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Abstract

GVC governance theory explains the management of interfirm relationships in the context of offshoring and outsourcing in the latter part of the 20th century. It emphasises the power of lead firms to shape the new global supply chains that were developed at this time. Parsimonious theorising combined with lead firm power has led to criticisms that the theory is determinist and fails to allow for the agency of the non-lead firms that are often referred to as suppliers. Critics have argued that more attention needs to be given to supplier agency and capability formation in the places where value chains touchdown in the global economy. This contribution argues that the weaknesses of GVC governance theory lie in its limited conception of the capability approach to industrial organisation and its focus on efficient government solutions at a given point in time. Introducing a dynamic capability perspective makes it possible to understand the circumstances in which suppliers are likely to possess capabilities that are valuable to their customers and allows a movement away from a static, equilibrium perspective. However, this view of suppliers does not rule out the importance of structural constraints on firm opportunities. The role of architectural manipulation in creating power asymmetries in GVCs is discussed.

Keywords: global value chains, governance, suppliers, capabilities, globalisation

JEL classification: D23; F2; L14; L20

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Abstract

GVC governance theory explains the management of interfirm relationships in the context of offshoring and outsourcing in the latter part of the 20th century. It emphasises the power of lead firms to shape the new global supply chains that were developed at this time. Parsimonious theorising combined with lead firm power has led to criticisms that the theory is determinist and fails to allow for the agency of the non-lead firms that are often referred to as suppliers. Critics have argued that more attention needs to be given to supplier agency and capability formation in the places where value chains touch down in the global economy. This contribution argues that the weaknesses of GVC governance theory lie in its limited conception of the capability approach to industrial organisation and its focus on efficient government solutions at a given point in time. Introducing a dynamic capability perspective makes it possible to understand the circumstances in which suppliers are likely to possess capabilities that are valuable to their customers and allows a movement away from a static, equilibrium perspective. However, this view of suppliers does not rule out the importance of structural constraints on firm opportunities. The role of architectural manipulation in creating power asymmetries in GVCs is discussed.

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1 Introduction

The characteristics of globalisation changed fundamentally in the latter part of the 20th century and in the first decade of the 21st. Manufacturing shifted to developing and emerging economies, as indicated by the declining share of the G7 countries in world exports and global manufacturing GDP. In 1991 the G7 accounted for 52% of world exports and 65% of global manufacturing GDP. By 2011 the shares had declined to 32% and 47% respectively (Baldwin, 2011: 3). At the same time, global manufacturing was characterised by the fragmentation of production into discrete parts and increasing trade in components (or tasks) rather than final products. Initially, at least, this led to a global division of labour in which low-skilled, labour-intensive tasks were shifted to low-wage economies while higher value activities remained in high-income countries. (Fröbel *et al.*, 1980; Gourevitch *et al.*, 2000; McKendrick, 2004). This process has been studied from many angles. Economists have referred to it as production fragmentation, vertical specialisation, global production sharing, slicing up the value-added chain, trading tasks and supply-chain trade (Arndt and Kierzkowski, 2001; Feenstra and Hanson, 2001; Krugman, 1995; WTO, 2013: 78; Baldwin and Robert-Nicoud, 2010; Baldwin and Lopez-Gonzalez, 2015; Grossman and Rossi-Hansberg, 2008). Approaches focusing on the firm, including international business, industrial organisation and international development, have referred to offshore outsourcing, global production networks, global value chains and the global factory (Doh, 2005; Coe *et al.*, 2004; Gereffi *et al.*, 2005; Buckley, 2011).

The theory of global value chain (GVC) governance set out by Gereffi *et al.* (2005)¹ contributed to these debates by examining how fragmented activities were being coordinated and focusing on governance forms that lay between arm's-length market relationships and hierarchy (vertical integration). GHS put forward a theory that presented three characteristics of transactions (information complexity, degree of codification and supplier capabilities) as the determinants of five different inter-firm governance types — market, hierarchy, and three intermediate forms (modular, relational and captive governance). In common with enterprise-focused analyses of globalisation, GHS stressed the important and strategic role of lead firms² in shaping and driving global value chains and choosing which governance form to manage relationships with other firms. In the words of Gibbon and Ponte, these activities include “defining the terms of chain membership, incorporating/excluding other actors accordingly and allocating to them value-adding activities that lead agents do not wish to perform” (2005: 3).

One consequence of this emphasis on lead firms was to characterise suppliers as largely passive respondents to the requirements and opportunities created by the active agency of lead firms. Critiques of this view have coalesced around two issues: its explanation of optimal governance choices as determined by the three transactional characteristics, and the absence of supplier agency. Gibbon *et al.* argue that GHS emphasises structural constraints (characteristics of industries or processes) “rather than the intentional strategic actions of firms” (2008: 323). Sako and Zylberberg (2017: 6) conclude that the three governance determinants create a theory that is deterministic and functionalist — the transactional characteristics determine the most efficient governance outcome for any transaction and that powerful lead firms possess the ability to choose and apply this outcome. In addition to this, it is frequently argued that the theory's focus on transactional characteristics and vertical linkages in value chains fails to understand that chains are embedded in broader relationships and in specific localities that expand the choices available to suppliers (Coe *et al.*, 2008: 274-75; Henderson *et al.*, 2002: 444-45).

This Discussion Paper argues that the underlying problem is neither the issue of supplier agency, nor one of determinist and functionalist explanations. However, the treatment of suppliers in GHS and in

¹ Hereinafter referred to as GHS.

² Other theories in this group have used similar names for the same type of role: focal firm (Coe *et al.*, 2004; Buckley, 2009), flagship firm (Rugman and D'Cruz, 1997), hub firm (Jarillo, 1988) and lead firm (Coe *et al.*, 2008).

GVC theorising more generally is certainly problematic. More recognition is required of the variety of roles played by suppliers in value chains. The root cause of GVC theory's difficulties on this issue lies in its tendency to confine the governance challenge to one of static efficiency, or "What is the best way to manage an outsourcing relationship at any given point in time?", rather than one of dynamic efficiency, which is about adapting to changing market and competitive environments in order to sustain the competitiveness of a linked set of businesses over time. This can be achieved by deepening the analysis of capabilities by introducing dynamic capabilities and considering the factors that influence the distribution of capabilities along value chains.

Section 2 provides an account of the GVC approach, drawing on GHS. It examines the empirical context in which the theory was developed and the different literatures it drew on to explain its approach to suppliers. This is followed by a more detailed examination of the critiques made of it in relation to its treatment of suppliers. A more detailed discussion of the issues of determinism and functionalism is provided in Appendix 1. Section 3 then introduces the literature on dynamic capabilities and uses this to provide an account of the circumstances under which suppliers play a more active role in sustaining the competitiveness of the chain as a whole by identifying new opportunities or meeting new challenges and mobilising the capabilities required to address them. The final part of Section 3 takes the discussion of capabilities further by introducing the concept of architectural manipulation in order to explore how, even if firms upstream and downstream in global value chains are able to exercise agency and make strategic decisions about capability, they may still find their options limited by asymmetries in power. Section 4 concludes.

2 Globalisation and global value chains

Global chains of linked activities are not a product of the late 20th-century. Researchers working in the framework of commodity chains and world systems theory have identified chains of linked activities spanning national boundaries in many sectors even prior to the development of industrial capitalism. Examples include the shipbuilding and grain flour commodity chains (Özveren, 1994; Pelizzon, 1994). The distinctive features of late 20th-century globalisation were the fragmentation of production processes and the switch from trade in products to trade in tasks.

Peter Dicken's influential work on globalisation contrasted pre-1914 *internationalisation* based on arm's-length trade in goods with late 20th-century *globalisation*, which involved "not merely the geographical extension of economic activity across national boundaries but also — and more importantly — the *functional integration* of such internationally dispersed activities. They reflect, therefore, essentially *qualitative* changes in the way economic activities are organized" (Dicken, 2003: 12, stress in original).

One way of achieving functional integration was to create subsidiaries and retain offshore activities within the enterprise. Dicken asserted that "deep integration, organized primarily within the production networks of transnational corporations (TNCs), is becoming increasingly pervasive" (2003: 12). In 1961 the US electronics company, Fairchild Semiconductor, relocated labour-intensive assembly of transistors from the United States to a subsidiary operation in Hong Kong. Components were shipped to Hong Kong, assembled and then returned to the USA. The type of trade is called vertical specialisation, which Yi defines as "the increasing interconnectedness of production processes in a sequential, vertical trading chain stretching across many countries, with each country specializing in particular stages of a good's production sequence" (Yi, 2003: 53). In the garment sector, Fröbel *et al.* (1980) analysed offshoring by German textile and garment companies to Eastern Europe and Asia and the resulting job losses and factory closures in Germany. However, while they documented many cases of overseas subsidiaries being created, they also noted that offshore facilities included "production abroad by quite a significant number of nominally independent foreign producers, in particular through subcontracting and export-processing cooperation agreements with Eastern European and

East Asian firms” (Fröbel *et al.*, 1980: 17). In other words, globalisation could involve outsourcing alongside offshoring.

