



REVIEW ARTICLE

Global value chains: A review of the multi-disciplinary literature

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Abstract

This article reviews the rapidly growing domain of global value chain (GVC) research by analyzing several highly cited conceptual frameworks and then appraising GVC studies published in such disciplines as international business, general management, supply chain management, operations management, economic geography, regional and development studies, and international political economy. Building on GVC conceptual frameworks, we conducted the review based on a comparative institutional perspective that encompasses critical governance issues at the micro-, GVC, and macro-levels. Our results indicate that some of these issues have garnered significantly more scholarly attention than others. We suggest several future research topics such as microfoundations of GVC governance, GVC mapping, learning, impact of lead firm ownership and strategy, dynamics of GVC arrangements, value creation and distribution, financialization, digitization, the impact of renewed protectionism, the impact of GVCs on their macro-environment, and chain-level performance management.

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INTRODUCTION

During the last few decades, the gradual liberalization and deregulation of international trade and investment, coupled with the rapid development and spread of information and communication technologies (ICT), have fundamentally changed how multinational enterprises (MNEs) operate and compete in the globalizing world economy. A clear and yet sophisticated pattern of organizationally fragmented and spatially dispersed international business activity has emerged, whereby offshore production sites located in low-cost developing countries are closely linked with lead firm buyers and MNEs from major consumer markets in North America and Europe (Coe & Yeung, 2015; Dicken, 2015; Gereffi, 2018). New MNEs have also emerged from developing economies, particularly those in East and Southeast Asia, as major strategic partners and manufacturing service providers for traditional MNEs from

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advanced industrialized economies (Yeung, 2016). This pattern signals a new divide in industrial organization on a worldwide scale: a transition from hierarchically organized MNEs, with their traditional focus on managing internalized overseas investments, to MNEs as international lead firms. These firms work with and integrate their geographically dispersed strategic partners, specialized suppliers, and customer bases into complex structures, referred to variously as global commodity chains (GCCs), global value chains (GVCs), global production networks (GPNs), or global factories.

Since Gereffi and Korzeniewicz's (1994) collection in the early 1990s, this phenomenon of organizationally fragmented international production has been subject to investigation in a wide range of academic disciplines, including economic sociology, international economics, regional and development studies, economic geography, international political economy, supply chain management, operations management, and international business (IB) (Buckley, 2009a, b; Coe & Yeung, 2015, 2019; Funk, Arthurs, Treviño, & Joireman, 2010; Gereffi, 1994, 2018; Gereffi, Humphrey, & Sturgeon, 2005; Henderson, Dicken, Hess, Coe, & Yeung, 2002). In economic sociology and development studies, the earliest work was concerned with global commodity trade and the governance structure of such *commodity chains* in labor-intensive and high-tech industries (Bair, 2009; Gereffi, 1999, 2018; Gereffi & Korzeniewicz, 1994). This literature has developed a simple typology of buyer-driven and producer-driven GCCs on the basis of the power and control exerted by buyers (retailers and brand name firms) or producers (original equipment manufacturers [OEMs]) in governing their international suppliers and service providers.

In 2000, the Rockefeller Foundation funded a large-scale GVC convention, which marked the beginning of a rapid growth of GVC research (Gereffi, Humphrey, Kaplinsky, & Sturgeon, 2001). By the early 2000s – near the beginning point of our review – the GCC literature moved away from its earlier focus on commodities (e.g., clothing, footwear, automobiles) to examining *value chains* that connected spatially dispersed production activities. In their introduction to a special issue of *IDB Bulletin* on globalization, value chains, and development, Gereffi et al. (2001) identified several pressing challenges for value chain researchers and pushed for the use of GVC as a common terminology. Since then, GVC has become the

primary focus of research and analytical attention in the social sciences and, lately, international policy communities. The economic sociology view of GVC remains concerned mainly with the social consequences of economic exchange, and with mapping the governance structures/developing typologies of GVCs and their consequences for local upgrading (Gereffi, 2018; Gereffi et al., 2005; Humphrey & Schmitz, 2002). The study of GVCs within the international economics literature focuses on efficiency of contractual organization and economic exchanges in GVCs, and on mapping the geography of international trade flows and value creation (Aichele & Heiland, 2018; Antràs & Chor, 2013; Grossman & Rossi-Hansberg, 2008; Johnson & Noguera, 2012; Lee & Yi, 2018). IB researchers are interested mainly in how firms can profitably strengthen and exploit their unique firm-specific advantages, and create value by forging business relationships across national borders through MNE activity in GVCs (Buckley, 2009a; Kano, 2018; Laplume, Petersen, & Pearce, 2016; Mudambi, 2008).

Closely related to the GVC concept is the GPN construct. The GPN concept was developed in the late 1990s by a group of researchers in economic geography, and emerged from a growing dissatisfaction with existing theories of economic development that failed to account for the increasingly complex, networked nature of production activities, which spanned across national borders and led to uneven development in different regions and countries (Coe & Yeung, 2015, 2019; Henderson et al., 2002; Hess, 2017; Yeung, 2009, 2018). The idea of a GPN goes beyond the simple notions of trading and outsourcing, and highlights firm-specific coordination and cooperation strategies through which such relational networks are constructed, managed, and sustained, as well as the networks' geographical reach in specific territories, such as sub-national regions and industrial clusters. It also considers the strategic responses of other corporate and non-corporate actors within the GPN, such as the state and business associations. This central focus on economic actors, such as MNEs and their strategic partners, and territorialized institutions, such as state agencies and business associations, also distinguishes GPN thinking from GCC research's focus on a particular commodity or GVC research's concern with the aggregation of different value chains into industries.

While the term "GPN" accurately reflects the fact that the firms involved often form intricate intra-

and inter-firm networks (rather than linear chains), we propose to use the term “GVCs” in an inclusive fashion throughout this review, to reflect the fact that disaggregation and geographic dispersion presently occurs in various parts of the value chain and encompasses both primary and support activities, with increasingly sophisticated knowledge-intensive processes being offshored and outsourced (Gereffi & Fernandez-Stark, 2010). The term “GVC” thus not only refers to manufacturing firms but also characterizes a variety of modern MNEs, including service multinationals and the so called “digital MNEs,” (i.e., firms that use advanced technologies to generate revenues from dispersed foreign locations without investing in production in a conventional sense) (Coviello, Kano, & Liesch, 2017). Since the 2010s, the concept and terminology of GVCs have also resonated very well with the development practice and policy communities in many international and regional organizations. A 2010 World Bank report on the post-2008 world economy, for example, claims: “given that production processes in many industries have been fragmented and moved around on a global scale, GVCs have become the world economy’s backbone and central nervous system” (Cattaneo, Gereffi, & Staritz, 2010: 7). To most observers in these international organizations, GVCs are now recognized as the new long-term structural feature of the global economy (Elms & Low, 2013; UNCTAD, 2013; World Bank, 2019, 2020).

While we draw on the above complementary research streams and theoretical lenses, we conduct our review from an *IB-centric* perspective. Following Mudambi (2007, 2008) and Buckley (2009a, b), we define a GVC as a governance arrangement that utilizes, within a single structure, multiple governance modes for distinct, geographically dispersed and finely sliced parts of the value chain. In other words, a GVC is the nexus of interconnected functions and operations through which goods and services are produced, distributed, and consumed on a global basis (Coe, Hess, Yeung, Dicken, & Henderson, 2004; Coe & Yeung, 2015; Henderson et al., 2002). IB scholars have recently acknowledged that the rapid rise of GVCs represents one of the most salient features of today’s economy (Turkina & Van Assche, 2018), and great strides have been made within mainstream IB literature to understand GVCs (Buckley, Craig, & Mudambi, 2019; Gereffi, 2019). Yet, surprisingly, there has not been, to the best of our knowledge, a paper that systematically reviews the social scientific *and*

management literatures on GVCs and suggests pointers for future research, specifically for IB scholars. Our review aims to fill this important void.

The rest of the paper is organized as follows. We start by developing an organizing framework to guide our systematic review of multidisciplinary literature. This framework is premised on an inclusive theoretical coverage of the seminal works on GVC governance, upgrading, competitive dynamics, and territorial outcomes, and follows comparative institutional analysis logic. We then discuss our review methodology, and present the results of the review of 87 empirical and conceptual studies, organized according to the framework developed. We conclude by assessing the body of literature reviewed, identifying knowledge gaps, and suggesting avenues for future research.

A COMPARATIVE INSTITUTIONAL FRAMEWORK FOR GUIDING LITERATURE REVIEW

Given the complexity of GVC-related phenomena and the resultant multifarious nature of published studies, a guiding conceptual framework is needed to help us systematically categorize and analyze these studies. We have adopted an IB-centric comparative institutional perspective, embodied in internalization theory/transaction cost economics (TCE) (Buckley & Casson, 1976; Hennart, 2009; Verbeke, 2013), as the foundation of our framework. We consider this approach particularly suitable for systematizing our review for two reasons. First, it focuses on comparative efficiency of various types of governance, and therefore explains under what circumstances GVC governance is preferable to other alternatives. Second, a comparative institutional approach incorporates and links together different levels of analysis, such as micro/individual, transaction/a class of transactions, firm, network, and macro environment; such an integrative approach to governance accurately reflects the multifacetedness and complexity of the GVC phenomenon. However, before we elaborate on this organizing framework for reviewing GVC studies, it is useful and necessary to revisit some of the seminal theoretical works on GVC governance and upgrading (Gereffi, 2018; Gereffi et al., 2005; Humphrey & Schmitz, 2002), and network organization and territorial development outcomes (Coe et al., 2004; Coe & Yeung, 2015; Henderson et al., 2002). These social science studies provided

content for designing our IB-centric organizing framework.

Seminal Theoretical Works on GVCs and GPNs in the Social Sciences: From GVC to GPN 2.0

In the early 1990s, Gereffi (1994, also 2018: Chapter 2) developed the first original framework for explaining the organization of international production networks on the basis of the economic power of giant buyers (e.g., largest retailers, supermarkets, and brand-name merchandisers) and producers (e.g., OEMs in automotive and other high-tech industries) in driving these commodity chains. Attempting to move beyond the then national state-centric modes of analyzing the global economy, Gereffi, Korzeniewicz, and Korzeniewicz (1994: 2) defined commodity chains as “sets of interorganizational networks clustered around one commodity or product, linking households, enterprises, and states to one another within the world economy. These networks are situationally specific, socially constructed, and locally integrated, underscoring the social embeddedness of economic organization.” Their idea was to promote a meso scale of analysis that could probe “above and below the level of the nation-state” and reveal the “macro-micro links between processes that are generally assumed to be discretely contained within global, national, and local units of analysis.”

To operationalize these conceptual ideas and the overall “drivenness” (buyer- or producer -driven) of particular commodity chains, Gereffi (1994) expanded on three main dimensions of commodity chains and networks: (1) an *input-output structure* that refers to a set of products and services connected together in a sequence of value-adding economic activities; (2) a *territoriality* that refers to the spatial configuration of the various actors involved, such as spatial dispersion or concentration of production and distribution networks; and (3) a *governance structure* that reflects the authority and power relationships within the chain, which determine the allocation and flows of materials, capital, technology, and knowledge therein. Despite this early theoretical development, many of the subsequent empirical studies suffered from a “theoretical deficit.” As argued by Dussel Peters (2008: 14), “most research on global commodity chains approaches the GCC framework as a ‘methodology’ and not a ‘theory’.” The result of this is vast quantities of empirical work on particular chains and the experiences of particular firms and regions in them, and relatively little theoretical

work attempting to account for these findings in a systematic and integrated way.”

Since Gereffi (1994), nevertheless, much of GVC theory work in the next decade has been focused on the third dimension of commodity chains – *inter-firm governance* – through mapping GVC governance structures as independent variables and developing typologies of these structures in order to postulate their consequences for *industrial upgrading*, as dependent variables, at the firm level and in local/regional development (see recent reviews in Coe & Yeung, 2015, 2019; Gereffi, 2018: Chapter 1).¹ In their important theoretical formulation following Gereffi’s (1999) influential empirical work on East Asian apparel upgrading trajectories and Kaplinsky and Morris’s (2001) highly cited handbook for value chain research, Humphrey and Schmitz (2002) conceptualized four types of GVC-related *upgrading* in industrial clusters: *process upgrading*, whereby the production system is made more efficient, perhaps through superior technology; *product upgrading*, in which firms move into more sophisticated product lines; *functional upgrading*, in which they acquire new functions to increase their value added; and *chain or inter-sectoral upgrading*, whereby firms move into new categories of production altogether. More recently, Pietrobelli and Rabellotti (2011) further theorized the relationships between these upgrading possibilities and different learning mechanisms embedded in local and regional innovation systems.

The most significant theorization of *GVC governance*, as an independent variable shaping local and regional upgrading outcomes, was Gereffi et al.’s (2005, also in 2018: Chapter 4) conceptual typology that came a decade after Gereffi’s (1994) work. In this most cited conceptual GVC study, Gereffi et al. (2005) drew upon earlier theoretical work on production fragmentation in international business and trade economics, coordination problems in transaction cost economics (TCE), and networks in economic geography and economic sociology. To them, the then recent work by geographers, such as Dicken, Kelly, Olds, and Yeung (2001) and Henderson et al. (2002), “has emphasized the complexity of inter-firm relationships in the global economy. The key insight is that coordination and control of global-scale production systems, despite their complexity, can be achieved without direct ownership” (Gereffi et al., 2005: 81). To theorize this complexity of inter-firm relationships, Gereffi et al. (2005) constructed a typology of value

chain governance by intersecting the three supply-chain variables of complexity of transactions, codifiability of transactions, and the capabilities within the supply base. By ascribing only two values – high or low – to these three variables, they identified a fivefold typology of governance within GVCs. In addition to the pure forms of *market* and *hierarchy*, the authors distinguished *modular*, *relational*, and *captive* forms of governance that rely on intermediate levels of coordination and control. While highly influential, this conceptual typology is still arguably somewhat limiting, and underplays the extent to which governance is also shaped by place-specific institutional conditions and intra- and extra-firm dynamics (Coe & Yeung, 2015). Further theoretical work mobilized convention theory to focus on the different modes and levels of governance operating within GVCs, distinguishing between overall drivenness, different forms of coordination (the five types of governance noted above), and the wider normalization and standards-setting processes that operate along the value chain (e.g., Gibbon & Ponte, 2008; Ponte & Gibbon, 2005).

As noted in the Introduction, a parallel theoretical development in the social sciences was the GPN framework developed by Dicken et al. (2001) and Henderson et al. (2002). Table 1 offers a comparison between GVC and GPN theoretical approaches that enable the “modular” theory-building efforts proposed by Ponte and Sturgeon (2014). As part of these efforts, Henderson et al.’s (2002) GPN 1.0 schema emphasized the complex intra-, inter-, and extra-firm networks involved in any economic activity, and elaborated on how these are structured

both organizationally and geographically. This theoretical framework for analyzing the global economy was intended to delimit the globally organized nexus of interconnected functions and operations of firms *and* extra-firm institutions through which goods and services are produced, distributed, and consumed. The central concern of any GPN analysis therefore should not simply be about considering the networks in their own terms, but should reveal the dynamic developmental impacts on locations and territories interconnected through these networks. GPN 1.0 thus extends beyond the above-mentioned GVC governance approach by (1) bringing extra-firm actors, such as state agencies, non-governmental organizations, and consumer groups, into GPNs; (2) considering firm–territory interactions at multiple spatial scales, from the local and the sub-national to the macro-regional and the global; (3) examining intersecting vertical (intra-firm) and horizontal (inter-firm) connections in production systems; and (4) taking a more complex and contingent view of how GVC governance is shaped by the wider regulatory and institutional contexts.

The most recent and comprehensive theorization of GVCs is found in Coe and Yeung’s (2015) monograph. This work seeks to develop a dynamic theory of GPNs by specifying the causal mechanisms that explicitly link earlier conceptual categories of value, power, and embeddedness to the dynamic configurations of GPNs and their uneven development outcomes. In this GPN 2.0 framework, the aim is to conceptually connect the structural capitalist dynamics that underpin GPN formation/operation to the on-the-ground

Table 1 Theoretical approaches in global value chains and global production networks. *Source:* Adapted from Coe and Yeung (2015: Table 1.1)

	Global commodity/value chain (GCC/GVC)	Global production network (GPN)
Disciplinary background	Economic Sociology Development Studies Industry Studies	Economic Geography International Political Economy Innovation Studies
Object of enquiry	Inter-firm networks in global industries	Global configurations of intra-, inter- and extra-firm networks Uneven regional development trajectories
Orienting concepts	Value-adding chains Governance models Organizational learning Industrial upgrading and rents Development policies	Value creation, enhancement, and capture Corporate, collective, and institutional power Societal, network, and territorial embeddedness Strategic coupling
Intellectual influences	World systems theory International business Trade economics	Competitive dynamics and technological innovations Relational economic geography GCC/GVC studies

development outcomes for local and regional economies. The underlying capitalist dynamics encompass key dimensions such as drivers of lowering cost-capability ratios, market development, financialization and its disciplining effects on firms, and risk management; together, these dimensions distil the inherent imperatives of contemporary global capitalism. These dynamics are key variables driving the strategies adopted by economic actors in (re)configuring their GPNs, and consequent value capture trajectories and developmental outcomes in different industries, regions, and countries. Interestingly, these competitive dynamics are not well theorized in the existing GVC literature, which is much more concerned with *governance* aspects of the operation of such chains and networks *after* they are formed. Coe and Yeung (2015) considered how these causal drivers shaped the strategies of different kinds of firms in GPNs. These firms organize their activities through different configurations of intra-, inter-, and extra-firm network relationships. Conceptually, these network configurations are shaped by different interactions of the underlying dynamics. The authors then examined the consequences of these causal mechanisms – comprising varying dynamics and strategies – for firms in GPNs.

