and its gap

The topics of multinational companies, trade, national development strategies, industrial upgrading, and small and medium-sized enterprises have always been associated with the GVC framework. Due to its rich dimensions of analysis, researchers from substantially diverse areas have been attracted to the theoretical structure developed over the last 20 years. International organizations are also keen to imprint their political and ideological bases on publications. In this sense, the researched topics based on the GVC approach have significant depth (Gereffi, 2019).

In the field of GVC, research often refers to the dimensions of governance analysis and upgrading. This concentration is sensible because these were considered the fundamental pillars of the GVC initiative, as discussed in the previous section. This historical background also explains, at least partially, the tradition of macro and meso (sectoral) level analyses of research.

Given this context, the first gap observed in the field is the scarcity of studies that consider the institutional dimension in their analysis. Research often refers to institutions as relevant to the insertion and evolution of a country, region, cluster, or firm in GVCs (two of these will be discussed further). However, the role of institutional dynamics in global chains remains under-researched (Dollar et al., 2016; Eckhardt & Poletti, 2018; Miranda & Wagner, 2015; Neilson & Pritchard, 2009).

In parallel to the issues discussed above, a qualitative approach is also noted in the literature review. Sturgeon and Gereffi (2009, p. 5) state the following: ‘The GVC framework provides a conceptual toolbox, but quantitative measures are lacking.’ The authors refer, above all, to studies with a macro approach that propose recommendations for public policies. Frederick (2014) observes that research of this nature often uses qualitative data.

The gap in studies that consider quantitative approaches and use microanalysis units (firms and clusters) is recognized by the academic community and international organizations. The broad conceptual tools provided by the approach require that several conceptual and methodological aspects be combined into an analytical structure that can transition bi-directionally between global and local. In this regard, improving the understanding of the reality of individual companies in chains through specific research capable of processing a broad range of data and information represents a promising path in the field of GVC analysis (De Backer et al., 2018; Giovannetti & Marvasi, 2018; Golini et al., 2018; Nielsen, 2018; Hernández & Pedersen, 2017; Keane, 2014).

Having recognized the empirical gaps in the field and considering that this article contributes to the dissemination of bottom-up investigations (at the firm or cluster level), in addition to prioritizing a quantitative focus in its design, we present below a brief review of the literature on the most recent research in this direction.

Some Empirical Quantitative Evidence at the Firm and Cluster Level

The pioneering works led by Robert Koopman and Zhi Wang, followed by the important observations of Robert Johnson on production fragmentation, helped researchers, policymakers, and international organizations move towards measuring international trade in terms of value addition rather than gross exports (Johnson, 2014; 2018; Koopman et al., 2014; Wang et al., 2013).

Frederick (2014) was one of the first researchers to seek to approximate the GVC and I–O (Input–Output) approaches. Concerned with quantification in GVC from industrial data, particularly on the aspects of upgrading and governance, the researcher specified ways to achieve improvement in this field using I–O datasets, supply–use tables, and trade data.

In this context, efforts have been made to use quantitative databases to analyze GVCs, mostly using global I–O arrays: World Input–Output Database (WIOD) and Trade in Value Added (TiVA). These efforts cover a wide range of topics, such as the distribution of value addition across countries, consequences of productive fragmentation for employment and revenue, spatial configuration of fragmentation, productivity gains and per capita income, upgrading in chains, and methodological alternatives to measure value added in I–O models (Banga, 2014; Constantinescu et al., 2017; Criscuolo & Timmis, 2017; Del Prete et al., 2018; Gurgul & Lach, 2018; Johnson, 2018; Miroudot & Nordström, 2015; Raei et al., 2019; Timmer et al., 2015).

Moreover, regarding the use of quantitative data, several studies used other databases (e.g., Orbis and Zephyr), and estimates of demand elasticity to understand the determining factors of vertical integration of firms, from suppliers' positions in the chain to the elasticity of demand faced by suppliers and end producers. With certain exceptions, the works converge to the evidence that producers of final goods (e.g., parent companies) tend to integrate stages that are further downstream (upstream) when the elasticity of

product demand is relatively higher (lower) (Alfaro et al., 2019; Antràs & Chor, 2013; Rungi & Del Prete, 2018).

Regarding the relationship between governance and upgrading, Golini et al. (2018) analyzed the effects that different forms of governance with suppliers and customers have on economic (product, process, and functional), environmental, and social upgrading. The authors extracted data from the International Manufacturing Strategy Survey, with quantitative information concerning a large number of companies located in different contexts (size, countries, products, and positions in the value chain). The results showed that participation in GVCs supported only certain forms of upgrading and only under specific relational or captive governance structures.

Regarding the topic of insertion in GVCs and its consequences, Del Prete et al. (2017) conducted an investigation using data from World Bank Economic Surveys. Based on firms in North Africa, the researchers found that those included in GVCs had better ex-ante performance and showed incremental gains in ex-post productivity. In addition, they suggested that policies designed to support certifications and compliance with international standards, as well as increasing trust among firms in different locations, are important elements for inserting developing countries into GVCs.