In both cases, however, offshoring was seen as the relocation of low-wage and low-skilled activities. The shift of hard disk drive (HDD) assembly activities from the United States to Southeast Asia provides a clear example. In 1995 US firms accounted for 88.4% of global hard disk production (by units, not value), but almost all (95%) of their labour-intensive final assembly operations had been shifted outside of the United States, with Southeast Asia accounting for 64.2% of global HDD final assembly in that year (Gourevitch *et al.*, 1997). Higher-paid tasks remained in the United States, and US workers accounted for a disproportionate share of these firms’ wage bills: 28.5% of their global workforce remained in the United States, but these employees accounted for 62.4% of their overall wage bill (Gourevitch *et al.*, 2000: 308).³

This is the context within which global value chain governance theory was developed — offshoring and outsourcing, the transfer predominantly of low-skilled fragments of overall production processes, and continuing integration of fragmented activities with or without direct ownership by the lead firm. The following section discusses how this context shaped the theory’s account of suppliers and their role and agency in GVCs.

2.1 Globalisation, fragmentation and integration

The idea of a chain of linked activities figures prominently in the work of Hopkins and Wallerstein (1977). They were concerned with the creation of the capitalist world economy, which they date to the 16th century, and the global-scale divisions of labour within it that created and reproduced inequalities between core and periphery regions. Commodity chains tie the world production system together and are central to the constitution of structural inequalities within it. They defined a commodity chain in the following terms:

“What we mean by such [commodity] chains is the following: take an ultimate consumable item and trace back the set of inputs that culminated in this item — the prior transformations, the raw materials, the transportation mechanisms, the labor input into each of the material processes, the food inputs into the labor. This linked set of processes we call a commodity chain.” (Hopkins and Wallerstein, 1977: 128)

This macro and long-term perspective on capitalist development was subsequently re-developed by Gereffi and Korzeniewicz into the “global commodity chain” concept, which analysed transnational divisions of labour and interfirm relations in late 20th-century globalisation from the perspective of chains of linked activities (Gereffi and Korzeniewicz, 1990; 1994).⁴ Gereffi refers to an input output structure as “a set of products and services linked together in a sequence of value-adding economic activities” (1994: 97). The critical point for Gereffi, however, was how the activities along such chains were to be coordinated — the governance question.

The basic governance choice facing an offshoring company is whether to create subsidiaries or contract with independent suppliers. This is the choice between “make-in” (vertical integration within the same company) and “buy out” (using the market). The option chosen is often explained by reference to the complexity of the tasks to be offshored and the risks involved. As Buckley (2009: 135) notes, “Products with standard manufacturing interfaces and services with standard processes are ideal for outsourcing.

³ It should be noted that trade policies such as the US 807 initiative and the EU’s Outward Processing Trade played an important role in promoting these new divisions of labour.

⁴ For a further discussion of the transition from world systems theory to global commodity chains and subsequently to global value chains, see Bair (2005; 2009).

A lack of interaction of the offshore facility with other functions enables a clean interface to be created and a 'fine-slicing' cut to be made." Where outsourcing would give rise to problems with intellectual property rights protection or the need for complex information exchanges, it is better to use a subsidiary.

One distinctive contribution of the global commodity chain approach (Gereffi, 1994) and, subsequently, GVC theory to this discussion lies in their treatment of the space between market and hierarchy: (i) this intermediate space is extensive and growing,⁵ and it plays a substantial role in interfirm relationships in the global economy; (ii) three distinct governance forms lie in the space between market and hierarchy; and, (iii) a simple, parsimonious framework can explain the occurrence of these different governance forms. The theory of GVC governance used three variables relating to the characteristics of transactions manufacturing networks and supplier competence — the complexity of information required to support the transaction (complexity), the extent to which the information required for the transaction was codified (codification) and the level of supplier competence in relation to that required to meet the requirements of the transaction. These three determinants created five types of governance: market, hierarchy and the three intermediate forms, modular, relational, and captive governance.⁶

Notwithstanding the observation of Buckley above, empirical studies of GVCs in the 1990s and early 2000s revealed complex relationships between firms without equity ties:

- Fragmentation requires coordination and this increases the complexity of even apparently "simple" outsourcing. Even if direct production work might use widely available skills, the complementary functions required from the supplier (such as ensuring product quality and safety, consistency of production, reliability of delivery, and the ability to respond to unanticipated circumstances) involve more complexity and more coordination.
- Retailers and brand companies often require products customised to their particular needs. This may extend to specifications about material and component inputs, manufacturing processes, delivery schedules, product mix, quality, and quality control. This requires more information transfer and more coordination of activities.
- Such requirements are further raised by the introduction of new management practices. For example, the use of low inventory models and the shift of inventory holding from customers to supplier (Gibbon, 2002) make systems more fragile and harder for suppliers to manage, while raising the cost to buyers of supplier performance failures.
- Gereffi's work on buyer-driven chains highlighted the role of non-manufacturing businesses — brand owners, retailers, etc. — in creating new global. The growth of "manufacturers without factories" (Gereffi, 1999: 46) increased the range of activities performed by suppliers. The outsourcing of production by upmarket design and branding businesses required close collaboration on the introduction of new designs and the transformation of these designs into final products that met the consumers requirements for quality, cost and delivery. As a result, the commissioning firms would remain "heavily involved in activities relating to the production of goods....FGPFs [factoryless goods producing firms] are manufacturing-like as they perform many of the tasks and activities found in manufacturing firms" (Bernard and Fort, 2015: 518).
- The need for such involvement and has increased as consumer and NGO concern about issues such as environmental impact and working conditions have pushed lead firms to take more responsibility for the environmental and social impacts of their value chains.

⁵ Hennart (1993) refers to this is the "swollen middle".

⁶ GHS argues that any transaction requiring non-complex exchanges of information will be managed through arm's-length market relationships. There are then four governance type responding to the possible permutations of codification and supplier competence.

Coordination is expensive, and businesses try to reduce the need for it. However, as more empirical work was carried out on a variety of different global value chains, the novel finding for many researchers was the extent to which lead firms intervened in the activities of the firms that supplied them.

Many researchers were aware that such linkages were not the whole story, but it certainly constituted a novel and important finding, and one that appeared to have been marginalised previously. The way this informed the analysis of developing country suppliers is shown by the example of Schmitz's work on a shoe industry cluster in southern Brazil. This had originally been framed by the literature on Italian and German industrial districts (Schmitz, 1989; Schmitz, 1992) that led to an interest in collective efficiency and the role of institutions and inter-firm interactions in making clusters globally competitive. However, Schmitz's long term, in-depth empirical research on the Sinos Valley shoe cluster in Brazil showed that the major footwear exporters were mostly working for global brand companies that were involved in design, branding and retail, but not manufacturing (Schmitz, 1995). The Brazilian firms used their customers' designs and sometimes relied on these customers for raw materials sourcing and outbound logistics. This division of labour was more typical of a fragmented global value chain than an Italian industrial district. In a subsequent paper on clusters and value chains, Humphrey and Schmitz recognised elements of the industrial district model that remain relevant — firm-level investments and strategic intent were important for capability acquisition even in the Sinos Valley (Humphrey and Schmitz, 2002: 1025) — but they chose to emphasise the importance of this cluster's global linkages:⁷

“The recognition of the importance of clustering has put economic geography back at the centre of the economic development debate in both developed and less developed countries. However, the preoccupation with the quality of local linkages has led to a neglect of the global linkages. The global value chain approach emphasizes that, in many cases, the clustering producers do not sell into open markets and that the chains connecting the local producers with the distant retailers are subject to governance by powerful lead firms.” (Humphrey and Schmitz, 2002: 1025)

Taken together, the characteristics of globalisation outlined so far created a particular view of the position of suppliers in GVCs at the end of the 20th century. First, the incorporation of new production locations into the global economy created the potential for mismatches between the requirements of global buyers and the experience and capabilities of local suppliers (Keesing and Lall, 1992). So-called “latecomer firms” that entered the global economy and switched from domestic markets to global markets might face knowledge gaps with respect to both the requirements of external markets and the technologies and capabilities required to meet them. Hobday refers to these as “competitive disadvantages” (1995: 1172), while Schmitz terms them marketing and technology gaps (2007: 420–21). The implication is that such suppliers might struggle to acquire the capabilities needed to meet the demands of their new global customers. These considerations account for the emphasis in GHS on supplier capabilities.

