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The global value chains applied to the agribusiness: challenges and prospects

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Abstract. This article examines the global value chain (GVC) framework and its relevance for analyzing the organization and transformation of the agribusiness sector. The main objective is to assess how GVC analysis contributes to understanding the coordination, governance, and international fragmentation of agri-food production systems in a context of increasing globalization. Drawing on an extensive review of the literature, the study highlights the key conceptual and methodological contributions of the GVC approach, particularly its ability to capture inter-firm relationships, value creation processes, and power asymmetries along agri-food chains. The results show that the GVC framework provides valuable insights into the strategic positioning of firms and countries within global agribusiness networks, as well as into learning, upgrading, and governance mechanisms. However, the analysis also reveals several limitations, notably regarding the consideration of territorial specificities, temporal dynamics, and socio-environmental dimensions. The article concludes that, despite these limitations, the GVC approach remains a relevant analytical tool for studying agribusiness value chains, provided it is complemented by institutional, territorial, and dynamic perspectives. Future research should focus on integrating sustainability issues, regionalization processes, and resilience strategies to better capture the evolving challenges and prospects facing global agribusiness value chains.
Keywords: *Global Value Chains; Agribusiness; Governance; Agri-Food Sector; Globalization.*

1. Introduction

Global value chains are the result of companies relocating their production processes to regions with the lowest labor costs. This geographical distribution enables companies to achieve economies of scale, increase their competitiveness, and access international markets. In recent decades, this phenomenon has accelerated due to lower costs associated with trade and the coordination of production activities, made possible by technological progress, digital advances, and trade liberalization. Research on global chains has produced a variety of discourses and issues offering many possible directions for work in our discipline (Palpacuer & Balas, 2010).

Although the global value chain framework is widely used across many sectors, its relevance can vary a great deal depending on the specific characteristics of each sector. For example, agri-food systems differ significantly from manufacturing industries in terms of how production is organized, the nature of the products, and the ways activities are coordinated. These differences raise important questions about how global value chains function outside traditional industrial contexts and highlight the need to look more closely at how this framework applies to agri-food systems.

Global agricultural and agri-food production is relatively well integrated into global value chains. At the global level, 21% of the value of agri-food products exported by a given country was integrated into goods and services produced in other countries (Amachraa and Maad, 2023). Services are an increasingly important component of agri-food value chains (Amachraa and Maad, 2023).

Agricultural markets are undergoing rapid globalization, leading to the emergence of new consumption patterns and new production and distribution systems. Value chains, often dominated by multinational or national companies and supermarkets, occupy an increasing share of agri-food systems in developing regions.

Although research on global value chains has expanded considerably, their use in the agri-food sector is still not sufficiently examined. Most GVC frameworks were originally designed with manufacturing industries in mind, where production processes tend to be more standardized, modular, and less affected by biological or territorial constraints. In contrast, agri-food value chains have distinct characteristics, including the perishability of products, strict sanitary and quality requirements, a strong reliance on natural resources, and the key role played by small-scale producers, especially in developing countries.

This leads to a key question about how relevant and adaptable the global value chain framework really is for the agri-food sector. To what extent can GVC approaches capture the unique dynamics, governance arrangements, and development challenges of agri-food systems? And what are the main conceptual and empirical limits that arise when this framework is applied to the agri-food context?

The originality of this article lies in its integrative and critical synthesis of the global value chain framework as applied to the agri-food sector. Rather than offering another purely descriptive review, the paper systematically examines how core GVC concepts align with the specific characteristics of agri-food systems. Drawing on insights from the GVC literature, agri-food economics, and development studies, the article highlights both the strengths and the blind spots of existing approaches. In doing so, it provides a structured assessment of the challenges and opportunities involved in applying GVC analysis to agri-food systems, and points to key directions for future research as well as policy-oriented debates.

Based on a review of the literature applied to the agri-food system, we will first analyze the different concepts and paradigms of global value chains, highlighting the main factors behind their development. In the second part, we will address the theory of GVC governance by analyzing the issue of coordination among globalized companies and their influence on market access for actors in developing countries. In the third part, we will highlight the limitations and weaknesses of the global value chain concept and propose some avenues for research in the agri-food sector.

2. Emergence and foundation of the CGV paradigm

a. Definition

i. Michael Porter's value chain

Before going into detail about the definitions of the global value chain, it is worth taking a closer look at Porter's value chain and highlighting the link between GVC and Porter's value chain.

Firstly, it should be noted that the concept of the value chain was popularized by Porter (1985). This concept is linked to the technique of value chain analysis, which is a method for identifying opportunities for cost reduction and product differentiation at different stages of the production and delivery process of a good or service (Abreha et al., 2022).