From a different database, the Eora multi-region input-output table (MRIO) covering 189 countries, Raei et al. (2019) arrived at rather similar conclusions on this topic. For the authors, participation in GVCs positively affects per capita income and productivity; however, they warned that upgrading in chains is neither automatic nor frequent. In this sense, they highlighted the importance of institutional characteristics (the enforcement of contracts and infrastructure quality) and the unit cost of labor as determining factors for participation in these value chains.

As with the latest research, others drawing on the background of I–O matrices that traditionally have a macro (countries) and meso (industrial sectors) scope can contribute to a better understanding of the dynamics of firms and/or clusters in GVCs, either in terms of their results or methodological proposals. An example of this last case is the research conducted by Tian et al. (2019), who discussed the upgrading dimension, with direct contributions to the micro-level discussion (firms and clusters) in the GVC approach.

Based on their literature review, these authors proposed eight indicators to measure industrial upgrading. Later, from the perspective of top-down analysis, they compared and analyzed the upgrading of different countries and sectors using World Input–Output Tables (WIOT). Regarding the measurement task, the article made an important contribution by proposing consolidated upgrading indicators that address the different aspects of the phenomenon (Tian et al., 2019).

Based on our analysis, these proposed upgrading indicators can be suitable for use in surveys at the firm level. The significant challenge of collecting and using microdata in research plays an important role for firm-level topics in GVC, given that the data on I–O tables and global trade have their limitations and

do not clarify, for example, many questions concerning the dimensions of governance and upgrading, nor those related to stakeholders and institutions, which, as indicated earlier by the two research studies, play an important role in the insertion and continuity of firms and countries in GVC.

Regarding studies with a firm-level analysis perspective in a production fragmentation scenario, case studies within companies have been conducted to track intermediate goods or identify the distribution of added value of a given product along its value chain. (Ali-Yrkkö et al., 2011; Dedrick et al., 2009; Feenstra, 1998; Ye et al., 2015).

These studies play an important role in disseminating and consolidating the phenomenon of fragmentation. However, their large sampling and analytical, geographic, and temporal limitations do not allow for a broader understanding of the effects and transformations of firms and/or clusters when included in GVCs. Accordingly, at the end of this section, we present two recent studies with the GVC approach that had a microanalysis unit and used data from a census and surveys applied to Italian firms.

Giovannetti and Marvasi (2018) began with a census conducted in Tuscany (Italy) to investigate how positioning and governance relate to productivity. In an econometric analysis with data at the firm level, the authors raised a hypothesis of self-selection of Italian companies regarding participation in GVCs, citing the conclusions of Del Prete et al. (2017).

The authors also noted that productivity is higher in GVCs than in domestic value chain companies, which they believe corroborates the existing literature. Conversely, they identified something that they believed was underemphasized in the literature: medium-sized companies in hierarchical chains are more productive than in market chains. Finally, they proposed that future research should investigate the causal link between participation in value chains and productivity and noted that this link should be bi-directional. They added that this challenge requires a panel of companies and good instruments to assess participation in the chain, positioning, and governance.

Golini and Boffelli (2018) analyzed the textile and clothing Industrial District (ID) in Bergamo (Italy) and sought to understand the role of the processing industry in supporting the participation of companies in GVCs. They employed the GVC framework and investigated the nature and content of the links between the stages of production.

The initially developed methodology mapped the productive activities in the ID, which enabled the analysis of the position of each firm, as well as the scope of its participation in the role of 111 activities. Subsequently, surveys were applied in four structures in a population of 443 firms, with a response rate of 32.7% (145). Finally, interviews were conducted with representatives of two local leader firms (Golini & Boffelli, 2018).

In the research, the connection between Italian companies and the GVC proved to be weak, while within the district it was relatively strong. On average, 31% of the companies' purchases and 30% of their

sales were made with other companies within the district. For the country, these percentages were 69% and 71%, respectively. However, when considering the rest of the world (outside Europe), the companies in the district only exported 11% and imported 18% (Golini & Boffelli, 2018).

Other elements for the district's integration into the value chain that are particularly interesting and underexplored in empirical research were presented. For example, although a significant number of firms performed one or a few of the 111 activities, which corroborates the literature, almost half of them were vertically integrated, often discontinuously, into a production stage. This integration is generally associated with pre- and post-manufacturing stages (Golini & Boffelli, 2018).

Finally, the authors highlighted the importance of new studies to investigate the causal links between different variables and proposed that future research should compare IDs of the same industry and country. Additionally, they suggested comparing other districts producing different goods in the same region, replicating the studies over time (after five years). The objective and quantitative methodology with the potential to generalize different productive clusters drew attention to an urgent topic in the field of GVCs: the connection between global and local value chains and their relationship with regional development.

Similar to this research, other studies observed that GVCs are not essentially global in nature but rather focused on regional clusters of production, and that multinational enterprises (MNEs) play a key role in these networks. A research agenda of this kind, concerned with specific policies that can help firms, clusters, regions, and countries benefit from participation in GVCs, especially in the Global South, seems to be a promising field of study in the GVC literature (Criscuolo & Timmis, 2017).