Fuller and Phelps (2018) further explained how parent–subsidiary relationships in MNEs can significantly influence the way that these competitive dynamics shape their *network embeddedness* in and *strategic coupling* with specific regional economies (Yeung, 2009, 2016). Departing from the industrial upgrading literature that often takes on a unidirectional pathway to upgrading (from process to value chain upgrading in Humphrey and Schmitz (2002)), Coe and Yeung (2015) further developed the concept of “value capture trajectories” to frame in dynamic terms whether firms are able or not to capture the gains from strategic coupling in GPNs. Ultimately, this GPN 2.0 work seeks to understand the impacts on territorial development by exploring how firm-specific value capture trajectories can coalesce in particular places and locations into dominant modes and types of strategic coupling, with different potential for value capture in the regional and the national economies.

Similar to other theories in the social sciences, the GVC/GPN frameworks discussed above are primarily explanatory rather than predictive in nature. The validity of predictions depends upon *ceteris paribus* conditions, which do not apply in open systems where social phenomena occur.

Hence, “it is unrealistic to assume that all relevant data will be consistent with a theory even if the theory is correct” (Lieberson, 1992: 7). As such, the predictive power of social science theories is curtailed (see Bhaskar, 1998 for a detailed discussion).

A Comparative Institutional Framework on GVCs

The above brief review of foundational works in GVCs and GPNs has clearly pointed to the general tendency in the social science literature to examine GVC governance, upgrading dynamics, and territorial outcomes. Still, there is a limited conceptualization of how different actors – from MNE lead firms to their strategic partners, key suppliers and customers, and other related firms – (1) *structurally organize* their business transactions to exercise control and coordination, determine locational choices, and configure networks; and (2) *strategically manage* their firm-specific activities to enhance learning and knowledge accumulation, create advantageous impacts, and orchestrate GVCs for better performance outcomes. These firm-specific considerations fall within the core premise and competence of IB research that can add much value to the existing GVC theoretical frameworks. In particular, we suggest that comparative institutional analysis can help link social science and IB approaches in GVC research. Comparative institutional analysis, as applied in firm-level studies, builds on the premise that economic actors will make decisions about the most efficient governance mechanisms to conduct economic exchange or to organize a given set of transactions. For example, they may choose between organizing production activities within the firm or through the market, and select coordination and control methods, such as the market system versus managerial hierarchy versus socialization (Gereffi et al., 2005; Hennart, 1993). Comparative institutional analysis has a number of branches, including internalization theory (Buckley & Casson, 1976), which is most relevant for exploring GVCs. Internalization theory applies the economic essence of comparative institutional analysis in an international setting, arguing that economic actors will select and retain the most efficient governance mechanisms to conduct cross-border transactions (Verbeke & Kenworthy, 2008).

From a comparative institutional perspective, a GVC represents a distinct form of governance, which is likely to emerge and thrive only if it enables superior efficiency when compared to other real-world alternatives (e.g., vertical integration or

market contracting). Efficiency is served by aligning governance systems (both *structural* and *strategic*) with the attributes of transactions in a cost-economizing way (Hennart, 1993). Ultimately, competitive advantage arises from the firm's ability to choose the most efficient, economizing mix of internal and external contracts as a function of various *micro-* and *macro-level* characteristics of transactions – decisions made by economic actors at the micro level and demand/technological/institutional characteristics at the macro level (Antràs & Chor, 2013; Gereffi et al., 2005; Hennart, 1994). The most efficient governance forms are those that are comparatively superior in terms of enabling the firm to: (1) economize on bounded rationality; (2) economize on bounded reliability²; and (3) create an organizational context conducive to innovation in its entirety (Verbeke & Kenworthy, 2008). Further, the firm must adjust its economizing mix of contracts over time as a function of changes in the micro- and macro-environments. Finally, the firm continually impacts both its micro-level and macro-level environments through changes in governance. Such changes evolve in a continuous, mutually reinforcing cycle (Williamson, 1996).

We combine comparative institutional logic with foundational GVC work discussed in the previous section to build an organizing framework, which facilitates our subsequent review of a large number of empirical and conceptual studies of GVCs. This framework, presented in Figure 1, arranges extant studies along the three main layers impacting the functioning of GVCs, and conceptually connects these layers with each other and, ultimately, with GVC governance and performance outcomes. While incorporating some of the key conceptual variables in Gereffi et al.'s (2005) governance typology and Coe and Yeung's (2015) GPN 2.0 theory, this integrative framework seeks to highlight *IB-specific* issues in relation to not only GVC-level variables, but also, crucially, micro- and macro-level influences that shape the organization and performance outcomes of MNEs and other firms in GVCs.

First, at the *micro-level*, we identify studies that explore specific assumptions about the behavior of decision-makers in both the lead firm and peripheral units, and ways in which these assumptions explain processes within the GVC; that is, how knowledge is exchanged and processed, how the hazards of reliability are managed, and how new capabilities are developed and obsolete ones are discarded. Second, at the *GVC level*, we discuss

studies that focus on governance and performance of the GVC. Here, we identify six broad dimensions that constitute critical elements of GVC governance: control, location, network structure, learning, impact of the lead firm, and GVC orchestration. GVC performance outcomes, to the extent that they are explored in the reviewed studies, are also addressed at this level. In accordance with comparative institutional analysis principles, and consistent with conceptual foundations of much GVC research, we view overall GVC performance in terms of sustainability of GVC as a governance form or its success in delivering value to participants, including capability development and upgrading. Third, at the *macro-level*, we focus on studies exploring the relationships between the GVC and its environment, including cultural, institutional, geographic, and economic make-ups of both home and host locations. Studies that constitute this group address both macro-level impacts on GVC configurations and the GVCs' impact on macro-environments within which they operate. In the following sections, we use this integrative framework to review 87 conceptual and empirical studies of GVCs.

METHODOLOGY

We focused on published journal articles and excluded books, because more often than not, authors of books also published journal articles that contained much of the reported results (e.g., Gereffi, 2018). We also excluded book chapters, which usually went through a less rigorous review process than journal articles and were less accessible digitally. We conducted a multi-disciplinary literature search that covered IB, general management, supply chain management, operations management, and a selected group of social science journals that published GVC research, namely economic geography, economic sociology, regional and development studies, and international political economy³. This extensive scope should cover most of the key GVC studies published in academic journals. We included leading journals of each discipline that attracted researchers to submit their best-quality GVC studies.

For each journal, we searched articles published in the past 20 years – the period characterized by rapid growth and increased sophistication of GVC research, as discussed in the Introduction. We used four search terms: global value chain, global commodity chain, global production network, and

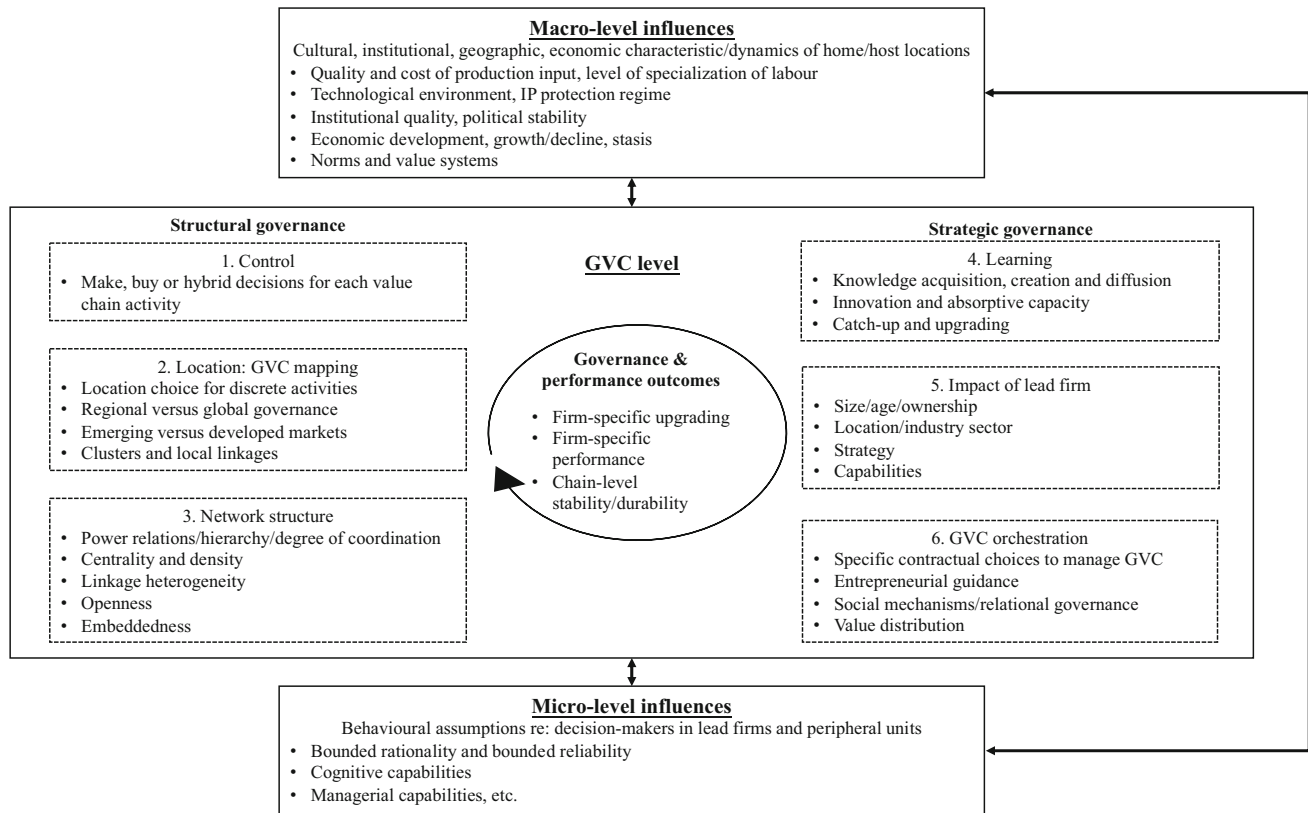


Figure 1 A comparative institutional framework of GVC governance.

global factory. We shortlisted conceptual articles with GVCs as their major foci, and empirical articles, whether qualitative or quantitative, that had at least one of the search terms as a major variable. That is, we excluded articles that casually cited or had any of the four terms serving as a control variable. Moreover, shortlisted studies targeted at the firm or network level, instead of other units of analysis, such as international organizations (e.g., Haworth's (2013) case study of the Asia Pacific Economic Cooperation), industries, or locations.

Since the social science journals have a very large number of publications on GVCs that amounted to several hundreds, we applied additional criteria to narrow down this considerable volume of literature to a proportionate number of articles. We started with identifying nine theoretical pieces that constituted the foundation of the theory section above. For empirical papers, we implemented three additional screening criteria. First, we included more recent papers published after 2005. Second, we focused on papers that were closest to the research interests of IB scholars. Third, we ensured that our selection covered a reasonable mix of authors from

different disciplines, institutions, and geographical locations, and that selected studies included both GVC and GPN approaches with a variety of research methods, industry coverage, and empirical locations in both developed and developing countries.

Based on the above criteria, a total of 21 journals publishing 22 theory papers (including the nine foundational pieces mentioned above) and 65 empirical articles were included in our review, as listed in Table 2. Notably we also searched the *Academy of Management Journal*, *Administrative Science Quarterly*, *Journal of Management* and *Management Science* (all commonly regarded as leading management journals), but failed to find any relevant articles. The same applies to the leading journals in sociology (e.g., *American Journal of Sociology* and *American Sociological Review*) and political sciences (e.g., *American Political Science Review* and *International Organization*).

The 33 shortlisted articles in mainstream IB journals (i.e., GSJ, IBR, JIBS, JWB, and MIR) provide the most comprehensive picture of our field's current state of knowledge on GVCs. Articles published in these journals, however, constitute about 58% of the group of non-social science

Table 2 Journals included in the review

Journal	Abbreviation	No. of articles
General management		
<i>Academy of Management Review</i>	AMR	1
<i>Journal of Management Studies</i>	JMS	2
<i>Organization Science</i>	OS	1
<i>Strategic Management Journal</i>	SMJ	1
International business		
<i>Global Strategy Journal</i>	GSJ	1
<i>International Business Review</i>	IBR	10
<i>Journal of International Business Studies</i>	JIBS	9
<i>Journal of World Business</i>	JWB	7
<i>Management International Review</i>	MIR	6
Supply chain/operations management		
<i>International Journal of Operations and Production Management</i>	IJOPM	10
<i>Journal of Operations Management</i>	JOM	2
<i>Journal of Supply Chain Management</i>	JSCM	3
<i>Supply Chain Management: An International Journal</i>	SCM	4
Economic geography/economic sociology/regional studies		
<i>Economic Geography</i>	EG	8
<i>Environment and Planning A</i>	EPA	2
<i>Global Networks: A Journal of Transnational Affairs</i>	GN	4
<i>Journal of Economic Geography</i>	JEG	5
<i>Regional Studies</i>	RS	3
<i>Review of International Political Economy</i>	RIPE	3
<i>Transactions of the Institute of British Geographers</i>	TIBG	1
<i>World Development</i>	WD	4
Total		87

journals, indicating that GVC is an important research topic attracting the attention of researchers working in disciplines beyond the IB turf. In the group of social science journals during the review period, GVC and GPN research has been particularly influential in the fields of economic geography, economic sociology, and regional and development studies. Here, we included only a small selection of 30 articles published in the leading journals, based on the criteria discussed above.

We studied each article and extracted two to three key GVC-related findings with respect to our organizing framework presented in Figure 1. Table 3 lists these 87 articles' key information (year of publication, authors, journal abbreviation, research method, and sample characteristics) and their most significant findings. The sample spans the time period from 1999 to the end of July 2019; however, for the non-social science journals, the more recent articles published after 2010 represent the bulk of the sample, reflecting a broad upward trend in GVC publications in the last decade. There is almost an equal split of research methods

between qualitative case studies and quantitative studies based on archival or survey data. There are both single-country and multi-country studies, together covering a wide geographic scope. Most of the studies analyze firms, networks or clusters in manufacturing industries. It is not surprising that the automotive industry is the most popular context for these studies, given the industry's requirement for many suppliers, large and small, manufacturing various components of an automotive. The studies as a whole investigate a variety of IB-related issues, as described in the next section.

REVIEW OF GVC LITERATURE

Micro-level: Microfoundational Assumptions and Their Impact on GVC

Microfoundations refer to generic human behavioral conditions that impact firm-level (and, in the case of GVCs, network-level) outcomes (Kano & Verbeke, 2019). Scholars have argued that individual-level characteristics, such as bounded rationality, bounded reliability, cognitive biases, and

Table 3 Summary of conceptual and empirical research on global value chains published in 1999–2019**

Reference	Journal	Method	Sample	Key findings
<i>General management journals</i>				
Chen (2003)	JMS	Qualitative, case study	10 electronics firms in Taiwan	FDI often starts at a location close to the home base where resources from domestic networks can be drawn, and subsequently moves on to more distant locations after the MNE has accumulated new network resources. FDI enables the MNE to develop a regional, or even global, subnetwork for supplying a set of wide-ranging, differentiated and low-cost products in a flexible manner. Most firms are in a subordinate position in buyer-driven value chains. As such, cost pressures force them to minimize wage expenditures. Given the prevalence of many overseas low-cost production options in the global apparel industry, these firms find it difficult to pay workers a wage premium commensurate with their skill level, leading to problems of high labor turnover and low worker commitment.
Taplin, Winterton, & Winterton (2003)	JMS	Quantitative, survey	754 clothing manufacturers in the UK	The author develops a framework that throws light on the nature of power and hegemony of GPNs, which are regarded as a set of structured yet contested relations. GPNs are not only arenas for market competition but also complex political economic systems in which market and political powers are intertwined as actors formulate and deploy economic, discursive, and organizational strategies.
Levy (2008)	AMR	Conceptual	N/A	Core firms that are in charge of the processes of interfirm learning from firm to dyad, and from dyad to network, and of knowledge-enhancing practices need to cultivate the transfer, recombination and creation of specialized knowledge. Successful learning processes accrue in dyads and networks where both the source and the recipient possess the requisite knowledge transfer capacity.
Lipparini, Lorenzoni, & Ferriani (2014)	SMJ	Quantitative, archival and interview data	892 Italian motorcycle industry projects enacted via 184 dyads of buyers and suppliers	The presence of “kingpins” – firms with superior market capitalization and disproportionately high R&D expenditures – in a segment is correlated with a higher share of total sector value by the segment. Kingpins generate a positive externality for their direct competitors, but their segments display increasing internal inequality in value over time.
Jacobides & Tae (2015)	OS	Quantitative, archival data	Firms and segments in the US computer industry	Firms can achieve performance gains when relational strategies for governing supply chains are fitted to cultural expectations of global supply chain partners (e.g., related to the level of information exchange in relationships). When relational strategies become standardized across partners, performance diminishes or remains unchanged.
<i>International business journals</i>				
Griffith & Myers (2005)	JIBS	Quantitative, survey	92 US importers engaged in business with Japanese and US supply chain partners	Firms at the centre of GCCs can exploit their ownership advantages without internalizing production, while retaining control over the essential aspects of the production process. These arguments are consistent with Stephen Hymer’s insights on the externalization of production, which predated modern GCC analysis. The arguments are illustrated by the example of the global garment industry.
Strange & Newton (2006)	IBR	Conceptual	N/A	