Second, the dominant view of fragmentation and the new division of labour within the global economy was that limited, often low-skilled tasks were offshored to subsidiaries or outsourced to suppliers in developing and emerging markets. This meant that opportunities for these suppliers to add value would be limited. Furthermore, it meant that such suppliers would mostly be confined to activities for which barriers to entry were low (although it was suggested above that the complexity of managing even simple production tasks has been underestimated). Low barriers to entry for suppliers combined with lead firms that are able to make strategic choices and possessed key resources create substantial asymmetries in power between lead firms and suppliers.

⁷ Similarly, Giuliani *et al.* (2005: 551) placed Latin American clusters in the context of GVCs, arguing that “more attention needs to be paid to external linkages.”

Third, GVC theory, in common with other characterisations of the role the powerful firms in the global economy (see note 2 above), saw this power as allowing lead firms to shape value chains in accordance with their strategic goals. For GVC theorists, lead firms shape value chains by performing some or all of the following tasks: defining product characteristics and production processes, choosing where to produce, distributing tasks along the chain, influencing the distribution of risks and rewards along the chain, and deciding on the inclusion and exclusion of suppliers and forms of performance monitoring (see, for example, Bair and Palpacuer, 2015: s4; Dolan *et al.*, 1999: 18-21; Ponte and Gibbon, 2005: 3). Lead firms are able to do this even in the absence of equity ties (Bair, 2005: 159).

Fourth, in addition to constraining the options available to suppliers at any given point in time, GVC theory often attributes changes in supplier capabilities and activities to decisions made by lead firms. Analyses of upgrading and capability acquisition by suppliers have frequently been framed in terms of the opportunities created or allowed by the lead firms. Bair and Gereffi argue that when Mexican garment suppliers made a transition from maquiladora to full package production, they did so partly as a result of NAFTA, but also because of changes in the nature of lead firms: “The contrast between manufacturers and other big buyers (retailers and marketers) in their capabilities and needs gives rise to the difference between assembly and full-package networks” (Bair and Gereffi, 2001: 1892). In a different context, Sturgeon and Kawakami account for the change in the activities performed by suppliers in the Taiwanese electronics industry by reference to local firms being “asked and in some cases forced by de-verticalised ‘manufacturers’ in the West — to move up the value chain...and take full responsibility for component sourcing, final assembly, and the organisation of multi-country value chains in East Asia” (Sturgeon and Kawakami, 2011: 129).

2.2 Shortcomings of the GVC approach to suppliers

Critiques of the approach set out in GHS fall into two categories. The first is the charge that GVC theory is “incomplete” because it ignores many other factors that affect how firms interact. The second is that it ignores supplier agency and supplier strategy. The first critique is often advanced by researchers using the Global Production Networks (GPN) approach.⁸ It is argued that the “three determinants” approach in GHS provides an incomplete account of governance because many other factors contribute to the functioning and evolution of GVCs. The key arguments are:

- Non-chain actors such as states, labour unions and NGOs have an impact on how chains function (Horner, 2017: 209; Coe *et al.*, 2004). For example, multi-stakeholder sustainability initiatives involving standards and certification alter GVC governance dynamics. An understanding of how GVCs operate should take such actors and initiatives into account. The GHS model can explain how standards and certification impact on the three governance determinants — for example, standards increase codification (replacing inspection of supplier facilities with audit and monitoring by a certification body) and raise supplier capability requirements in areas such as process management and documentation — but it provides no explanation of when and how pressures arise to adopt standards arise.
- GVCs “touch down” in specific places. Local institutions and local initiatives impact on the ability of suppliers to acquire new capabilities or seek out new markets. Therefore, it follows that even with the same lead firms, levels of information complexity and degree of codification, different outcomes might arise according to where GVCs touch down: “In reality, each stage of a production chain is embedded in much wider sets of non-linear/horizontal relationships” (Coe *et al.*, 2008: 274-75). Where suppliers are competent, more complex tasks might be

⁸ The GVC and GPN approaches are closely related, with overlaps in personnel and collaborations on research.

outsourced.⁹ Equally, the agglomeration of many firms in the same sector and the presence of local institutions should reduce the costs of searching for new customers. These factors create a degree of heterogeneity which, it is argued, is not reflected in the broad generalisations about sectors and value chain structure provided in much of GVC theorising.

- The “touching down” argument then leads to a broader critique of the chain concept itself, with GPN scholars contrasting it with the concept of network which, it is frequently suggested, allows for greater complexity and is inherently non-deterministic (Henderson *et al.*, 2002: 444-45). This has consequences for how supplier capabilities evolve: “In contrast to the linear and rather deterministic upgrading paths typical of some GVC approaches (e.g. Gereffi *et al.*, 2005), [GPN 2.0] instead foregrounds the many different *value capture trajectories* that can result when a firm in a particular locality connects into a global production network” (Coe and Yeung, 2019: 780, stress in original).

The second critique, supplier agency, focuses on the issue of individual firms, strategy and agency, linking these questions to both the acquisition of technological capabilities and choice of customers. Morrison *et al.* discuss supplier capability acquisition in terms of cluster effects, purposeful investments by firms and their absorptive capability:

“For [local producers], technological efforts and absorption capabilities are also crucial, and the GVC literature often underplays them and, with a high dose of determinism, suggests that knowledge transfers and upgrading are influenced mainly by the institutional settings, with GVC structures and chain leaders’ strategies setting the pace and direction of knowledge flows and upgrading (either in favour or against the interests of local producers).” (Morrison *et al.*, 2008: 47)

A similar critique is advanced by De Marchi *et al.* (2015), who consider the transfer of technological knowledge in the context not only of inter-firm linkages within GVCs but also within domestic technological capabilities and local innovation systems. This comprehensive study concludes that “GVC studies tend to overlook the wide heterogeneity existing at the local level, as local suppliers in developing countries are very different in terms of their capacity to absorb, master, and change knowledge and capabilities that lead firms in GVCs can potentially transfer to them” (De Marchi *et al.*, 2015: 33).

A related critique by Sako and Zylberberg (2017)¹⁰ points out that while GVC governance theory recognises the active and extensive agency of lead firms i GVCs supplier agency is almost completely absent. They criticise GVC theory for not recognising that “suppliers exercise discretion not only over which capabilities to internalize, but also which client(s) to work for. These strategic decisions on the part of suppliers are seen to influence how inter-firm relationships are governed” (Sako and Zylberberg, 2017: 2-3). If suppliers do become able to provide inputs and services of greater value to customers, barriers to entry increase and supplier power rises. As a result, governance relationships and power asymmetries become more favourable to supplier agency and value capture.

The argument is that GHS and the subsequent GVC literature overemphasizes the importance of buyers and ignores the agency of suppliers and other actors in the places they touch down. Although detailed case studies (for example, of suppliers in East Asia in a volume edited by Kawakami and

⁹ In the case of Kenyan fresh vegetable exporters, for example, the research of Dolan and Humphrey (2000; 2004) found that exporters were able to offer UK importers and supermarkets ideas for new product development, but the overall message of the research was framed in terms of buyer control of day-to-day activities and performance.

¹⁰ Sako and Zylberberg examine the issues of supplier agency and value capture. The discussion here focuses on supplier agency only.

Sturgeon (2011)) emphasize how the development of firm capabilities is determined not only by the outsourcing strategies of lead firms, but also by the learning strategies of latecomer firms (Kawakami, 2011b: 5-6), this has not been central to much GVC work.

The critiques just outlined have important implications for GVC theory. The determinist critique is that the three variables put forward in GHS are truly exogenous determinants that arise from the characteristics of transactions (as is the case, for example, with the category of asset specificity in transaction cost economics), which leaves lead firms with a single, optimal governance choice. In addition, the functionalist critique is that GHS expects lead firms to be constrained to adopt the one optimal solution because failure to adopt it would lead to a loss of competitiveness. Hence, there is a direct link between transactional characteristics and governance outcomes that eliminates both agency and diversity. An alternative interpretation of GVC governance theory and the arguments put forward in GHS is provided in Appendix 1. This discusses an alternative conception of the meaning of “chain”, presents a different view about whether the three variables are exogenous determinants of governance choices, argues that the theory need not be interpreted as functionalist, and discusses the concept of lead firm.