The value chain is a tool for analyzing the relationships between different actors and activities within a specific organization (Porter, 1985). As such, it encompasses activities such as research and development (R&D), design, production, marketing, distribution, and end-consumer support (Gereffi et al., 2001). These activities may be carried out within a single company or distributed among different companies.

ii. Global Value Chain

A value chain can be described as global when one or more activities in Porter's chain, such as R&D, design, production, marketing, distribution, or after-sales service, are spread across several countries and involve one or more companies.

Value chains are referred to as "global" when they include stages, processes, and actors from at least two countries. Their dispersion across several countries and suppliers explains why the value chain is considered "global" (Amachraa and Maad, 2023).

Furthermore, from a global perspective, the Global Value Chain Initiative defines a value chain as: "the complete range of activities undertaken to move a product or service from its conception to its final use, as well as how these activities are distributed geographically and across international borders." This definition shows that Global Value Chains, in contrast to the value chain within a company, consider the creation and transfer of value to be the result of the efforts of production networks whose distribution structure influences the choice of their form of international organization. As a result, GVC analysis is not a global extension of Porter's value chain approach, as the scope and motivation differ (WTO, OECD, WB, 2017).

A global value chain integrates a group of actors into a production process. The main goal is to divide the work and create final added value through intermediate added value, with each actor focusing on a specific task. These value chains are driven by structuring operators known as "prime contractors," around which are organized layers of equipment manufacturers of various ranks, as well as the entire subcontracting chain required to produce the final product (Amachraa and Quélin, 2022).

According to Palpacuer and Balas (2010), a GVC is an inter-organizational network built around a product, connecting households, businesses, and states within the global economy. As for Blyde (2014), he finds that production processes are becoming increasingly fragmented around the world. This is why many products are now manufactured as part of a multi-country process in which different stages of production are carried out in companies located in several countries.

Relocalization is now a global concern. It refers to the ability to acquire greater autonomy over a number of products. However, it is not always easy to reorient or relocate GVCs (IMF, 2022) as this requires huge investments and skilled labor is not always available (World Bank, 2020).

The global wheat value chain is a representative example of this structure, as wheat is a staple cereal produced in Ukraine, Russia, and Australia, then processed into flour in Indonesia and Turkey, before being exported to make noodles in China or bread in Africa and the Middle East (OECD, 2020).

b. Usefulness and importance of the GVC

The literature on value chains has been crucial in analyzing the coordination of relationships between companies and countries within these chains, identifying the rules of the game, determining the actors responsible for key decisions, and examining the consequences for the distribution of added value and the inclusion or exclusion of suppliers and trading partners.

The GVC is a very rich concept. According to Temple et al (2011), this approach lies at the intersection of economics, sociology, management sciences, and political sciences, with strong historical roots in development sociology, questioning North-South relations. From a methodological point of view, the VCA concept is a powerful and relatively comprehensive tool for analyzing sectors and characterizing long-term dynamics.

The CVC approach is intended as a tool for contextualized analysis of value chains that are now transnational, organized in complex intertwining intra- and inter-company networks, and in which the hierarchy of activities, decision-making systems, power relations, and relationships with the territory have undergone profound changes (Palpacuer & Balas, 2010). The GVC approach reveals powerful yet unexplored mechanisms in the way companies have reorganized production processes on a global scale. It offers an original perspective on the forms of governance that govern the globalization of value chains, while allowing for a variety of perspectives depending on the normative concerns and theoretical affinities of the research currents that comprise it (Palpacuer & Balas, 2010).

According to Hugon (2015), global value chains are the result of companies optimizing their supply strategies by splitting their production layers across several territories. As a result, intermediate inputs such as parts and components are produced in one country and then exported to other countries for production or assembly into final products.

We now know that global value chains divide the production process in such a way that goods can be produced in stages in a number of different countries, with value added at each stage according to each country's comparative advantages (Krugman, 1991). It is therefore possible to produce in one place, consume in another, and control production and other segments of the value chain remotely from another country. For example, wheat is produced in Ukraine, Russia, and Australia, then processed into flour in Turkey and Indonesia to make noodles in China and bread in Africa and the Middle East (OECD, 2020).

GVC analysis is not simply an extension of a characterization of flows on a global scale. It presents a multidisciplinary interpretation of the organization of activities and relationships between actors (Cheriet, 2015). It clearly falls within the framework of sector analysis, combining perspectives from international strategy and institutional economics, enriched by contributions from organizational sociology (Temple et al, 2011).