Table 3 (Continued)

Reference	Journal	Method	Sample	Key findings
Asmussen, Pedersen, & Petersen (2007)	MIR	Quantitative, survey	420 Danish firms with internationally dispersed value chains	The study develops an index for measuring how lead firms configure their value chains – specifically, whether firms locate value chain activities in globally specialized units to exploit international division of labor. This global specialization index was tested empirically on a sample of Danish lead MNEs
Buckley (2009a)	IBR	Conceptual	N/A	The article develops the concept of “the global factory”, based on internalization thinking. The global factory is a dynamic and flexible structure that combines internalized and externalized governance across geographically dispersed, fine-sliced activities, whereby flexibility provides resilience, and the total sum of transaction costs across activities is minimized. The headquarters are more important than in conventional hierarchies, because of the need to determine ownership and control modes for each specialized activity. This role demands new management skills, including the ability to fine-slice, control information, and coordinate external organizations into the strategy of the focal firms
Buckley (2009b)	JWB	Conceptual	N/A	The rise of the global factory system constrains development options in developing countries, where firms participating in the global factory network are most often limited to being suppliers of labor-intensive manufacturing or services. There are two options for breaking into the system: (1) incremental upgrading within established global factories; and (2) developing new global factories under local control. Both options are difficult in that they require mobilizing entrepreneurial abilities and developing managerial skills
Eng & Spickett-Jones (2009)	JWB	Quantitative, survey	268 electronics manufacturers in Hong Kong and mainland China	Three dynamic marketing capabilities – product development, marketing communication, and channel management – are crucial for manufacture upgrade in buyer-driven commodity chains
Hatani (2009)	JWB	Qualitative, case study	13 production units of Japanese auto parts suppliers in China	In the context of emerging economies, excessive inward FDI structurally inhibits technology spillovers from MNEs even at the lower tiers of the supply chain due to limited interactions between local firms and MNEs
Funk, Arthurs, Treviño, & Joireman (2010)	JIBS	Quantitative, survey	319 US consumers	Consumers’ willingness to purchase “hybrid products” (i.e., products manufactured through dispersed GVCs) is negatively affected by partial production shifts to animosity-invoking countries. This impact is less pronounced in consumers exhibiting “openness” (versus “conservation”) values
McDermott & Corredoira (2010)	JIBS	Quantitative, survey	90 autoproduct manufacturers in Argentina	A few direct social ties to international assemblers appear to be most beneficial for local suppliers, although these ties may not be sufficient to make up for the negative effect of being located in lower tiers of the value chain. Supplier–customer relationships that promote regular, disciplined discussions about product and process improvements are especially beneficial for suppliers’ upgrading

Table 3 (Continued)

Reference	Journal	Method	Sample	Key findings
Buckley (2011)	MIR	Conceptual	N/A	The new form of organization of business activities in the global economy is best conceptualized as “the global factory” – a dynamic system, whereby the focal firm acts as the controlling intelligence of the global network by making two core analytical decisions for each activity: location and control. Control of information (as opposed to control of physical assets) is central to the success of the global factory, as are extra freedom in location of activities, and the ability to manage an internationally distributed network of activities
Yamin (2011)	MIR	Conceptual	N/A	Global factory, as an organizational form, is vulnerable because of its embeddedness in the network and over-emphasis on operational efficiency, which potentially comes at the expense of innovation. The global factory exerts not only organizational, but also political power. While it may improve world welfare, it can also constrain economic development
Azmeh & Nadvi (2014)	IBR	Qualitative, case study	Four large Asian garment manufacturing MNEs	Asian garment manufacturers (tier 1 suppliers to large multinational buyers) tend to disintegrate their own value chains, and become MNEs in their own right by shifting production to different locations, and coordinating the division of labor/value distribution between these locations. This represents a different type of upgrading, whereby suppliers do not move into branding/retailing, but rather achieve competitive gains by becoming effective coordinators of multiple production locations, thus increasingly shaping the geography of GVCs
Corredoira & McDermott (2014)	JIBS	Quantitative, survey	59 autoproduct manufacturers in Argentina	Process upgrading by suppliers located in emerging markets is aided by multiple, strong ties to focal MNEs and non-market institutions, which act as knowledge bridgers to help firms tap into knowledge embedded in isolated industrial districts. MNEs alone do not help process upgrading, but add value only when MNE ties are combined with ties to geographically diverse non-market institutions
Eriksson, Nummela, & Saarenketo (2014)	IBR	Qualitative, case study	A small ICT system provider in Finland	Small focal firms need to develop dynamic capabilities to manage GVCs, that help them overcome liabilities of smallness and newness. These include individual-level capabilities (cognitive and managerial), and organizational-level capabilities that build upon the individual level ones (flexibility and absorptive capacity)
Jean (2014)	IBR	Quantitative, archival data	633 new technology ventures in China	Firms participating in trade shows are more likely to pursue upgrading in GVCs from OEM to ODM, but the relationship decreases with increased export activity. Firms engaging in Internet-based B2B transactions are less likely to pursue upgrading, but those with strong quality control practices are more likely to do so. No direct relationship between R&D and upgrading is observed: inadequate home institutions hinder transforming R&D into innovative products and processes

Table 3 (Continued)

Reference	Journal	Method	Sample	Key findings
Kumaraswamy, Mudambi, Saranga, & Tripathy (2012)	JIBS	Quantitative, archival and interview data	Indian auto components firms	Catch-up and upgrading by GVC suppliers located in emerging markets is a dynamic process that mirrors the evolution of the liberalization process in home countries. At the beginning of market liberalization process, catching up through upgrading technical competencies is the dominant strategy, with short-run negative impacts on performance. As liberalization progresses to allow greater ownership/control by MNEs, development of strong customer relationships and upgrading internal R&D become dominant strategies, with positive impacts on performance
Liu & Zhang (2014)	IBR	Qualitative, case study	Six Taiwanese technology firms	Local supplier's ability to develop new capabilities depends on strategic characteristics of learning partners, the presence of specific tactics to enhance trust within different cultural contexts, and knowledge characteristics. It is easier for suppliers to accumulate technological than marketing capabilities through alliances; successful upgrading from OEM to ODM is more common than to OBM
Wang, Wei, Liu, Wang, & Lin (2014)	MIR	Quantitative, archival data	357,641 manufacturing firms in China	The presence of foreign MNEs has a negative impact on indigenous firms' domestic sales but a positive impact on their exports. MNEs from Hong Kong, Macau and Taiwan are more likely to produce this pattern of impact than MNEs from other countries
Khan, Lew, & Sinkovics (2015)	GSJ	Qualitative, case study	50 Tier 1 Pakistani suppliers and three JIVs of Japanese automotive assemblers and Pakistani partners	JIVs between Japanese MNEs and Pakistani firms play a boundary-spanning role in facilitating technological knowledge transfer and development of cross-cultural socio-technical ties for Pakistani component suppliers, by linking local firms with tier 1 suppliers in Japan and elsewhere in the world
Suder, Liesch, Inomata, Mihailova, & Meng (2015)	JWB	Quantitative, archival data	Asian International Input–Output tables representing nine East-Asian countries and three industries	Regional integration in East Asia is aligned with value-adding production network activities. This integration is motivated by the decisions of MNEs to internationalize in search of productive capabilities obtained through GVCs. Countries with more advanced production technologies are engaged more in the upstream segments of the vertical production process, and become key suppliers of components to other countries in the region. This pattern evolves as countries move through stages of industrial development
Gooris & Peeters (2016)	JIBS	Quantitative, survey	581 offshore service production units covering 59 host countries and 19 home countries	When the host country offers weak legal IP protection, and when internalization of activities is not the most efficient governance mode, MNEs may opt to fragment global business processes across multiple service production units, rather than co-locating processes. Firms can use ITC to exploit complementarities between the dispersed fragments of a process, while reducing the misappropriation hazard of individual fragments
Hillemann & Gestrin (2016)	IBR	Quantitative, archival data	OECD data on FDI and cross-border M&As	Core hypothesis of the global factory paradigm – that MNEs increasingly choose control over ownership of physical assets in GVCs – is supported. Cross-border financial flows related to intangible assets increase relative to flows related to tangible assets. Foreign assets are increasingly reverting to domestic ownership

Table 3 (Continued)

Reference	Journal	Method	Sample	Key findings
Laplume, Petersen, & Pearce (2016)	JIBS	Qualitative, case study	3D printing	Impact of 3D printing technology is the greatest in industries with low minimum efficient technical scales, short production runs and low degrees of automation. Diffusion of 3D printing in these industries is likely to make GVCs shorter, more dispersed, more local, and closer to end-users. These GVCs will engage a wider variety of firms, as well as households, in manufacturing
Buckley & Tian (2017)	MIR	Quantitative, archival data	Top 100 non-financial MNEs in the world and top 100 non-financial MNEs from emerging economies	Control of the GVC is in the hands of technology leaders. Emerging-market MNEs extract monopoly-based rents from internationalization, but are constrained to the periphery position in GVCs unless they can learn global orchestration know-how. This ability is constrained by home institution. Advanced-market MNEs, in contrast, achieve profitability through global orchestration capabilities
Lojacono, Misani, & Tallman (2017)	IBR	Quantitative, archival data	261 international alliances in the home appliances industry	More complex transactions in a GVC, which require greater coordination, are more likely to be governed through equity participation. Offshore production-oriented alliances are more likely to be governed through contractual alliances, whereby individual transactions are governed through specified contracts. Alliances that are likely to play a more strategic role locally (i.e., with the objective to produce for local markets) are more likely to be governed through a JV
Enderwick (2018)	IBR	Conceptual	N/A	In a global factory system, the corporate social responsibility for actions of network participants is assumed by the lead firm, irrespective of ownership and directness of linkages – at least in the minds of stakeholders. The full extent of this responsibility is likely to be determined by whether indirect partners are exclusive or non-exclusive
He, Khan, & Shenkar (2018)	JWB	Qualitative, case study	Acquisition of UK-based Dynex by China's Times Electric	An emerging-market MNE acquiring a developed country firm can “impel” capability upgrading and encourage “co-learning” in the acquired subsidiary, by leveraging the MNE's GVC lead firm position, its complementary assets, and the unique power relationship between the MNE and the subsidiary
Kano (2018)	JIBS	Conceptual	N/A	A GVC can only be sustained over time if it is more efficient than alternative governance (e.g., full integration) in terms of economizing on bounded rationality and reliability, and fostering innovation and capability development throughout the chain. The orchestrating firm in a GVC can enhance these efficiency outcome by deploying six social mechanisms identified in the study: selectivity, inclusion of non-business intermediaries, joint strategizing, relational capital, multilateral feedback, and rules for equitable value distribution among GVC participants

Table 3 (Continued)

Reference	Journal	Method	Sample	Key findings
Khan, Rao-Nicholson, & Tarba (2018)	JWB	Qualitative, case study	12 Pakistani motorcycle parts suppliers to Japanese and Chinese assemblers	In the context of weak institutional support, Pakistani motorcycle parts suppliers develop exploitative innovation capabilities based on knowledge coming from MNEs. As a balancing strategy, these suppliers develop international networks with global tier 1 suppliers, international trade fairs, and international institutions. This strategy enables them to circumvent the negative influence of home institutional factors on exploratory innovation
Turkina & VanAssche (2018)	JIBS	Quantitative, archival data	154 clusters in the aerospace, biopharma, and ICT industries	Innovation in knowledge-intensive clusters disproportionately benefits from strengthening their constituent firms' horizontal connections to foreign knowledge hotspots, whereas innovation in labor-intensive clusters mainly gains from stronger vertical connections by their firms to central value chain members abroad
Ancarani, Di Mauro, & Mascali (2019)	JWB	Quantitative, archival data	495 relocation initiatives in Europe	Backshoring initiatives (relocation of production back to high-cost regions) are tied to firms' strategic priorities. Backshoring is associated with adoption of advance labor-saving technologies when firms compete on quality. Backshoring initiatives that prioritize cost reduction or responsiveness are not tied to technology adoption
Khan, Lew, & Marinova (2019)	IBR	Quantitative, survey	155 auto parts manufacturers in Pakistan	Local suppliers' learning intent allows them to move from potential absorptive capacity (ability to acquire knowledge) to realized absorptive capacity (ability to transform and exploit acquired knowledge). Realized absorptive capacity is critically important in spurring exploitative and exploratory innovation, which, in turn, improves suppliers' value-added position in GVCs
Sinkovics, Choksy, Sinkovics, & Mudambi (2019)	MIR	Qualitative, multiple case study	12 Pakistani offshore service providers	Building knowledge connectivity in a GVC is a two-sided decision. Lead firms' willingness to build connectivity depends on the complexity of transactions, the codifiability of information, and supplier capabilities; individual characteristics of managers moderate this relationships. Suppliers may offset lead firms' hesitation by investing into connectivity building, however, the extent of this investment depends on suppliers' intent, that is, whether they intend to step-up the relationship, or to eventually break out of the supplier role in the GVC
<i>Supply chain/operations management journals</i>				
Akkermans, Bogerd, & Vos (1999)	IJOPM	Qualitative, policy-Delphi study	30 Dutch supply chain managers	The results indicate a gloomy picture of vicious cycles frustrating the implementation of effective international supply chain management (ISCM) strategies. The authors develop an exploratory causal model of goals, barriers, and enablers related to effective ISCM strategies by applying the generic mechanisms of vicious cycles to create a virtuous cycle
van Hoek (1999)	SCM	Qualitative, case study	16 food, electronics, automotive and clothing manufacturers in the Netherlands, Belgium, and Germany	In food supply chains, both postponement and outsourcing are applied to a lesser extent than in supply chains of other industries. The author develops a framework to position supply chains in terms of degree of outsourcing, level of postponement and spatial configuration

Table 3 (Continued)

Reference	Journal	Method	Sample	Key findings
Colotla, Shi, & Gregory (2003)	IJOPM	Qualitative, case study	Two international manufacturing networks comprising eight factories in six countries	Factory and network level capabilities simultaneously affect a set of dimensions of operational performance. Decisions concerning factory and network issues are often taken independently of each other, although they may be heavily interdependent
Karlsson (2003)	IJOPM	Conceptual	N/A	The author discusses new challenges faced by companies that organize more and more activities external to their traditional boundaries and as a result have to deal with external networks. He identifies patterns of organizational principles and consequences for organizing and managing such operations
Chiarvesio & Di Maria (2009)	IJOPM	Quantitative, survey	630 firms in Italy	Industrial district firms rely more on local systems in terms of subcontracting networks to exploit flexibility, while non-district firms also invest in national level subcontracting networks. Industrial district firms search for efficiency and value-added competences when expanding supply networks globally. In contrast, non-district firms adopt a more hierarchical approach to internationalization. Differences between these two types of firms decrease as firm size increases
Zhang & Gregory (2011)	IJOPM	Qualitative, case study	Nine firms in engineering focused sectors	The authors develop a framework that demonstrates different value creation mechanisms of global network operations along the engineering value chain in terms of efficiency, innovation and flexibility. Operations focusing on different stages of the value chain prioritize the three kinds of value creation mechanisms differently
Cereffi & Lee (2012)	JSCM	Conceptual	N/A	The authors highlight some of the main features of GVC analysis and discuss the relationship between the core concepts of governance and upgrading
Casson (2013)	JSCM	Conceptual	N/A	The author analyzes GVCs from an internalization theory perspective by considering how a division of labor is coordinated. He compares coordination by management with coordination by the market
Lampel & Giachetti (2013)	JOM	Quantitative, archival and interview data	38 automakers with headquarters in 15 countries	There is an inverted U-shaped relationship between international manufacturing diversification and financial performance. Two factors, namely product diversification and co-locating production and sales in foreign markets, positively moderate this relationship
Carnovale & Yenyurt (2014)	JSCM	Quantitative, archival data	1158 firms and 509 JVs in global automotive industry	Ego network size and ego network betweenness centrality of the focal OEM have significant and positive effects on new JV formations, so does ego network size of its potential partner. There is a diminishing return to ego betweenness centrality of the focal OEM in new JV formations
Seppälä, Kenney, & Ali-Yrkkö (2014)	SCM	Qualitative, case study	One precision machinery firm in Finland	Transfer pricing is a critical factor for understanding the geographic distribution of value added in an MNE's global supply chain. The MNE's accounting system and transfer pricing mechanism may not reflect where its most valuable assets are located
Chen, Wei, Hu, & Muralidharan (2016)	IJOPM	Qualitative, case study	Eight firms in Chinese toy industry	When facing rising labor costs, some OEMs move their operations to low-cost regions, while others enter the ODM business by investing in R&D, and some gradually develop further to become OBM by investing in marketing and brand-building

Table 3 (Continued)