Discussions

Research obstacles and an investigative framework for research in GVC

The reasons for the scarcity of research in the field of GVCs with a quantitative focus and/or micro-analytical units may be associated with several factors. The **first factor** may be related to the origins of its precursors, despite the bottom-up approach (economic clusters) having established the pillar of upgrading (Gereffi, 2019). Research conducted in the field—primarily focused on governance and upgrading—has been concerned with the role of countries in global value chains, often with a qualitative analysis bias.

In the early 2000s, this line of qualitative research was encouraged by international organizations such as the International Labor Organization (ILO) and the United Nations Industrial Development Organization (UNIDO). These were followed by the World Bank, World Trade Organization (WTO), Organization for Economic Co-operation and Development (OECD), and national development agencies, with this trend intensifying after the 2008–2009 financial crisis. These organizations contributed to the

broader scope and visibility of the GVC framework, improving the quality and relevance of published results. However, different organizations use various definitions of GVC according to their political and ideological contexts (Gereffi, 2019).

Although international trade data disclosure initiatives regarding value-added analysis have encouraged a wave of quantitative research, as presented in subsection 4.2, initiatives to work with microdata remain in an embryonic stage. Quantitative research focusing on firms and clusters aligns with the collection, processing, and dissemination of such data. However, the availability of microdata alone does not guarantee a proliferation of studies focused on firms and clusters.

This hypothesis is supported by evidence that the lack of quantitative research has persisted since the GVC framework's inception, both before and after the initiatives by Robert Koopman and Zhi Wang (Koopman et al., 2014; Wang et al., 2013). Although bottom-up research with primary data has been conducted, even on a small scale, it is still relatively recent. The **second factor** that may have hindered the consolidation of this bottom-up research agenda is the challenge of establishing firm-level variables, despite the wide range of analytical tools that the approach offers.

This challenge becomes even more daunting when considering, for example, the institutional aspects highlighted in the literature, which are rarely investigated from a bottom-up perspective. Although significant advances have been made in the literature regarding governance and upgrading dimensions, with research generally linked to productivity issues, there is still a gap in defining firm-level study variables for the other dimensions. This situation may even contribute to overestimating the role of governance and upgrading in the analysis of firms and clusters in GVCs, and consequently, underestimating the role of other dimensions.

Once the challenge of constructing analytical elements at the micro level is overcome, there remains a methodological challenge that may have contributed as a **third factor** discouraging or hindering the development of a larger number of quantitative studies in GVC literature. Given that most of the analytical elements associated with the dimensions of the approach—governance, institutions, upgrading, and stakeholders—are essentially qualitative, the measurement or translation of these into quantitative terms may have been a critical discouraging factor[3].

Understanding that the first factor arises from the genesis of the GVC approach itself and the profile of its pioneering researchers, and that the third factor is mainly methodological, we focus on the second issue. Table 3 presents an exercise in constructing analytical elements applicable to firms and clusters.

[3] Although we raise this hypothesis, we argue that there are multiple methodological designs capable of overcoming this issue. For example, in more recent GVC literature, Ribeiro (2022) and Ribeiro and Pedroza Filho (2022) have presented methodological proposals in this regard.

Although generic, these elements represent a step toward proposing more precise variables of analysis in the GVC research field.

Table 3

Elements of the global value chain (GVC) approach: An innovative proposal for micro and quantitative investigations

Dimensions of GVC	General objectives	Key elements (Chain, clusters and firms)	Authors
Input–output	Analyze the dynamic and structure of companies under each segment of the GVC. Additionally, understand how the main activities and segments are organized.	Mapping of activities and number of firms involved in research and design; inputs; production; distribution and marketing, sales and recycling. In terms of the chain: global production; sales, jobs and taxes paid. It also important to analyze the evolution of the industry and the trends that have shaped it. In terms of the company-specific characteristics: size; state-owned or private; value share in the chain; number of jobs; profits; costs; productivity; utilization rate, logistics infrastructure; access and availability of inputs, equipment and natural resources.	Agostino et al. (2015); Antràs and Chor, (2013); De Marchi et al. (2020); Fernández-Stark and Gereffi (2019); Giovannetti and Marvasi (2018); Golini and Boffelli (2017); Gonzalez-Ramirez et al. (2020).
Geographic Scope	Analyze the configuration and position of countries and firms in the GVC. It is important to understand the domestic, regional and global level of firms' activities and products.	Geographical distribution of firms and clusters; connections between the global and local in value chains; spatial configuration and geographical range of activities, inputs and sales; share of exported production; share of imported inputs and potential to export or expand exports.	Giovannetti and Marvasi (2018); Golini and Boffelli (2017); Gonzalez-Ramirez et al. (2020); Gurgul and Lach (2018); Rungi and Del Petre (2018); Sun and Grimes (2016); Timmer et al. (2015).
Governance	Understand which governance structure predominates in the chain, cluster and firms and its consequences. It is also important to understand power relationships and barriers between the actors.	Identification of existing governance typologies; information coding level; barriers to entry and exit; partner change frequency; scales of confidence; domestic quality conventions; switching costs; levels of buyer involvement in supplier specification of product and process standards, R&D activities, and technology dissemination.	Gereffi (1994); Gereffi et al. (2005); Pietrobelli and Saliola (2008); Ponte and Gibbon (2005); Ponte and Sturgeon (2014).

