

# Global Food Value Chains

## *A Conceptual Guide*

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This book aims to introduce a new framework of analysis for competition law and policy, but also the broader field of regulation of the food economy, drawing on the concept of global value chains. These global value chains (henceforth ‘GVCs’) are structures of organisation of economic activity, which are characterised by their “systemic, coordination-driven nature”.<sup>1</sup> They rely on various systems of transnational governance and different sorts of linkages, some traditional such as contract law, others novel and relying on corporate law, property law or some more informal mechanisms, relying on information technology. For instance, GVCs are becoming a primary conduit for the transfer of intellectual property (‘IP’) globally, with the creators of intellectual products relying less on traditional IP regimes to enable them to limit access to their material, and more on a combination of contractual rights and technological protections.<sup>2</sup>

GVCs are prevalent in the global economy. As a joint report from the OECD, WTO and World Bank indicates, in 2013, “between 30% and 60% of G20 countries’ exports consist of intermediate inputs traded within GVCs”.<sup>3</sup> Sobel-Read goes as far as arguing that “the most important paradigm for understanding the global economy, and the political and social relationships that both guide it and stem from it, is no longer the template of the market but rather the role of global value chains”, “corporate action, in the form of global value chains not only driving but also

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<sup>1</sup> K. B. Sobel-Read, *Global Value Chains: A Framework for Analysis*, (2014) 5(3) *Transnational Legal Theory* 364, 365.

<sup>2</sup> *Ibid.*

<sup>3</sup> See OECD, WTO and World Bank Group, “Global Value Chains; Challenges, Opportunities and Implications for Policy”, (2014), <[https://www.oecd.org/tad/gvc\\_report\\_g20\\_july\\_2014.pdf](https://www.oecd.org/tad/gvc_report_g20_july_2014.pdf)>, 13; UNCTAD, “World Investment Report”, (2013), <[http://unctad.org/en/PublicationsLibrary/wir2013\\_en.pdf](http://unctad.org/en/PublicationsLibrary/wir2013_en.pdf)>.

defining, and therefore creating, the market”.<sup>4</sup> Indeed, value creation is increasingly structured around GVCs, which permit the simultaneous and coordinated transnational production and distribution of a very large array of products that each stage of the supply chain has to manage effectively, without this necessarily involving vertical integration by ownership.<sup>5</sup>

Although the tool was initially framed so as to help policy-makers to design industrial strategies geared towards a greater participation of firms, active in their jurisdiction, to the global economy, we think that its descriptive potential is wider than that. By exploring the sequences of tangible and intangible value adding activities, “from conception and production to end use”, GVC analysis offers a picture of global industries both “from the top-down”, by examining for instance “how ‘lead firms’ govern’ their global-scale affiliate and supplier networks”, but also from “the bottom-up”, asking “how these business decisions affect the trajectory of economic and social ‘upgrading’ or ‘downgrading’ in specific countries”<sup>6</sup>.

This mapping approach examines various dimensions: (i) the input-output structure of a GVC, by focusing on the process of transformation of raw materials and factors of inputs of production to final products, (ii) the geographic scope of GVCs which explains the degree of global dispersion of the chain, (iii) the governance structure of the GVC, which delves into the issue of control of the chain, (iv) the upgrading, which describes “the dynamic movement within the value chain” and “how producers shift between different stages of the chain”, (v) the local (or global) institutional context in which the value chain is embedded, including regulation and self-regulation, (vi) industry stakeholders that may be various local (but also global) actors of the value chain that interact to achieve industry upgrading. These may not only be companies, but also industry associations, workers, educational or research institutions, government agencies and ministerial departments. All these actors are involved to a certain degree in the operation of the global value chains and influence their development.

With some exceptions, GVCs have not been systematically explored by competition law scholars.<sup>7</sup> The concept nevertheless offers an important analytical potential. The most obvious one relates to the transnational dimension it brings forward, calling for a “transnational coordination” between “destination states” and “producer states”, with this coordination being pursued at global, regional or bilateral

<sup>4</sup> *Ibid.*

<sup>5</sup> K. De Backer, Koen and S. Miroudot, “Mapping Global Value Chains”, (2014), European Central Bank, *Working Paper Series*, No. 1677.

<sup>6</sup> G. Gereffi and K. Fernandez-Stark, *Global Value Chain Analysis: A Primer* (CGGC: 2nd ed., 2016), 7.

<sup>7</sup> See I. Lianos and C. Lombardi, “Superior Bargaining Power and the Global Food Value Chain: The Wuthering Heights of Holistic Competition Law?”, (2016) *Concurrences* 1-2016, 22-35; D. Gerber, “Competition Law and Global Supply Chains”, (2016), <<http://ssrn.com/abstract=2807154>>; I. Lianos, “Global Value Chains and Competition Law”, (2016), CLES Research Paper Series 5/2016.

levels.<sup>8</sup> A deeper impact could be the re-conceptualisation of the way competition law deals with vertical integration or quasi-integration, but also more generally the competitive process. Traditionally, the relation between the different levels of a vertical supply chain has been thought of as complementary, with competition authorities rarely seeing any reason to intervene, unless one of the segments disposes of considerable market power and engages in acts of exclusion, for instance, by raising the costs of its rivals upstream or downstream. This approach tends to ignore the allocation of the revenues engendered by the supply chain between the various partners (what some have called “vertical competition”),<sup>9</sup> as an issue external to the exclusive focus of competition law on economic efficiency. In contrast, the GVC approach recognises that issues relating to the distribution of the total surplus value of the chain also take a prominent role in the relation between the various economic actors participating in the supply chain, especially as supply chain management, even if it is flexible, facilitates the crystallisation of their position (and share). By dissecting the chain-wide coordination of various economic activities, the GVC approach also better describes the systemic nature of GVCs; each part of the chain has an impact upon the other parts. Finally, the focus on value creation accepts that value does not only relate to profits made by economic activity in product markets, but also includes all forms of value creation in modern financial capitalism, in particular the appreciation of assets in futures markets, which is of particular importance in view of the financialisation of the food value chain.<sup>10</sup>

The GVC approach provides a theoretical framework that enables us to understand how the global division and integration of labour in the world economy has evolved over time and, more importantly, how the distribution of awards, from the total surplus value, is allocated between the various segments of the chain.<sup>11</sup> The starting point for the development of this framework was the growing importance of new global corporations, such as buyers (e.g. big retail) constituting “buyer-driven

<sup>8</sup> Gerber, (7), 24-26.

<sup>9</sup> See R. Steiner, “Intrabrand Competition-Stepchild of Antitrust”, (1991) 36, *The Antitrust Bulletin*, 155–200; Sobel-Read (1), who notes that “one consequence of these evolving strategies is that competition in the global marketplace is becoming increasingly vertical rather than horizontal. In other words, the most effective path for a clothing supplier in Reebok’s value chain is often *not* to switch to a slightly better contract with a competing brand such as Adidas but instead to advance to higher value-added work within its existing value chain for Reebok. Such work can include the performance of additional activities (e.g. assembly in addition to cutting) or the performance of current activities for a more profitable market (e.g. cutting high-performance cotton rather than standard cotton)”.

<sup>10</sup> See, I. Lianos, A. Velias, D. Katalovsky & G. Ovchinnikov, Financialization of the food value chain, common ownership and competition law, (2020) 16(1) *European Competition Journal* 149 and T. Ferrando (Chapter 3 in this volume).

<sup>11</sup> On the GVC framework and its predecessor Global Commodity Chains, see G. Gereffi and M. Korzinenewicz, *Commodity Chains and Global Capitalism* (edited by G. Gereffi and M. Korzinenewicz; Praeger, 1994); R. Kaplinsky and M. Morris, “A Handbook for Value Chain Research”, <<https://www.ids.ac.uk/ids/global/pdfs/VchNovo1.pdf>>.

global commodity chains". These powerful lead firms are usually located in industrialized countries and interact with economically less powerful suppliers present in the developing countries. Contrary to traditional Neo-classical price theory analysis, and more in vogue with transaction cost economics ("TCE") and economics of organisation, the GVC approach enables competition authorities to focus not only on issues of horizontal market power and concentration at each segment of the chain, but also to engage with the vertical links between the various actors with the aim to understand how and whether "lead" actors can capture value. Their focus is on the distribution of the value generated by the chain, rather than the maximisation of the surplus (efficiency) as such.

GVC's "holistic view" of global industries centres on the governance of the value chain, that is, how some actors can shape the distribution of profits and risks in the chain. Taking a political economy perspective, the GVC approach explores the way economic actors may maintain or improve ("upgrade") their position in the global value chain, "economic upgrading" being defined as "the process by which economic actors—firms and workers—move from low-value to relatively high-value activities in GVC".<sup>12</sup> Concerns over global competitiveness, employment, investment in quality competition and long-term consumer interest may weigh in on the decision of competition authorities to explore the dynamics of global value chains and the way issues of distribution may be included in competition law assessments.

We consider that such an approach contributes to understanding the challenges transnational production raises to competition law enforcement. This is particularly the case in the context of GVCs affecting developing or emergent economies,<sup>13</sup> which is a topic that has attracted some attention in view of the necessity to promote a political economy framework that will enable local firms to participate in GVCs and, thus, to capture value or to "upgrade" existing capabilities and to create "domestic" added value.