2.3 From static to dynamic buyer-supplier relations

The world of suppliers and their relationships with customers, even in developing and emerging economies, is markedly more complex now than it was even 20 years ago. Global mega suppliers have emerged in both industrialised and emerging markets (Sturgeon and Lester, 2004), and increasing concentration among global retailers has driven concentration among suppliers and the emergence of “giant transnational contractors” (Appelbaum, 2008: 71). These new trends go alongside a greater appreciation of the role of suppliers as innovation leaders by authors such as Hsieh (2015). The need to refine an understanding of lead firms and their suppliers acquires even greater urgency because of the development of technology and market platforms that appear to radically alter interfirm relationships (Van Alstyne *et al.*, 2016).

Addressing these issues requires a rethinking of the theory of governance advanced in GHS that goes beyond considerations of supplier agency and the places where GVCs touch down in the global economy. Two changes in particular are required. The first is to move away from a static, contractual approach to the issues of establishing firm boundaries and managing external relations (as discussed by Rathe and Witt, 2001). The key question is not “At any given point in time, what is the most efficient way to define the boundaries of the firm manage relationship’s with suppliers?”, but rather “What are the governance implications of the need to manage technical change along chains in the context of competitive challenges, and what determines the location of innovative activities along chains?” The second is to incorporate a more sophisticated discussion of capabilities into the GVC governance framework. This requires a discussion of dynamic capabilities.¹¹

A step in this rethinking is set out in the following section. It discusses the capability approach — particularly dynamic capabilities. This is followed by an analysis of the factors that determine where innovation is situated in GVCs. Finally, it examines how the options available for businesses to acquire capabilities are constrained by architectural manipulation (Jacobides *et al.*, 2006). This allows a recognition of increasing agency and heterogeneity in GVCs while at the same time recognising that industry structures place constraints on what is feasible at any given time, or with any given level of resources.

¹¹ It should be noted that almost half of the analysis in GHS is devoted to a section entitled “dynamic value chain analysis: sectoral cases”. The four case studies describe examples of supplier innovation, supplier learning and the co-evolution of suppliers and buyers, but these insights are weakly reflected in the article's theoretical framework.

3 Suppliers and capabilities: a dynamic approach

The theoretical underpinnings for GHS were drawn from a range of sources that were deployed unevenly across the governance categories. Transaction costs economics and knowledge-based theories of the enterprise figure prominently in the explanations of captive and modular governance. These are linked, as much of the discussion of transaction costs in GHS focuses on the “mundane transaction costs” (Bair, 2005: 163) that arise from information transfer, rather than the costs involved in controlling opportunism. Drawing on the prior work of Sturgeon (2002), the modular governance category focuses on the role of product modularity in codifying knowledge and enabling firm boundaries to be drawn at “thin crossing points”.¹² Product modularity has the following impact on governance:

“In essence, the standardized component interfaces in a modular product architecture provide a form of embedded coordination that greatly reduces the need for overt exercise of managerial authority to achieve coordination of development processes, thereby making possible the concurrent and autonomous development of components by *loosely coupled organization structures*....using technological knowledge to create *modularity in product designs* becomes an important strategy for achieving *modularity in organization designs*.” (Sanchez and Mahoney, 1996: 64, stress in original)

This insight into the role of modularity in interfirm relationships could have been used to explore the issue of distributed design, but in GHS the main focus was on how modularity reduces the costs of coordination at any one point in time. This follows the efficiency maximisation approach used by both transaction costs economics and knowledge-based theories. Williamson takes transactional characteristics (uncertainty, frequency of exchange and transaction-specific assets) and argues that “The efficient organization of economic activity entails matching governance structures with these transactional attributes” (Williamson, 1979: 261). The knowledge-based approach adopts a similar logic: “The knowledge-based view suggests that firms organize to maximize the ease of communication—the transfer of knowledge—between the units involved in the product design process. These literatures also suggest strategies for achieving these goals and the resulting implications for the modularity of the firm’s organization.” (Hoetker, 2006: 502).

Alongside these theories, GHS also introduces the capability approach, which initially cites Penrose to explain why firms might outsource complicated tasks (Gereffi *et al.*, 2005: 81). Capabilities figure prominently in the explanation of relational governance, which introduces the ideas of complementary capabilities and tacit knowledge, drawn from the analysis of Palpacuer (2000). However, the capability discussion in GHS and in GVC analysis more generally should be considered as a lost opportunity. First, relational governance is by far the least discussed category of governance in the subsequent GVC literature. Captive governance and its implications for economic growth, incomes and livelihoods in developing and emerging markets was of much more interest to many GVC researchers.¹³ Second, the treatment of capabilities in GHS is limited. The term is used predominantly in the sense of an ability to perform some activity, without references to the deployment of tacit knowledge and skills that are hard to develop. These elements are central to the capability approach. Third, while the case studies

¹² This argument drew on the work of Baldwin and Clark (2000), whose arguments concerning standards and firm boundaries were developed further in a subsequent article by Baldwin (2008).

¹³ There are some exceptions to the neglect of capabilities and the implications of the capability approach within the GVC literature. Kaplinsky and Morris (2001) discuss capabilities in relation to upgrading and value capture. Palpacuer (2000) analyses firms’ organisational strategies in relation to the distribution of competences along chains or networks. This draws substantially on the management literature on core, complementary and standard competencies.

of value chain dynamics in the second half of GHS refer to increasing supplier competence, there is little discussion of how suppliers might acquire new capabilities or what determines the location of particular capabilities along and value chain. More in-depth discussion of the capability approach and its implications for the analysis of suppliers is required.

3.1 Static and dynamic capabilities

All theories of economic organisation are concerned with imperfect knowledge and uncertainty about the future. Langlois and Foss identify two categories of imperfect knowledge that are relevant to economic organisation: knowledge about how to produce and knowledge about how link one firm's production knowledge with another's (1999: 203). The first is about capabilities, and the second about qualitative coordination. GVC theory is stronger on the latter, but under-developed on the former. A third category of imperfection can be added to this list – imperfect information about markets. Sabel's concept of self-discovery (Sabel, 2012) emphasises the time and space-specific efforts required to identify market opportunities and devise ways of deploying resources to meet them. These imperfections and their uneven distribution across firms and locations provide a link to the technology and marketing gaps literature mentioned above.

The capability approach to industrial organisation views productive knowledge as the key to enterprise competitiveness. Within the literature on industrial organisation, capability has been defined as “the firm-specific and time- and space-contingent ability to perform a particular productive activity” (Jacobides and Winter, 2012: 365). The incremental and tacit accumulation of knowledge within the enterprise is the source of its specific competitive advantages:

“productive activities are not best understood as a matter of applying commonly accessible explicit knowledge ('blueprints') in the instantaneous and profit-maximizing combination of factors of production. Rather, such activities involve processes of accumulation of partly tacit knowledge through various largely incremental learning-processes (learning by doing, by using, and by searching). This tends to make the firm's course of development path-dependent. It is ultimately these properties that make firms differ.” (Foss, 1996: 17-18)

Capabilities are not acquired easily and cannot be transferred easily between firms. They arise in specific times and places (hence the importance of locality, local institutions, local business interactions and markets, and state institutions and support), and their uneven and differentiated distribution creates firm heterogeneity.

Two elements of the capability literature offer insights into how to think about suppliers in the GVC context. The first is the focus on capabilities that give firms a competitive advantage. For competitiveness and value capture, the ability to generate and manage valuable, rare, inimitable and non-substitutable (VRIN) resources are what matters (Pitelis, 2009: 1120; Madhok *et al.*, 2010: 98). These enable businesses to obtain rents at any given point in time (Ambrosini and Bowman, 2009: 29-30). However, such resources will always be subject to challenges from competitors and changes in the external environment. This leads to the distinction between ordinary and dynamic capabilities, as discussed by Teece (1997). Ordinary capabilities are those required to perform a set of activities correctly: “Ordinary capabilities can best be thought of as achieving technical efficiency and ‘doing things right’ in basic business functions: operations, administration, and governance” (Teece, 2015: 18). This characterisation corresponds to the static efficiency perspective in GVC theory — the best way to manage an outsourcing relationship at any given point in time.