Dimensions of GVC	General objectives	Key elements (Chain, clusters and firms)	Authors
Economic Upgrading	Analyze movements and their conditions to reach higher value activities on GVCs.	Considering the types of economic upgrading and their presence in firms or clusters analyze technological improvement (process and/or product); acquisition of a new role in the chain; acquisition of machinery or equipment; increase of capital intensity; workforce training; product diversification; brand development; research capabilities and quality management; future upgrading expectations; relationship between clusters and upgrading.	Humphrey and Schmitz (2000); Islam and Polonsky (2020); Marcato and Baltar (2020); Milberg and Winkler (2011); Navas-Alemán (2011).
Institutional context	Identify and understand how institutional aspects affect GVCs.	Availability of labor; formality of labor (labor rights); skills level and costs; quality of women's participation in the labor force; availability and access to education; financial resources and tax incentives; efficiency and quality of laws and regulations; bonds of trust; mutual fidelity and social cooperation.	Antràs (2020); Barrientos (2019); Barrientos et al. (2011); Dollar and Kidder (2017); Dollar et al. (2016); Miranda and Wagner (2015); Raei et al. (2019); Rossi (2013); Williamson (1985).
Stakeholders	Analyze how relationships between stakeholders are governed at the local level. Also to evaluate the impact of Multi-Stakeholder Initiatives (MSIs) on the dimensions of governance, institutional context and social and environmental upgrading.	Number of actor's involved and voluntary partnerships; existence and role of export and investment promotion agent; participation of governments and non-governmental organizations; level of strategic articulation between stakeholders and conditions to drive change.	Dallas et al. (2019); Fernández-Stark and Gereffi (2019); Gereffi and Lee (2016).

Source: Authors. Note: Exclusively for a better presentation of the elements proposed by this present research, we organized them in the six contexts proposed by Fernández-Stark and Gereffi (2019). This proposal does not seek to limit each element exclusively to a single context, because some of them are clearly transversal. For example, trust can be a key element to analyze the relationships of the actors in governance, but it is also a valuable topic for social upgrading and institutional thinking. Also in this track, the literature associated with social upgrading were allocated in the institutional context.

Regarding Table 3, the division of objectives and key elements based on GVC dimensions was adopted merely for organizational purposes. Given the intertwined nature of these dimensions, the same applies to the proposed elements. There is no strict compartmentalization of objectives and elements, but rather a standard suggestion that can and should be reorganized based on the nature of each research study.

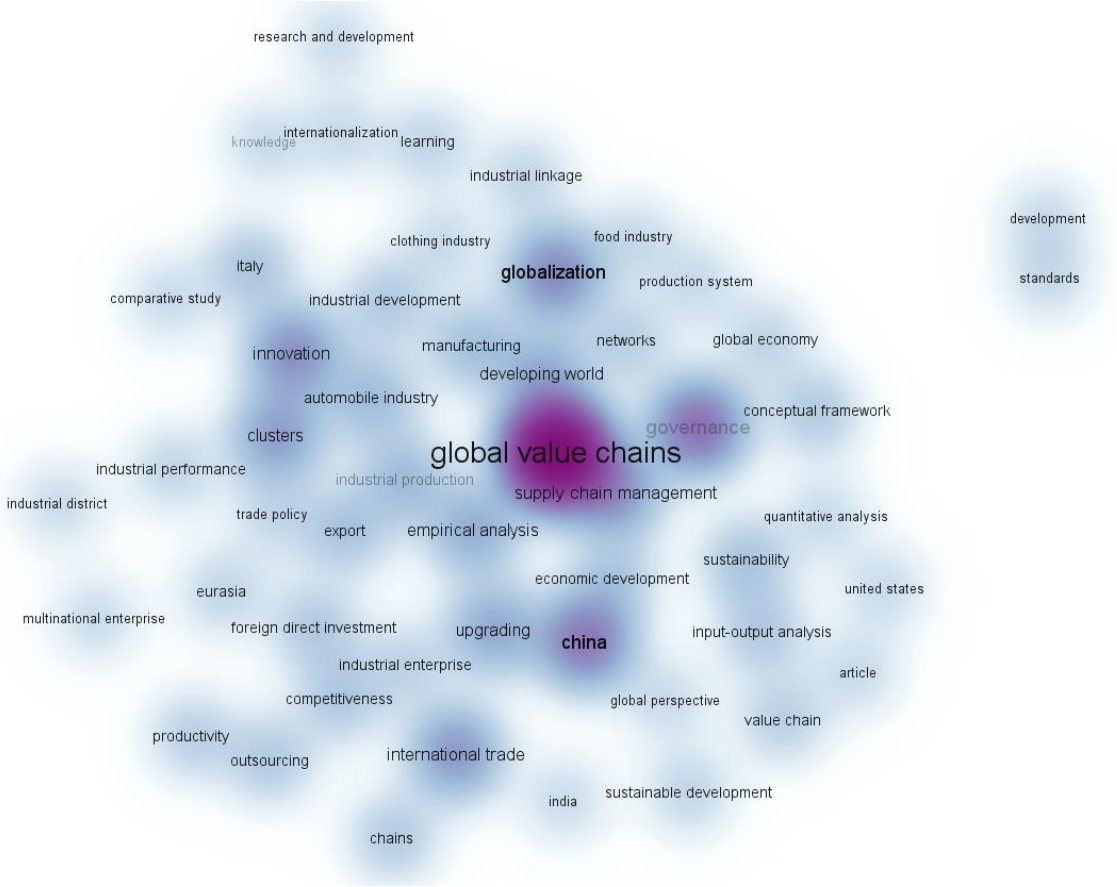
Some of the elements and indicators proposed in Table 3 can be found in recent literature. Examples include studies by Kwon, Park, and Cho (2021)[4]; Banga (2022)[5], Ribeiro (2022)[6]; Ribeiro and Pedroza Filho (2022)[7]; Altun, Turan and Yanikkaya (2023)[8]; Ribeiro et al. (2024)[9]. However, many of the elements summarized in Table 3 remain unexplored, particularly in studies with methodological designs that simultaneously analyze multiple dimensions.