The approach is also helpful in order to examine the organisation of the global food system in global food value chains, which forms the object of our study. The food supply chain is generally depicted as being composed of three main levels: agricultural production, industrial processing and wholesale or retail distribution. At a closer look, however, the food supply chain becomes more complex; it involves a number of other stages and links that add value to the chain either in the form of goods or services inputs. The food industry is heavily dependent on scarce resources like arable land, water and genetic resources (a limited biodiversity). At each level of the supply chain, firms, as well as other organisational forms, perform specific activities in the supplying of goods and/or services. Moreover, at the same level there may be one or more firms performing the same or complementary activities thereby adding specific value at

<sup>12</sup> G. Gereffi, "Global Value Chains In A Post-Washington Consensus World", (2014) 21(1) *Review of International Political Economy*, 18.

<sup>13</sup> See, for instance, R. Kaplinsky, "Competitions Policy and the Global Coffee and Cocoa Value Chains", (2004), Paper for UN Conference for Trade and Development <<https://www.ids.ac.uk/files/RKaplinskycocoacoffee05.pdf>>.

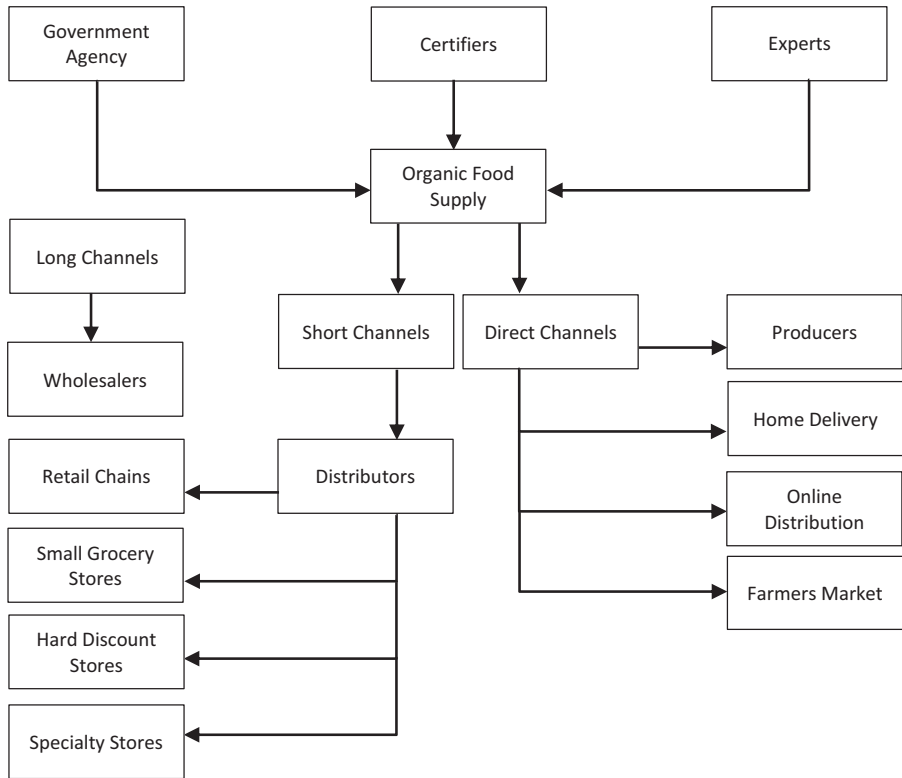


FIGURE 1.1. *The Long and Short Supply Chains*

Source: Europea Commission, Joint Research Center 2013, M. Kneafsey, L. Venn, U. Schmutz, B. Balázs, L. Trenchard, T. Eyden-Wood, E. Bos, G Sutton, M. Blackett, 'Short Food Supply Chains and Local Food Systems in the EU' (2013) Report EUR 25911 EC, available at [https://publications.jrc.ec.europa.eu/repository/bitstream/JRC80420/final%20ipts%20jrc%2080420%20\(online\).pdf](https://publications.jrc.ec.europa.eu/repository/bitstream/JRC80420/final%20ipts%20jrc%2080420%20(online).pdf)

their stage of activity. The food supply chain, as a whole, originates, therefore, even before the agricultural sector, with the factor market (for example, the seed provider), and ends with the final consumer. The power relations in the global food value chain are characterised by international actors and local producers operating within the geographic area determined by the logistics of the product. Issues of distribution of the total surplus value of the global food chain are, thus, paramount and should inevitably influence competition law enforcement.

The agricultural commodities generally undergo a processing stage before being distributed. However, in some cases they are sold directly to consumers (direct chain) or through the sole mediation of the wholesale industry (short supply chain). The length of the supply chain depends on how many stages of transformation or commercialisation the product undergoes before reaching the final consumer (Figure 1.1).

A simplified description of the structural organization of the supply chain is generally based on the relationships between producers and suppliers, on one hand,

and suppliers and retailers, on the other.<sup>14</sup> Typically, at production level, the relationship between market actors spans from a spot market exchange to a full ownership integration.<sup>15</sup> Within this range, there are different types of contractual relationships, which contribute to the definition of the governance model adopted by the supply chain. In particular, marketing agreements and production agreements are the categories under which different relationships between contractors and growers are defined.<sup>16</sup> At distribution level, instead, there are generally three types of wholesalers around which the supply chain is structured: a) merchant wholesalers; b) manufacturers' branches and offices; and c) brokers and agents.<sup>17</sup>

Along the food supply chain, firms perform their activities together with and in compliance to governmental agencies and NGOs-managed regulatory regimes and certifications. In this perspective, production, services and monitoring activities, all bundle in the same value chain that brings the product to the final consumer. Consequently, one may add to the concept of 'length' of the supply chain that of 'width', aiming to describe the situation in which actors that are situated at the same level of the value chain perform similar or complementary activities, adding specific value at their stage of activity. However, some of the actors may simultaneously perform the same activity for different levels of the supply chain. This is the case, for instance, of the certification agencies, which verify the activity of both suppliers and sub-processors, thus blurring the significance of the distinction between width and length. The characteristics and number of firms involved in the different segments of the food value chain vary considerably:

The profitability and structure of the various segments of the value chain also vary. Some segments are characterised by intense levels of competition and consequently lower profitability, while others are more concentrated (Figure 1.2).

The recent pandemic Covid-19 has challenged the resilience of this global organisation of value chains. The various global value chains had to respond to two types of simultaneous shocks. On the supply side, food prices surged, first as a result of climate change and the occurrence of infectious diseases of animals and plants at a regional level, second, as a result of the disruption because of Covid-19 and the lock-downs affecting farm labour and export restrictions to important disruptions of food production and distribution, along the food supply

<sup>14</sup> Food supply chains are generally presented as characterized by a structure characterized by two bottlenecks, one at supply level and the second at retail level, see for instance South Centre, 'Rebalancing the Supply Chain: Buyer Power, Commodities and Competition Policy' (2008) South Centre.

<sup>15</sup> J.M. Harris, Ph.R. Kaufman, S.W. Martinez & C.C. Price, 'The US Food Marketing System: Competition, Coordination, and Technological Innovations Into the 21st Century' USDA Economic Research Service (2002) 1.

<sup>16</sup> James M MacDonald and others, 'Contracts, Markets, and Prices: Organizing the Production and Use of Agricultural Commodities' [2004] USDA-ERS Agricultural Economic Report <[http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=754986](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=754986)> accessed 22 May 2015.

<sup>17</sup> J.M. Harris and others (16).

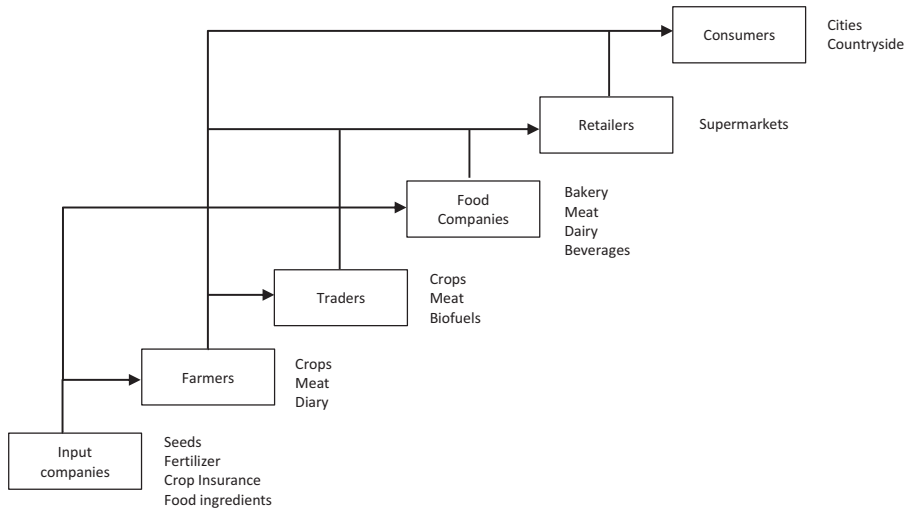


FIGURE 1.2. *Key profitability metrics of the agribusiness value chain*

Source: KPMG International (2013), *The agricultural and food value chain: entering a new era of cooperation* (2013), 5

chain.<sup>18</sup> On the demand side, panic buying has quickly depleted stockpiles, with empty shelves appearing in supermarkets, thus further fuelling panic.<sup>19</sup> As food safety, at a national level, becomes a key concern for governments, this may alter to a certain extent the policy followed with regard to certain dimensions of the governance of the food value chain, for instance by focusing on key logistic bottlenecks, facilitating the coordination between the different segments of the food value chain<sup>20</sup>, or by enabling

<sup>18</sup> C.M. Reinhart & R. Subbaraman, *How can we prevent a COVID-19 food crisis?*, WEF (May 16, 2020), available at <https://www.weforum.org/agenda/2020/05/preventing-a-covid-19-food-crisis/>.