Dynamic capabilities enable businesses to continually renew their resources and to sustain their competitive advantage: “The dynamic capability perspective focuses on the capacity an organization facing a rapidly changing environment has to create new resources, to renew or alter its resource mix”

(Ambrosini and Bowman, 2009: 29-30). They allow businesses “to continuously create, extend, upgrade, protect, and keep relevant the enterprise’s unique asset base” (Teece, 2007: 1319). These include the ability to identify new opportunities and new ways of meeting market challenges, as well as the ability to mobilise the organisation and its resources to meet these opportunities.

Teece focuses on the enterprise and its resources. The introduction of a GVC perspective reframes this issue to put dynamic capabilities in the context of buyer-supplier relationships. It is now common to talk about competition between supply chains or ecosystems (Hein *et al.*, 2020; Jacobides, 2019), and the discovery of new market opportunities and new ways of satisfying them might require simultaneous and coordinated action from multiple businesses along the value chain.¹⁴ This defines the key governance challenge as one of generating and managing change. The challenges of achieving such coordination may result in vertical integration. This is the finding of work on the hard disk drive sector: where periodic changes in substrate materials to increase storage capacity require changes in read-write mechanisms and uncertainties about interactions between the modules of the newly-designed product (Chesbrough, 2003: 182-84). However, Dibiaggio warns against generalising from such findings and concludes that “although designing the architecture of the system requires knowledge integration, this process need not necessarily be managed by a single entity but can be undertaken by a set of cooperating partners” (Dibiaggio, 2007: 246). In some cases, vertical integration may not be an option as firms outsourcing activities may have the expertise and tacit knowledge required to perform them.

At the level of the chain, dynamic capabilities are best characterised as the ability of suppliers and customers to respond to changes in the technological and competitive environment in coordinated ways that secure the value of their resources. This could involve suppliers innovating to meet new customer requirements, or suppliers anticipating or identifying new market opportunities independently or jointly with customers. A focus on dynamic capabilities puts innovation at the centre of GVC governance questions and responds to Langlois’ observation that the ability to generate technological progress is the central question for the analysis of network and hierarchical forms of industrial organisation (Langlois, 1998: 1-2). GVC governance theory has not provided an adequate understanding of the role of suppliers in this process.

The importance of dynamic capabilities in value chains is not limited to cases where businesses are operating at the technology frontier. A dynamic chain capability is one which enables a business to adapt to a changing environment, both internally and in conjunction with other chain actors. This could mean making incremental changes that improve performance or modification of inputs and products in response to the differentiated and changing needs of different markets (Bell and Pavitt, 1993: 162). This idea follows Hobday’s argument on technological capabilities in latecomer firms, which makes a distinction between innovations that are “new to the firm, rather than to the world marketplace” (Hobday, 1995: 1190). Such innovations still require efforts to adapt knowledge and equipment to local conditions and existing capabilities. Equally, finding new opportunities and then finding, adapting and deploying the knowledge and equipment necessary to take advantage of them can be a challenging and often idiosyncratic process.

The analysis of the Taiwanese bicycle industry by Hsieh (2015) provides a rich account of the ways in which suppliers contributed to technical advances that enabled the industry as a whole to move into new product designs and greatly increase its exports of high-value complete bicycles and components. One of the innovations analysed by Hsieh is the introduction of aluminium frames, and the study shows how one specialist frame manufacturer (i.e., a supplier) worked with an international aluminium company (Alcoa and one of its subsidiaries) to acquire knowledge about welding and heat treatment, and also worked with local aluminium producers to gain access to local supplies of aluminium of a

¹⁴ The conditions under which suppliers might initiate such changes are discussed below.

grade and quality sufficient for frame manufacturer (Hsieh, 2015: 349-52). The insights to be drawn from this analysis are:

- The role of industry specialists such as Alcoa, which was facilitated by the fact that the subsidiary which possessed the specialised knowledge about welding aluminium was not competing directly against the Taiwanese company with which the specialist knowledge was shared.¹⁵
- The need for firm-level problem-solving by suppliers.
- The importance of knowledge gained in one sector that could be used for problem solving in another. In the case of local aluminium suppliers, for example, products ranged from relatively simple aluminium windows to complex products for the aerospace industry. This provided a broad range of local knowledge that could be tapped by cycle frame manufacturers.
- The innovation capabilities of suppliers derived in part from learning from customers based in multiple industries and then applying this knowledge to related problems faced by other customers. The concept of “technological convergence”, developed by Rosenberg (1963), analyses the common technological problems and solutions that arise across multiple industries.
- Agency matters — an individual firm set out to solve the problems involved in introducing what was for them a new technology. However, the exercise of this agency was only made possible by the prior distribution of innovation capabilities across firms in the bicycle industry in the locality, as well as technological convergence across the aluminium industry. In other words, agency has to be placed in the context of structure, and this is discussed further below.
- The relationships that drive innovation in the bicycle sector rely on established interfirm networks and local governance arrangements that made complex collaborations manageable. Locality and history matter.

3.2 Suppliers, innovation and dynamic capabilities

It is possible to find suppliers in developing and emerging economies that have acquired the capacity to develop new products and processes that are valuable to their customers. The challenge is to explain the conditions under which suppliers are likely to possess such capabilities and what this implies for relationships between suppliers and their customers. There are three questions:

- What are the factors that drive vertical integration and the concentration of innovation in lead firms?
- When does supplier-led innovation and specialisation offer efficiency advantages?
- If suppliers do possess important capabilities, what are the implications for chain governance?

Langlois (1998) explores the first question by making a distinction between autonomous and systemic innovation. Autonomous innovation, which by definition means innovations that can be contained within modules, should allow for vertical disintegration without any cost penalties. As long as changes are kept within the design boundaries set by the overall product architecture and its design rules there is no need for extra-module coordination, providing the boundary of the module coincides with the boundary of the firm. In contrast, systemic innovation “requires simultaneous change in many different stages of production” (Langlois, 1998: 2), and in these circumstances vertical disintegration is likely to incur a cost penalty because of the complexity of coordinating such changes across firm boundaries. The issue is not simply one of information exchange. Langlois’ work on dynamic governance costs points to the “costs of persuading, negotiating, coordinating and teaching outside

¹⁵ A line of argument that highlights non-monetised exchanges of knowledge and collaborative innovation is provided by Baldwin and von Hippel (2009).

suppliers” (Langlois, 1992: 113). The process of innovation itself is also uncertain. Design interdependencies create complex problems, solutions of uncertain value (to the chain as a whole and to individual firms) and situations in which the firms involved can skimp on solutions and may lack incentives to invest (Baldwin, 2008: 170-71). Furthermore, uncertainties about future innovation requirements and their implications for firms along the chain make it difficult to contract for in advance.

As was noted above, however, systemic innovation does not automatically lead to vertical integration. The cost element has to be balanced against benefits. The standard benefits of outsourcing and vertical disintegration from a transaction cost perspective are economies of scale and risk pooling (Williamson, 1979: 245). These are the static costs to be found in equilibrium. Dynamically, Langlois points to the ability of outsourcing to draw on a wider range of capabilities. Autonomous innovation and specialisation create the “ability of networks to access a larger and more diverse pool of relevant capabilities” (Langlois, 1998: 2).¹⁶

In addition to this, Rosenberg (1963) provides an argument about supplier specialisation and learning, based on the growth of the machine-tool industry in the United States in the 19th century. This saw the emergence of specialist equipment suppliers, particularly in the textile and metal cutting sectors. Rosenberg argues that in the early part of the century, US manufacturing businesses produced much of the machinery they needed to carry out their operations: textile companies produced textile machinery, for example. Over time specialist manufacturers emerged. These had the advantage of supplying machinery to multiple companies within a given sector, enabling economies of scale and risk pooling. In addition, they could use the same machine-building skills to supply businesses in other sectors — a process seen particularly clearly for machine-tools used for the cutting and shaping of metals. Hence, “A major episode, then, in the process of industrialization lay in the emergence of a specialized collection of firms devoted to solving the unique technical problems and mastering the specialized skills and knowledge requisite to machine production” (Rosenberg, 1963: 418). Strong learning effects arise from this cross-industry convergence of technologies, and this promotes the spread of innovations across a range of industries. Rosenberg suggests that this was typical of various US industries in the late 19th and early 20th centuries, including railroads, sewing machines, bicycles and vehicles (1963: 419-20).