Figure 1 illustrates the co-occurrence of keywords from 196 GVC-related studies extracted from the Scopus database. The keyword with the highest co-occurrence after "global value chains" was "governance." The dimensions of upgrading and input-output were also directly represented by their keywords. In addition, a group of keywords emerged related to the geographic scope dimension (e.g., China, Italy, India, Eurasia, United States, networks, global perspective, etc.). However, no clear terms were associated with the institutions and stakeholder's dimensions.

[4] Variables related to the input-output dimension.
[5] Variables related to the economic upgrading dimension.
[6] Variables related to the institutional context dimension.
[7] Variables related to dimensions: input-output; economic upgrading; institutional context; and governance.
[8] Variables related to the input-output dimension.
[9] Variables related to the economic upgrading dimension.

Figure 1

Keywords occurrence density map



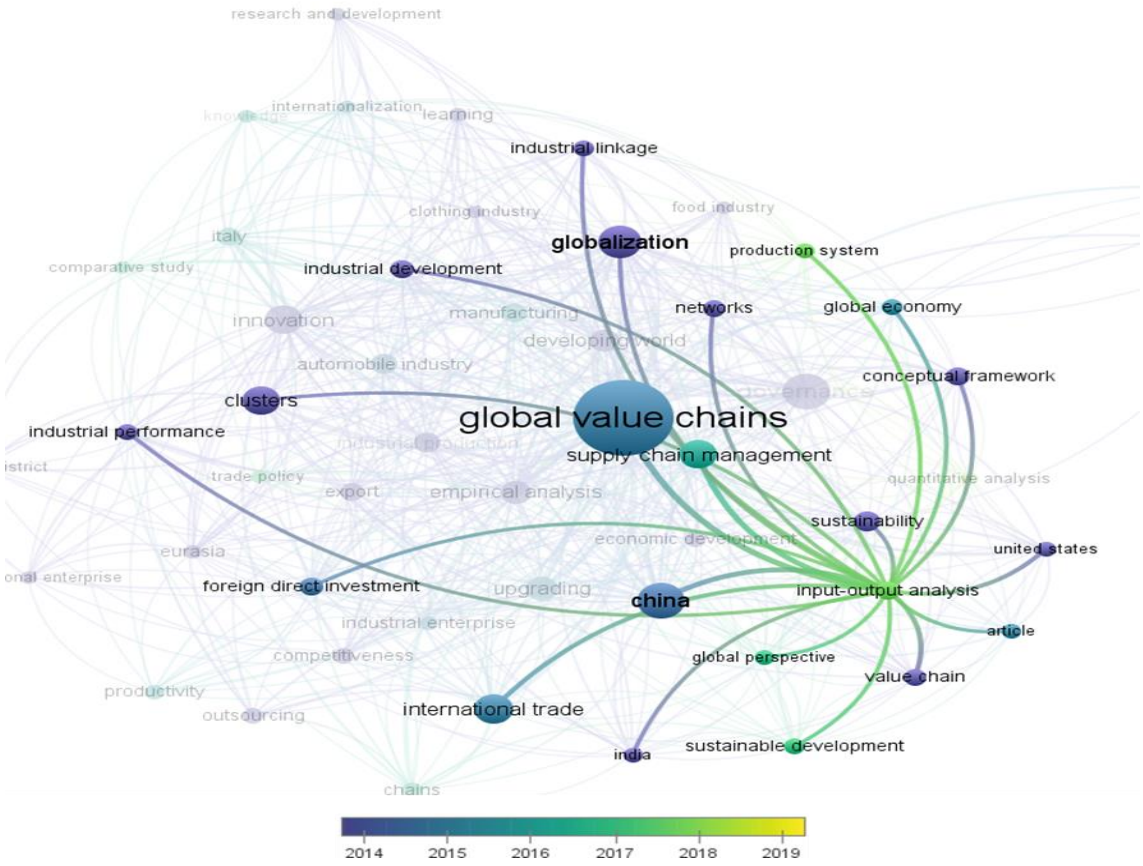
Source: Authors.