As a result, producing within globalized value chains is a source of productivity gains for producers and consumers, allowing consumers to access products or services at lower prices. Countries involved in GVC (Global Value Chains) networks have benefited from increased foreign direct investment, productivity, additional jobs, technology transfers, and improved living standards for local populations (Amachraa and Maad, 2023).

In conclusion, integrating a global agri-food value chain offers many advantages for an organization, including access to new markets, increased competitiveness, reduced costs, access to international financing, and risk diversification. This allows the organization to strengthen its resilience, maximize its growth, and improve its strategic positioning in the global market.

c. Historical reading

Understanding historical developments allows us to assimilate the factors that have influenced the current structure of GVCs, while revealing the challenges to be overcome and the opportunities to be seized. This section traces the history of agri-food GVCs, examining the key stages in their development, the economic and technological transformations that have shaped them, and their effects on food systems at the global and local levels.

According to (Bair, 2010), three approaches constitute the field of research on global chains: 1) the world-systems tradition, offering a macroeconomic and long-term historical approach to commodity chains; 2) global commodity chains (GCC), a framework developed by Gary Gereffi and others based on a cross between organizational sociology and development studies; and 3) global value chains (GVCs), the most

recent variant, which draws on its predecessor GCC but also, in certain aspects of its formulation, on transaction cost theory and other approaches in organizational sociology.

Commodity Chain: The term "commodity chain" dates back to an article published in 1977 by Hopkins and Wallerstein, in which the authors sought to differentiate their understanding of the territorial dimension of capitalism from the orthodox approach to globalization (Bair, 2010). In their initial formulation during the 1980s, "commodity chains" emerged from world-systems theory, which focused primarily on the new forms of North–South domination being constructed in the post-Fordist period (Palpacuer & Balas, 2010).

Global Commodity Chains: The second generation, dating from the 1990s, is that of Gereffi's "global commodity chains," which differs from the first generation in that it places greater emphasis on companies as actors in the globalization process and focuses, beyond issues of domination, on the development opportunities these chains offer to countries in the Global South (Palpacuer & Balas, 2010). Research during this period shifts toward the process of "industrial upgrading," through which producers in developing countries can improve their position within the chains by moving from simple assembly activities—often the preferred entry point due to low capital requirements—to more lucrative activities such as "turnkey" production, following the trajectory of the newly industrialized countries of Southeast Asia (Palpacuer & Balas, 2010).

Global value chain: However, the third generation emerged in the early 2000s with the emergence of "global value chains" (Bair, 2010). Promoted by Gereffi, Humphrey, and Sturgeon (2005), and largely inspired by the latter's work in electronics, this new orientation tends to decontextualize the analysis by considering the abstract characteristics of "transactions" as major determinants of governance modes within chains (Palpacuer & Balas, 2010).

The CGV approach, as currently used, only emerged in the 2000s, when issues such as supply chain governance, relationships between actors, and power (or even domination) dynamics became central concerns (Cheriet, 2015). GVC is thus a refined approach to inter-firm coordination relationships (Gereffi, et al., 2005). Inspired by the work of Gereffi (Gereffi and Sturgeon, 2005), the concept of the global value chain emerged, proposing a synthetic model that combines the concepts of added value and globalization. It emphasizes chain governance and how multinationals coordinate the activities of international production and distribution networks.

Overall, the emergence of the global value chain (GVC) paradigm reflects a progressive broadening of analytical perspectives on production systems. Building on Porter's original value chain concept, which focused on firm-level value creation, the GVC framework extends the analysis to a global scale by integrating cross-border fragmentation, inter-firm relationships, and power asymmetries. This evolution highlights the usefulness of the GVC approach as a tool for understanding how value is created, distributed, and governed across geographically dispersed activities. The historical reading of the paradigm shows that GVC analysis emerged in response to profound transformations in the global economy, particularly the internationalization of production and the reorganization of industries. As such, the GVC framework provides a solid conceptual foundation for analyzing contemporary economic dynamics, especially in sectors characterized by strong global interdependencies such as agribusiness.

3. Global value chain applied to the agri-food industry

The globalization of the agri-food industry is characterized by the growing influence of large corporations and a new "multinational" division of labor, reflecting new North-South relationships (with companies in

the North taking charge of brand and product development, and those in the South providing assembly services and supplying raw materials) (Palpacuer, Balas 2010). The globalization of the agri-food industry reflects new relationships of dependence and domination, notably with the growing influence of large distribution companies, leading to an even greater shift in bargaining power towards the downstream end of the supply chain (Cheriet, 2015).