<sup>19</sup> See, *The Guardian*, *Off our trolleys: what stockpiling in the coronavirus crisis reveals about us* (April 3, 2020), available at <https://www.theguardian.com/news/2020/apr/03/off-our-trolleys-what-stockpiling-in-the-coronavirus-crisis-reveals-about-us>.

<sup>20</sup> See for instance, the approach followed by the EU Commission which in response to the ongoing COVID-19 pandemic, it took steps to stabilize some food sectors (milk, flowers and potatoes) whose supply chain was significantly affected by the pandemic, through an exceptional derogation from the EU competition rules, using a possibility offered by Article 222 of Regulation 1308/2013 [Regulation (EU) 1308/2013 of the European Parliament and of the Council, establishing a common organisation of the markets in agricultural products and repealing Council Regulations (EEC) No 922/72, (EEC) No 234/79, (EC) No 1037/2001 and (EC) No 1234/2007, [2013] OJ L 347]. The EU Commission adopted Implementing Regulation (EU) 2020/593 of 30 April 2020 authorising agreements and decisions on market stabilisation measures in the potatoes sector, [2020] OJ L 140/13; Implementing Regulation (EU) 2020/594 of 30 April 2020 authorising agreements and decisions on market stabilisation measures in the live trees and other plants, bulbs, roots and the like, cut flowers and ornamental foliage sector, [2020] OJ L 140/17; Implementing Regulation (EU) 2020/599 of 30 April 2020 authorising agreements and decisions on the planning of production in the milk and milk products sector, [2020] OJ L 140/37.

farmers' access to markets through e-commerce channels.<sup>21</sup> The e-commerce purchase rate of food or groceries in Europe, but also other parts of the world, has increased significantly in recent years,<sup>22</sup> and this trend has accelerated with the Covid-19 pandemic, due to the consumer lockdown and other restrictive measures.<sup>23</sup>

The book focuses on global *value* chains, because of our emphasis on the issues of distribution of the total surplus value of the chain and inequality of bargaining power in the context of these transnational supply chains, which, according to us, competition law should tackle.<sup>24</sup> Hence, the use of the terminology of GVCs carries, for us, normative implications. Yet, we also envision this book as an opportunity to engage with competition law work focusing on global food *supply* chains as an economic phenomenon of interest for competition law.

We engage with the traditional competition law framework that has been mainly used by competition authorities in guiding their action in this area and assess if it is up to the task. We explore other alternatives on offer, including the value chain approach, and examine their comparative advantages and disadvantages. In order to do this we take a political economy perspective and also explore the issue of the global governance of food value chains, focusing on the interaction of competition law principles with other public policy objectives at a local and a global scale. As the food value chain is still to a large extent global, it may be subject to intense transnational regulations and the application of various competition laws and other forms of regulation.

Although we aim to take a broader perspective than price theory in the conceptualization of competitive interactions between economic actors involved in food production and commercialisation, we have chosen not to incorporate in this analysis the broader macro-perspective of “food regimes”.<sup>25</sup> We recognize that this

<sup>21</sup> M. T. Cullen, COVID-19 and the risk to food supply chains: How to respond? (Food and Agriculture Organization of the United Nations, March 2020), available at [www.fao.org/3/ca8388en/CA8388EN.pdf](http://www.fao.org/3/ca8388en/CA8388EN.pdf).

<sup>22</sup> In some countries, online commerce of food and groceries has expanded to cover a significant part of the market, with the Netherlands leading in Europe with one-third of final consumers having bought food or groceries online in 2019. See, statistics available at [www.statista.com/statistics/915391/e-commerce-purchase-rate-of-food-or-groceries-in-europe-by-country/](http://www.statista.com/statistics/915391/e-commerce-purchase-rate-of-food-or-groceries-in-europe-by-country/).

<sup>23</sup> See, for instance, <https://theblog.adobe.com/april-digital-economy-index-how-covid-19-continues-to-shift-e-commerce-trends/>.

<sup>24</sup> See, I. Lianos, Competition Law as a Form of Social Regulation, (2020) 65(1) The Antitrust Bulletin, 3.

<sup>25</sup> This term denotes the “rule-governed structure of production and consumption of food on a world scale”: H. Friedmann, ‘The political economy of food: a global crisis’. (1993) 197 New Left Review 29. On “food regimes” see also, H. Friedman, International regimes of food and agriculture since 1870. In: T. Shanin, (ed.) *Peasants and peasant societies* (Oxford: Basil Blackwell, 1987), p. 258; H. Friedman, From colonialism to green capitalism: social movements and the emergence of food regimes. In: F.H. Buttel & P. McMichael, (eds.) *New directions in the sociology of global development. Research in rural sociology and development* (Vol. 11, Oxford: Elsevier, 2005), p. 229; Ph. McMichael, ‘A food regime genealogy’, (2009) 36(1) Journal of Peasant Studies 139. For a critical review, see H. Bernstein, ‘Agrarian political

theoretical framework may offer useful insights in understanding the important structural changes of the governance of food systems the last decades, with the rise of the globalization of food production and consumption (the de-nationalisation of food systems and the emergence of an international food order which largely operates on the basis of transnational food value chains) and the increasing financialisation of food with the emergence of a “corporate food regime”<sup>26</sup> Although we recognize that the quest for “food sovereignty” may be an important driving force for the action of various public authorities involved in the regulation of economic activities in the food sector, we consider that if we had prominently integrated this concern in a competition law and policy setting, the clash of sovereigns that will have surely emerged would have made more difficult our effort to develop common understandings and practices among competition law authorities in BRICS and around the world. That said, we recognize that “food sovereignty”<sup>27</sup> concerns may, in reality, at least influence the enforcement activity of competition law authorities, in particular with regard to global mergers and conduct that further internationalises the food production and commercialisation system, away from its domestic “roots”, and that it might explain some of their enforcement priorities, and the design of remedies imposed for competition law infringements, for instance with regard to global mergers. We can therefore consider it as useful background information and a possible independent variable, although we have not taken it systematically into account in this book.

Our starting point is that as all markets, food markets cannot be analysed abstractly without realising that they are embedded in social relations,<sup>28</sup> not only between consumers and producers or retailers, but also between other sociological categories

economy and modern world capitalism: The contributions of food regime analysis’, (2016) 43 *Journal of Peasant Studies* 3.

<sup>26</sup> Ph. McMichael, Global Development and the Corporate Food regime, in F.H. Buttel and P. McMichael (eds). *New Directions in the Sociology of Global Development* (Oxford: Elsevier Press, Volume 11, 2005), 269.

<sup>27</sup> On “food sovereignty” see, *inter alia*, Ph. McMichael, ‘Historicizing food sovereignty’ (2014) 41 *The Journal of Peasant Studies*, 933; Ph. McMichael, ‘Commentary: Food regime for thought’, (2016) 43 *The Journal of Peasant Studies* 648; (noting that food sovereignty “is about reorganizing international political economy, modeling social struggle around democratic principles, gender equity, producer rights, ecological practices and rebalancing the urban/rural divide”).

<sup>28</sup> On the social embeddedness of markets and more generally economic activity, see M. Granovetter, Economic Action and Social Structure: The problem of Embeddedness, (1985) 91(3) *American Journal of Sociology* 481; M. Callon, Introduction: The Embeddedness of Economic Markets in Economics”, in M. Callon (ed.), *The Laws of the Markets* (Oxford: Blackwell, 1998), 1–57; B. Jessop, The Social Embeddedness of the Economy and its Implications for Economic Governance, in F. Adaman & P. Divine (eds.), *The Socially Embedded Economy* (Black Rose Books, Montreal, 2001). This approach questions the assumption of neoclassical price theory that the market forms a clearly delimited, socially disembedded sphere of economic relations, in which the various actors only pursue their material interest in order to satisfy their wants, exchange being entirely driven by the optimizing, economizing behaviour of pre-constituted rational individuals with pre-given and stable preference functions, their incentives and subsequent action being “managed” by the invisible hand of the price mechanism.

of actors that are present in various fields of activity, sometimes invisible from the specific market where the economic exchange about food took place and the price was presumably formed.<sup>29</sup> These could even go beyond the economic sphere and touch upon the political or the cultural fields.<sup>30</sup> Furthermore, the social importance of food renders these markets, and their regulation, particularly sensitive to politics. For instance, farmers and their struggle for land re-distribution and economic independence has profoundly influenced the political and economic constitution of modern capitalist societies<sup>31</sup> and to a large extent explains the emergence of antitrust law, the last decades of the 20th century.<sup>32</sup>

This joint political economy and economic sociology perspective is supplemented by the important body of knowledge in industrial organisation and agricultural economics in order to delve into the following issues: How do the incentives of farmers, suppliers and retailers align with those of consumers? What is the current state of learning with regard to price transmission across the chain? What about the transmission of other parameters of competition (e.g. quality, safety)? Should one abandon an efficiency focused approach or one focusing on “consumer welfare” for one that emphasises the “fair” distribution of the surplus value or other public interest aims? Would a GVC approach focusing on the distribution and allocation of the surplus value among the many actors in the chain arrive at different results, with regard to the actors and interests “worthy” of competition law protection? How

<sup>29</sup> In reality, the process of price formation is quite complex, the global price of a food staple being set not by actual exchange on a market (actual prices), but also by “futures” and “prosthetic” prices, such as different global price indexes that also take into account subsidies and the expectations of financial investors, which structure the various exchanges and become the actual world price of the food staple, in question. For a fascinating analysis with regard to global cotton markets, see K. Çalışkan, *Market Threads: How Cotton Farmers and Traders Create a Global Commodity* (Princeton Univ. press 2010), Chap. 1 &2 in particular.