These types of supplier-user relationships can involve a variety of different governance arrangements. First, in the case of specialised machinery and technologies that are widely used across industries, the incorporation of the technology into machinery or materials can often be managed by arm’s-length market relations. A single footwear machinery supplier might supply standardised machines and inputs to a large number of footwear manufacturers with little or no customisation to specific needs. A supplier of specialist fabrics might do the same. Platforms may also take this route. Platform suppliers can package core components in standardised forms that can be integrated into final products by customers that have limited technical skills. This is the argument advanced by Watanabe (2014) in a collection of articles on the role of core technology suppliers in facilitating final goods production by Chinese firms across a broad range of industries. In the case of mobile phones, for example, the core chipset may be sold as a standardised package that many downstream users can use, with their customisation and innovation confined to peripheral items, as seen in the use of such core chipsets by small handset manufacturers in China (Ding and Pan, 2014). Second, the development of industry-wide standards can be a route to managing change across multiple enterprises. Such standards can be sponsored by particular enterprises, developed by standards-setting organisations and coalitions or mandated by regulatory authorities (David and Greenstein, 1990: 4). Third, more complex relational governance may be required to manage change in fast-evolving products and industries where the benefits arising from innovations that have cross-modular implications become sufficiently strong to outweigh the benefits of staying within the limits established by a particular product architecture, even

¹⁶ The argument about enlarging the talent pool is particularly relevant for the analysis of platforms.

if the former increases coordination and dynamic governance costs. This has been seen clearly in the case of mobile businesses in China. As Chinese handset manufacturers moved upmarket and closer to the technology frontier, they began to become involved in product innovations that had implications that stretched across firm boundaries, including the core chipset manufacturers, camera makers, software suppliers and battery and memory management businesses. These required cross-module collaborations for design and joint troubleshooting of unexpected problems and interdependencies between the different elements of the final product (Humphrey *et al.*, 2018: 414-15; Ding and Hioki, 2018). Fourth, in the case of suppliers that “provide high performance inputs into complex systems of production in the form of machinery, components, instruments and software” (Bell and Pavitt, 1993: 178-79), there is likely to be a high degree of joint design and problem-solving between supplier and customer, which also creates interdependency and complex transfers of tacit information.

It becomes clear that the key factor in these relationships is the relative levels of the capabilities of suppliers and customers. The value of the knowledge and capabilities possessed by a supplier has to be considered in relation to the knowledge and capabilities of the customer. The relationships between the two are changing as a result of globalisation. For example, Marukawa (2009) analyses the role of suppliers in providing both advanced components and technical support to assemblers in the Chinese motor vehicle industry. These global suppliers with long experience of automotive manufacture are able to provide a broad set of problem-solving services to relatively new Chinese automotive manufacturers. The established global automotive manufacturers do not require such services. Similarly, recent work by Ding (2020) has documented how specialised Japanese small suppliers have used the provision of specialist inputs and a range of problem-solving skills and services to their Chinese customers as a strategy to overcome their cost disadvantages relative to Chinese competitors. In these circumstances, suppliers may have opportunities to provide knowledge and capabilities to customers in one market that have been acquired partly through learning from more technological the incapable customers in other markets.

This has two implications for the discussion of suppliers and innovation in GVCs. First, the exploration of the potential role of suppliers in GVCs is not exhausted by a discussion of the conditions under which they might be able to escape the constraints of subordination to lead firms. Second, supplier-customer relationships may take very different forms according to the capability levels of each across different locations. There is agency and indeterminacy in GVCs, but there are also differences in the structural conditions under which suppliers can acquire and market VRIN capabilities, innovate within chains and improve their overall performance.

3.3 Industry architecture and architectural manipulation

The discussion of capability acquisition by suppliers (or firms in general) has to be put in the context of structural constraints, and the concepts of industry architecture and architectural manipulation are one way of doing this. The industry architecture concept argues that industry sectors have, at any one time, a characteristic division of labour between firms:

“The concept of industry architecture (Jacobides *et al.*, 2006) defines the ways in which roles are distributed among interacting firms. Industries have fairly well-established rules about what activities each party undertakes, as well as roles played by industry players. Industry architecture defines both the division of labour between firms and the division of surplus in industries, and provide the template for both ‘who does what’ and ‘who gets what’. Industry architectures are characterized [by] the distinct ways in which industries follow particular rules and how firms’ scope, roles, and relationships, account for the ways in which value gets both created and appropriated.” (Tee and Gawer, 2009: 219)

Industry architectures change over time, but in the short term they constrain available choices: firms “must choose from a realistic menu of what their transactional partners (with given capabilities) can offer” (Jacobides and Winter, 2012: 1370). These architectures do not arise simply from product or technology characteristics. They are shaped by the purposive action of firms that seek to strengthen their own position (creating entry barriers), weaken their direct competitors, and increase the availability of outsourcing options (by facilitating entry). This process is called “architectural manipulation”. A platform owner will seek an architecture that is particularly useful for preserving its platform leadership and increasing value capture, but the outcome is not necessarily “efficient” at the level of the industry as a whole.

The continuing power of lead firms and the resources that they have to change architectures is shown in the case of the auto industry by Jacobides *et al.* (2016). Certain structural characteristics of the auto industry — vertical integration, capital intensity and economies of scale, the use of proprietary (closed) standards, and the role of OEMs (assemblers) as system integrators with massive scale — restrict the entry of new competitors. They go on to show how, at a given point in time, lead firms in the industry adopted a policy of outsourcing that gave greater opportunities for suppliers to design substantial parts of passenger vehicles. Subsequently, when they (the OEMs) realised that this could allow substantially greater value capture by suppliers, they were able to reverse this policy. As a result, “To this day, OEMs do most R&D, develop product architecture, design specific models, and set (mostly proprietary) specifications for components” (Jacobides *et al.*, 2016: 1948).

Architectural manipulation is also central to the development and preservation of platform leadership. Barriers to entry are created in the segments occupied by lead firms and entry to complementary activities facilitated.¹⁷ Platform leaders attempt to protect their position against rival platforms by creating “imitation barriers”, often through increasing technological complexity and the use of proprietary technologies (Banalieva and Dhanaraj, 2019: 6), so that the platform becomes a point of concentration, or bottleneck. At the same time, they reduce the costs of entry into the complementor market by promoting standards and by providing “boundary resources” such as supplier development kits (SDKs), application programming interfaces (APIs),¹⁸ roadmaps to provide information about future developments and free or low-cost licensing of some intellectual property (Ghazawneh and Henfridsson, 2010; 2013). They facilitate entry for complementors (for example, producers of apps for mobile phones) while maintaining control over the platform needed for these complements to function. For a time, this may secure the position of the platform leader, particularly when network effects create monopoly or oligopoly providers, but it is always open to challenge, particularly when established practices are disrupted by technological change. The current disruption of the motor vehicle industry created by the transition to electric vehicles provides an example of a long-standing industry architecture that is now under threat.

Industry architecture and the strategies used by businesses to create it is particularly evident in the computer industry, in part because of the rapid pace of technological development and the clear impact of technological discontinuities on both product architecture and industry structure (for example, the introduction of smartphones). On a longer timescale, other industries undergo similar transformations. The shift in the garment industry from producer-owned brands to retailer and fashion-business brands described by Gereffi would be a case in point. As Duguid (2003) has

¹⁷ The extensive literature on platforms and complements discusses how the broader platform ecosystem includes the platform and the complements that provide or increase functionality for users. Creators of complements are not suppliers in the traditional sense, as they are encouraged to innovate (within platform limits) and may not have a transactional relationship with the platform (see, for example, Gawer and Cusumano, 2014; Hagi and Wright, 2015).

¹⁸ According to Wikipedia, an API is “a set of subroutine definitions, protocols, and tools for building application software.” Source: https://en.wikipedia.org/wiki/Application_programming_interface.

demonstrated, the placement of particular activities along the value chain (in this case, the location of branding) is an outcome of intense competition between different actors in the chain and is not simply determined by “efficiency” or product characteristics. Rent capture is the key factor — both directly through ownership of the brand and indirectly through the impact of branding on sourcing options. In the cases of branding of alcohol products analysed by Duguid, multiple competing models of branding coexist.

4 Conclusions

The parsimonious theory of GVC governance put forward in GHS has been criticised for being both deterministic and failing to provide a convincing account of the role of suppliers in GVCs. One area where these potential deficiencies emerge with clarity is in accounts of lead firm power in GVCs. These appear to demote suppliers to the position of objects without agency whose fate is determined by the decisions made by powerful lead firms. It has been argued that this conception of how GVCs operate arises, in part, from the importance of offshoring and outsourcing of low-skilled work in late 20th century globalisation.