Participation in a GVC can help the country and national agricultural SMEs in their process of improving product quality and developing value-added tasks (Amachraa and Maad, 2023). The concept of global production networks (GPNs) makes it possible to go beyond sectors of activity and national economies to establish new forms of participation in the creation of final value, based on intermediate added value (Amachraa and Maad, 2023).

a. Definition of the sector

The concept of the supply chain is central to the analysis of production and processing systems, particularly in the agri-food sector. As an analytical approach, it provides an understanding of the organizational mechanisms and relationships between the various actors, from the primary production stages to final consumption. This chapter aims to examine the epistemological foundations of the supply chain, while highlighting its development in theoretical and practical terms. Special attention will be given to the agri-food supply chain, before exploring the transition to the analysis of global value chains, which offers a broader perspective on the challenges of integration and competitiveness in a global context.

The concept of a sector was devised by industrial economists to refer to a set of activities linked to the production, transformation, and distribution of a good or service (Bencharif and Rastoin, 2007). The classic approach to the concept of a value chain is the notion of a sector. The industry is an alternative economic category that complements the notion of branch or sector, offering a breakdown of the production system to better understand the dynamics of emergence, decline, and reconfiguration of its components (Temple, Lançon, Palpacuer, and Paché, 2011).

b. The agri-food industry

In the agricultural and agri-food sector, supply chain analysis was pioneered in the 1950s by R.A. Goldberg in a seminal work entitled “A Concept of Agribusiness” (Goldberg and Davis, 1957).

According to R.A. Goldberg, "the commodity system approach encompasses all participants involved in the production, processing, and marketing of an agricultural product (Bencharif and Rastoin, 2007). It includes agricultural suppliers, farmers, storage contractors, processors, wholesalers, and retailers, enabling the raw product to move from production to consumption. Finally, it concerns all “institutions,” such as government institutions, markets, and trade associations, which affect and coordinate the successive levels through which products pass. (Goldberg, 1968).

Today, it would seem that the term “agribusiness” is used mainly to refer to the activities of companies working for the agricultural market (agricultural supplies). Harvard's research focused more on the flows linking the various elements of the sectors than on the agents within those sectors, clearly highlighting the value-added sequences and the growing distance between agriculture, the “technical core” of agribusiness, and the end markets (Bencharif and Rastoin, 2007).

***c.* From sector analysis to the global value chain**

Analyses of agri-food sectors have become widespread since the 1960s. Initially developed on the basis of national accounting flows, they quickly underwent a series of theoretical and methodological

contributions, which have now made them a mature empirical framework for identifying vertical relationships, value sharing mechanisms, price transmission tools, and the characterization of the profiles of the actors involved and their roles in the structuring of production and trade activities (Cheriet, 2015).

After the pioneering work on structural analysis to characterize flows and actors, the objective in the 1970s was to characterize the performance of sectors through the strategies of their companies (SCP model) (Cheriet, 2015). The first break came in the 1980s with the emergence of Porter's competitive advantage paradigm, which focused on issues such as company positioning, competitiveness, and the integration of "secondary" operations as determinants of the value created by companies (Cheriet, 2015). Stimulated by the emergence of the new institutional economics in the late 1990s, a second shift was marked by interest in the challenges of coordination between actors (Cheriet, 2015). Finally, driven by the work of Gereffi (Gereffi et al., 2005) and through the introduction of a dynamic and multidisciplinary approach (notably with the emergence of organizational sociology), a final development highlighted the concept of global value chains (GVCs) (Cheriet, 2015).

CGV analysis is not simply an extension of a characterization of flows on a global scale. It also, and above all, presents a multidisciplinary interpretation of the organization of activities and relationships between actors (Barhdad and Benabdelhadi, 2021).

Furthermore, the examination of CGV clearly falls within the framework of sector analysis, combining interpretations of international strategy and institutional economics, enriched by contributions from organizational sociology (Kaplinsky, 2000). The CGV is an analytical framework developed on the basis of contributions from previous trends in sector analysis (Cheriet, 2015).

The main theoretical and methodological approaches to agri-food sector analysis discussed above, along with their key tools and analytical uses, are summarized in table 1.

Table 1. Methods, tools, and uses of sector analysis (Source : Rastoin, Ghersi (2010), p 188)