<sup>30</sup> See N. Fligstein, *The Architecture of Markets – An Economic Sociology of Twenty-First-Century Capitalist Societies* (Princeton University Press, 2001), highlighting the importance of studying markets also as political and cultural fields, markets being social constructions that require extensive institutional support. One may also add that in some cultural contexts, certain types of food may have both nutritional and sacralization functions (or only the second).

<sup>31</sup> K. Polanyi, *The Great Transformation: The Political and Economic Origins of our Time* (first published 1944, Beacon Press, 2001). According to Polanyi, the disembeddedness of the market from other spheres of social activity has been achieved only because it has been followed by a counter movement, various social groups (or society) attempting to re-embed market forces in social institutions and thereby to regulate the market mechanism (the so called “double movement”). Social movements, such as those initiated by farmers have played an important role in this respect.

<sup>32</sup> In the US, the so called “Granger movement” was established in 1867 by Oliver Hudson Kelley, with the aim to unite the farmers against the monopolistic practices of railroads and elevators and to institute for themselves cooperative methods of buying and selling: S.J. Buck, *The Granger Movement – A Study of Agricultural Organization and its Political, Economic, and Social Manifestations 1870–1880* (Harvard Univ. Press, 1913); T.J. DiLorenzo, *The Origins of Antitrust: An Interest Group Perspective* (1985) 5 *International Review of Law and Economics* 73.

have competition authorities around the world used the concepts of “market power”, “bargaining”, or “buyer power” in selling and procurement markets in this sector? What is the evidence so far on the welfare effects of bargaining power and the various configurations of market structures along the supply chain? What about innovation and choice? Is it possible to measure these effects and what do we know about them? What are the insights of the GVC approach for competition law and policy? Does it have the potential to develop an alternative or complementary framework to the one currently used?

Finally, throughout the book, we engage with the significant developments in technology that have transformed agricultural production, as a result of the “fourth industrial revolution”, but also important shifts in consumer trends (fair trade, organic food), civic movements and in the intellectual underpinnings of regulatory action (behavioural economics, advances in data analytics).

Collaboration is at the forefront of the next Green Revolution. With the Internet comes the creation of a new scale of interconnectedness that serves to link networks in more intricate and efficient ways than ever before witnessed in history. The global agricultural value chain can be transformed into an ecosystem of closely tied players as the IoT increases<sup>33</sup>. In particular, this could entail “farmers, food manufacturers, distributors, retailers, technology companies, the public sector, and NGOs working together to alleviate the bottlenecks to information flow as they arise”<sup>34</sup>. Digital techniques will place the quantity and quality of agricultural output, cost savings, less input utilization as the aim of its intention<sup>35</sup>. Precision agriculture and its ability to use technologies to produce more with less will benefit large farms the most, resulting in farm size increases due to the large investments needed for these technological implementations.

Farmers are often required to secure lending in order to fund the high input costs derived from fertilizers, seeds, and volatile export sales. From an economic incentives standpoint, this presents a worrying landscape. Consequently, the next Green Revolution could mean small farms face a lack of economic incentives and financial challenges due to the “thin profit margins and relatively long payback periods” for those in the agricultural sector<sup>36</sup>. While offering numerous benefits, the emergence

<sup>33</sup> W. Sami, J. Mariani & J. Kaji, From dirt to data: The second green revolution and the Internet of Things, (2016) Deloitte Review Issue 18, available at <https://dupress.deloitte.com/dup-us-en/deloitte-review/issue-18/second-green-revolution-and-internet-of-things.html>.

<sup>34</sup> Ibid.

<sup>35</sup> European Parliament, Precision Agriculture and the Future of Farming in Europe, IP/G/STOA/FWC/2013-1/Lot 7/SC5 (December 2016), available at [http://www.europarl.europa.eu/RegData/etudes/STUD/2016/581892/EPRS\\_STU\(2016\)581892\\_EN.pdf](http://www.europarl.europa.eu/RegData/etudes/STUD/2016/581892/EPRS_STU(2016)581892_EN.pdf).

<sup>36</sup> See W. Sami, J. Mariani & J. Kaji, From dirt to data: The second green revolution and the Internet of Things, (2016) *Deloitte Review Issue 18*.

of FoodTech requires a more skilled workforce of farmers, but could also decrease the number of jobs on farms because of greater use of these technologies.<sup>37</sup>

As farmers begin to implement these technologies, the vast amount of data that will be generated through the use of smart sensors and connected farm equipment will raise questions of ownership and control of these agronomic and equipment insights.<sup>38</sup> Consequently, policy makers and businesses must answer what data management, data ownership, and access to open data should look like throughout the food value chain in terms of standards for exchange, exploitation, and abuse. Experts convey that “making farmers the owners of their data and providing opportunities to control the flow of their data to stakeholders should help build trust with farmers for exchanging data” to encourage an egalitarian approach to big data analysis.<sup>39</sup> Others reinforce the argument that information is thus the revolutionary aspect of the Green Revolution and not genetic tinkering or new plant breeds.<sup>40</sup>

The hope is that with increased insights, decision making will become simpler, more intelligent, and more focused by fusing instinct with technology. In particular, agricultural giants like Bayer aim to supply the tools needed for “improved decision making”. Other key actors such as Monsanto (merged with Bayer) intend to build a “network of in-field sensors to expand the scope of soil, weather and other data flowing in its digital agriculture tools” which could combine open source software development to enable relevant application creation.<sup>41</sup> Overall, it would appear that the future is geared towards these ecosystem models for agricultural products. Additional pushes for the adoption of FoodTech are that the modern farmer deserves less time consuming ways to inspect crops that conventional methods and should have access to the prosperity produced by digital agricultural services.<sup>42</sup> For example, the use of non-invasive high resolution sensors can provide information that is calculated in linear and nonlinear models and used to successfully detect plant disease and weeds very early on.<sup>43</sup> Delving even deeper into the components of FoodTech reveals that products and applications for food production, processing,

<sup>37</sup> See European Parliament, Precision Agriculture and the Future of Farming in Europe, IP/G/STOA/FWC/2013-1/Lot 7/SC5 (December 2016), available at [http://www.europarl.europa.eu/RegData/etudes/STUD/2016/581892/EPRS\\_STU\(2016\)581892\\_EN.pdf](http://www.europarl.europa.eu/RegData/etudes/STUD/2016/581892/EPRS_STU(2016)581892_EN.pdf).

<sup>38</sup> See Tech Crunch 2016, Available at: <https://techcrunch.com/2016/07/06/the-land-grab-for-farm-data/>

<sup>39</sup> European Parliament, Precision Agriculture and the Future of Farming in Europe, IP/G/STOA/FWC/2013-1/Lot 7/SC5 (December 2016).

<sup>40</sup> Harvard (2017), available at <https://news.harvard.edu/gazette/story/2017/04/the-future-of-food-will-be-proactive-efficient-and-digitized-or-else/>

<sup>41</sup> Reuters (2016) <https://www.reuters.com/article/us-monsanto-farming-data/monsantos-climate-corp-to-expand-digital-farming-platform-idUSKCN10SiQ4>.

<sup>42</sup> Accenture Digital Agriculture: Improving Profitability, available at [https://www.accenture.com/\\_acnmedia/Accenture/Conversion-Assets/DotCom/Documents/Global/PDF/Digital\\_3/Accenture-Digital-Agriculture-Point-of-View.pdf](https://www.accenture.com/_acnmedia/Accenture/Conversion-Assets/DotCom/Documents/Global/PDF/Digital_3/Accenture-Digital-Agriculture-Point-of-View.pdf).