This is now, at best, a very limited perspective. Empirically, globalisation has changed so rapidly in the first two decades of the 21st century that generalisations from the early stages of offshoring and outsourcing are poor guides to the dynamics of interfirm relationships in the current period. In particular, the rapid evolution of supplier capabilities in developing and emerging economies, combined with findings that show much more complexity and variability in supplier relations than GVC theorising has tended to recognise, makes a reconsideration of these issues urgent. While critiques of the approach set out in GHS have focused on the issues of determinism, functionalism and supplier agency (discussed further in Appendix 1), this paper has argued that a rethinking of the role of suppliers in GVCs can be supported by the incorporation of the capabilities approach and a recognition of the importance of dynamic capabilities in a more systematic way than that found in GHS.

This has five benefits:

- It provides resources for explaining observed heterogeneities in value chain structures across different countries and localities by emphasising the local and temporal aspects of capability acquisition.
- It offers a way of addressing an issue — the outsourcing decision — that GVC governance theory marginalised from the outset. GHS starts from the existence of outsourcing and focuses on explaining why this can involve different governance forms. Use of the capability approach would provide a better understanding of the make-in/buy-out decision and offer insights into the dynamic processes that lead to changes in the division of labour along GVCs.
- The capability approach also provides a basis for distinguishing between different types of suppliers and identifying those types of supplier activities that might favour the acquisition of capabilities that are valuable for their customers and hard for others to acquire. This then links the discussion of supplier agency to structural factors that constrain, but not necessarily exclude, their ability to take strategic actions.
- The capability approach and arguments about industry architecture and architectural manipulation provide a link between lead firm agency and industrial structure, and this offers a way of exploring the issue of power inequalities in global value chains.
- By picking up the concept of dynamic capabilities and applying it in the chain context, the argument points to the importance of seeing GVCs as dynamic, changing entities. This changes the discussion of governance from one of the efficient organisation of static relationships to the management of dynamic relationships and the role of suppliers in the overall competitiveness of GVCs.

The full implications of going down the capability route as a way of resolving the problems GVC theory has with suppliers have yet to be worked through, and this is the challenge that needs to be taken up.

Appendix 1: GVC governance theory: determinism and functionalism

The discussion of suppliers, supplier agency and the broader context within which chains operate frequently leads to claims that GVC theory is deterministic and functionalist, as expressed clearly in the following quote:

“In explaining the coordination of transactions between firms, GVC theory privileges these structural constraints rather than the intentional, strategic actions of firms...the ‘governance as coordination’ formulation reflects a key assumption of transaction cost economics, i.e. that the economy’s organizational forms emerge as efficient solutions to structural challenges of transacting, and particularly to problems associated with asset specificity.” (Gibbon *et al.*, 2008: 323)

These claims are often derived from the theory’s use of the chain concept, its incorporation of transaction cost economics, the development of a parsimonious theory based on three determinants, and the emphasis placed on the role of lead firm power in the shaping operation of GVCs.

A deterministic and functionalist interpretation of GVC theory can be elaborated along the following lines:

1. Consumer requirements in final markets are differentiated, and GVC theory is particularly concerned with trade in non-standard products that require more coordination than arm’s-length market relationships can provide. Customising products to particular market requirements has implications for product characteristics, and hence design, production and delivery.
2. Product characteristics determine transactional characteristics: asset specificity, degree of modularity, capability requirements etc. The three variables used to explain the five governance outcomes in GHS are determined exogenously by transactional characteristics.
3. The five outcomes are efficient solutions to governance challenges within the context of a given set of transactional characteristics.
4. Lead firms have the power to make decisions that shape value chains and allow them to decide which governance options to implement.
5. Competition between firms (and chains) ensures that the most efficient outcome will be achieved. Businesses that fail to adopt the governance solution indicated by the transactional characteristics will not survive. March and Olsen (1984: 735) refer to this as the assumption of historical efficiency.
6. The consequences for suppliers are that they cannot exercise agency and their only options are determined by the efficient outcomes implemented by lead firms.

This appendix considers these arguments by examining four issues: the chain concept, determinism, functionalism and lead firms.

A1. What is meant by a “chain”?

The idea of a linked sequence or chain of activities contributing to the production of a product is central to GVC framework and its antecedents. This idea is not unique to GVC theory. Yi (2003: 53) refers to “a sequential, vertical trading chain stretching across many countries”. Feenstra (1998: 36) refers to activities outsourced by large corporations as “part of their larger ‘value chain,’ which include all the activities from the conception of a product to its final delivery”. A widely definition of a global value chain comes from Kaplinsky and Morris (2001: 4): “the full range of activities required to bring a product or service from conception, through the different phases of production (involving a

combination of physical transformation and the input of various producer services), delivery to final consumers, and final disposal after use.”

Such definitions lead to the criticism that value chains in GVC theory are “simple linear *chain* formations” (Coe and Hess, 2005: 453, stress in original). But, Kaplinsky and Morris follow their definition immediately with the observation that real-world value chains are considerably more complex. Similarly, Gereffi’s characterisation of a global commodity chain as a sequence of value-adding economic activities is followed by a diagram that shows different actors and multiple routes that products might take as they move between producers and consumers (Gereffi, 1994: 97-98).

Chains may not be linear, but the conception of a chain of activities running from conception to disposal/recycling has two substantial problems. First, how is it possible to establish where a chain begins and ends? Does a chain that involves metal components “begin” at the point(s) where the metal ore is taken out of the ground, or is it necessary to go back further and analyse mining industry inputs— heavy vehicle production, power generation, explosives, shipping, etc.? Second, what is the relevant scope of the activities that contribute to the creation of a product and should be included in the value chain? Global commodity/value chain theories tend to focus on design, physical transformation and marketing, whereas Hopkins and Wallerstein (1977: 128) include the reproduction of labour as part of the commodity chain.

In fact, “chain” is better seen as a metaphor for connectedness and interdependence, as suggested by Sturgeon *et al.* (2008: 302). GVC governance theory is about different types of interdependence and how to manage them, and chain linkages only become interesting when interdependence has consequences.¹⁹ So, what is interdependence? The literature distinguishes between two types of interdependence — “sensitivity interdependence” and “vulnerability interdependence” (Baldwin, 1980: 476-77). In the context of interfirm relationships sensitivity interdependence means that one firm is affected by the actions of another. If Firm A reduces its prices, another firm, Firm B, is affected in some way (it might lose market share if it is a competitor, or find its costs are reduced if it is a customer). Vulnerability interdependence implies a stronger relationship. Baldwin defines this as a situation where there are “benefits that would be costly for one or both parties to forego” (Baldwin, 1980: 481). In other words, one firm’s actions could have potentially serious consequences for another. The seriousness of these consequences would lie on a continuum from ‘not very’ to ‘extremely’. The second definition is how interdependence has been mostly used in GVC governance theory, although recent analysis of power in GVCs has emphasised that indirect exercises of power through standards or norms can also have substantial consequences for other businesses (Dallas *et al.*, 2019).

Following this line of argument, a chain of transactions is a heuristic device whose usefulness depends upon the extent to which identifying transactional linkages allows key interdependencies to be located. The heuristic is certainly been useful for GVC theory is, as it drew attention to transnational production interdependencies not related to ownership. However, transactional linkages are neither necessary nor sufficient to create interdependence. They are not sufficient because commodities can flow between businesses without creating interdependence, as is the case with arm’s-length market transactions for standardised commodities. GVC theory focuses on the intermediate forms of governance, where interdependencies are more complex. Transactional linkages are not necessary for

¹⁹ This has two consequences. First, if a chain used standardised inputs to produce standardised outputs, both of which might be produced by many firms, governance issues would be uninteresting because switching costs would be so low as to eliminate most (if not all) interdependence. Second, the relevant parts of a chain for GVC analysis might change according to the nature of the problem being analysed. The construction and analysis of a “chain” to analyse the spread of foot-and-mouth disease in sheep might focus on livestock transport and markets, while a concern with quality and branding might focus on production and marketing. Any analysis of a chain has to be selective in order to be manageable, and selection depends on the issue to be explained.

interdependence because it can arise in their absence. The analysis of market and technology platforms shows that actors within a product ecosystem can have a substantial impact on other actors without having a direct transactional relationship. When Atari opened up its games platform to game developers, it managed it in a way that left it “unable to prevent entry of opportunistic developers, who flooded the market with poor-quality games” (Boudreau and Hagiu, 2009: 163). This had serious consequences for Atari.