Method	Main tools	Uses
Structural analysis	Technical flowchart, economic model Accounting (turnover, value added, employment) at natinal and firm level Food balance sheets	Visualization of value chain components Characterization of flows through key figures, calculation of performance indicators
Functional analysis Industrial economics	Structure–Conduct–Performance (SCP) Competitive advantage (M. Porter) Quantitative microeconomics	Value chain structure and dynamics Analysis of firm positioning / competitiveness Econometric modeling and simulation
Institutional analysis Neo-institutional ecomnics	Transaction cost theory	Coordination mechanisms between agents or groups of agents taken pairwise
Systemic analysis	Environmental variables and canonical O-I-D framework (operations, information, decisions)	Overall representation, analysis of components and relationships within a value chain
Global Value Chain (GVC)	Flow and stakeholder analysis (public and private actors), governance modes, economic sociology	Global vision of the value chain, typologies, identification of dominant actors and value chain dynamics
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Applying the global value chain framework to the agri-food industry makes it possible to capture the specific characteristics of a sector that is both highly fragmented and deeply embedded in global markets. By clarifying the definition of the agri-food sector and its industrial components, this analysis shows how agricultural production, processing, and distribution are increasingly organized across borders. Moving from traditional sector analysis to a global value chain perspective allows for a more comprehensive understanding of how value is generated, coordinated, and distributed among a wide range of actors, from primary producers to multinational firms. The GVC approach thus offers a relevant analytical lens for addressing the complexity of agri-food systems, where economic, institutional, and geographical dimensions interact to shape production structures and competitive dynamics.

4. Analysis and governance of the global agri-food value chain

a. Analysis of the global agri-food value chain

CGV analysis is a powerful and relatively robust tool for characterizing agri-food sectors (Cheriet, 2015) Through a historical reading of flows and relationships between actors, it provides information on long-term dynamics (Kaplinsky 2000). It also allows us to consider the "deconstruction-reconstruction" of certain sectors and the complexity of globalized supply chains (Cheriet, 2015).

GVCs are characterized by four fundamental dimensions, namely their input-output structure, their geography, their intra- and inter-firm governance, and their socio-institutional context (Gereffi, 1994). Gereffi proposes four methodological steps for analyzing GVCs applied to agri-food: sequencing activities, delimiting the relevant geographical and economic space, identifying the institutional framework, and analyzing modes of governance and coordination. These four steps involve a series of actions, sometimes requiring the collection of significant amounts of quantitative and qualitative data. A GVC can be described through four elements:

- a sequence of activities from design to implementation (structure and input/output flows);
- a geographical and economic space, estimated through the location and concentration of activities (market share) and international trade;
- an institutional context (public policies, regulations, public or private agreements and standards);
- a governance system (power relations that determine the allocation of human, financial, and material resources in the GVC).

The sequence of activity can be understood through branch accounting, the effects method, and product balance sheets (Bencharif and Rastoin, 2007). We believe this dimension is essential because it provides quantified content and leads to modeling of the sector (Bencharif and Rastoin, 2007). However, it is still rarely present in empirical studies proposed within the CGV framework (Bencharif and Rastoin, 2007). The geo-economic space is described by market structures (Zylhersztajn, 1999). The institutional context falls within the scope of neo-institutional economics and political economics (Bencharif and Rastoin, 2007). The governance system draws on management sciences (corporate governance), transaction cost theory, organizational sociology, and political sciences (Bencharif and Rastoin, 2007).

These four dimensions enable us to characterize a type of supply chain. The governance system distinguishes between buyer-driven chains (such as in the agri-food sector) and producer-driven chains (such as in the automotive or IT sectors) (Bencharif and Rastoin, 2007).

It should be noted that Bencharif and Rastoin (2007) have incorporated a fifth dimension called "temporal" in addition to the four dimensions of GVC analysis developed by Gereffi. Their argument is that the

dynamics of GVCs can only be analyzed over a sufficiently long period of time to incorporate all actual or probable significant events. This multidimensional construct makes it possible to understand the strategic and managerial challenges of globalization in all their complexity and from a variety of perspectives, including those of companies located in different places or "links" in global chains and endowed with varying degrees of assets to capture sustainable value, but also those of NGOs involved in GVCs to change their social and environmental conditions, or those of governments seeking to guide the socio-economic trajectory of their countries (Palpacuer & Balas, 2010).

In this sense, the analytical methodology for constructing GVCs consists of tracing the material flows from the processing of raw materials to the marketing of the product, in order to characterize the input-output sequence while identifying organizational arrangements in terms of specialization and inter-firm coordination, the geography of chains, and their socio-institutional embeddedness (Palpacuer & Balas, 2010) . This approach makes it possible to account for the specific characteristics of chains according to the products and countries considered, while identifying the common principles underlying their development (Palpacuer & Balas, 2010).

b. Governance of Global Agri-Food Value Chains

In this unprecedented context, GVCs offer an appropriate policy framework for building a sustainable global system that guarantees agricultural products at the best value for money, with stakeholder involvement and fair and innovative use of natural resources (responsibility) (Amachraa and Maad, 2023). Integrating a GVC is the response of a network of agricultural countries and MNEs to global social demand. It is about supporting collective dynamics and breaking with the individualism of previous food security programs (Amachraa and Maad, 2023). Investing in a GVC always means developing R&D and seeking to reflect on the challenges of tomorrow: agro-industrial, social, and environmental (Amachraa and Maad, 2023).