<sup>43</sup> J. Behmann, T. Mahlein, et al., A review of advanced machine learning methods for the detection of biotic stress in precision crop protection, (2015) 16(3) *Precision Agriculture* 239–260.

preservation packaging and all aspects of the food value chain will experience new opportunities for innovation. Technology can turn farms into lab-like settings, to more efficiently approach high-value but thirsty crops such as almonds, pistachios and grapes through smart farming.<sup>44</sup>

Fueling the framing of the digital revolution in agriculture is to define farmers as businessmen who urgently need the capacity to make rapid decisions with customizable options they cannot do with their own instinct: like choosing the right crop variety and “applying exactly the right fertiliser dose”.<sup>45</sup> Emerging markets involve small holder farmers still entrenched by antiquated farming practices, overusing macro fertilisers or missing preventable pest infestations. Not without moral and ethical questions, the digital revolution in agriculture means acknowledging that these 500 million smallholder farms will likely depend on the social responsibility of corporations and governments in their transition towards the IoT adoption and sensor dispersal.<sup>46</sup>

This further exemplifies the need for a skilled workforce capable of utilizing the technology to effectively reap its benefits. Of course, it is the younger generations who must re-engage with rural areas to better understand how food is produced and inspire innovation and improved food security.<sup>47</sup> Ultimately, consumers can drive the demand for change in the industry by engaging with the connectedness the IoT provides to encourage more locally sourced food access or more sustainable shipping routes through improved mapping technology. This need of global food value chains to track and trace, starting from the farm level, leads to communication improvements for consumers about the origin, production, processes and carbon footprints. Consumers should be able to trust the agri-food sector founded “upon greater transparency and traceability along the whole value chain”.<sup>48</sup>

This technological revolution is also visible in the last segment of the food value chain: retail. After a period of relatively slow introduction of e- and m-commerce in food retail due to factors such as costs, the complexity of logistics, shipping fees, the quality and freshness of the products, the digital revolution has introduced major changes in the distribution of products, with increasing food and beverage sales currently occurring online, in particular during the COVID-19 pandemic. The market has seen the emergence of new intermediaries, such as online grocery

<sup>44</sup> The Economist 2016, Technology Quarterly. Available at: <http://www.economist.com/technology-quarterly/2016-06-09/factory-fresh>

<sup>45</sup> Bayer Scientific Magazine. Available at <https://www.research.bayer.com/en/digital-farming.aspx> <https://www.research.bayer.com/en/digital-farming.aspx>

<sup>46</sup> W. Sami, J. Mariani & J. Kaji, *From dirt to data: The second green revolution and the Internet of Things*, (2016) Deloitte Review Issue 18.

<sup>47</sup> European Parliament, Precision Agriculture and the Future of Farming in Europe, IP/G/STOA/FWC/2013-1/Lot 7/SC5 (December 2016).

<sup>48</sup> European Commission, Digitising the Agri-food Sector: a research agenda for Horizon 2020 (European Commission – Directorate General for Agriculture and Rural Development November 2016).

delivery services, concierge shopping and subscription prepared meals start-ups offering services that really are differentiated from traditional supermarket shopping and do not necessarily require home delivery of food items but enable also offer 'click and collect' services. Amazon Inc. has become a major competitor of traditional food retail chains, such as Walmart. Organic food constitutes one of the most fast-growing areas of e-commerce in both developed and developing economies<sup>49</sup>. Omnichannel retailing, that is, the use of all physical channels (offline) and digital channels (online) offering a seamless, customer-centered experience may be the new frontier in food retail. Although supermarkets and big brick and mortar stores have been attempting to integrate digital commerce in their model, this has still great potential. Public policy makers have been increasingly looking closely to e-commerce in groceries.

Finally, an important societal development is the emergence and increasing popularity of organic food and fair trade. Both constitute strategies of quality product differentiation that occur not only at the food processing level, but also at the retail level with specific retailers specializing in the distribution of organic and fair trade products. Contrary to traditional product differentiation relying on branding and advertising for specific products, these constitute generic categories of product differentiation and labelling, based on perceived attributes of particular types of products, in particular relating to the inputs used and the process of their production (e.g. natural, recyclable, eco-friendly, low energy, recycled content, non-toxic). This market for quality-product differentiation is regulated by private or government-run certification process. Such public and private certification systems may raise similar competition concerns to technology standard-setting.<sup>50</sup>

Market definition may be quite challenging in this context of generic categories product differentiation. In *Federal Trade Commission v. Whole Foods Inc.*, the US Court of appeal reversed the decision of the district court, which had rejected the demand for a restraining order and preliminary injunction brought by the FTC in order to block a merger between two premium, natural and organic (PNO) supermarkets.<sup>51</sup> The government's case was based on the theory of unilateral effects, advancing that the merger will create a monopoly in eighteen cities where the two merging companies were the only PNO supermarkets. This contention was

<sup>49</sup> See, for instance, Organic Shop, India's largest online organic marketplace of organic products. It was also reported that an implication of the consumers' increasing preference for organic food, "[...] the amount of organically cultivated land in the 27 EU member countries grew by 6 percent per year from 2002 through 2011, when the total organic planted area represented 5.4 percent of total agricultural land": Boston Consulting Group, *Crop Farming 2030 – The Reinvention of the Sector* (April 2015), available at [www.bcgperspectives.com/content/articles/process-industries-innovation-crop-farming-2030-reinvention-sector/](http://www.bcgperspectives.com/content/articles/process-industries-innovation-crop-farming-2030-reinvention-sector/), p. 6.

<sup>50</sup> P. Karolyczk, *Product Certification – the next big standard-setting debate?* (March 14, 2013), available at <http://kluercompetitionlawblog.com/2013/03/14/product-certification-the-next-big-standard-setting-debate/>

<sup>51</sup> *Federal Trade Commission v. Whole Foods Inc.*, 548 F.3d 1028 (2008).

based on internal business documents that demonstrated the closeness of competition between the two merging companies and direct evidence (based on diversion ratios) showing that entry by other PNO supermarkets had greater impact on PNOs prices than entry by conventional supermarkets. The district court rejected these arguments, as they focused on the effect of the merger to consumers that were buying only organic food. The district court chose instead a market definition that considered important the role of marginal consumers, thus including conventional supermarkets in the same relevant market as the PNO supermarkets: ‘because so many people are cross-shopping for natural and organic foods and are marginal rather than core customers, the actual loss from a SSNIP would exceed the critical loss’, that is, it will be unprofitable. The US Court of appeal agreed with the district court on the need to define a relevant market but it also emphasized that core consumers, demanding exclusively a particular product or package of products, are in some situations “worthy of antitrust protection”, therefore leading to the definition of a distinct submarket of PNO supermarkets. The Court found that these consumers “may be captive to the sole supplier, which can then, by means of price discrimination, extract monopoly profits from them while competing for the business of marginal consumers”.<sup>52</sup>

As the previous discussion has made clear enforcing competition law in the food sector involves many parameters and value judgments, which existing competition law tools, such as market definition, may not adequately take into account, hence the need for additional conceptual tools, such as the concept of “value chain”. The book has therefore two inter-related aims: (i) to introduce the GVC approach as a promising theoretical framework for competition law analysis and (ii) to implement this framework in a notoriously complex economic sector, the food industry, complex because of its polycentric character (as it is at the intersection of different public policies)<sup>53</sup> and its dynamic evolution and transformation the last few decades (from technological and governance perspectives). We believe that the GVC framework will shed light on the intricacies of the various policies in operation in this field and can provide a useful conceptual framework to competition authorities, companies and academics interested in this area.

The book is divided in six parts.

The **first part** sets the stage on global food value chains, technological challenges and new economic realities.

Chapter 2 by *Dennis Davis*, *Raphael Kaplinsky* and *Mike Morris* provides a conceptual architecture for analysing the governance of global value chains (‘GVCs’). It distinguishes between three spheres of governance: (i) setting the rules (i.e. ‘legislative governance’), (ii) implementing the rules (i.e. ‘executive

<sup>52</sup> *Federal Trade Commission v. Whole Foods Inc.*, 548 F.3d 1028, 1038 (2008).

<sup>53</sup> On the challenges of “polycentricity” for the traditional competition law toolkit, see I. Lianos, *Polycentric Competition Law*, (2018) 71 *Current Legal Problems* 161.

governance') and, (iii) monitoring rules and sanctioning malfeasance (i.e. 'judicial governance'). This analytical framework is focused on the exercise of power in GVCs which affects the generation, protection and appropriation of rents. It is considered through the lens of four sets of key GVC stakeholders: the corporate sector ('endogenous governance'), civil society organisations, the nation state and supranational institutions (who collectively reflect what we term 'exogenous governance'). The Chapter concludes that whilst the corporate sector is very effective in governing its GVCs, the other three sets of stakeholders have deficient capabilities in this regard. Three case studies are presented which lead to and support the hypothesis that the capacity of non-corporate stakeholders to govern GVCs is contingent upon the extent to which this coincides with the interest of the corporate sector.

Chapter 3 by *Tommaso Ferrando* focuses on the financialisation of land and agribusiness, a dimension that is often omitted. Throughout the world, private equity funds, pension funds, special purpose vehicles and hedge funds are increasingly acquiring control over land and agribusinesses. Without underplaying the relevance of finance in shaping other pieces of the food system such as seeds production, transformation and distribution, the present Chapter exclusively focuses on the link between financial actors, farmland and agribusinesses and offers a critical overview of the way in which this process is taking place along with their potential legal and socio-economic implications. In the main two sections, the Chapter utilises data and examples to trigger further debate and investigation, in particular, among scholars whose work deals with the competitiveness of food chains, the respect of the right to food, and the more theoretical debate between increasing production and redistribution. Finally, the conclusions focus on governance and present the case of a recent environmental campaign around Indonesian forests to underline the new forms of accountability and control that may lie behind the expansion of the financial interests over land and agribusinesses.