Reference	Journal	Method	Sample	Key findings
Ferdows, Vereecke, & De Meyer (2016)	JOM	Qualitative, case study	Three European firms and two European divisions of US firms	The authors propose a model that delayers the global plant network into a set of subnetworks based on the complexity of proprietary information in the products they manufacture and production processes they employ. The authors illustrate the usefulness of the model by applying it to analyze the global production networks of five companies
Golini, Deflorin & Scherrer (2016)	IJOPM	Quantitative, survey	441 manufacturing plants in 17 countries	A higher level of autonomy of plants in a network is associated with very limited effects on operational performance. This lack of effect is due to two dimensions of manufacturing network embeddedness (manufacturing network integration and supply chain integration), which enhance performance, but are themselves reduced by higher autonomy
MacCarthy, Blome, Olhager, Srai, & Zhao (2016)	IJOPM	Conceptual	N/A	The authors trace the GVC lifecycle and identify six factors that may affect a GVC over its lifecycle – (1) technology and innovation, (2) economics, markets and competition, (3) policy and regulation, (4) procurement and sourcing, (5) supply chain strategies and (6) re-engineering
Benstead, Hendry, & Stevenson (2018)	IJOPM	Action research	A multi-billion pound turnover company in the textiles and fashion industry	Successful horizontal collaboration among GVC members is dependent on both relational capital and effective (formal and informal) governance mechanisms. Through collaborating, firms build new capabilities that improve social sustainability performance by generating relational rents in terms of the organizations' reputation for responding to modern slavery legislation
Golini & Gualandris (2018)	IJOPM	Quantitative, survey	471 manufacturing plants in the US, Europe, and Asia	Adoption of sustainable production practices at the plant level is significantly and positively related to the integration and globalization of firm-wide manufacturing networks. In contrast, adoption of sustainable sourcing practices is more strongly affected by the integration of external supply chains and benefits from manufacturing networks only indirectly, through the association with sustainable production practices
Kumar, Bak, Guo, Shaw, Colicchia, Garza-Reyes, & Kumari (2018)	SCM	Quantitative, survey and interview data	103 survey responses and six interviews in the Chinese manufacturing industry	Supply risk and manufacturing risk management are both vital for business performance. Supply orientation is effective in managing supply risk, but supply dependency has no significant influence on it. Customer orientation has positive effects on manufacturing and supply risk
Treiblmaier (2018)	SCM	Conceptual	N/A	The author discusses the potential implications of blockchain technology for supply chain management by presenting a framework based on four established economic theories, namely, principal-agent theory, transaction cost analysis, resource-based view, and network theory
<i>Social science journals</i> Dicken, Kelly, Olds, & Yeung (2001)*	GN	Conceptual	N/A	The authors adopt a network methodology and differentiate between the analytical strengths of commodity chains and production networks in understanding contemporary global economy. They provide indications of the utility of such a methodology

Table 3 (Continued)

Reference	Journal	Method	Sample	Key findings
Henderson, Dicken, Hess, Coe, & Yeung (2002)*	RIPE	Conceptual	N/A	The authors explain the critical dimensions of value (creation, enhancement and capture), power (corporate, collective and institutional), and embeddedness (territorial and network). Firms and institutions are interwoven in different network structures and industrial sectors to account for development outcomes. A stylized mapping of GPNs is offered
Humphrey & Schmitz (2002)*	RS	Conceptual	N/A	Clusters are inserted into GVCs, and this has consequences for enabling or disabling local-level upgrading efforts. Firms' insertion into GVCs affects their upgrading strategies because of governance relations. Variations in GVC governance account for different types of upgrading, ranging from process and product to functional and inter-sectoral upgrading
Coe, Hess, Yeung, Dicken, & Henderson (2004)*	TIBG	Conceptual	N/A	The authors delimit the "strategic coupling" of GPNs and regional economies, which ultimately drives regional development through the processes of value creation, enhancement and capture. They develop a framework for analyzing regional development and GPNs
Gereffi, Humphrey, & Sturgeon (2005)*	RIPE	Conceptual	N/A	This paper develops a theoretical framework to explain governance patterns in GVCs, and discusses five types of GVC governance – hierarchy, captive, relational, modular, and market – that range from high to low levels of explicit coordination and power asymmetry. There are three variables that play a large role in determining how GVCs are governed and change: the complexity of transactions, the ability to codify transactions, and the capabilities in the supply-base
Liu & Dicken (2006)	EPA	Qualitative, case study	16 automotive IJVs China	The FDI of automotive MNEs in China shows clear features of obligated embeddedness of their operations (including their supplier relationships) in terms of their optimal organization of GPNs. The Chinese government has exerted virtually complete control over entries by these MNEs through determining the form that their investment can take. The state's unique bargaining position has enabled it to play off one MNE against another
Sturgeon, Van Biesebroeck, & Gereffi (2008)	JEG	Qualitative, case study	Major American and Japanese automotive lead firms and over 150 suppliers in North America	National political institutions create pressure for local content, driving production close to end markets and to be organized nationally or regionally. In terms of GVC governance, rising product complexity, low codifiability and a paucity of industry-level standards together drive buyer–supplier linkages toward the relational governance mode, which is more compatible with Japanese than American supplier relations. The small number of powerful lead firms that dominate the automotive industry contributes to the difficulty of developing industry-level standards that could underpin a more loosely articulated spatial architecture of GVC
Yeung (2009)*	RS	Conceptual	N/A	This paper develops further the concept of "strategic coupling" in analyzing the impact of GVC activities in high-growth East Asian regions of mainland China, Taiwan, South Korea, Thailand, and Malaysia. Three types of strategic coupling – international partnership, indigenous innovation, and production platforms – are theorized to account for growth in these regional economies

Table 3 (Continued)

Reference	Journal	Method	Sample	Key findings
Brown, Derudder, Parnreiter, Pelupossy, Taylor, & Witlox (2010)	GN	Qualitative, case study	Lead firms in coffee commodity chain and financial services chain	Mapping of the forward linkages of producer service firms and the (service) backward linkages of firms in commodity chains can be useful to understand the geographical reach of operations that emanate in world cities. This mapping explains the spatial stretching of GVCs towards specific world cities inputting producer services
Ivarsson & Alvstam (2011)	JEG	Qualitative, case study	IKEA and 23 suppliers in China and Southeast Asia	Suppliers use IKEA's technological support to improve not only their operational and duplicative capabilities but also adaptive and innovative capabilities. Typologies of GVC governance structures need to include a "developmental" category, where buyer-driven value-chains are coordinated by powerful retailers with a global sourcing organization. Such structures are aimed at facilitating close, local and long-term interaction, and enable lead firms to efficiently source low-cost, finished products. They also enable technological upgrading among suppliers
Pietrobelli & Rabelotti (2011)*	WD	Conceptual	N/A	Learning mechanisms can vary widely within the various forms of GVC governance. When the competences of the actors in the value chain are complementary, learning is mutual and is based on intense face-to-face interactions. The relationship between GVCs and innovation systems is nonlinear and endogenous, and mutually affecting. A well-structured and efficient innovation system would help to reduce transaction complexity and enable transactions based on relational forms of GVC governance
Werner (2012)	EG	Qualitative, case study	A large garment firm in the Dominican Republic	The efforts of firms to reposition themselves through upgrading in GPNs are conditioned by a new gender division of labor between the masculinization of skilled sewing and the feminization of new service engineering functions
Morris & Staritz (2014)	WD	Qualitative case interviews and secondary data	18 lead firms and 27 branch plants	Ownership characteristics of supplier firms shape the ability to shift between different end markets, respond to lead firm requirements, and pursue upgrading in GVCs. With Madagascar's loss of the African Growth and Opportunity Act status, locally embedded European/French diaspora-owned apparel supplier firms and regionally embedded Mauritian-owned firms were able to shift market channels and upgrade, whereas Asian-owned firms largely exited the apparel industry
Taylor, Derudder, Faulconbridge, Hoyer, & Ni (2014)	EG	Quantitative, archival data	175 advanced producer service firms across 526 cities	Activities by advanced producer service firms in inter-firm networks define the "network strategicness" of global cities on the basis of a model of interlocking network specification. Combinations of command capacity and generation of innovations within these firms indicate stronger strategic presence in networks
Dallas (2015)	RIPE	Quantitative, archival data	439 of China's largest exporters in 18 subsectors of the electronics and light industries	Sector-specific organization and the specific value chain strategies of firms are important independent drivers of trade patterns. Trade is "governed" by powerful lead firms and channelized within exclusive buyer-supplier relationships. Even beyond high-tech industries, China's export-led manufacturing strength heavily relies on governance channels developed by MNEs

Table 3 (Continued)

Reference	Journal	Method	Sample	Key findings
Lund-Thomsen & Coe (2015)	JEG	Qualitative, case study	Nike's main football supplier factory in Pakistan	Corporate social responsibility initiatives can facilitate and/or constrain labor agency in GPNs. But this potential agency is shaped by wider economic forces within the global economy and by relationships with local or national actors and regulatory frameworks. National contexts for work and employment may place clear limits on what stakeholders can achieve in terms of facilitating more responsible forms of GPN governance
Yeung & Coe (2015)*	EG	Conceptual	N/A	This paper focuses on competitive dynamics in GPNs, such as cost-capability ratios (e.g., labor, technology, know-how, and capital), sustaining market development (e.g., reach and access, dominance, time-to-market, customer behavior, and preferences), and working with financial discipline (e.g., access to finance, and investor and shareholder pressure) that serve as the causal mechanisms in shaping firm strategies within broader risk environments
Ascani, Crescenzi, & Iammarino (2016)	EG	Quantitative, archival data	6888 greenfield investment projects originating from the old 15 EU members	MNEs' preferences for the economic institutions of the countries hosting their investment are highly heterogeneous. Important locational factors are favorable business regulation and the protection of property rights, but the heterogeneity of these preferences seems to be largely linked to the most sophisticated activities in sectoral (high-medium technology sectors) and functional (headquarters and innovation) terms. Intrafirm organization of different segments of GVCs is also subject to MNE heterogeneous preferences with respect to the local institutional environment
Barrientos, Knorringer, Evers, Visser, & Opondo (2016)	EPA	Qualitative, case study	Regional retailers and local suppliers in South Africa, Kenya and Uganda	Expansion of global and regional supermarkets provides new opportunities for strategic diversification by some horticultural producers and workers. Strategic diversification in turn offers opportunities for economic and social upgrading by more capable suppliers and skilled workers, but the persistence of economic downgrading pressures excludes some workers and producers from both global and regional value chains
Kleibert (2016)	RS	Qualitative, case study	18 offshore service firms in the Philippines	The offshore service sector is characterized by vertical investments, with the locus of power remaining overseas. Foreign ownership, control and dependency characterize most of the branch office positions in GPNs, which are controlled by headquarters located abroad. A functional and spatial separation of lower-end tasks has emerged
Brancati, Brancati, & Maresca (2017)	JEG	Quantitative, survey	About 25,000 Italian firms	Heterogeneities influence how GVC participants fared during the 2008/2009 crisis. High-skill relational suppliers tend to engage in innovative activities and R&D projects. Other modes of GVC participation display no significant premium compared to domestic firms. This heterogeneity is also reflected in differential productivity and sales growth in favor of relational GVC participation
Havice & Campling (2017)	EG	Qualitative, case study	Canned tuna industry in 18 countries	Moments of change in the value chain offer a dynamic understanding of how a lead firm gains and reproduces its power, and strategies that subordinate firms deploy to counter the power of lead firms. This dynamic is inextricable from the environmental conditions of tuna production through which governance relationships in GVCs are made possible

Table 3 (Continued)

Reference	Journal	Method	Sample	Key findings
Pipkin & Fuentes (2017)	WD	Qualitative, case study	Representative sample of 45 case studies of primary product and light manufacturing industries in developing countries	Advanced-country buyers are not the main force in initiating industrial upgrading. In most cases, developing-country firms initiate upgrades in the face of market vulnerability, usually produced by state policies, that force them to seek to change their existing operations. Once initiated, upgrading processes can produce a wide spectrum of results – from little to no advancement in market position ('treadmilling') to jumping to the forefront of a global industry ('leaps forward'). These processes are dependent on the sources of learning present in the local institutional environment, such as state agencies and business associations
Foster, Graham, Mann, Waema, & Friederici (2018)	EG	Qualitative, case study	The tea, tourism, and business-process outsourcing sectors in Kenya and Rwanda	Digital connectivity can lead to further marginalized positions in GVCs controlled and coordinated by global lead firms due to shifting modes of value chain governance facilitated by digital information platforms and data standards. African firms can benefit more from GVC participation with better support for complementary capacity and competitive advantages
Fuller & Phelps (2018)*	JEG	Conceptual	N/A	The agency role of MNEs in GPNs is shaped by the variety of parent–subsidiary relationships within MNEs, the dynamic capabilities in underpinning corporate change, and the micropolitics of MNEs and subsidiaries that impact on firm-institutional change within regional economies. The agency exercised by MNEs influences the "selection" of investment locations, "coupling" processes, and the depth and pace of host institutional change
Homer & Murphy (2018)	GN	Qualitative, case study	Eight trading and 57 manufacturing firms in India's pharmaceutical industry	The structures and processes associated with South–South GPNs are different from those with a South–North orientation, in terms of the practices to meet production and quality standards, access markets and innovate. Indian pharmaceutical firms employ different business practices towards Southern end markets, such as lower margins and higher volumes, compared to Northern end markets
Neilson, Pritchard, Fold, & Dwiartama (2018)	EG	Qualitative, case study	Six global lead firms in chocolate products and their distributors in Indonesia	Contextual factors are critical in influencing how GPN dynamics in the form of cost-capability ratio, financial discipline and market imperative will shape lead firm behavior and their relationships with suppliers and distributors. Contextual heterogeneity in different network segments (e.g., cocoa farming and processing, point-of-sale) also constrains lead firm behavior
Pavlínek (2018)	EG	Mixed, survey and case study	Survey of 133 and interviews with 50 automotive firms in Slovakia	Weak strategic coupling in the form of dependent supplier linkages between foreign subsidiaries and domestic firms undermines the potential for technology and knowledge transfer from foreign subsidiaries to the domestic economy. Consequently, weak strategic coupling also attenuates positive long-term regional development effects of large FDI by automotive lead firms in European peripheral countries

Table 3 (Continued)

Reference	Journal	Method	Sample	Key findings
Rehnberg & Ponte (2018)	GN	Qualitative, case study	3D printing	This paper examines the impacts of the widespread adoption of 3D printing on restructuring, upgrading and distributing value added along manufacturing GVCs. It identifies two scenarios: a complementarity scenario that would reproduce power relations in GVCs and the current distribution of value added, and a substitution scenario that would have the effects of "rebundling" activities, regionalizing or localizing GVCs
Amendolagine, Presbitero, Rabelotti, & Sanfilippo (2019)	WD	Quantitative	Two firm-level data sets on 19 Sub-Saharan African countries and Vietnam matched to country-sector level measures of GVC involvement	Host countries' involvement in GVCs is associated with local sourcing by MNEs and their FDI. The larger participation in GVCs is associated with higher levels of local sourcing. More intense GVC participation and upstream specialization are associated with a higher share of inputs sourced locally by foreign investors, and a higher degree of these investors' support for local suppliers. These effects are larger in countries with higher education spending and stronger rule of law

*Foundational papers which provided content for our organizing framework.

**This summary excludes some of the impactful studies that influenced our analysis and are cited in the manuscript, but did not meet our sample criteria.

entrepreneurial orientation, impact GVC governance (Denicolai, Strange, & Zucchella, 2015; Kano, 2018; Levy, 1995; Verbeke & Kano, 2016), in terms of how transactions are organized and orchestrated. Therefore, systematic attention to microfoundations is necessary in order to meaningfully advance the GVC research agenda. However, few empirical studies directly observe or measure individual-level variables. Further, while certain behavioral assumptions are frequently implied – e.g., the nature of individual-level knowledge and capabilities is inherent in the idea of learning and upgrading; the need for knowledge sharing across units implies bounded rationality of individual actors and associated information asymmetries; the notions of power balance and the need for intellectual property (IP) protection assume a certain level of bounded reliability of actors involved – these assumptions are, for the most part, neither articulated explicitly nor examined empirically.

Only seven studies in our sample directly address the impact of microfoundations (either stated or implied) on GVC geographic configurations, knowledge acquisition and dissemination within the GVC network, and efficient functioning and orchestration of the network. In an early qualitative study of supply chain management, Akkermans, Bogerd and Vos (1999) discuss how bounded rationality, as expressed in supply chain partners' diverging beliefs and goals, contributes to functional silos and erects barriers to effective value chain management. Lipparini, Lorenzoni and Ferriani (2014) argue that GVC networks that benefit the most from knowledge transfer among partners are those where partners share common identity and language. These features serve as safeguards against the potential threat of opportunism and allow participating firms to learn from partners with reduced risk of proprietary knowledge spillover outside of the immediate network. Eriksson, Nummella and Saarenketo (2014) suggest that individual-level cognitive and managerial capabilities of lead firm managers, such as cultural awareness, entrepreneurial orientation, global mindset, interface competences and analytical capabilities, constitute a critical building block for firm-level ability to successfully orchestrate cross-border transactions in a GVC. Seppälä, Kenney and Ali-Yrkkö (2018) focus on boundedly rational accounting decisions in lead MNEs, and argue that lead firms' accounting systems may misrepresent where the most value is created in a GVC. This mismatch

implies that GVC activities to which value is allocated may be selected somewhat arbitrarily, and this further impacts location decisions. Kano (2018) argues that bounded rationality and reliability of decision-makers in participating firms impact the efficiency of the GVC; as such, the role of lead firm managers is to control bounded rationality and reliability through a mix of relational mechanisms, so as to improve the likelihood that the GVC will be sustainable over time. Treiblmaier (2018) theoretically predicts structural and managerial changes introduced into GVCs by blockchain technologies, by analyzing four behavioral assumptions of major economic theories: bounded rationality, opportunism, goal conflict, and trust. Finally, Sinkovics, Choksy, Sinkovics and Mudambi (2019: 151) explore the relationship between three variables – information complexity, information codifiability, and supplier capabilities – and knowledge connectivity in a GVC, and conclude that individual characteristics of lead firm managers – specifically, their risk perceptions and associated “comfort zones” – moderate this relationship.