Analyses of agri-food sectors using the CGV approach have developed significantly over the last decade (Cheriet, 2015). The consistency of the CGV theoretical framework (management and sociology of organizations) and the methodological value of sector analysis reinforce the relevance of this mode of analysis (Temple et al., 2011). There have been numerous empirical applications in the agri-food sector: exports of tropical products from Africa, access of agricultural products to the European market, the extroversion of certain sectors in developing countries, the structuring of local sectors, international sourcing by large distribution companies, etc.

These empirical applications have often led to detailed assessments of the relationships between actors and a characterization of modes of governance and coordination (Cheriet, 2015). They have also made it possible to assess the learning and upgrading efforts of certain local sectors (Gereffi et al., 2005). Some research is currently attempting to broaden the scope of investigation to other topics (Cheriet, 2015).

The governance of global value chains (GVCs) is of major importance in a context marked by globalization and the growing interconnection of markets. It influences interactions between actors in the chain, the distribution of added value, production standards, and power relations.

One of the main topics of discussion in the field of research on global value chains concerns their mode of governance (Bair, 2005). The points of discussion in this multidisciplinary debate focus on issues related to the analysis of globalization phenomena and the examination of the new power relations created by the organization of global markets. In this context, the governance system developed by Gereffi (1994) is one of the analytical tools that has received particular attention from researchers.

In contrast, the approach to global value chain governance introduced by Gereffi is defined as "the relationships of authority and power that determine how financial, material, and human resources are allocated and circulate within a chain." This is why governance is considered a central concept in Gary Gereffi's theory of global value chains. In developing it, he drew inspiration from the transaction cost model of industrial economics theory. Against this backdrop, the origins of GVC governance concepts can be traced back to institutional economics theories.

In this vein, Gereffi (1994) defines governance as "the authority and power relations that determine the distribution of material, financial, and human resources throughout the chain." Other researchers have focused on the division of labor within the chain as a priority.

The concept of corporate governance applied to GVCs generally examines the relationships between multinational firms (leaders) and their suppliers (affiliated and non-affiliated companies) (Amachraa and Maad, 2023).

According to the OECD, "governance refers to the organization of a value chain and coordination between actors, enabling a product to be transported from primary production to end use. This may include the power and capacity of certain actors in the value chain to exercise coordination and/or control along that value chain" (Amachraa and Maad, 2023). Thus, governance represents the way in which GVCs are managed and translates into rules of the game (Amachraa and Maad, 2023).

Gereffi (2005), in his seminal article on Global Value Chains, sought to shed more light on the issue by developing a much broader typology that distinguishes five types of GVC governance: hierarchical, captive, relational, modular, and market-oriented (Amachraa and Maad, 2023).

Consequently, a good understanding of how a value chain is structured and coordinated can reduce risks and provide a better understanding of the interdependencies between intermediate actors (Miller and Jones, 2013).

In more recent work, Gereffi, Humphrey, and Sturgeon (Gereffi et al., 2005) distinguish five types of GVC governance: the market, modularity (custom work), relational network (based on reputation, family, or ethnic criteria), captive network (dependence on large buyers, as is the case in the agri-food sector in rich countries), and finally hierarchy (integration) (Bencharif and Rastoin, 2007). Forms of governance can be deduced from public policies or corporate or inter-company strategies. A fifth dimension deserves to be included in the CGV method: the temporal dimension. Understanding the dynamics of a sector can only be achieved over a sufficiently long period of time to detect the major trends that have been at work and the disruptions that are likely to occur (Kaplinski, 2004).