In Chapter 4, *James Ming Chen* integrates the economic and legal discussion in the broader technological system and its evolution that ultimately frames its direction. Agriculture consists of a process for converting energy and biological information into physical products for human consumption. The ongoing consolidation of biotechnology and agricultural analytics into a handful of massive multinational corporations clearly illustrates this definition of agriculture as a process of information flow. The architectural ideal in information science is the 'end-to-end' principle. All intelligence within an information platform arises from its ends; either with its originators or with ultimate consumers, or, as so often happens in an interactive age, with consumers who themselves become second-order creators of content. The corollary of the end-to-end principle, however, is that physical and logical layers, which facilitate the transmission of intelligence become 'dumb pipe'; effectively their sole contribution to this chain consists of efficiently transporting the relevant information.

Within its own domain, agriculture has become dumb pipe. The rise of biotechnological tools, such as CRISPR/Cas9 and RNA interference, coupled with the incorporation of 'big data' involving geographic factors and abiotic inputs, has rendered all but obsolete the traditional contribution of farmers as the primary agents of evolutionary change in agriculture. With conventional breeding techniques having given way to selective gene editing and the microbiome, very little is left for producers to contribute beyond brute labour. The resulting effect of driving all intelligence in the agricultural supply chain to its ends – to the multinational corporations controlling basic biological and informational inputs and to agribusinesses best situated to respond to consumer tastes – compels a fundamental re-evaluation of intellectual property law and competition policy in agriculture.

These broader trends are illustrated in Chapter 5 by an analysis of the organisation of agricultural chains in Brazil by *Maria Sylvia Macchione Saes, Rodrigo Lanna Franco da Silveira and Beatriz Macchione Saes*. From the late 1980s onwards, Brazilian agricultural chains have experienced significant changes, particularly with the deregulation of the domestic market. The most substantial and comprehensive change occurred in the organisation of agribusiness systems, with consequences, on the one hand, on the distribution mechanisms of inputs and, on the other hand, on the coordination mechanisms between agriculture and the processing and retail industry. With regard to the industry of inputs, market concentration, the internationalisation of companies and the development of technological packages integrated in and associated with biotechnology have led to the development of closer relationships between suppliers and their users. Intertwined in this process is the new role of resellers of inputs and the services added to the products sold emerges. With regard to the processing segment, increasing denationalisation and the concentration of the food industry have explicitly put an end to the logic devised at the beginning of the period of Brazilian industrialisation regarding the division of roles between national and transnational companies. The consumer market for light goods with low technological capacity, into which the food industry was inserted, was restricted to national companies, whilst the market for durable goods, was restricted to multinationals. The end of restrictions on the entry of firms in this sector, combined with the great attractiveness of the Brazilian consumer market and the incorporation of sophisticated technology marked the entry of major foreign companies into the food processing market. This entry determined a new competition pattern, whilst defining new forms of organisation among the agents of the production chain.

Similarly to *Ferrando, Saes, Silveira and Saes* argue that visible changes can also be observed in the patterns of agricultural production financing, with an important role for the industry of inputs and for buyers of commodities. In addition to reflecting the more complex relationships between the production sectors, these new settings, by determining the rights of ownership of resources, show how the distribution of income occurs in the value chain. The issue is to understand the

relationship between business strategy and the organisation of agricultural production chains that have developed in the institutional and competitive environments that have emerged over these past few decades.

The **second part** of the book delves into the broader issue of the consolidation of the food supply chain and the challenges it presents for competition law and policy. This consolidation has been quite important in the upper segment of the value chain: the factors of production and in particular seed players, and their relations with the other segments of the value chain – i.e. farmers, in view of the important transformations occurring in this segment the last few decades. For instance, global seed producers (Monsanto, Syngenta, Dow DuPont, Bayer, BASF etc.) continue to increase their global presence in the ‘seed chain’ and have recently acquired critical market influence in key food exporting regions. The degree of consolidation of this segment of the value chain has increased considerably in recent years. Corporate mergers, joint research enterprises and patent pools established by the leading global seed companies have led to higher levels of concentration on several markets. The development of bottlenecks in the food supply chain may affect consumers and other market actors, such as farmers. The increasing consolidation of the inputs market may raise important public policy concerns, in particular, as the share of the total surplus value appropriated by the farmers has considerably fallen. This may be of concern, in particular, for jurisdictions that do not benefit from sophisticated state subsidies regimes capable of enabling some transfer of resources to poorer rural communities, highly dependent on agriculture. An analysis of recent M&A activity shows a shift in strategy from seeds acquisitions to acquisitions in the biotech and IT sectors – there has been a clear moved towards diversification by global leaders in relation to ‘digital agriculture’. The rise of ‘contract agriculture’ also provides competition authorities with interesting challenges.

In Chapter 6 *Ioannis Lianos* with *Dmitry Katalovsky* examine the rise of concentration in the food value chain, first as a side-effect of the technological transformation of agricultural production, and second as a result of the various merger waves that have occurred during the last three decades. The Chapter provides a concise analysis of the degree of concentration in various segments of the food value chain, noting that the trend has been an important increase of concentration, although this may vary from product market to product market and from geographic region to geographic region. The authors nevertheless note that the causal link between the rise of concentration and price effects remains unclear, and that competition authorities have relied instead in more elaborate theories of harm, than simple structuralism, in order to assess the anticompetitive effects of merger activity. However, firms’ strategies in the food value chain change and as farmers get locked in in larger agri-tech ecosystems, competition authorities become increasingly aware that focusing on price effects in specific product markets may not be the only dimension they should focus on. The food industry is also important from a social perspective, and public authorities increasingly take into account broader public

policy concerns, such as the struggle against climate change, the protection of biodiversity and the environment. They also have to respond to the frequent systemic crises in this sector, most recently with the COVID-19 pandemic. This more complex economic, technological and policy context calls for a more complex public policy response to the rise of economic concentration, which breaks with the more traditional approaches of acting only within the boundaries of the different policy fields.

Chapter 7 focuses on the situation in the US, *Peter Carstensen* exploring American competition policy with respect to the agriculture and the food system. Public enforcement is split among the Federal Trade Commission, the Antitrust Division of the Department of Justice and the Department of Agriculture. This split creates additional discontinuities in enforcement actions. This Chapter finds that antitrust enforcement has been weak and inconsistent in the United States with respect to anticompetitive conduct and market structure affecting farmers. Buyer power issues have been largely, but not entirely, ignored. The Department of Agriculture has failed to use its authority to protect farmers. Despite the apparent promise of the Obama administration in its early months in office, the trend for the last three plus decades has been an overall failure to protect the long-term interests of producers and consumers in a workably competitive agriculture-food system.

In Chapter 8 *Alessandro Octaviani* analyses the food value chain in Brazil from the perspective of its antitrust authority ('CADE'), with a specific focus on the decisions it has rendered. The research focuses on the Brazilian transgenic seed and meat production markets, which are distinguished from one another by the different degrees of technology employed in their production processes. In considering Brazil's meat exports, this Chapter analyses international barriers for commodities commerce, such as subsidies adopted by developed countries and the United States' Committee on Foreign Investment ('CFIUS').

With the world population rapidly increasing, achieving food security has been a recurring global challenge. Consequently, dependence on agricultural inputs such as fertilisers has continued to grow. The dependency on inorganic fertilizers is especially acute for developing countries. Paradoxically, the major developing economies that need fertilizers to meet their ever-increasing food production requirements are not self-sufficient in the fertilizer sector. In this realm, Potash is a typical case in point. Production and supply of potash has historically been controlled by international export cartels that consist of a limited number of firms. Not very recently, one of the major export cartels underwent further concentration when the Potash Corporation of Saskatchewan merged with Agrium Inc. to form the largest crop nutrient producer in the world – Nutrien.

In Chapter 9 *Parveer Singh Ghuman* and *Ujjwal Kumar* discuss the merger and the resultant competition concerns from the perspective of two major import-dependent economies i.e. China and India. It also delineates some limitations of the merger reviews conducted by the respective competition authorities. The

objective therein is to address the limitations of the standard ex-post competition analysis and to highlight the political economy issues that affect the state of competition and consumer welfare in markets that are subject to international cartels.

In Chapter 10, *Svetlana Avdasheva and Maxim Markin* assess the intervention of competition policy in the process of value chain restructuring. Russia provides a good example for explaining the possibilities and weaknesses of competition policy as a regulatory instrument in the food value chain because both the restructuring of the food sector and the development of the Russian competition law and regulatory system have been developing simultaneously since the beginning of the 21<sup>st</sup> century. The chapter focuses on the enforcement of competition law as well as industry-specific regulation centred on the retail trade. During the last quarter of the 20<sup>th</sup> century, the Russian food processing industry became highly concentrated due to numerous mergers and acquisitions. Concurrently, large retail chains emerged. Large participants at both stages of value chain, whether they operate at the processing stage or the retailing stage, have sought to gain influence and importance in governance of the value chain. Governance in the chain, aimed at increasing competitiveness through the motivation and coordination of business partners, at the same time presumes the redistribution of value towards the governing party. Redistribution therefore becomes an important policy issue. The history of Russian competition enforcement in the food retail chain illustrates the limitations of traditional enforcement tools to effectively correct the distributional distortions within the food value chain, and, therefore, highlights the necessity to look for alternative policy instruments.