This overview supports the argument that the dimensions proposed by Fernández-Stark and Gereffi (2019) should not be considered inflexible. Organizing elements through keyword clusters, for example, could reveal different clusters. Although the research's dimensional configuration biases the elements analyzed, it is noteworthy that the two main pillars of the GVC approach are more central in the figure. This suggests that the terms "upgrading" and "governance" frequently connect with a broader range of key terms identified in the studies.

In contrast, the co-occurrence of the keyword "input-output analysis," although less central, shows a more recent increase in frequency (Figure 2), signaling a rising trend in research linked to the input-output dimension.

Figure 2

Temporal evolution of keywords co-occurrence: input-output analysis



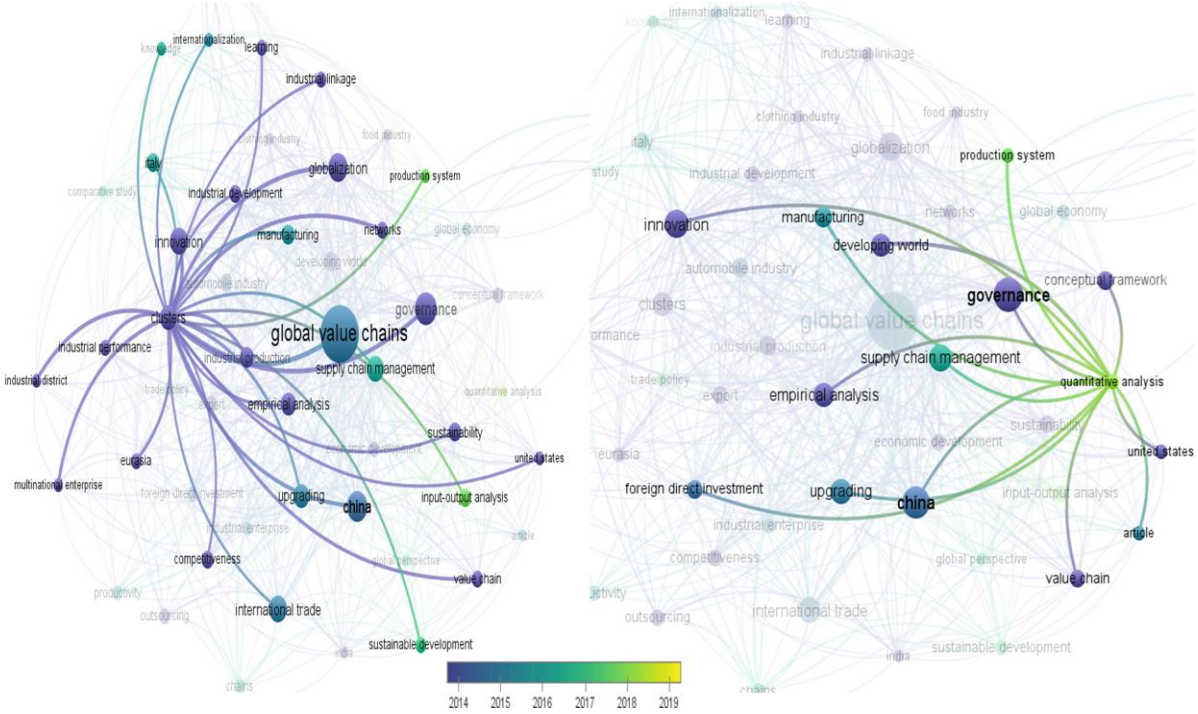
Source: Authors.

This framework underscores the importance of analyzing historical perspectives and trends for all the key elements presented in Table 3. For instance, understanding governance elements such as the structure in which firms or entire chain segments operate, or the level of trust between partners from an evolutionary perspective, is critical to comprehending GVC dynamics.

From a historical perspective, the more recent co-occurrence of the keyword "quantitative analysis" compared to "clusters" suggests that GVC quantitative research is a more recent trend (Figure 3). This supports the notion of a growing body of quantitative studies, considering that over half of these studies have been published since 2018 (Table 2).

Figure 3

Temporal evolution of keywords co-occurrence: clusters and quantitative analysis



Source: Authors.

Following recent trends, it is still early to analyze and predict how the Covid-19 pandemic will affect GVC configurations. Verbeke (2020) hypothesizes that governance models may shift, with leading companies potentially engaging in more relational (and less formal) micro-level contracts with key partners identified as more reliable. Such partners may be able to access and process local economic information and expectations more effectively than an isolated leading company, resulting in more resilient and robust strategies for the entire value chain.

From the perspective of this article, value chains—whether more or less globalized—are increasingly subject to shocks. Therefore, we emphasize the importance of conducting studies that can be replicated over time to better understand the dynamics of these changes, especially for chains in the early stages of global integration.