The second problem with the chain heuristic is its focus on products and material flows. Rosenberg (1963: 422) rejected the Marshallian idea that an industry is constituted by “a collection of firms producing a homogeneous product — or at least products involving some sufficiently high cross-elasticity of demand”. While accepting that this is useful for many analytical purposes, he argues that it hinders the analysis of technological development in the 19th century, when the same capital goods and technologies were used across multiple industries. The same reservation applies to products that may be used in a variety of sectors. For example, South African leather is used to make both shoes and car seats. As a result, automotive trade policy (which at one time led to a rapid increase in exports of another car seats) had a significant impact on the shoe industry, but the chain metaphor would not have drawn attention to this. The same kind of considerations apply to agriculture, whose outputs are incorporated into a wide range of industries, including food, construction, pharmaceuticals, chemicals, etc. Like all heuristics, the chain concept has advantages and disadvantages. Choosing an alternative concept such as network or ecosystem might create different advantages and disadvantages.

A2. Determinism.

The claim that GVC theory is deterministic and allows no space for agency rests largely on the claim that the three determinants of GVC governance forms — information complexity, codification and supplier competence — are exogenous variables. Complexity and codification would, in this view, be determined by the nature of the products and services transacted, and supplier competence also seen as exogenous to the transactions conducted. These “determinants” can, however, be viewed as the result of firm strategies, particularly those of lead firms.

Complexity of information. The complexity of information required to sustain a transaction is the result of the decision about the product characteristics that are required. GHS introduces this concept with a direct reference to strategy, arguing that “Lead firms increase complexity when they place new demands on the value chain, such as when they seek just-in-time supply and when they increase product differentiation” (Gereffi *et al.*, 2005: 84). Governance consequences arise from these decisions. In the case just mentioned, the introduction of just-in-time supply would place new demands on suppliers (at the very least, stockholding closer to the customer) and increase the vulnerability of both parties, but this is not determined by the nature of the product. Taking a different case, the decision by a company to seek assurances about suppliers’ labour standards would require changes by the suppliers, but this can be introduced in several different ways — through direct supervision, through company created and administered standards and through the adoption of independent standards regimes. The governance consequences of each would differ. GVC theory provides an account of the consequences of taking decisions targeting market segments and adjusting product design and production to meet the needs of these segments, but it does not define a one-to-one relationship between products and governance.

Codification. Codification is an important determinant of governance for GHS. Drawing on the work of Sturgeon (2002) and others, GHS emphasises the role of codification in reducing the costs of information transfer and the complexity of coordination. Technical standards provide, in the words of Sanchez and Mahoney (1996: 64), “embedded coordination that greatly reduces the need for overt exercise of managerial authority to achieve coordination of development processes.” Process standards (such as labour and environmental standards managed through standard schemes) also

reduce and outsource the costs of oversight. However, standards can be created and adopted in a variety of ways, and the processes frequently involves a competition and cooperation between firms, groups of firms, standards-making organisations and states (David and Greenstein, 1990). GHS has been criticised explicitly for focusing on the positive collective aspects of technological standards and ignoring competition (Wen and Yang, 2010: 2114), but GVC studies have recognised explicitly the issues of power and competition in standard-setting (Sturgeon and Kawakami, 2011; Ponte *et al.*, 2011).

Supplier competence. The prior discussion has already examined the reasons why GVC theorising and empirical research have tended to focus on the incorporation of latecomer firms into the global economy as suppliers, with the resulting emphasis on their (in)ability to meet the demands of global customers. The explanatory variable is not the level of supplier capabilities as such, but rather the relationship between the capabilities needed to complete a transaction successfully and the level of supplier capabilities. The latecomer firm argument provides a general explanation of why, in the context of the incorporation of new productive regions into the global economy, there might be an issue with supplier competence.²⁰ Lead firms can affect relative supplier competence through their decisions about what to outsource, through the selection of suppliers and locations, and through the extent to which they provide support for suppliers. These are influenced by factors such as costs in different locations and judgements about how to manage supplier performance risk.

A3. Functionalism

The critique of GVC governance theory as functionalist argues that it explains efficient governance choices as an outcome of the three transactional variables and assumes that efficient outcomes will be realised without providing an explanation of the processes that lead to it, or indeed the factors that might prevent efficient outcomes being achieved. Efficiency explanations are common in theories of industrial organisation. Transaction cost economics costs explains governance choices in terms key transactional characteristics that identify a most efficient solution: uncertainty, frequency of exchange, and the “degree to which durable transaction-specific investments are incurred” (Williamson, 1979: 239). Later in the same article, Williamson goes on to state that: “The main hypothesis out of which transaction cost economics works is this: align transactions, which differ in their attributes, with governance structures, which differ in their costs and competencies, in a discriminating (mainly, transaction cost economising) way.” (Williamson, 1991: 79). Similarly, the knowledge-based perspective of the enterprise sees interfirm relationships as seeking the minimisation of information costs (Hoetker, 2006: 502).

As Foss points out, this line of reasoning fails to explain how agents learn to produce maximising decisions, how institutions change and which agents are responsible for the changes (Foss, 1994: 10). Instead, there is a resort to general arguments relating to competitiveness as the force ensuring efficient outcomes are proposed (businesses that adopt non-efficient solutions fail to survive). This approach is “inclined to see history as an efficient mechanism for reaching uniquely appropriate equilibria, less concerned with the possibilities for maladaptation and non-uniqueness in historical development” (March and Olsen, 1984: 735). The challenge for theories of the firm and theories of globalisation (including but not limited to GVC theory) is not to provide an argument in favour of indeterminacy — that things are more complicated and less predictable than parsimonious theories would imply — but rather to provide an account of evolution of the global economy that explains recent changes in capabilities, institutions and agents. Much of the empirical work in the field of GVCs and GPNs has paid attention to these questions. The task is now to incorporate this into theory.

²⁰ Other GVC theorising, particularly in relation to upgrading, does put forward arguments about whether lead firms would promote or hinder the acquisition of capabilities by suppliers and distinguishes between different types of upgrading in the capabilities related to them (Giuliani *et al.*, 2005; Humphrey and Schmitz, 2002; Pipkin and Fuentes, 2017).

A4 Lead Firms

A final question that requires further attention is what is meant by “lead firm” in GVC theory. This term is used extensively across large parts of the GVC literature, with similar or identical terms being used in other approaches to firm linkages in the global economy (see note 2). Despite the centrality of the concept, its definition is not always clear. GHS refers to “lead firm” 27 times without providing a definition. In practice, the GVC literature tends to define lead firms by describing what they do:

- Choosing the characteristics of the output of the chain (i.e., selecting the characteristics of the product and hence the target market — typically, in situations where product differentiation is an element of competitive strategy).
- Inclusion/exclusion — supplier choice. In addition to this, there are further strategic decisions relate to sourcing strategies: the number of suppliers, which countries to source from, etc.
- Distribution of activities. This is sometimes referred to as bundling and splitting. Which activities are bundled together within the single enterprise, or at a single location?
- Monitoring performance. As the performance of actors in the supply chain has nontrivial consequences for supermarkets, controls over performance are required.²¹

A second approach is to emphasise the role of the lead firm in making the decision to place a product on the market and initiate a production process: “Lead firms, at the very least, set product strategy, place orders, and take financial responsibility for the goods and services that their supply chains churn out” (Sturgeon, 2009: 129). In an earlier article Sturgeon (2001: 11) states that lead firms are “firms that initiate the flow of resources and information through the value chain by developing and marketing final products.”²² It is not clear how much this differs from the “shaping” definition. Does any firm that initiating production count as a “lead firm”? If such a firm relied totally on readily-available parts and components and made a product similar to that of many other businesses, would it still be a “lead firm”? Or do phrases such as “set product strategies” and “developing and marketing final products” in the quotes above imply more than this?

A third approach would make an explicit connection between lead firms and power. The two previous conceptions of lead firm were developed at a time when power in GVCs was viewed almost entirely as “exercised by well-defined actors with the resources to engage in intentional action to achieve clearly defined outcomes” (Dallas *et al.*, 2019: 671). Dallas *et al.* see direct and dyadic power relations as one, but only one, form of exercising power and argue effectively in favour of complementing this “coercive” power with agenda setting power, preference shaping and the social construction of routines and practices. If lead firms are seen as those that exercise power in one or more of these ways, then lead firms could include those which define product architecture or standards, or play a role in establishing industry-wide norms that constrain or enlarge the options open to other firms. One implication of this is that platform leaders also included in the category of lead firm. Another is that instead of expecting to find a single lead firm in a value chain, there might be a constellation of firms with different levels of power that may be exercised across different choice areas.

²¹ It is worth noting that this list fails to include reference to the specific capabilities of lead firms and how they are required. By focusing on outsourcing and its management, GVC theory tends to leave the internal operations of the lead firm as a black box.

²² Cited by Kawakami (2011: 19).

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