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GLOBAL VALUE CHAINS IN MANUFACTURING INDUSTRY

Where they came from, where they are going and why this is important

Raphael Kaplinsky

Introduction

This chapter focuses on the origins and trajectories of global value chains (GVCs). It charts their growing significance in global trade and identifies a series of literatures which have documented their global extension. The early documentation of dispersed global production chains was often largely heuristic. By contrast, the contemporary GVC literature is rich in theory and provides important insights into the dynamics of the global economy and the distributional outcomes of growth. The transformation of a heuristic framework into an analytical framework draws on a series of theoretical constructs, namely on changing market dynamics, core competences and rent, chain governance, upgrading, embeddedness and the subordination of labour. The chapter concludes with a discussion of possible future dynamics in GVCs, and in particular the potential impact of the emergence of low and middle income rising powers.

Simple and complex definitions

In its simplest form the value chain (VC) describes the full range of activities which are 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. However, contemporary VCs are considerably richer and more complex than this simple description. The purpose of this chapter is to explore these complexities to show the analytical strengths of VC analysis and to show their dynamics.

The simple definition of a VC provided above is a heuristic device which recognises that the life cycle of production, distribution, consumption and recycling of a product (a physical good or a service) involves a series of discrete and linked activities. It enables us to identify and plot each of these discrete links in the chain. What it does not do is tell us anything about the coordination and governance of these diverse activities, the geography in which these activities are located, their consequences for the distribution of incomes in the chain, or their

impact on the environment and their sustainability. Contemporary VC literature therefore seeks to move beyond heuristic description and to provide an analytical framework which helps us to understand the economic, social, political and environmental dynamics of the evolving global economy.

In this introductory discussion we briefly outline the significance of VCs in the global economy. Because many chains have become increasingly global in their geographical spread, we will therefore refer to these chains as global value chains. This is followed by a discussion of the diverse origins of the GVC. This helps us to understand the multiple ways in which the GVC concept is used in much of contemporary analytical and policy discourse. In the second section we focus on the analytical underpinnings of the GVC framework. The chapter concludes by focusing on the dynamics of contemporary GVCs.

The growth of GVCs

For reasons which will be elaborated in the second section below, two central features of VCs are that they have become increasingly fractured (a growing number of links in the chain) and that chains have become increasingly dispersed globally.

The depth of integration of the global economy has grown in recent decades. The ratio of global exports to global GDP more than doubled from 11.4 per cent in 1970 to 26.1 per cent in 2009 (falling back to 16 per cent in 2012 as a consequence of the global financial crisis).[1] A similar process of global integration occurred in the second half of the nineteenth century. This earlier phase of integration (which Baldwin refers to as the 'first great unbundling') involved trade in primary products and in final products driven by improvements in transport infrastructure (Baldwin, 2013). By contrast, the 'second great unbundling' after the 1950s saw a dramatic growth in the share of semi-processed intermediate products in global trade, increasingly driven in recent decades by advances in information and communications technology (for both IT and transportation systems). By 2012, more than half of total global merchandise exports and more than half of traded services comprised intermediate products and services (Miroudot *et al.,* 2009).

Behind these trends in global macro aggregates lies the restructuring of production in GVCs. The well-known example of the Apple iPhone4 illustrates this well. Each device retailed at just under $500 in the USA. The phones were exported from China – 'made in China' – at a unit price of $179. But the value added in China was only $6.50, with the balance made up of imported components (for example, valued at $80 from Korea, $25 from the US and $16 from Germany), and service payments to Apple in the USA (Xing and Detert, 2010).[2] This reflects a production chain in which parts are sourced from all over the world, are assembled under Apple's design in China and then branded and marketed in the USA and other final markets. A similar process of fragmented production can be observed in the aerospace sector (Figure 11.1).

This structure of production involving the fragmentation of production across national borders is evidenced in an increasing number of sectors, in both physical goods and services. So great is the resultant trade in intermediates, that according to the World Trade Organisation, 28 per cent ($5tr out of $19tr) of global trade in 2010 involved double-counting, that is the value of intermediate products traded directly across national borders and indirectly as subsequently incorporated in final products (UNCTAD, 2013a). Reflecting the pervasiveness of these GVCs, particularly in manufacturing, most of the world's exporting firms thus combine imported inputs into final products. In the USA in 2011, firms that both exported and imported accounted for 92.5 per cent of all US exports and 84.4 per cent of all imports (US Census Bureau News, 2013).