Chapter 11 offers a perspective from South Africa. In South Africa the pursuit of distributive justice is eminently permissible, if not compelled, by South African competition law and its unique responsiveness to the issues of distributional equity and fairness. For example, in merger regulation and exemption applications, the Competition Act permits consideration of equity issues such as empowerment, employment and concern for small- and medium-sized enterprises ('SMEs'). *Liberty Mncube and Yongama Njisane* explore how the Pioneer/Pannar case provides an example of the effort made to take public interest factors and innovation competition into account in merger enforcement.

The **third part** deals with power in the food value chain. Supermarkets have often played the role of the villain when it comes to competition law authorities and their investigations. The consolidation of the food sector and intense political pressure from small suppliers and farmers, have attracted the attention of enforcement authorities. The issue of retail power and its effects has been a hotly debated topic. Recent research has raised doubts over the impact of retail concentration on prices and consumer choice, although some effect on innovation has been found. It is also unclear if competition law and competition authorities are better equipped than other public authorities and areas of law (contract law, unfair competition law etc.) to deal with retail power, assuming that these areas of law pursue similar objectives.

But what if they pursue different objectives? What are the determinants of the optimal interaction among these various instruments dealing with retail power? How should competition authorities deal with private labels, slotting allowances, buying alliances and retail consolidation? Should competition authorities promote concentration at the level on which farmers operate as a form of countervailing power and exclude from the scope of competition law agricultural cooperatives and other forms of producer organisations? Should competition authorities move beyond 'traditional' forms of monitoring of the food chain and promote transparency along the chain? This Part thus, constitutes an important break from the usual focus on buyer power in a static and one dimensional framework and engages with issues of distribution of the total surplus of global value chains and vertical competition, which are of paramount importance for understanding the competitive dynamics of global food value chains.

In Chapter 12, *Lianos, Carballa-Smithowski, Lindeboom and Lombardi* introduce a new economic framework to analyse power in the food value chain. Spurred on by the increased interest of policy makers and antitrust authorities over the last decade, academic scholarship has made progress in analysing the origins and consequences of different dimensions of power across the value chain: buyer power, bargaining power, economic dependence. This Chapter summarises the key concepts used to analyse and measure power in the food value chain and explores the different theories of harm that have been developed and occasionally tested in recent cases. Far from representing just a 'mirror image' of the exercise of seller power, the analysis of buyer power may at times require a different set of analytical tools and a more detailed, case-by-case understanding of its specific origins and effects. From then on, the authors move to suggesting a broader theoretical framework that would encompass all different dimensions of power in the value chain, under the rubric of vertical power. After defining the theoretical contours of the concept, the authors offer some metrics that enable an empirical verification of the existence and exercise of vertical power.

In Chapter 13, *Caron Beaton-Wells and Jo Paul-Taylor* focus more specifically on supermarket power and explore how efficiency and fairness become interdependent discourses in supermarket-supplier relations. Around the world serious concerns have emerged in recent years about the control that supermarkets wield over, and their corresponding treatment of, suppliers. This concentration in large grocery retail, in conjunction with associated growth in private labels and retailer control over shelf space, have generated a substantial power imbalance between big supermarket chains and the businesses that supply them. Supermarkets are said to be exploiting the imbalance to their own advantage – imposing ever-more onerous, punitive even, supply terms and conditions as a means of unreasonably transferring risk and generating greater profits through increased margins. This conduct has spawned a growing chorus of complaints from suppliers and from their representative organisations and political supporters. It has also garnered intense media,

political and regulatory attention across a range of jurisdictions. This Chapter uses the analytical technique of problematisation to demonstrate how the “problem” concerning supermarket-supplier relations involves two distinct discourses relating to competition, on the one hand, and fairness, on the other. It highlights both potential tensions and interdependencies between these discourses and explores how they have been salient in both framing the aforementioned problem in public and policy debates and shaping regulatory responses. In particular, it critically examines the emergence of codes of conduct as a response to this problem in the last decade drawing primarily on experience in Australia and to some extent, by way of comparison, the United Kingdom. However, as the issues are similar in many other countries around the world, this analysis and its insights are relevant beyond these two countries.

In Chapter 14, *Xianlin Wang* explores how this debate over supermarket power has manifested itself in China, where disputes between large retailers and suppliers regularly occur and have been at the core of legal developments. In this country, the supply of commodities generally exceeds demand which, in turns, leads retail channels, especially those provided by well-known large retailers, to effectively become scarce but valuable resources. Furthermore, the combination of the majority of small and/or medium-sized suppliers in China operating on a small-scale, the fact that they are scattered throughout the nation and the high degree of homogeneity between the products they provide has resulted in fierce competition among suppliers. Due to such factors, it is difficult for suppliers to form a coalition capable of successfully bargaining with large retailers. Also these factors currently permit large retailers to enjoy positions of market power; commonly they enjoy a comparatively advantageous position over that of suppliers, which they abuse in order to bully suppliers into submission. To combat this issue, China has introduced legislation and regulation. Following the adoption of the ‘Administrative Measures for Fair Transactions Between Retailers and Suppliers’, a tailored departmental regulation concerning transactions between retailers and suppliers, a series of regulatory documents were promulgated and specific work has been conducted. In addition, the principle of ‘fairness’ and some stipulations in the ‘Contract Law of the People’s Republic of China’ have also been held to apply in certain circumstances. Finally, the ‘Anti-Monopoly Law’ but also the Anti-Unfair Competition Law may also tackle superior bargaining power under some circumstances. However, due to the lack of clarity concerning the interplay between different laws and regulations, there are challenges inherent in their practical application.

In Chapter 15, *Maksim Bashkatov, Ekaterina Galkova and Ekaterina Perevoshchikova* provide a glimpse of alternative approaches to deal with supermarket power, outside the competition law toolbox, by exploring the various Russian law instruments designed to protect the weaker party to a contractual agreement, which is subject to the principles of Russian law. Following its reform, Russian law has faced the need of establishing a methodical system capable of balancing and/or

countering the market power of monopolists; such persons have traditionally occupied nearly all of the major economic spheres in Russia. The authors argue that both Russian law and Russian judicial practice dispose of all the necessary instruments to help contracting parties achieve economic justice in specific cases. The authors describe the genesis and further development of Russian legislation, judicial practice and legal policy regarding the protection of the weaker party, through a comparative law perspective. In particular, the authors describe the impact of the concept of ‘superior bargaining power’ in both contract law and competition law in Russia. They argue that this traditional civil-law concept may narrow down antitrust enforcement and make it more balanced and fair from the perspective of market actors. By fostering the expansion of the superior bargaining power concept, the authors contend that it will mitigate the problems that arise out of the complexity and excessive formality of the traditional antitrust enforcement criteria applied in Russia.

In Chapter 16, *Viktorija Daskalova* raises the question about the appropriate role of EU competition law in addressing concerns with unfair trading practices (UTPs) in the food supply chain in the context of an integrated market. Taking a different, functional approach, looking outward to what other laws and policy instruments may achieve, the chapter tests the boundaries of competition law and suggests a possible way forward, should the scope of competition law not accommodate broader concerns. This may require some additional regulatory intervention in different forms, such as sector-specific legislation on unfair trading practices, or other corrective measures, such as subsidisation, which can provide the needed solution.

The **fourth part** of the book explores the intersection of competition law in the food industry with a number of international and transnational legal regimes, in particular, trade law, human rights law and international standard setting. We examine the broader competition policy environment of the food industry, the opening of international trade being an important element of this environment, as it enables market actors to establish transnational/global value chains. We explore the implications this will have on the development of agri-food standards, which constitute one of the main drivers for the development of global value chains. These are set by public authorities or by the private sector, in some instances by suppliers, in other instances by retailers or other intermediaries (e.g. importers, exporters). The structure of the governance regime also differs from product to product and is, in some cases, supply-driven, whilst in others, buyer-driven. This Part also engages critically with the call from the United Nations’ special rapporteur on the right to food to integrate the competition law framework within a human rights’ narrative and to take into account the right to food (and other international obligations, such as biodiversity) in the enforcement of competition law.

In Chapter 17, *Klaas Hendrik Eller* reminds us that food value chains have seen a proliferation of private, hybrid and public certification schemes to regulate both material and immaterial attributes of food. Drawing on a case study of the GlobalGAP scheme, this Chapter explores how certification as a regulatory hybrid

adds a governance layer to the chain which reacts to the systemic risks created through the complexity of global value chains ('GVCs'). In particular, social and environmental sustainability certification gives voice to the plurality of social rationalities upon which GVCs have an impact. Food GVC labels are not limited to addressing information asymmetries resulting from the credence quality of certain attributes. Their function is much more nuanced and builds on an institutional structure involving various actors. Certification implements non-economic rationalities in the contractual design of the chain and puts forward the chain itself as normatively relevant unit of analysis. It installs a reflexive apparatus along the chain by requiring due diligence in its composition. In essence, certification formulates and uses market dynamics to enforce collision-rules between economic and other rationalities.

This polyfunctionality of certification poses considerable challenges for competition law. Whilst privately set standards, in particular those relating to Corporate Social Responsibility (CSR), had long remained under the radar of legal analysis, they are now being evaluated through the fragmented lenses of different legal disciplines. This Chapter calls for the bringing together of these variegated doctrinal discourses in accordance with their subject matter. Even within the branches of competition law, there is an interesting dialectic with unfair competition law being used to strengthen the impact of such standards while antitrust law raises concerns. An analysis of competitive effects reveals that, while certification may lower competition with regard to the certified attribute and be exclusionary towards non-certified suppliers ('green clubs'), it fuels competition between certified and non-certified products and reduces consumer search costs. Furthermore, certification and auditing have turned into flourishing markets themselves.