The analysis of firms and clusters should not be static, and the actions of domestic or foreign governments should be treated as endogenous to the analyses. Although we include elements aiming to establish this connection, we recognize the need for significant progress in this direction.

Operationalizing the collection, processing, and analysis of many of the proposed key elements poses challenges. However, some of these elements, despite their complexity, offer valuable opportunities

for future research, such as the relationship between clusters and upgrading, which is crucial to understanding the movements of upgrading in GVCs.

GVC and SCP: An embryonic proposal for approximation

The GVC approach, with its multiple analytical elements, can benefit the SCP paradigm by expanding the view of market operations through the functioning of value chains[10]. By offering a wider range of analytical elements, GVC can help advance the New Empirical Industrial Organization (NEIO) literature. Additionally, examining a country's and firm's position within the global and regional network, the extent of their involvement in global value chains, and their connections with other actors can shed light on how these elements shape market structures (Structure), corporate strategies (Conduct), and overall economic outcomes (Performance) in the context of global value chains.

Furthermore, the SCP paradigm benefits the GVC approach by providing a rich historical framework of empirical research accumulated over decades, most of which is quantitative and conducted at the firm level—something we have identified as a gap in the GVC literature. The SCP's causal logic and feedback effects can bring a new analytical perspective to research the relationship between different dimensions and key elements of the approach. The SCP model can also illuminate alternative ways of organizing the dimensions and elements of GVC analysis.

In this context, a possible empirical method for integrating the two paradigms in future research would be to (re)frame the quantitative and micro-level analytical elements present in the SCP literature into the dimensions of analysis of the GVC paradigm, and vice versa. From a theoretical standpoint, considering the multidisciplinary nature of the GVC approach, research that seeks to analyze theoretical convergences between the paradigms, particularly in relation to the IO or NEIO schools, could make significant contributions to this field.

Although the objective of this research is not to propose a debate on the integration of the two approaches, we invariably take some steps in this direction. Regarding SCP, the analytical elements presented herein contribute to bringing the dimensions of the GVC framework into discussions on industrial organizations that use the model and to incorporating the variables of analysis from Table 3 into the field.

Notably, Figueiredo Junior et al. (2014) have already proposed an extension of the SCP model, categorically connecting it to value chain strategies. At the time, they presented arguments justifying such an expansion, considering the limitations of the traditional model in addressing value chains. One example

[10] As Ferguson (1988) pointed out, using the SCP model to formulate public policies requires the broadest possible understanding of market operations.

given was that the choice of organizational arrangements between competitors is part of the behavioral, non-structural dimension, and organizational decisions do not always follow a desirable, ordered sequence.

Although they reference some authors linked to the GVC tradition, this connection is relatively mild and associated with studies that primarily addressed the two main pillars of the approach—governance and upgrading—from a macro-development perspective. Additionally, the authors made it clear that the unit of analysis in the extended model was not a company but rather a part of a value chain in one territory that competes with another in a different location (Figueiredo Junior et al., 2014).

In a pragmatic sense, the analytical framework in the specific case of the SCP model can potentially help address the limitations presented by Ferguson (1988), despite the challenges in interpreting, collecting, and processing this information. This can also extend to alternative industrial organization approaches. As Lee (2007) noted, by improving the quality and availability of market-level data, studies based on the NEIO can be improved.

Within the scope of this article, GVC enriches the SCP paradigm by providing a wealth of analytical elements due to its dimensions of analysis and the variables—presented in Table 3. Conversely, the SCP paradigm sheds light on important structuring elements for empirical research in GVC studies, particularly in line with the main objective of this work, which is to present analytical elements that can be used for micro and quantitative research within the GVC framework. Furthermore, considering the SCP paradigm's tradition of developing studies of this nature, Bain's (1959) central hypothesis raises an important issue for GVC studies.

In other words, given the causal logic of the SCP paradigm, different structures lead to different behaviors and outcomes among firms. Therefore, measuring multiple forms of firm or cluster performance, whether already included or in the process of inclusion in GVCs, using the rich set of tools presented by the approach, seems to be an interesting way forward. Research in the field of value chains, as presented in Section 4.2, also seeks to understand causal links common in the SCP literature, such as relationships between governance and upgrading, governance and productivity, and entry into GVCs and productivity. However, while performance is often reduced to productivity proxies (which can be much more complex), recognition of the feedback effects typical of industrial organization models has received little attention in studies associated with the GVC literature.