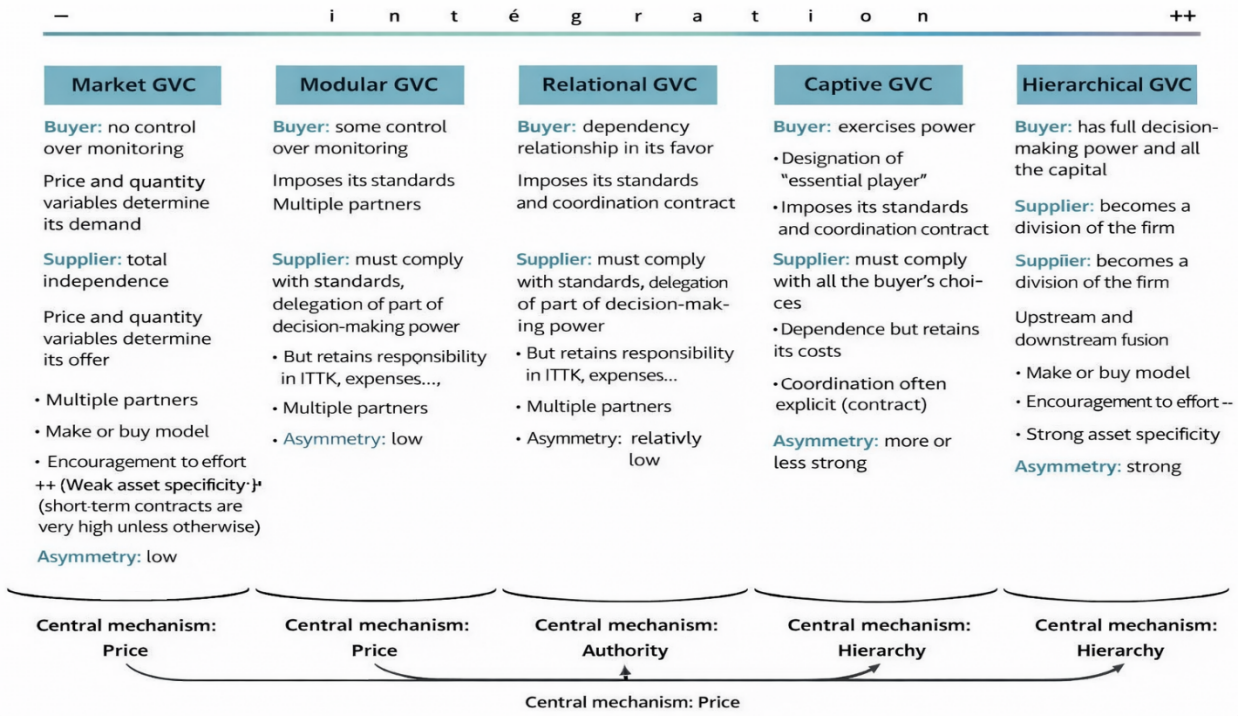
We can therefore say that globalization is disintegrating or deconstructing supply chains through an increasing division of labor and greater distances between, on the one hand, the production site for all types of inputs needed to manufacture finished products and, on the other hand, the place where these products are purchased and consumed (Bencharif and Rastoin, 2007). This is therefore fundamentally a deconstruction of activities in relation to a territory: we are moving from a "nodal" or "point" sector (farming) to a "short" sector (artisanal stage), then a 'fragmented' sector (agro-industrial stage), and finally a globally "scattered" sector (agro-tertiary stage) (Bencharif and Rastoin, 2007).

The first level of interpretation concerns the governance of the GVC. The five modes of governance developed by Gereffi et al. (2005) determine the degree of integration of activities: Market governance; Modular governance (the buyer imposes its standards; low information asymmetry; suppliers and customers work with several partners); Relational governance (mutual dependence, asset specificity,

physical proximity); Captive governance (power is exercised directly by the key player, significant asymmetry, control and coordination of the chain are entirely managed by the leading firm); Vertical integration (supplier and leading firm become one). The second level distinguishes between three modes of coordination (Tozanli and El Haddad-Gauthier, 2007): vertical, networked, and market-based. These two levels are summarized in the figure below:

The analysis of global agri-food value chains highlights the diversity and complexity of relationships that structure production and distribution at the global level. By examining the organization of activities along the chain, this approach sheds light on how value is created and captured by different actors, as well as on the strategic positioning of firms and countries. Governance mechanisms play a central role in this process, as they determine the forms of coordination, power distribution, and control that shape global agri-food networks. Understanding these governance structures is essential for assessing opportunities for upgrading, learning, and inclusion, but also for identifying the constraints faced by less powerful actors. Overall, the GVC framework provides a robust analytical tool for interpreting the evolving dynamics of the global agri-food system in a context marked by increasing uncertainty, market concentration, and structural change.

Figure 1. : Governance arrangements for global value chains (Gereffi *et al.*, 2005)



For better governance, several economists, echoed by civil society, have suggested that social actors commit to finding ways to leverage CSR and force change to shift global value chain economic models toward models that enable more inclusive and sustainable activities, with the active participation of all stakeholders in global value chains (Amachraa and Maad, 2023).

5. Limits and Prospects of Global Agri-Food Value Chains

GVCs face numerous economic, geopolitical, technological, and environmental risks. The GVC approach has several limitations due to its lack of attention to the spatial and territorial dimension of the chain.