As much as competition law in the *ordo-liberal* tradition was seen to constitutionalise markets, certification claims to constitutionalise GVCs. To what extent can and should competition law be responsive to this private ordering of markets? To what extent can certification help in considering GVCs as the prime ordering paradigm of the global economy? As this Chapter contends with regard to Art. 101 TFEU, competition law puts both procedural and substantive constraints on certification. Most intriguingly, it holds a mirror up to competition law theory by intervening in a vivid debate surrounding the goals of competition law and by challenging its ability to conceptualize the relationship between GVCs and their plural and transnational social environments. This Chapter concludes by suggesting criteria of exemption for food GVCs certification and discusses this as a step towards a more "holistic" or polycentric competition law.<sup>54</sup>

In Chapter 18, *Amber Darr and Ioannis Lianos* provide a human rights' narrative in envisioning the implementation of competition law in the food value chain. They argue that competition law, with its inherent focus on market regulation and

<sup>54</sup> I. Lianos (53).

providing a level playing field to market players, offers a credible conceptual and institutional response for addressing this challenge along transparent, predictable and sustainable lines. They argue that not only does the implementation of the right to food stand to benefit from a market-centred approach but also that competition itself becomes a more “holistic” and meaningful tool for social reform by taking into account values inherent in the progress towards the global right to food by integrating the multi-dimensional reality of the global food supply and retail chain in the assessment of specific commercial practices and/or sectors. The Chapter provides the “grammar” of a more holistic competition policy in this crucial sector for national and global economies and attempts to dissect the actual and potential impact of the right to food rhetoric on competition law enforcement.

The **fifth part** engages with the considerable role of intellectual property (‘IP’) rights and innovation in the development of the industry and the strategies followed by the main actors, in particular, in the upstream factors of production market to build competitive advantage and protect their technology. We examine the interplay between various forms of IP protection (mainly patents but also plant variety rights) and the economic actors benefitting the most from them, the way this international IP protection was implemented at the local level (in particular, in BRICS), the possible limitations of IP rights from other international obligations (e.g. biodiversity, the right to food, right to health etc.) and the constitution of global commons. We also focus on the strategies developed by major economic actors at the upstream part of the food supply chain (i.e. the ‘factors of production’), which dispose of considerable portfolios of IP rights and the way the interaction between competition law and IP law has been managed or may be managed in the future. We explore how the competition law landscape may evolve in the next few decades in view of the importance of IP portfolios and technology in agricultural production, of the constitution of vertically integrated platforms and of the need to ensure interoperability between different platforms/systems competing with each other to enable smaller actors to enter into a specific segment of the market.

Historically, plant material and seed material were regarded as communal resources that were to be freely shared. Traditionally, farmers were incentivized to save, replant and resell seeds to other farmers with the dominant paradigm for trait development being farmer sharing. However, starting with the mechanisation and the use of tractors in the late 19th century and, most recently, with the granting of the first plant biotechnology patent in 1992, intellectual property rights (‘IPRs’) have been used in the agricultural sector in order to stimulate research, development and innovation. They also formed the basis for the emergence of a private seed industry following the ‘Green Revolution’ of the 1960s–1970s. Initially funded by the public sector, the Green Revolution led to an important increase of productivity at a higher cost for the independence of farmers who had, until then, ensured the effort of innovation in the sector by developing crop diversity (a decentralized and highly fragmented innovation environment). The development of biotech and genetic

engineering in the 1990s, also had profound implications on the development of the industry and the process of its privatisation. Genetically modified ('GM') (and shortly, genetically edited, following the development of the CRISPR/Cas technology) seeds are at the centre of the innovative effort in modern agriculture with the plant science industry being one of the most R&D intensive industries in the world. Many of these companies control IPRs. In the seed business, IPRs consist of patents, plant variety rights, trademarks, trade secrets and geographical indications. These IPRs enable seed companies prevent farmers from both saving seeds of a specified protected variety or from sharing it with their neighbours or selling it informally (i.e. the concept of 'brown bagging'). They also prevent competing plant breeders from using a protected variety in the development of a new variety (i.e. in cumulative innovation) and prevent competing seed producers from multiplying and marketing the protected variety without a license or using a protected product name and logos. Seed laws requiring compulsory seed certification, with the aim of policing seed quality, also provide some form of protection to breeders in the absence of IPRs.

This brief historical overview shows that over the last few decades an important shift has occurred in relation to the governance of innovation in the agricultural sector (seeds and beyond): from a commons regime, we have moved on to one that is heavily propertized. The main justification for this evolution is that IPRs are more efficient than the commons regime when it comes to incentivising and disseminating innovation and are better at satisfying the broader objectives of biodiversity and sustainable development. This Chapter then presents various options of open regimes (such as a global commons) and less open regimes that may show the way forward in this area, drawing inspiration from work undertaken in other fields, for instance, the regimes governing global exchange and distribution of microorganisms in the life sciences (microbial global commons), examining if these are adequate and could be transposed into the field of agriculture.

In Chapter 19 *Daryl Lim* explores U.S. agribiotech patent issues as they relate to the food supply chain. Agribiotech patents challenge how we think about fundamental issues of seed ownership, innovation, and when downstream uses are or should be permissible. The chapter first sketches the arc of agribiotech developments in the U.S. from its colonial past to the current day and observes the evolution of protection over seed traits transition from an open socialist-style franchise to a tightly controlled oligarchy subsisting on patent rights. It then assesses patent exhaustion through the lens of *Bowman*<sup>55</sup> and the Court's more recent decision in *Impression Prod., Inc. v. Lexmark Int'l, Inc.*<sup>56</sup> Finally, *Lim* offers observations on three issues: (1) patentees and generic seed companies will remain invested in maintaining compliance for transgenic seed exports; (2) the recent spate of mega-mergers continue the transformation set in motion by the privatization of agriculture

<sup>55</sup> *Bowman v. Monsanto Co.*, 133 S. Ct. 1761 (2013).

<sup>56</sup> *Impression Prod., Inc. v. Lexmark International, Inc.*, 137 S. Ct. 1523 (2017).

more than a century ago, with these mergers benefiting agribiotech companies and farmers abroad, unfortunately, at the expense of U.S. farmers at home; and (3) developments such as retaliatory tariffs on transgenic seed exports will affect agribiotech innovation as surely as developments in patent law, and should be part of any comprehensive analysis of dynamic trends in the food value chain.

In Chapter 20, *Pierre Régibeau* and *Katherine Rockett* examine if mergers raise substantial additional issues when the parties have significant innovation programs. After a thorough review of the economic literature on innovation and competition in general and innovation and mergers in particular, they explore the basic effects generated by mergers and propose a new typology to assess static effects, dynamic effects, and efficiency. They also analyse the effects of horizontal and vertical mergers on innovation. Although *Régibeau* and *Rockett* acknowledge that it makes sense to be suspicious of mergers taking place in an already highly concentrated market, they raise the question of whether the existence of a similar presumption with regard to effects on innovation would also make sense. According to them, if static effects (magnified by their dynamic equivalent) cannot be fully remedied or if there are significant concerns about foreclosure in innovation markets then analysing the additional positive effects of the merger on innovation will become indispensable to reaching a fair decision about whether or not to approve it. In such a case, they argue, the burden of proof should be on the merging parties, since the size of “additional” effects, such as knowledge sharing and the avoidance of duplication, will depend on the nature of R&D activities and the internal organisation of the parties, both of which are factors that the merging parties should have much better information on than the regulator/ competition authority. Based on these principles, *Régibeau* and *Rockett* propose a policy algorithm which makes it possible to distinguish between first and second order effects and also helps with comparing the innovation dimension of mergers to the more traditional pricing/ output dimension. This algorithm is empirically implemented in the mergers relating to the genetically modified crops and seed industries in recent years, from which they draw conclusions for the merger policy of emergent economies, such as BRICS.

The final **sixth part** features a chapter with a case study by *Ivanov* and *Orlov* showing the necessary linkages between different strategies in order to ensure competitive markets: trade policy, competition law enforcement, and infrastructure (including digital infrastructure) building. The global grain trade is an essential element of the global food value chain, as a growing number of countries rely on the international market in providing food security for their people, and respectively, more farmers are selling their produce on the global market. The established mechanisms facilitating this trade are characterized by a sustained economic concentration and such distortions that put both agricultural producers and final consumers in a precarious position. The COVID-19 pandemic, like the financial crisis of 2008 beforehand, has once again emphasized the systemic problems in the functioning of this segment of the food value chain and has made even more

palpable the pressing need to reinvent global trading mechanisms in the grain sector. At the same time, the historically dominant group of global traders is also in search of new methods to preserve their unique status in the global food value chain. Joint digital platforms and complex forms of financialisation are already serving this purpose. With this Chapter, the authors start a discussion as to how a more connected approach to trade policy, competition law enforcement and infrastructure building could help to bring forward a more sustainable and pro-competitive solution for the global grain trade market.

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