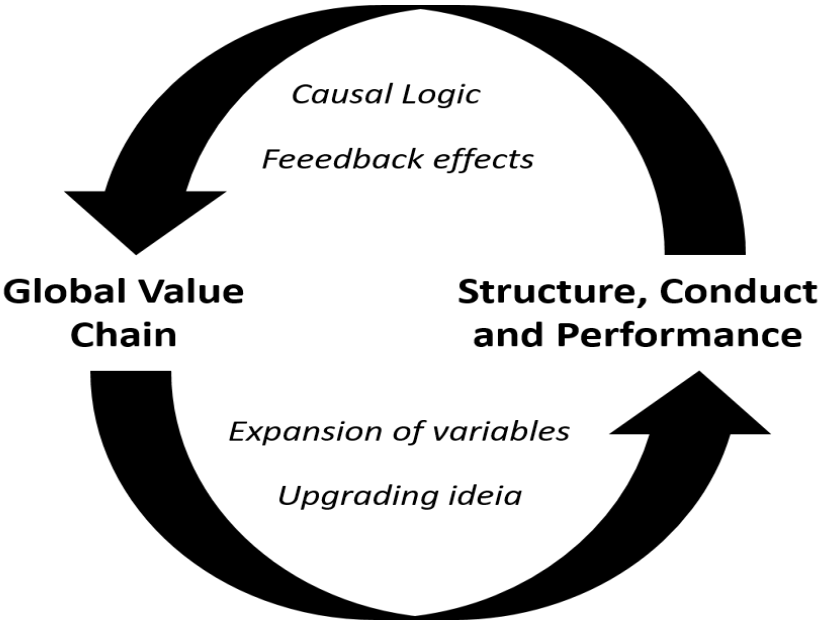
Another contribution is that the SCP model can be useful for GVC studies in aspects related to research design. Reframing GVC analytical elements through the lens of the three axes of SCP can clarify aspects such as testing causal links, as the GVC framework generally does not facilitate this task. This could be a way to address specific research agenda demands, as proposed by Giovannetti and Marvasi (2018) and Golini and Boffelli (2018).

In this regard, one proposal would be to establish causal hypotheses from the logical and functional perspective of the SCP paradigm. For example, elements associated with governance and upgrading, such as: firm governance typologies; R&D investment strategies; and the acquisition (or not) of a new role in the chain, could be analyzed from the dimensions of structure, conduct, and performance, respectively.

In summary, the tradition of micro-level and quantitative research is broader in the industrial organization literature compared to the more recent GVC approach, which, in turn, presents a wide range of analytical elements. Thus, integrating this tradition with the GVC approach is a two-way street that benefits both schools of thought and contributes to greater visibility and robustness of published results.

Figure 4

Summary of mutual benefits from the approximation of approaches



Source: Authors.

Conclusions

Our research indicated an existing gap in quantitative research with microanalysis units (companies and clusters) in the recent field of GVC and discussed factors that over the years have made this phenomenon possible. As a result, it presented an innovative framework of elements based on literature that could be used in empirical research to mitigate the gap reported. This innovative framework is advance in GVC literature, since it systematizes a series of key analytical elements based on the dimensions of GVC.

Although limited, there has been progress in the most recent literature in quantitative research at the firm level that has used variables associated with what is shown in Table 3. As we have seen, these studies cover some dimensions of GVC analysis, but there are few studies that simultaneously analyze more than one dimension.

In this sense, this research may have another important contribution to the field. By presenting analytical elements from multiple dimensions in a single framework, it sheds light on the understanding that quantitative studies at the firm level can integrate multiple dimensions of GVC.

Parallel to this, the research brought the approaches of GVC and SCP closer together, pointing out mutual benefits for both. On the one hand, GVC expands the discussion to global value chains and presents an extensive range of analytical elements. On the other hand, the tradition of investigating the causal relationships between microeconomic elements of the SCP model establishes important structural foundations for quantitative and firm-level research in the field of GVC.

Despite the limitations of the research in terms of changes and practical advances in the approximation of approaches, we also point out that GVC can contribute to the advancement of the literature on SCP and NEIO on two fronts. Firstly, by expanding the view of market operations and contributing to improving the analysis of public policies in the literature. Secondly, GVC from a globalized perspective of chains can contribute to a better understanding of how international trade affects and shapes the structures, conduct and performance of firms.

Additionally, we believe that analyses that integrate the two approaches and consider the reference of the range of elements presented in this research have the potential to support future research agenda that gives greater visibility and robustness to the published results. This scenario is particularly important for greater consolidation and acceptance of the GVC approach in academic and political settings.

On this last point, it is of paramount importance to advance in studies with the characteristics that we intend to promote, as an integrated discussion of studies of different natures and units of analysis, under the same lens, are crucial to subsidize better appropriate interventions by governments. Improving industrial policies and socioeconomic development in the different stages of GVC will only be possible with a broad and multifaceted view of the phenomenon.

The recent inability, exposed by the Covid-19 pandemic, of governments and global chains (especially in medical supplies) to respond to economic and health crises reinforces this argument. We need to incorporate a broader systemic and strategic perspective to analyze and plan for more robust and resilient GVCs.

Disclosure statement

No potential conflict of interest was reported by the authors.

CRediT authorship contribution statement

Vinícius Souza Ribeiro: Conceptualization, Methodology, Software, Validation, Formal analysis, Investigation, Data curation, Original, Supervision, Project management. **Manoel Xavier Pedroza Filho:** Conceptualization, Formal analysis, Investigation, Resources, Data curation, Original, Revision and editing, Obtaining funding. **Jaqueline Boni Ribeiro:** Methodology, Validation, Data curation, Original, Revision and editing, Viewing.

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