GVC Level: Components of GVC Governance

The term “governance” refers to the organizational framework within which economic exchange takes place, including the processes associated with the exchange (Zaheer & Venkatraman, 1995). In the context of a GVC, governance includes the overarching principles, structures and decision making processes that guide the “checks and balances” in network functioning, so as to make sure that the interests of the entire network (and broader societal/environmental interests where relevant) are served above and beyond localized interests of participating firms and individual decision-makers within these firms. These principles, structures and processes encompass considerations related to boundaries of the network and its geographic make-up, control and orchestration mechanisms for economic activities performed within the GVC, value distribution, relationship management, and direction of knowledge flows. Outcomes of successful governance include meeting of individual participants’ performance goals, as well as, ultimately, long-term sustainability of the GVC as a whole.

Here, a distinction can be made between *structural* and *strategic* governance of the GVC, as shown in Figure 1. The former refers to the actual structure governing economic activities, e.g., make versus buy decisions, organizational structure of the

network (number of players, power balance, boundaries, etc.), geographic and functional allocation of activities, level of centralization of decision-making, and so on. In contrast, strategic governance is concerned with dynamics of actors’ behavior in respect to strategic decision making (Schmidt & Brauer, 2006; Zaheer & Venkatraman, 1995). In the context of GVCs, strategic governance is about orchestrating the usage of resources, through codified and uncoded routines and managerial practices, to ensure smooth functioning of the entire network (Kano, 2018). Our review identified six broad, interrelated conceptual dimensions (Figure 1) that constitute critical elements of structural and strategic governance of a GVC. These dimensions, as well as outcomes of governance practices, are discussed below.

Control

Control decisions establish the governance structure of the GVC, that is, whether each value chain activity should be internalized, outsourced, or controlled through hybrid forms such as joint ventures (JVs) (Buckley et al., 2019). It has been argued that in a GVC, control of critical knowledge and intangible assets (e.g., brand names and technological platforms) takes precedence over ownership of physical assets (Buckley, 2011, 2014; Mudambi, 2008), and ownership advantages can be exploited without internalizing operations (Strange & Newton, 2006). This core premise underlying the GVC is supported in Hillemann and Gestrin’s (2016) analysis of OECD data on foreign direct investment (FDI) and cross-border mergers and acquisitions (M&As), which shows that cross-border financial flows related to intangible assets continue to increase relative to those related to tangible assets. An analysis of about 25,000 Italian firms also suggests that control of GVC activities, as compared to ownership, yields benefits in terms of greater propensity toward innovation, increased productivity, and faster sales growth (Brancati, Brancati, & Maresca, 2017). The preference for control without ownership is enabled by increasing digital connectivity, which allows lead firms to influence various units in the GVC without directly managing them (Foster, Graham, Mann, Waema, & Friederici, 2018).

To some extent, control decisions are impacted by host countries’ regulatory environments, particularly when national political institutions create pressure for local content on MNEs that are trying to gain access to large downstream markets in

emerging economies (Lund-Thomsen & Coe, 2015; Morris & Staritz, 2014; Sturgeon, Van Biesebroeck, & Gereffi, 2008). This is the case with “obligated embeddedness” (Liu & Dicken, 2006: 1238) of automotive MNEs in China, where the government’s industrial policy dictates that inward FDI should take a JV form. Further, control decisions are linked to sectoral and functional factors – for example, lead MNEs operating in high- and medium-technology sectors and/or locating knowledge-intensive functions (e.g., innovation) in host markets are more likely to pursue ownership in jurisdictions that offer weaker IP protection (Ascani, Crescenzi, & Iammarino, 2016). Ownership allows the MNE to have better control over the creation, transfer and leakage of propriety knowledge, and is thus a pre-emptive measure for knowledge protection.

However, considerable heterogeneity in control decisions exists among lead firms operating in the same geographic regions and industry sectors, which suggests that firm-level strategic considerations, and not only macro-level forces, are powerful drivers of control patterns in GVCs (Dallas, 2015; Sako & Zylberberg, 2019). These considerations include lead firms’ levels of specialization, the nature of their relationships with partners, the need for flexibility versus stability in offshore operations, and the value of the operations to the lead firm (Amendolagine, Presbitero, Rabellotti, & Sanfilippo, 2019; Dallas, 2015; Kleibert, 2016). Control decisions can be also driven by the level of local adaptation required, whereby the lead MNE may need to source external expertise in order to perform the desired degree of customization. Here, a carefully designed mix of internalized and externalized, yet managerially or technologically linked, activities is argued to allow the lead firm to achieve the ultimate balance between integration and responsiveness (Buckley, 2014).

Location

Location decisions determine the most advantageous geographical configuration of the GVC, namely, where activities should be located, and how they should be distributed in order to maximize the value created in and captured through the GVC. Location decisions encompass such considerations as the regional effect (Rugman & Verbeke, 2004), the nature of industrial clusters (Turkina & Van Assche, 2018), and the links between GVCs and local clusters. Location decisions are tightly intertwined with control decisions discussed

earlier. For example, FDI (as opposed to market contracting) enables the MNE to construct a regional, or even global, network under its control to supply wide-ranging, differentiated and low cost products in a flexible manner. Chen’s (2003) study of electronics firms in Taiwan indicates that FDI often starts at a location close to the home base, where resources from domestic networks can be drawn, and subsequently moves on to more distant locations, after the lead firm has developed a regional sub-network to support its further expansion.

Location considerations are linked to macro-level characteristics of host and home countries, including level of economic development and corresponding factors such as cost of labor, technological environment, and institutional quality. Among these factors, favorable business regulations, IP protection, and significant education spending typically attract technologically and functionally sophisticated activities (Amendolagine et al., 2019; Ascani et al., 2016; Pipkin & Fuentes, 2017). Control of the GVC resides in the hands of technology and/or market leaders, which are typically (although not always) located in developed economies and extract value from their GVCs through global orchestration capabilities (Buckley & Tian, 2017). Countries with more advanced production technologies are naturally engaged more in the upstream segments of the GVC, and become key suppliers to other countries in the region, thus supporting regional integration of production (Amendolagine et al., 2019; Suder, Liesch, Inomata, Mihailova, & Meng, 2015).

Most empirical studies address location of production activities, whereby labor cost emerges as one of the core determinants for GVCs led by both advanced economy MNEs (AMNEs) and emerging economy MNEs (EMNEs). For example, Asian tier 1 suppliers to MNEs and OEMs become GVC lead firms in their own right by shifting production to lower cost locations in the region (Azmeah & Nadvi, 2014; Chen, Wei, Hu, & Muralidharan, 2016). Yet efficiency-seeking offshoring may create strategic issues, particularly when inefficient local institutions fail to prevent unwanted knowledge dissipation. Issues can also emerge on the demand side due to sustainability and ethical breaches in large MNEs’ value chains, as evidenced in multiple, recent instances of public backlash in response to poor working conditions in manufacturing factories in South and Southeast Asia (Malesky & Mosley, 2018). Funk et al.’s (2010) survey of US

consumers suggests that developed economy consumers' willingness to purchase is negatively affected by partial production shifts to animosity-invoking countries (countries with poor human rights records/with poor diplomatic relationships with the home country). As the wave of consumer movement spreads to less developed countries, it is in the best interest of the lead firm to evaluate carefully the undesirable attributes of a potential host country when making FDI decisions (Amen-dolagine et al., 2019; Morris & Staritz, 2014).

Desire to access large and fast-growing consumer markets drives production activities close to end markets, for example, when host country governments in emerging markets pressure MNEs for local operations (Sturgeon et al., 2008). Co-location of manufacturing and sales also allows lead firms to be more responsive to customer demands, and to offset the costs of globally dispersed activities by reducing investment in transportation and logistics (Lampel & Giachetti, 2013).

Strategic asset seeking by lead firms and suppliers explains much of the geographic configuration of GVCs, whereby MNEs locate value chain activities in globally specialized units to exploit international division of labor (Asmussen, Pedersen, & Petersen, 2007). This is particularly pronounced in knowledge-intensive industries, where lead firms often locate operations in innovation hubs and global cities (Taylor, Derudder, Faulconbridge, Hoyler, & Ni, 2014). In their analysis of clusters in the aerospace, biopharma, and ICT industries, Turkina and Van Assche (2018) demonstrate that innovation in knowledge-intensive clusters benefits from horizontal connection to global hotspots, as opposed to labor-intensive clusters where innovation gains from vertical GVC connections.

While much has been written about fine-slicing and fragmentation of value chain activities in a GVC (Buckley, 2009a, b), few empirical studies measure the costs and benefits of geographic diversification of operations within the same part of the value chain. Lampel and Giachetti (2013) address a relationship between international diversification of manufacturing and financial performance in the context of the global automotive industry, and find an inverted U-shaped relationship, whereby advantages of diversified manufacturing (i.e., greater flexibility and access to internationally dispersed strategic resources) are eventually off-set by increased organizational complexity and managerial inefficiencies. Further, location decisions are tied to firms' strategic priorities

beyond cost reduction – for example, increased needs for customer responsiveness and/or enhanced quality control. Focus on such priorities may prompt backshoring initiatives (Ancarani, Di Mauro, & Mascali, 2019). Yet, geographic diversification may serve strategic purposes such as IP protection. Gooris and Peeters' (2016) survey of offshore service production units demonstrates that lead firms may opt to fragment their global business processes across multiple service production units, rather than co-locating processes, with the explicit purpose of reducing the hazard of knowledge misappropriation.

Finally, technological advances continue to shape geographic make-up of GVCs (MacCarthy, Blome, Olhager, Srai, & Zhao, 2016). Few studies in our sample measure the impact of digital technologies on location choice, but several studies address current and potential influences of technology indirectly and/or conceptually. Ancarani et al. (2019) suggest that adoption of labor-saving technologies leads to backshoring in instances when lead firms compete on quality, rather than on cost. While digital connectivity enables exploiting complementarities between geographically dispersed processes (Gooris & Peeters, 2016), it may limit participation by suppliers located in technologically underdeveloped regions (Foster et al., 2018). Further, the latest technology, such as 3D printing, is likely to impact GVCs of relevant industries by making them shorter, more dispersed, more local, and closer to end users (Laplume et al., 2016; Rehnberg & Ponte, 2018).

Network structure

Network structure refers to the structural make-up of a GVC and has been well theorized in some of the most cited GVC conceptual frameworks (e.g., Coe & Yeung, 2015; Gereffi, 2018; Gereffi et al., 2005; Henderson et al., 2002). While a GVC can typically be conceptualized as an asymmetrical or high centrality network with a lead firm at its centre (Kano, 2018), these networks can also be heterogeneous in terms of such characteristics as depth, density, openness, and the presence of structural holes (Capaldo, 2007; Rowley, 1997). These characteristics affect power relations in the GVC, the level of control afforded to the lead firm, and innovation and business performance. Not surprisingly, a large number of empirical studies in our review address various dimensions of the nature and/or role of network structures in GVC governance and performance outcomes.

The network structure in a typical GVC can be dyadic or multi-actor in nature, and can affect knowledge flows (Lipparini et al., 2014), new venture formation (Carnovale & Yeniyurt, 2014), and operational performance (Golini, Deflorin, & Scherrer, 2016). A firm with high centrality (i.e., most links in a network) has greater power over other firms in a dyadic or multi-actor network, whereby control can be exerted by the lead firm beyond its legal boundaries over independent – but captive – suppliers (Yamin, 2011). In supply chain management, Carnovale and Yeniyurt's (2014) study of automotive OEMs and automotive parts suppliers shows that manufacturing JV formation between lead firms and potential partners can be enhanced by higher network centrality of either the lead firm or the potential JV partner. This network centrality is seen as a proxy for greater legitimacy and credibility within the network. However, the study found mixed outcomes in relation to network density. High network density is not necessarily favorable to new JV formation due to "lock-in" effects through structural homophily. This network structure in turn limits access of lead firms to a diverse set of potential partners and hinders learning and innovation. Similarly, the studies of manufacturing plants in various countries by Golini et al. (2016) and Golini and Gualandris (2018) demonstrate that a higher level of external supply chain integration (e.g., through GVC activities) can improve the operational performance of and the adoption of sustainable production by manufacturing MNEs due to information sharing, learning, and innovation through supply chain partners.

The density of network structure in GVCs, however, may change over time in relation to the emergence of new technologies and platforms, some of which may favor greater density in localized networks. In their perspective article on 3D printing and GVCs, Laplume et al. (2016) question if technological advancements can influence the relative density of globally dispersed and localized production networks. As more local firms can participate in the production of high-value components through 3D printing, their need for technological acquisition and/or specialized components through MNE lead firms in GVCs may be reduced, leading to what Rehnberg and Ponte (2018) call "unbundling" and "rebundling" of GVC activities towards regionalized or even localized GVCs. In this scenario for decentralized GVC network structure, local producers can engage

in more transactions with each other, and thus localized production networks may get denser over time.

In addition to centrality and density, network structures in GVCs can also be distinguished by linkage heterogeneity – the mix of horizontal linkages (between firms with similar value chain specialization) and vertical MNE-supplier linkages (with different value chain specialization). This structural mix has significant influence on the innovation performance of firms in different industries (Amendolagine et al., 2019; Brancati et al., 2017). Drawing on a social network approach, Turkina and Van Assche's (2018) study of industrial clusters shows that network structures underpinned by dense horizontal linkages among local firms tend to enhance innovation performance in knowledge-intensive industries, whereas strong vertical linkages between local firms and MNEs can promote innovation in labor-intensive clusters. The former network structure tends to promote innovation through intra-task knowledge capability development among horizontally linked firms. As to the latter case of local suppliers in labor-intensive industries, inter-task capability development can be better served through vertical and international linkages with global lead firms.

Finally, power relations among GVC actors play out very differently in different network structures (Dallas, Ponte, & Sturgeon, 2019; Grabs & Ponte, 2019). In one of the earliest studies of industrial upgrading through GVC participation, Humphrey and Schmitz (2002) observed that network structures characterized by quasi-hierarchical power relations in favor of one party – often global lead firms or global buyers – were generally not conducive to the upgrading of local firms. Sturgeon et al. (2008) followed up with this line of research by examining major American and Japanese automotive lead firms and over 150 suppliers in North America. They found that upgrading of local suppliers was more likely if the GVC network structure moved towards a relational form of power dynamics. Such a relational form of network structure tends to favor inter-firm cooperation and credible commitment (e.g., IKEA and its suppliers in Ivarsson & Alvstam, 2011 and tuna canning firms in Havice & Campling, 2017). Similarly, Khan, Lew and Sinkovics's (2015) study of the Pakistani automotive industry shows that local firms are more likely to acquire technological know-how and develop new capabilities by participating in geographically dispersed rather than locally oriented

networks. Through international JVs (IJVs) with global lead firms, these local firms can access different knowledge base and know-how in those international networks.

As noted earlier, network structures are embedded in different national and institutional contexts. Pipkin & Fuentes (2017) find that domestic institutional environment, such as state policies and support from business associations, is more significant than lead firms' influence in shaping network dynamics in developing countries. Horner and Murphy's (2018) study of manufacturing firms in India's pharmaceutical industry shows that network structures characterized by firms from similar national contexts (e.g., the Global South) can be more open and cooperative in relation to production and quality standards, market access, and innovation. This greater openness in South–South GVCs entails different business practices toward their end markets due to lower entry barriers, lower margins, and higher volumes. The opportunities for learning in these GVCs are also different from those tightly controlled and coordinated by lead firms from the Global North. Another study of chocolate GVCs in Indonesia by Neilson, Pritchard, Fold and Dwiartama (2018) also points to the importance of contextual heterogeneity in shaping the influence of different network structures on lead firm behavior and relationships with suppliers and distributors. Drawing upon Yeung and Coe's (2015) GPN 2.0 theory, Neilson et al. (2018) argue that network structures differ significantly between branded chocolate manufacturing and cocoa farming/processing in agrofood manufacturing. Owing to domestic industrial policy and international business lobbying, the role of national context is much more pronounced in the network structure of cocoa farming/processing that favors inter-firm partnership and cooperative learning.