More recently, supply chain disruptions have been widely felt in all countries and at all levels of the economic sectors (Amachraa & Quelin, 2022). Calls for the regionalization of GVCs are growing in the post-COVID-19 context, and therefore research on regionalization strategies could contribute to enriching the literature (Toura and Boubrahimi, 2023).

The concept of vulnerability determines the impacts that will be felt following an internal or external shock, focusing on the adaptive capacity of stakeholders involved in globalized production processes (Amachraa and Maad, 2023). Consequently, an increase in GVC vulnerability may therefore be the result of an increase in (F) fragmentation of global production and (I) interdependence, a reduction in (CA) adaptive capacity, or any other negative interaction between these three factors (Amachraa and Maad, 2023).

Increased vulnerability of the global value chain may result from more pronounced fragmentation of global agricultural production, interdependence of activities and actors, and reduced adaptive capacity or any other negative interaction between these three elements. Conversely, reduced vulnerability may result from a decrease in expected impacts or an increase in adaptive capacity (Amachraa and Maad, 2023).

According to (Amachraa and Maad, 2023), we would now like to propose a new paradigm for analyzing global agricultural value chains based on new values:

- Global community: Integrating a global value chain in the agricultural and food sector is the response of a network of agricultural countries and MNEs to global social demands such as climate change mitigation/adaptation and food security. The aim is to support collective dynamics and break with the individualism of previous food security and climate change adaptation programs.
- Responsibility: Integrating a GVC is a way of guaranteeing its stakeholders agricultural products and services at the best value for money to ensure maximum well-being with the most efficient use of resources (water, fertilizers, and technology as a priority).
- Innovation: Finally, integrating a GVC is a way to continually encourage R&D and reflection on solutions to the challenges of tomorrow: agro-industrial, social, and environmental.

In this sense, and in line with work analyzing the organization and dynamics of global agri-food value chains (GAVCs), a major focus now lies in explicitly integrating financial performance and sustainable finance criteria into the assessment of their competitiveness. While research has largely focused on productive, logistical, and institutional dimensions, stakeholders' ability to measure, manage, and compare the overall economic performance of the chain remains limited. At the same time, the rise of sustainable finance through ESG requirements, green financing mechanisms, and increased investor expectations is gradually transforming the competitiveness criteria for agri-food GVCs. These chains will therefore not only have to optimize their costs and traditional value creation, but also demonstrate their environmental and social resilience to attract financing, secure markets, and comply with new regulations. The challenge for future research will be to articulate these two dimensions by developing analytical frameworks capable of capturing the real impact of sustainable finance on the structure, governance, and overall performance of agri-food chains.

6. Conclusion

This article has provided a critical synthesis of the global value chain (GVC) framework and its application to the agribusiness and agri-food sector. By revisiting the conceptual foundations and evolution of the GVC paradigm, it highlights how this approach goes beyond traditional sectoral and value chain analyses

by explicitly addressing international fragmentation, inter-firm coordination, and power asymmetries within globally organized production networks. Overall, the review confirms the value of GVC analysis for understanding the organization, governance, and strategic dynamics of contemporary agri-food systems.

The relevance of the GVC framework for the agri-food sector is closely tied to the specific features of this industry, such as biological constraints, product perishability, strict sanitary and quality standards, strong territorial embeddedness, and the central role played by small-scale producers, particularly in developing countries. Taking these characteristics into account helps clarify how value is created, distributed, and captured along agri-food chains, and how governance structures shape market access, upgrading opportunities, and patterns of inclusion or exclusion.

At the same time, this review points to several limitations of the GVC approach when applied to agri-food systems. The literature remains fragmented, and important dimensions—such as territorial specificities, long-term dynamics, and socio-environmental issues—are still insufficiently explored, despite their central importance in agri-food contexts. These gaps suggest that relying on a single analytical perspective may result in only partial understandings of complex value chain dynamics.

Despite these limitations, the scope for future research within the GVC framework remains substantial. Greater analytical clarity, more comparative and replicable empirical studies, and stronger attention to informal coordination, territorial anchoring, and historical trajectories would significantly strengthen future work. Recent supply chain disruptions and growing vulnerabilities further highlight the need to integrate resilience and adaptive capacity into GVC analysis.

By systematically confronting the GVC framework with the specific characteristics of agri-food systems, this article addresses a key gap in the literature, where GVC concepts are often applied without fully questioning their sectoral relevance. Its main scientific contribution lies in offering a coherent and critical synthesis that clarifies both the strengths and the structural limits of GVC analysis in the agri-food context. In doing so, the article provides a necessary conceptual foundation for future empirical research and policy debates on the transformation of global agri-food systems. From this perspective, the GVC framework remains a valuable analytical tool, provided it is complemented by institutional, territorial, and dynamic approaches.

7. Références

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