Learning

Conceptual studies have identified knowledge diffusion and transfer as an important aspect of network governance (Ernst & Kim, 2002; Inkpen & Tsang, 2005). Empirical studies take note of this topic and examine various dimensions of learning in a GVC. Most of such studies in our sample focus on interfirm learning in the context of capability development, technological catch-up and upgrading by peripheral GVC actors – that is, emerging economy suppliers' progression from OEM to original design manufacturing (ODM) and to own brand manufacturing (OBM). As touched upon in

the previous section, macro-level conditions such as market forces and state policies, rather than lead firm initiatives, are argued to be the main force in spurring supplier upgrading (Pipkin & Fuentes, 2017). Upgrading initiatives can produce a wide range of results, from incremental to significant leaps in market position (Pipkin & Fuentes, 2017), depending on a number of factors. Eng and Spickett-Jones (2009) argue that upgrading hinges on suppliers' ability to simultaneously develop three sets of marketing capabilities: product development, marketing communication, and channel management. Wang, Wei, Liu, Wang and Lin's (2014) study of manufacturing firms in China indicates that the presence of MNEs alone does not guarantee knowledge spillovers, and may in fact have a negative impact on indigenous firms' domestic performance due to increased competition. Hatani (2009) describes barriers to learning by emerging market GVC suppliers. Her study of autoparts suppliers in China suggests that excessive inward FDI limits interactions between lead firms and local suppliers and thus creates structural obstacles to technology spillovers to lower GVC tiers. Also researching the autoparts industry (but in Argentina rather than China), McDermott and Corredoira (2010) suggest that supplier upgrading is facilitated by regular, disciplined discussions with the lead firm about product and process improvement; in this context, a limited amount of direct social ties to international assemblers appears to be the most beneficial.

In a follow-up study, Corredoira and McDermott (2014) find that lead firms alone do not help process upgrading, but add value particularly when emerging market suppliers' ties to MNEs are augmented with multiple, strong ties to non-market institutions (e.g., universities and business associations), which act as knowledge-bridgers and help suppliers tap into knowledge embedded in the home country. These types of ties are particularly useful for accessing knowledge for the development of exploitative innovation, while exploratory innovation is best achieved through participation in trade fairs and collaboration with international (rather than domestic) institutions, according to the study of Pakistani motorcycle part suppliers by Khan, Rao-Nicholson and Tarba (2018). Similarly, Jean's (2014) study of new technology ventures in China indicates that firms that participate in trade shows and have strong quality control practices are more likely to develop requisite knowledge to pursue upgrading, while firms engaging in

Internet-based business-to-business transactions are less likely to upgrade. Based on their studies of the garment and toy industries, Azmeh and Nadvi (2014) as well as Chen et al. (2016) describe alternative paths to upgrading: some OEMs invest in R&D to enter the ODM business, or invest in marketing and branding and move toward the downstream end of the value chain to become OBMs. Others achieve competitive gains by shifting production to different locations and learning how to effectively coordinate multiple production locations (see also detailed case studies of ODMs from Taiwan and Singapore and OBMs from South Korea in Yeung, 2016). Buckley (2009b) suggests that both options – incremental upgrading within the established GVC and developing a new GVC under local control – are difficult in that they require mobilization of entrepreneurial abilities and development of sophisticated managerial skills. Successful upgrading hinges not only on suppliers' acquisition of knowledge, but also on their ability to absorb it and transform it into innovation, which ultimately improves suppliers' position in GVCs (Khan et al., 2019).

Specific knowledge acquisition strategies required for upgrading vary depending on the nature of home institutions and labor markets (Barrientos, Knorringa, Evers, Visser, & Opondo, 2016; Pipkin & Fuentes, 2017; Werner, 2012). Weak home institutions hinder the transformation of knowledge into actual innovative products and processes (Jean, 2014). This explains why catch-up and upgrading by GVC suppliers often mirrors the evolution of home institutions (Kumaraswamy, Mudambi, Saranga, & Tripathy, 2012): as institutions evolve toward liberalization, upgrading strategies change from upgrading technical competencies through licensing and collaborations, to upgrading internal R&D and developing strong relationships with lead firms. The weakness of local institutions can be overcome by gaining knowledge through participation in international networks and collaboration with global suppliers (Khan et al., 2018).

The nature of relationship among parties in GVCs matters for technological knowledge transfer, as network ties are channels through which knowledge flows. Khan et al.'s (2015) above-mentioned study indicates that IJVs represent a governance vehicle that facilitates the creation of social capital between focal MNEs and automotive parts suppliers located in emerging economies, and thus facilitate development and acquisition of complex technological knowledge by local firms.

Learning and knowledge accumulation and diffusion in the lead firm, as well as lead-firm initiated network-wide learning, garnered significantly less scholarly attention, with one notable exception. Through analyzing Italian motorcycle industry projects carried out via dyads of buyers and suppliers, Lipparini et al. (2014) develop a framework that addresses multi-directional, multilevel and multi-phase knowledge flows in a GVC, and describe practices implemented by lead firms to successfully cultivate creation, transfer and recombination of specialized knowledge to facilitate network-wide learning. In such a dynamic and somewhat open context of knowledge sharing, the threat of opportunism is likely to be outweighed by the advantages of learning from other network members.

There appears to be consensus in the literature that strong linkages within the GVC – frequently referred to as embeddedness of actors in the network (Henderson et al., 2002) – are conducive to transferring various types of knowledge, including production processes, sourcing practices, technological knowledge, and innovation capabilities (Golini et al., 2016; Golini & Gualandris, 2018; Ivarsson & Alvstam, 2011). Such linkages are the most effective when purposefully facilitated by strong lead firms. Lead firms can impel capability upgrading on peripheral units by leveraging their central positions and complementary assets, as indicated by the acquisition of UK-based Dynex by China's Times Electric (He, Khan, & Shenkar, 2018). Ivarsson and Alvstam's (2011) case study of IKEA and its suppliers in China and Southeast Asia similarly shows that lead firms can contribute to peripheral units' upgrading by fostering close, long-term interactions, and by offering technological support. Conversely, weak strategic coupling between lead firms and peripheral units hurts knowledge transfer and capability development (Yeung, 2016). For example, Pavlínek's (2018) study of automotive firms in Slovakia suggests that weak and dependent supplier linkages between MNEs and domestic firms undermine the potential for technology and knowledge transfer from the former to the domestic economy.

Lead firms are often motivated to drive their suppliers' capability upgrading, because they themselves benefit from suppliers' enhanced capabilities through improved sourcing efficiency, higher-quality inputs, and more generally valuable knowledge diffusion throughout the GVC. In the next section, we discuss how characteristics of the lead firm impact its position and role in the GVC.

Impact of lead firm

Extant conceptual research has acknowledged that smooth and efficient functioning of the GVC is contingent on the lead firm's ability to establish, coordinate and lead the network (Kano, 2018; Yamin, 2011; Yeung, 2016; Yeung & Coe, 2015). Buckley (2009a) argues that the role of headquarters is more important in a GVC than in a conventional hierarchical MNE, because leading a GVC demands specific management capabilities such as the ability to fine-slice the value chain, control information, and coordinate strategies of external organizations. Yet few studies directly investigate the specific impact of lead firm characteristics on the boundaries, configurations and performance of the GVC. The studies that do use lead firm features as independent variables focus on such aspects of the lead firm as size (small versus large), industry sector (and associated sector-specific value chain strategies), location (headquarters location in a particular region/in emerging versus developed markets, and proximity to clusters), and technological leadership.

Lead firm size appears to be seen as a proxy for power and influence in a network. Eriksson et al. (2014), in a case study of a Finnish high-tech SME at the centre of a globally dispersed value chain, argue that SMEs face additional liabilities of smallness and newness when managing a GVC, and suggest that in order to manage successfully a GVC over the long term, the SME must develop three distinct yet related sets of dynamic capabilities: cognitive, managerial, and organizational. Dallas (2015) takes a finer-grained view of firm size as a determinant of GVC management strategy. While his analysis of transactional data of Chinese electronics/light industry firms uses size as a control, rather than independent, variable, he concludes that ways in which GVCs are organized vary not simply by lead firm size and productivity, but also by other heterogeneous firm level features, such as distinct governance channels available to lead firms. Dallas (2015) thus cautions GVC researchers not to make assumptions about the distinctiveness of large lead firms as a group, and to focus on other potential sources of heterogeneity, which can be linked to sector-specific features as well as firm-level strategies.

One of such sources of heterogeneity appears to be the level of economic development of home country, dichotomized in some GVC papers as emerging versus advanced. Two studies explore differences in GVCs led by EMNEs versus AMNEs.

He et al. (2018), based on a case analysis of China's Times Electric-led GVC, argue that power relationships in the GVC seem to be more balanced when EMNEs, rather than AMNEs, are in lead positions. Buckley and Tian (2017) compare internationalization patterns of top non-financial EMNEs and AMNEs, and find that AMNEs are more likely to achieve profitability through global GVC orchestration, while EMNEs' ability to develop orchestration know-how is restricted by home institutions. Therefore, EMNEs are more likely to extract monopoly-based rents from internationalization, but to remain constrained to the periphery position in GVCs.

It follows, then, that control of the GVC is likely to remain in the hands of technology leaders (Buckley & Tian, 2017). Jacobides and Tae (2015) describe such technology leaders as "kingpins," operationalized as firms with superior market capitalization and comparatively high R&D investment. In their study of firms active in various segments in the US computer industry, the authors show that "kingpins" impact value distribution and migration through the value chain. Technological and R&D capabilities, however, need to be accompanied by global orchestration know-how in order for lead firms to achieve profitability from fragmented, globally dispersed operations (Buckley & Tian, 2017). We address GVC orchestration in the next section.

GVC orchestration

Orchestration refers to decisions and actions by lead firm managers – a managerial toolkit – aimed at connecting, coordinating, leading, and serving GVC partners, and ultimately shaping the network's strategy (Rugman & D'Cruz, 1997). Orchestration encompasses such elements as, *inter alia*, formal and informal components of each relationship within the network, the entrepreneurial element of resource bundling, interest alignment among parties achieved through strategic leadership by the lead firm, knowledge management⁴, and value distribution.

Formal orchestration tools – that is, codified rules, specific contractual choices to manage partner relationships, and price-like incentives and penalties – are typically easier to observe and operationalize than informal tools such as social mechanisms deployed by lead firms to govern relationships. Yet, only a few studies in our sample investigate contractual choices in a GVC. Lojacono, Misani and Tallman (2017) examine nuances of

cooperative governance in the dispersed value chain of the home appliances industry, and find that more complex transactions requiring greater coordination are more likely to be governed through equity participation. Specifically, non-equity contracts are more efficient for coordinating offshore production, while equity JVs are preferable for managing local strategic relationships, such as production alliances whose primary objective is to serve local markets. Chiarvesio and Di Maria (2009) explore differences in GVC orchestration between lead firms located within industrial districts versus those located outside. Their quantitative study of Italian firms active in the country's four dominant industries – furniture, engineering, fashion, and food – shows that there are subtle differences in ways district and non-district lead firms manage their GVCs to achieve optimal efficiency: while lead firms located within industrial districts rely more on local systems through subcontracting networks, non-district firms invest in national level subcontracting. Here, local subcontracting networks allow lead firms to exploit flexibility, and national subcontracting facilitates greater efficiency and acquisition of value-added competences through the GVC. Of note, these differences decrease as firm size increases. Finally, Enderwick (2018) conceptually studies responsibility boundaries in a GVC, and argues that the full extent of lead firm responsibility for actions of indirect GVC participants depends on whether indirect partners' contracts are exclusive or non-exclusive.

Entrepreneurial guidance by the lead firm is an important component of GVC orchestration (Buckley, 2009a), as it serves to redirect GVC resources and tasks toward creating innovation. While most research in our sample implicitly assumes the lead firm's entrepreneurial role in generating value, two empirical studies take a close look at the process of entrepreneurial resource recombination in a GVC, initiated by the lead firm. In a multiple case study of engineering firms, Zhang and Gregory (2011) identify mechanisms of value creation in global engineering networks: efficiency, innovation, and flexibility. The efficacy of these mechanisms depends on which part of the engineering value chain is the core focus of the operations: product development/production, design/idea generation, or service/support. Ivarsson and Alvstam (2011) discuss how IKEA manages resources to generate greater value and stimulate innovation capabilities

in its supply chain. Their case study reveals that IKEA provides access to inputs through global sourcing, shares business intelligence, implements management systems and business policies across the network, and fosters informal R&D collaborations with suppliers.

Relational governance, as perhaps the most important of the five types of GVC governance in Gereffi et al.'s (2005) typology, emerged as a key tool for network orchestration. There appears to be a broad consensus in our sample that cultivating informal relationships, as a means of network orchestration, has a potential to facilitate knowledge transfer, secure commitments, enhance innovation, respond to legislation, and improve overall GVC efficiency. In fact, Brancati et al. (2017) show, based on a survey of about 25,000 Italian firms, that GVCs comprised of firms with strong relationships and active decisional roles in the value chain have a 4-6% higher probability of engaging in innovation and R&D, and display greater productivity and sales growth. Benstead, Hendry and Stevenson (2018) argue that relational capital facilitates successful horizontal collaboration among GVC members, which allows participating firms to respond more effectively to modern slavery legislation in the textiles and fashion industry, and consequently improve reputation and performance. In a case study of major American and Japanese automotive lead firms and their suppliers, Sturgeon et al. (2008) find that relational governance is necessitated by rising product complexity, low process codifiability and a paucity of industry-level standards. These relational links explain continued dominance of regional structures in the industry.

Studies have described specific relational strategies deployed by lead firms. These include promoting regular communication between suppliers and buyers (McDermott & Corredoira, 2010), adapting communication strategies to cultural contexts where GVC partners are embedded (Griffith & Myers, 2005), involving multiple actors in establishing functioning principles for the GVC, facilitating shared identity and common language (Lipparini et al., 2014), extending the network to include non-market institutions (Corredoira & McDermott, 2014; Kano, 2018; Pipkin & Fuentes, 2017), investing into image building (Horner & Murphy, 2018), and establishing a long-term horizon for inter-unit relationships to facilitate repeated interactions (Ivarsson & Alvstam, 2011).

Finally, extant research identifies GVC value distribution as the responsibility of the orchestrating firm. The lead firm must ensure that partners receive an equitable share of value created in the GVC, as a function of their respective contributions to the network (Dhanaraj & Parkhe, 2006). In most studies in our sample, a power view of the GVC is assumed, whereby value distribution is seen to be a result of the power struggle between the lead firm and the periphery. Typically, lead firms – particularly those that possess valuable technological knowledge and/or intangibles such as brand names and patents – are argued to capture the lion share of the value (Jacobides & Tae, 2015), while most peripheral players appear in a subordinate position and under high cost pressures (Taplin, Winterton, & Winterton, 2003), and must deploy strategies to counter the power of the lead firm (Grabs & Ponte, 2019; Havice & Campling, 2017; Pipkin & Fuentes, 2017), including attempts to move up the value chain, as discussed above. This power imbalance appears to be more pronounced in GVCs led by AMNEs than those led by EMNEs, because lead EMNEs are likely to build their GVCs with a knowledge-seeking objective, by enlisting AMNEs that possess desired knowledge (He et al., 2018).

Some conceptual studies in our sample approach the issue of value distribution as a deliberate orchestration tool on behalf of the lead firm. Kano (2018) argues that equitable value distribution improves reliability of partners and enhances sustainability of the GVC over time. Of note, equitable value distribution undermines potential efficiency gains achieved through externalization of activities; however, as argued by Yamin (2011), such sacrifice in terms of loss of efficiency may be necessary in order to ensure legitimacy and survival of the network.

Governance and performance outcomes

A significant proportion of papers in our sample is concerned with developing typologies, mapping linkages in GVCs, analyzing configurations, and investigating processes, without an explicit focus on performance. Studies that addresses performance per se conceptualize and measure performance outcomes in a variety of ways, depending on research questions and units of analysis. Most studies focusing on GVC suppliers are concerned with upgrading as a performance goal, as evidenced by suppliers' development of technological and/or branding capabilities, or by their ability to

reconfigure activities so as to become lead firms in their own right (e.g., Azmeh & Nadvi, 2014; Buckley 2009b; Chen et al., 2016).

Studies focusing on lead firms are more likely to use financial performance measures as indicators of GVC success: for example, value capture as measured by comparative market capitalizations of various industrial sectors (Jacobides & Tae, 2015), sales and profit growth (Griffith & Myers, 2005), and return on assets (Buckley & Tian, 2017; Lampel & Giachetti, 2013). Other conceptualizations of lead firm performance include, *inter alia*, its ability to exercise control over independent partners and coordinate division of labor (Casson, 2013; Strange & Newton, 2006), ability to minimize the total sum of transaction costs (Buckley, 2009a), capability development (Eriksson et al., 2014), and corporate social responsibility (CSR) performance (Enderwick, 2018).

Studies concerned with performance of the GVC network as a whole naturally explore more complex aspects of performance, such as flexibility/dynamism of the production process, access to a wide range of resources, operational efficiency, cohesiveness/connectivity, innovation/ability to transform ideas into commercial products, and sustainability of the GVC over time (Akkermans et al., 1999; Buckley, 2011; Chen, 2003; Colotla, Shi, & Gregory, 2003; Kano, 2018; Karlsson, 2003; Sinkovics et al., 2019; Yamin, 2011; Zhang & Gregory, 2011). Notably, studies in the social sciences group may focus on development and sustainability outcomes of GVC governance, such as industrial/economic development and positive institutional change (e.g., Coe et al., 2004; Fuller & Phelps, 2018; Henderson et al., 2002; Lund-Thomsen & Coe, 2015; Pavlínek, 2018; Yeung, 2016). Due to its complexity and multifariousness, GVC-level performance is difficult to operationalize quantitatively, and is mostly addressed in qualitative and conceptual studies in our sample.

Macro-level: Interaction of Home and Host Environment Characteristics and GVC Governance

GVC organization is contingent on a number of location characteristics, including levels of economic development (Mudambi, 2007), IP and FDI protection regimes (Johns & Wellhausen, 2016), trade and tariff regimes (Curran, Nadvi, & Campling, 2019; Kim, Milner, Bernauer, Osgood, Spilker, & Tingley, 2019), regulatory environments and government policy interventions, labor costs, level of technological sophistication, and societal

norms (Dunning, 1988). The role of the state, in particular, can significantly shape the organization and evolution of GVCs over time (Alford & Phillips, 2018; Coe & Yeung, 2019; Smith, 2015; Yeung, 2016). Macro-level impacts on GVC governance have been discussed in the preceding sections, but we summarize the key themes and findings below.

Institutional factors, such as trade regulations and the strength of local institutions, are major determinants of GVC governance attributes, including geographic and structural configuration, operating mode choices, power balance, and possibility of upgrading by peripheral players. Host country institutions can both attract investment by lead firms through policies encouraging local content and promoting local supplier linkages (Amendolagine et al., 2019; Dawley, MacKinnon, & Pollock, 2019; Liu & Dicken, 2006; Sturgeon et al., 2008; Yeung, 2016), and deter such investment due to insufficient IP protection and underdeveloped legal systems (Gooris & Peeters, 2016). However, the impact of host country institutional environment on GVCs is heterogeneous: while it is tempting to assume that lead firms are attracted by favorable local business regulations and strong institutions, this impact in fact varies across GVCs, depending on specific functions/activities being offshored, internationalization motives, and lead firm-level strategies and capabilities (Ascani et al., 2016; Morris & Staritz, 2014).

One conclusion that can be drawn from our review is that institutions greatly impact GVCs' abilities to engage in, and profit from, innovation. Inadequate local institutions prevent domestic firms from transforming R&D into innovative products and services (Buckley & Tian, 2017; Jean, 2014), and thus effectively hinder supplier catch-up and upgrading. This likely explains why most GVCs are controlled by MNEs that stem from developed institutional environments and, consequently, display technological leadership. Peripheral players in GVCs can respond to this challenge by entering into international collaborations, engaging with international institutions, and more broadly becoming embedded in international networks that off-set the weakness of local institutions (Khan et al., 2015, 2018; Pipkin & Fuentes, 2017). This is a crucial dimension of strategic coupling in GPN 2.0 theory (Coe & Yeung, 2015; Yeung, 2009, 2016). It is important to note that the impact of institutions is dynamic. As trade, liberalization and economic development in emerging markets progress, so do suppliers' strategies. Internal R&D becomes a

dominant strategy for upgrading (Kumaraswamy et al., 2012), and suppliers with more advanced technologies become core players in their regional networks (Suder et al., 2015).

Economic factors, such as labor cost and supply, markets and competition (MacCarthy et al., 2016), impact GVC configurations and, more recently, determine further production shifts in GVCs, whereby tier 1 GVC suppliers begin disintegrating their own value chains, in search of both greater efficiency (as a response to rising labor costs) and better production capabilities (Azmeah & Nadvi, 2014; Suder et al., 2015). In the terminology of GPN 2.0 (Coe & Yeung, 2015), this simultaneous attainment of both cost efficiency and production capabilities is translated into lower cost-capability ratios in favor of strategic partners and suppliers of global lead firms. This strategy is an alternative to functional upgrading discussed above (Chen et al., 2016; Humphrey & Schmitz, 2002; Sako & Zylberberg, 2019), and represents a different type of upgrading, where major suppliers become MNEs in their own right, e.g., leading ODMs such as Quanta and Wistron and contract manufacturers such as Foxconn, Flex, and Venture from East Asian economies (Yeung, 2016).

The impact of macro-level cultural characteristics is considered in a smaller subset of studies, and mainly in relation to the lead firm's strategic governance routines. Griffith and Myers (2005) suggest that host country cultural expectations impact GVC performance by affecting the lead firm's ability to effectively deploy relational strategies across the network. They argue that cultural adaptation of relational governance results in improved performance. Sturgeon et al. (2008) discuss the impact of home country cultural characteristics on American and Japanese lead firms' abilities to successfully engage in relational governance. Only one study (Funk et al., 2010) analyzes the broader impact of home country consumers' cultural characteristics on GVC profitability, using Schwartz's (2006) theory of values.

It is acknowledged that technology is one of the major macro-level factors impacting a GVC over its lifecycle (MacCarthy et al., 2016). In the prior section, we have discussed ways in which advanced technologies impact structural and strategic governance decisions in a GVC, mostly in the context of facilitating connectivity and determining innovation and power loci in the network. Some studies in our sample investigate a direct impact of the latest, advanced technologies on GVC configurations.

Laplume et al. (2016) analyze potential impact of 3D printing technologies on GVC structure and geographic reach. Treiblmaier (2018) discusses potential implications of blockchain technology for various aspect of GVC management, including boundaries, structures and relationships.

GVCs are not only impacted by, but also influence the macro-environment; specifically, sustainability impacts of GVCs and associated policy implications have to date invited much scholarly and practitioner dialogue (Coe & Yeung, 2015; Gereffi, 2018). This interest is to some extent reflected in our sample, yet few studies explicitly address ways in which GVCs affect social, economic and environmental conditions in host countries. For example, labor standards have become one critical frontier of GVC organization (Hastings, 2019; Malesky & Mosley, 2018). Lund-Thomsen and Coe (2015) studied Nike's main football supplier factory in Pakistan, and investigated whether CSR initiatives by the lead firm can facilitate or constrain labor agency in GVCs. Their results indicate that lead firms are limited in their ability to shape local labor agency, as it is impacted by wider economic forces, relationships with local and national actors, and local regulatory frameworks; these factors can place clear limits on lead firms' efforts to facilitate responsible forms of GVC. Barrientos et al. (2016) address the impact of diffusion by global and regional supermarkets in "global South" – South Africa, Kenya, and Uganda – and find that entry by large global retailers provides new opportunities for strategic diversification to the most skilled local horticultural producers and workers. This facilitates economic and social upgrading; yet, persisting economic downgrading pressures mean that many less skilled suppliers are excluded from both global and regional value chains. Kleibert (2016) explores local impacts of the Philippinean offshore service offices' participation in GVCs, and finds that the majority of these offshore offices are characterized by foreign ownership and a high degree of dependency. However, participation in the GVC increases the number and quality of jobs in the region, and creates new opportunities in the labor force – particularly for young college graduates, who suffer from a high level of unemployment in the region. Finally, in a longitudinal study of the international canned tuna industry, Havice and Campling (2017: 309) argue that value chain governance and environmental governance are "mutually constituted": lead firm power dynamic is inextricable from the

environmental conditions of production, and inter-firm strategies work not only with, but also *through*, environmental governance.

CRITICAL ASSESSMENT OF EXTANT LITERATURE AND FUTURE RESEARCH AVENUES

Conceptual Underpinnings and the Theory of the GVC

Our systematic analysis of the GVC literature reveals the theoretical and empirical terrains that have been covered to date, and shows that a substantial body of work has been accumulated to advance our understanding of the GVC phenomenon. One observation that emerged in our review is a high degree of theoretical pluralism. This is to be expected due to the multidimensionality of the construct, and the multidisciplinary nature of the review. One of the more common theoretical approaches deployed in IB, management, and supply chain/operations studies is based on various forms of business network theory (Carnovale & Yeniyurt, 2014; Chen, 2003; Golini et al., 2016; Humphrey & Schmitz, 2002; McDermott & Corredoira, 2010). Many studies investigating capability development and upgrading rely on capability-based theories, such as dynamic capabilities, resource-based view (RBV), knowledge-based view and organizational learning (Chen et al., 2016; Corredoira & McDermott, 2014; Eriksson et al., 2014; Jean, 2014), as well as theories of innovation (Golini et al., 2016; Werner, 2012). Macro-level trade and development theories (Dallas, 2015; Seppälä et al., 2014), institutional theory (Hatani, 2009) as well as resource dependency theory (He et al., 2018; Suder et al., 2015) are invoked in several studies focusing on geographic and structural make-up of GVCs.

Several IB studies, particularly those conducted within the global factory research stream and those investigating host country governance mode dynamics, adopt an internalization theory perspective (Buckley & Tian, 2017; Eriksson et al., 2014; Gooris & Peeters, 2016; Hilleman & Gestrin, 2016; Kumaraswamy et al., 2012). A number of other theoretical angles, perspectives or frameworks are used to address specific research questions. These include international entrepreneurship (Eriksson et al., 2014), cultural values and norms (Funk et al., 2010; Griffith & Myers, 2005), and theories of clusters and cities (Brown, Derudder, Parnreiter, Pelulessy, Taylor, & Witlox, 2010; Turkina & Van

Assche, 2018). Some studies attempt to address the complexity of the GVC phenomenon by merging interdisciplinary theoretical lenses: for example, Turkina and Van Assche (2018) combine insights from IB theory, economic geography, and social network analysis to study innovation in knowledge-intensive clusters; Treiblmaier (2018) develops a framework to explain the role of blockchain technology in GVCs based on four theories: principle-agent theory, TCE, RBV, and network theory.

Yet, despite the impressive amount of research investigating the GVC phenomenon from a variety of theoretical angles, it appears that we do not yet have a dominant theory of GVC. A number of studies – particularly those in the economic geography and economic sociology research streams – refer to the *GVC theory* of Gereffi et al. (2005) (or, alternatively, GPN/GCC theory, see, for example, Blažek, 2015; Brancati et al., 2017; Hatani, 2009; Neilson et al., 2018; Sturgeon et al., 2008; in a recent review by Coe & Yeung, 2015). However, as mentioned above, existing GVC frameworks (e.g., Gereffi, 1994; Henderson et al., 2002) and typologies (e.g., Gereffi et al., 2005) do not provide detailed causal mechanisms (Bunge, 1997), and thus do not constitute predictive theory of GVC in a sense of offering “a statement of relations among concepts within a set of boundary assumptions and constraints” (Bacharach, 1989: 496). Instead, they are useful organizing frames for empirical research on GVCs. Although Coe and Yeung’s (2015) recent book on GPN 2.0 theory comes closer to a causal approach to theory development, there is still a lack of empirical studies to test its generality, validity, and robustness (e.g., Coe & Yeung, 2019; Neilson et al., 2018). Overall, GVC is a complex construct that captures a particular empirical phenomenon, namely progressive disintegration and geographic dispersion of MNEs’ value chains. The studies reviewed here investigate various dimensions of this construct and establish links among select dimensions, but fall short of developing an overarching theory of GVC that can adequately explain the phenomenon, preferably with some predictive power. Admittedly, predictability is difficult to achieve in social science theories, where the validity of predictions depends upon elusive *ceteris paribus* conditions (Bhaskar, 1998). Yet, in an applied field such as IB, predictive capacity makes our theories actionable for managers, and therefore is viewed as a desirable (though hard to attain) outcome of theory development.

Here, our comparative institutional analysis-based model (Figure 1) can be used as an eclectic framework that integrates various theoretical perspectives in order to explain the functioning of the GVC, and, we hope, predict specific outcomes, in terms of benefits accrued to GVC participants and chain-level sustainability. From the internalization theory perspective, a GVC will be sustained over time only if GVC governance is comparatively more efficient than alternative governance forms. The lead firm thus must manage inefficiencies at the macro-level (e.g., institutional frailties, economic shifts, public push-back, technological complexities), at the GVC level (e.g., need for structural changes, shifting power dynamics among partners, unequitable value distribution), and at the micro-level (e.g., cognitive biases, information asymmetries, commitment failures), by economizing on bounded rationality and reliability involved in GVC-related transactions, and by fostering an environment conducive to value creation and capture in the GVC (Kano, 2018). The lead firm must select and implement structural features and strategic governance routines that best serve these economizing objectives.

Taken together, the studies in our sample address all elements of our comparative institutional framework, although some elements have garnered more scholarly attention than others. Our review reveals a number of knowledge gaps, which indicate promising research directions for IB, management studies, and the broader social sciences. We discuss these in the next section.

Knowledge Gaps and Direction for Future Research

Microfoundations of GVC governance

The microfoundational aspect appears to be under-represented in our sample. While microfoundational assumptions are frequently made, they are rarely articulated or examined empirically. This is concerning particularly because GVC configurations are essentially outcomes of managerial choice. Our ability to predict accurately these configurations hinges on our understanding of the individual, which is for the most part omitted in our sample. Even papers that examine learning are typically silent on the role of individual behavior. In particular, studies based on archival data often engage in what Tsang (2006: 999) calls “assumption-omitted testing”; that is, although key behavioral assumptions may be made

implicitly or explicitly for the purpose of developing hypotheses, such assumptions are not tested empirically.

It should be noted that this gap is particularly evident in IB and management literatures. Sociology, development studies and economic geography literature does address individual motivations and behavior, mostly through the case study and/or ethnographic methods. Yet, economics-based research tends to steer away from directly examining such psychological factors. The fact remains that few narratives at the individual level are published in the journals represented in our review.

Future IB studies could explicate individual-level assumptions, and examine specific links between these assumptions and various components of GVC governance, such as ownership and control decisions, geographic and structural configurations, knowledge management, and network orchestration. In particular, the largely under-researched aspects of value distribution in a GVC could be advanced by incorporating specific microfoundational assumptions. Current narrative on value distribution implies a certain level of bounded rationality and bounded reliability of decision-makers. First, managers find it difficult to identify accurately where the most value is generated in the network (Seppälä et al., 2014). Second, most studies that address value distribution assume the presence of a power struggle among the players, whereby each actor attempts to appropriate the greatest amount of value, frequently at the expense of other players – consider the proverbial case of large buyers in Gereffi's (1994) buyer-driven commodity chains or Gereffi et al. (2005) captive mode of GVC governance. Here, large buyers are assumed to opportunistically squeeze their suppliers to the point where relentless downward cost pressure leads suppliers to make suboptimal, environmentally and socially detrimental choices. However, this power view is not universally applicable, as noted recently in Dallas et al. (2019). Inequitable value distribution may alienate critical partners and undermine the sustainability of the entire GVC arrangement (Levy, 2008; Yamin, 2011). It is in the interest of the lead firm to sustain the GVC over time, particularly in situations of bilateral dependence from core suppliers. Explicating and testing individual-level assumptions can help scholars understand mechanisms underlying value distribution in a GVC.

Geographic scope of GVCs and GVC mapping

Location emerged as one of the key variables in empirical GVC studies, yet few empirical studies in our sample attempt to measure the geographic dispersion of value chains investigated, in order to determine whether the scope of these value chains is in fact global, in a sense of a relatively equal distribution of activities across regions (Rugman & Verbeke, 2004). In fact, only two studies (Azmeah & Nadvi, 2014; Suder et al., 2015) directly address the regional effect in GVCs, although a larger number of empirical studies published in economic geography journals (Table 3) focus on GVC impacts on location-specific upgrading and regional development. It has been argued that very few truly *global* value chains are currently in existence, and that the label "global," used either out of inertia or as a teaser, may in fact misrepresent the actual geographic reach of MNEs' international networks (Verbeke, Coeurderoy, & Matt, 2018). It is therefore the responsibility of GVC scholars to measure systematically the geographic breadth and depth of relevant value chain activities, and to arrive at an accurate definition of what a GVC represents. Such goal could be accomplished through firm-level GVC mapping, namely, linking locations with detailed data on inputs, outputs, flows of services and skills, employment, revenue, and value creation and capture. Unlike international economics studies based on value-added trade data (Escaith, 2014; Johnson & Noguera, 2012; World Bank, 2019, 2020), such firm-based GVC mapping not only clarifies the geographic scope of economic activity as global versus regional, but also serves an important managerial purpose of specifying the precise location of value creation and capture within the firm and its GVC. This potentially helps managers to appraise comparative efficacy of global, regional and local governance.

Learning in a GVC

As indicated in Inkpen and Tsang's (2005, 2016) conceptual discussion of social capital, networks and knowledge transfer, the topic is surely a challenging as well as fruitful one. A number of empirical studies have examined knowledge diffusion and transfer in a GVC, but knowledge management is discussed mostly in the context of upgrading, technological catch-up and moving up the value chain by peripheral firms and strategic partners. Reverse knowledge transfer and learning

in the lead firm are less explored (with the notable exception of Lipparini et al., 2014). Further, while recent conceptual studies have called for a closer examination of specific mechanisms for knowledge transfer in a GVC (Pietrobelli & Rabelotti, 2011; Cano-Kollmann, Cantwell, Hannigan, Mudambi, & Song, 2016; Kano, 2018), few empirical studies have addressed this. Future studies can examine channels through which knowledge travels in a GVC in multiple directions, and specific behaviors in various parts of the network that aid or constrain these processes. Finally, the concept of organizational unlearning – getting rid of obsolete knowledge or routines – points to another promising research area that has been neglected. Given the rapid technological and environmental changes, knowledge possessed by members of a GVC has to be regularly updated. Organizational routines that used to be cost-saving may no longer be so. The extent to that GVC members individually or collectively can replace such outdated knowledge or routines partly determines the GVC's performance or even long-term survival. Since unlearning at the organizational level and the individual level are intricately connected (Tsang & Zahra, 2008), attention to microfoundations of individual behavior, as suggested above, can help advance this research agenda.

Impact of lead firm ownership and strategy on GVC governance

Several studies in our sample analyze the impact of lead firm features, such as size, industry, location, and capabilities, on GVC governance. However, few studies (with the exception of, e.g., Morris & Staritz, 2014) examined the impact of ownership, meaning potential differences among GVCs led by private, public, state-owned, and family-owned MNEs. Of particular interest here is behavior of firms whose international strategy may be driven by non-economic objectives, such as state-owned enterprises (SOEs), government-linked corporations (GLCs) and family firms. The social and political goals of SOEs and GLCs may conflict with efficiency considerations (Grøgaard, Rygh, & Benito, 2019; Rugman, 1983), and may drive idiosyncratic GVC configurations. These idiosyncrasies may be enhanced by lead firms' unique relationships with key macro-level actors, such as the state, regional and local institutions, and trade unions, and their comparatively greater ability to influence economic

policies that govern international investment. For example, political transformation in developing countries can enable the strategic coupling of national economic actors, such as SOEs, GLCs and even sovereign wealth funds, with lead firms in different historical periods. Yeung's (2016) comparative study details the politics of state transformation in South Korea, Taiwan, and Singapore since the 1990s and explains how this transformation has led to a strategic coupling shift of the development process from SOE-led industrialization to an assemblage of state-firm-global production networks in which SOEs and GLCs work closely with lead MNEs in a variety of industries, such as personal computers, semiconductors, automotive, ship building, and passenger aviation.

Similarly, family-owned MNEs' international strategy may be driven by non-economic objectives of the controlling family, such as keeping the firm in the family, providing jobs for future generations, cultivating connections with "chosen" stakeholders, and building a reputation in the community (Miller, Wright, Le Breton-Miller & Scholes, 2015). The prevalence of these non-economic preferences gives rise to a dysfunctional governance feature that family firm scholars termed "bifurcation bias": an affect-based decision rule, whereby family-based assets and capabilities are given *de facto* preferential treatment over non-family ones (Kano & Verbeke, 2018). In the context of GVC governance, bifurcation bias can impact, *inter alia*, location and control decisions and network composition. Lead family firms may be more likely to seek to protect family-based assets through internalization, and to ascribe a commodity status to non-family assets and govern those assets through contractual modes, regardless of their actual value and contribution to the GVC. Location decisions in bifurcation-biased family firms are also likely to be subject to affect logic; for example, a desire to create jobs for the local community may drive domestic production even when more efficient options exist. This decision dynamic was evident in the well-known case of the iconic Danish toy manufacturer LEGO, where the family's excessive loyalty to its home community of Billund, Denmark, prevented it from achieving efficiency through offshoring (Bennedsen & Foss, 2015). The choice of network partners may also be unique in family firm-led GVCs, since family firms display a strong preference toward partnerships with "kin-controlled" suppliers

(Memili, Chrisman, & Chua, 2011: 53). These, and other idiosyncratic features of GVCs led by firms with alterative ownership, can be investigated in future studies.

The impact of the lead firm's international strategy can also be explored further. No studies in our sample have addressed this relationship. However, we assume that the lead firm's international strategy (defined according to, e.g., Bartlett and Ghoshal's (1989) integration/responsiveness framework, Ghemawat's (2003) aggregation/adaptation/arbitrage framework, or Verbeke's (2013) administrative heritage framework) will influence structural and strategic governance of the GVC, particularly because organizing operations through the GVC is meant to aid the lead MNE in achieving the ultimate balance between integration and responsiveness (Buckley, 2014).

Temporal factors and dynamics of GVC arrangements

Temporal considerations, such as assignment duration and timing of changes in governance modes, have received limited attention in GVC studies to date, likely because they are typically subsumed within control and/or location decisions (Buckley et al., 2019). Only two studies in our sample (Brancati et al., 2017; Havice & Campling, 2017) examined temporal factors in a targeted manner. However, time considerations represent a key parameter of GVC governance, particularly because modern GVCs thrive on flexibility and adaptability of their governance structures. We propose that future IB studies focus on such temporal elements as optimal assignment duration for economic activities, flexibility/stability trade-offs, and associated knowledge accumulation and learning. Analyzing temporal dynamics of the GVC will likely shed light on the issue of back sourcing, inshoring, and reshoring (Bailey & De Propriis, 2014; Kinkel, Rieder, Horvath, & Jäger, 2016; Vanchan, Mulhall, & Bryson, 2018), which also is not sufficiently addressed in extant research.

Value creation, capture, and distribution in a GVC

Despite significant scholarly attention to the issue of value in a GVC, the question of how lead firms should coordinate value creation, capture and distribution is as of yet unresolved. Here, interdisciplinary differences in approach are particularly evident. IB scholars tend to focus on lead firms as key actors responsible for value orchestration in a

GVC, viewing these firms as residual claimants of the network's value proposition (Kano, 2018). Social science-based GVC scholars consider more closely contestation over value creation and distribution among lead firms and their partners, and approach value distribution from the perspective of various forms of power asymmetries between the lead firm and suppliers (Dallas et al., 2019; Strange & Humphrey, 2019). Both approaches present conceptual and empirical challenges. First, the empirical reality is that lead firms cannot accurately account for where value is created in the GVC (Seppälä et al., 2014), which complicates their role as value distributors. Second, formal and informal connections and arrangements in modern GVCs continually change in response to economic, political, and technological processes (Benito, Petersen, & Welch, 2019); this dynamism impacts both power relationships in a GVC and loci of value creation. Future studies can fruitfully combine IB and social science approaches to further investigate value creation and distribution in a GVC (Benito et al., 2019).

Finance and financialization in MNEs' participation and coordination of GVCs

Overall, we know little about how financial considerations affect MNE strategies, management of GVCs, and competitive outcomes. Earlier studies by Milberg (2008) and Milberg and Winkler (2013) examined how financial considerations (e.g., share prices) shaped GVC configurations. From being a relatively obscure factor in the early GCC literature during the 1990s, finance has come to the forefront of accounting for the evolutionary dynamics of lead MNEs and their GPNs in the 2010s. Coe and Yeung (2015) argue that the pressures and opportunities associated with financial market considerations have compelled lead MNEs to further develop and expand their international operations. MNEs' responses to financial dynamics produce different geographical and organizational configurations of networks. Lead firms, such as certain American MNEs, that succeed in meeting the demands of financial discipline through globalizing production, tend to perform well in the financial market in terms of stock price and executive rewards. This prompts further strategic shift toward a greater emphasis on finance-driven approach to corporate growth and governance in lead MNEs.

GVC impact on macro-environment

Extant research has long acknowledged that GVCs are embedded in, and co-evolve with, political, socio-economic and environmental systems (Alford & Phillips, 2018; Santana, Vaccaro, & Wood, 2009; Smith, 2015; Whittaker, Zhu, Sturgeon, Tsai, & Okita, 2010; Yeung, 2016). GVCs thus have a continued impact on these complex systems, both positive and negative, intended and unintended. These impacts are well documented. On the positive side, they include economic upgrading, namely income and employment growth and skill development in domestic firms. GVCs' negative impacts on host communities have attracted even more attention, and include increasing inequality, deteriorating labor standards, environmental damage (Kolk, 2016; Kolk, Rivera-Santos, & Rufin, 2018), and, in extreme cases, large-scale crises such as the Rana Plaza disaster in Bangladesh. Lead MNEs' efforts to address these impacts by enforcing strict labor standards throughout the chain and implementing partial re-internalization are not unambiguously helpful for host communities. These initiatives limit local enterprise growth and reduce employment prospects among the most vulnerable population, and thereby attenuate some of the above-mentioned positive effects of GVCs on local economies (Narula, 2019). Today, in the era of the rise of political populism, renewed protectionism and the growing skepticism toward globalization, the question of whether GVCs are paragons or parasites is hotly debated in the academe, in the business community, and among the general public.

It is therefore surprising that few studies in our sample directly address the impact of GVCs on various facets of their macro-environment (although many more papers in the social science literature have addressed this issue). The reason may be that operationalizing and measuring social, economic and environmental impact is a challenging task and a rapidly moving target, even if we put aside the problem of data availability. Nevertheless, studying GVC impacts on relevant societies is an important direction of inquiry, which presents one of the "grand challenges" of IB research. To make such research actionable, IB scholars are encouraged to "expand the firm-centric lens" (Gereffi, 2019: 195) so as to incorporate broader views on international development. Engagement with policymakers and researchers from adjacent fields such

as international economics can facilitate linkages between firm-level and macro-level perspectives and help IB researchers translate their findings into policy and development implications.

While host country institutional environments were factored into many investigations, few studies (e.g., Fuller & Phelps, 2018) examined feedback effects from GVC governance on host, home, and international institutions. Such impacts (e.g., improvement to legal frameworks, changes to local business institutions, development and enforcement of industry standards, changes to regulations to implement protectionist measures or to promote liberalization) present another interesting area for future research.

The impact of renewed protectionism

Protectionism, as expressed in governments' measures to discriminate against foreign commercial interests through trade policies, is not a new phenomenon, and has been observed over the years through periods of crises and economic downturns (Evenett, 2019). Yet, the issue of protectionism is gaining renewed relevance today, especially in light of Brexit, President Trump's foreign policies, and associated trade tensions and the wide-spread backlash against globalization. These developments naturally create risks for GVCs, particularly in regards to manufacturing activities offshored to low-cost countries. Lead firms may respond by reconfiguring their value chains and/or reshoring/repatriating production to home countries (Bailey & De Propriis, 2014; Vanchan et al., 2018). While renewed protectionism certainly impacts GVC configurations and governance, the nature and extent of this impact is not yet clear. First, reshoring occurs for a number of reasons, including rising labor and transportation costs, currency fluctuations, technological developments, and strategic considerations (Ancarani et al., 2019; Vanchan et al., 2018). Second, reshoring, even in the face of, for example, US-China trade war, is difficult and may prove inefficient. Access to specialized skills, infrastructure, and large-scale manufacturing facilities presents serious barriers to reshoring. Repatriation of assembly and production of commodity components from China to high-cost home countries may be next to impossible, as no developed country can presently match China's combination of scale, skill, infrastructure, and cost (Economist, 2018). The impact of renewed

protectionism is not directly addressed in our sample, likely because it will take some time to materialize, and the patterns and outcomes of GVCs' responses are still in a state of flux. Further, available data on the impact of protectionism are presently limited (Evenett, 2019). That being said, the potential impact of various expressions of the renewed protectionism, such as Brexit and Trumpism, on GVC governance is a major avenue for future research, with significant implications for academics, practitioners, and regulators.

GVCs and digitization

Extant studies have addressed the impact of new technologies on GVC configurations (Laplume et al., 2016), however, future studies can answer the broader question of how digital technologies have transformed the basic governance structure of GVCs (Foster & Graham, 2017; Foster et al., 2018; Wu & Gereffi, 2019). Digital technology-enabled "platformization," or "the shift from individual products or services to platforms as the basis for offering value" (Nambisan, Zahra, & Luo, 2019: 1465), has considerable implications for GVCs, but these impacts are complex. On the one hand, platform MNEs facilitate connectedness among different groups of actors around the world in fundamentally new ways (Coviello et al., 2017; Stallkamp & Schotter, 2019). Digital platforms and associated ecosystems offer new venues for multi-faceted innovation and value creation, and for transferring value across borders with added efficiency and flexibility. Digitization also allows MNEs to quickly change their business models by adding or subtracting network units, adjusting multi-sided platforms, or modifying existing links and interactions (Nambisan et al., 2019). For suppliers based in technologically advanced emerging economies such as China, digitization reduces barriers to upgrading and diversification and facilitates access to end consumers (Li, Frederick, & Gereffi, 2019). On the other hand, increasing digitization may put at a disadvantage or even exclude GVC actors located away from innovation hubs. Platforms and ecosystems provide young and small firms with access to infrastructure and opportunities to quickly reach geographically dispersed customers (Nambisan et al., 2019), yet they also prompt increasing standardization of inputs, which makes suppliers, especially SMEs, more interchangeable and consequently vulnerable. Lead

MNE's orchestration task in a digital environment is more challenging, as lead firms must coordinate, recombine resources, and establish cooperative relationships with actors that are loosely connected and may be situated far beyond the traditional boundary of the lead firm's industry and beyond the scope of its expertise (Li, Chen, Yi, Mao, & Liao, 2019). Further, the growing importance of big data and data analytics led to the emergence of an entirely new form of value chain: a "data value chain" evolving around a firm that manages worldwide acquisition, storage/warehousing, modeling, analysis, and production of insights from data (UNCTAD, 2019). This type of value chain represents a fundamentally new business model, presently little understood by IB scholars.

The phenomenon of platformization presents a number of novel and fascinating research opportunities. A platform MNE can be seen as a global virtual value chain, with the lead MNE possessing critical technology, and with the flows of inputs and outputs being mostly intangible. Specific research questions to be explored include, *inter alia*, power dynamics in digital value chains, business model innovation enabled by platformization, monetization of raw data and ownership of value-added data, integration of digital and brick-and-mortar scenarios within the same network, the impact of home country Internet regulations on GVC governance (Wu & Gereffi, 2019), specialization versus standardization, integration versus responsiveness, consumer involvement in digital GVCs, e-commerce-enabled supplier upgrading (Li et al., 2019a, b), relational governance in a digital environment, and building trust in the global virtual teams in a GVC (Foster et al., 2018; Jarvenpaa & Leidner, 1999). As technology continues to advance, future studies can investigate potential impacts of artificial intelligence, internet of things, and virtual reality on both traditional and digital GVCs (UNCTAD, 2019).

GVCs performance measurement

As discussed above, GVC-level performance measurement is a challenging task, due to the tremendous complexity of the fine-sliced, multi-layered, geographically dispersed network as well as the multiple and potentially diverging objectives of its members. We proposed here that sustainability of the GVC over time served as an indication of governance efficiency and could, therefore, be seen

as the ultimate GVC performance outcome. Future research can elaborate on this measure, and propose other ways in which lead firms in GVCs can assess network performance.

CONCLUSION

To date, scholars from a range of disciplines have accumulated an impressive body of research on GVCs, yet this work is presently characterized by a number of knowledge gaps and a lack of a unifying theory. These gaps present exciting opportunities for GVC researchers, and we hope that our review may contribute to an integrative GVC research agenda. We have suggested a comparative institutional framework for GVC analysis, and identified a number of under-researched issues at micro, GVC, and macro levels, which we would like to further synthesize into what we see as three interrelated “grand challenges” of GVC research in IB. At the micro-level, we need to pay greater attention to individual behavior and motivations, and ways in which these individual characteristics play out as MNEs expand their value chains across geographies and product markets. At the GVC level, we need to engage in rigorous GVC mapping, by specifying relationships among all critical elements of structural and strategic governance of the GVC. At the macro-level, we need to investigate carefully and objectively the intermingling of GVCs and new technologies, and the complex impacts of GVCs on their surrounding societies and the natural environment. The latter point is particularly relevant in the present political climate. With critics of globalization increasingly – and irrationally – blaming GVCs (and, more generally, MNEs) for the demise of public goods and “the rise of global public bads” (Verbeke et al., 2018: 1102), it becomes the social responsibility of GVC researchers to paint an accurate picture of GVCs that demonstrates the fundamental and non-reversible interconnectedness of today’s global economy.

We would like to conclude by suggesting that this task is best accomplished through interdisciplinary research. Our review showed that each discipline can contribute unique and useful angles, both theoretically and methodologically. In terms of achieving research objectives outlined above, sociology scholars can contribute their expertise in individual-level variables and network-level analysis; economic geographers can enrich the

discussion through their superior command of location data, geographical scales of network configurations, and uneven development outcomes; organizational behavior researchers can enhance our understanding of the psychological aspects of managerial decision making and strategy formulation and execution, and IB scholars can bring to the table theoretical rigor and sophisticated treatment of MNEs and their cross-border networks. We advocate that scholars from different disciplines should communicate, collaborate, and gain from this cross-pollination of ideas, and we look forward to seeing more cross-disciplinary GVC research.

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NOTES

¹Gereffi (1999; also reproduced in 2018: Chapter 3), for example, applied his buyer- and producer-driven commodity chains framework to analyze empirically the industrial upgrading pathways of East Asian firms and economies in the global apparel commodity chains led by US buyers. Similar to Hobday’s (1995: Chapter 3) earlier work examining East Asian electronics firms, he identified four types of upgrading trajectories in the form of apparel exports based on basic assembly, OEM, OBM, and ODM roles, and introduced them into the GVC literature. Gereffi (1999) also highlighted the importance of organizational learning as a mechanism for achieving industrial upgrading in GCCs.

²Bounded rationality implies that economic actors’ behavior is “intendedly rational, but only *limitedly* so” (Simon, 1961: xxiv). Bounded reliability explains failure of economic actors to make good on open-ended promises, irrespective of intent (Kano & Verbeke, 2018). It is an extension of the narrower construct of opportunism – a

central behavioral assumption in the Williamsonian version of transaction cost economics, defined as “self-interest seeking with guile” (Williamson, 1981: 1545).

³Hereafter, we refer to this latter group of journals as “social science journals.” We realize that management research also falls under the social sciences

umbrella, however, we make a distinction between management journals and other social science journals for simplicity.

⁴Due to the significant volume of work dedicated to examining knowledge management in a GVC, we analyzed it as a separate aspect of GVC strategic governance (see the section on learning above).

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