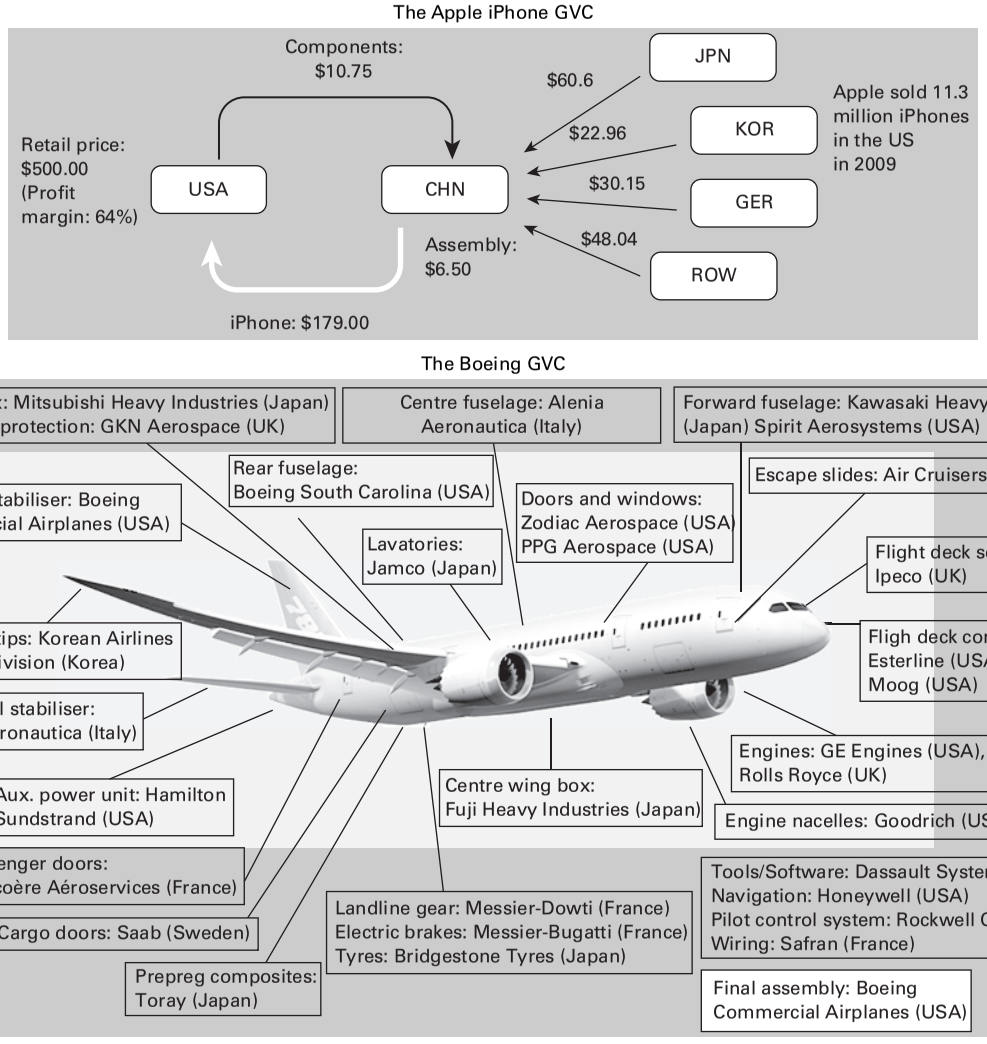

Figure 11.1 GVCs in the mobile and aerospace sectors.

Source: Provided by Sebastien Miroudot, and drawn from Xing and Detert (2010) and www.newairplane.com.

The origins of the GVC framework[3]

There are multiple origins to the GVC framework, some of which developed independently and others which reflect a process of explicit cross-referencing. It is possible to identify six loosely clustered families of literature. The boundaries between these families are porous and some of the contributions span more than one category. The taxonomy is, however, useful since it helps to explain why it is that the GVC concept often means different things to different people and why GVC analysis is sometimes pursued under different labels.

The division of labour

A key component of the GVC framework is the decision between in-house versus outsourced production. The roots of this discussion can be traced back to Adam Smith. His discussion of the division of labour transcended the enterprise and identified the growing role of a specialised capital goods sector (Smith, 1776). Moving on a couple of centuries, Williamson's analysis of why large firms may wish to internalise production – a reduction in transaction costs, the asset-specificity of some inputs and the inability to trust suppliers – provides important insights into equity-based GVCs (Williamson, 1985). But not long after Williamson's contribution, it became increasingly clear that large firms were bent on outsourcing non-core-competences (Hamel and Prahalad, 1994). To protect themselves from the costs identified by Williamson they were required to engage in structured processes of supply chain management (Park *et al.*, 2013). The experience of Toyota in the management of suppliers in the 1970s and 1980s (Cusumano, 1985) was critical in the extension of supply chain management across a swathe of industries.

The filiere, the value stream and beneficiation

French scholars focused on the structure of value added in US agricultural research to analyse the processes of vertical integration and contract manufacturing in French agriculture during the 1960s (Raikes *et al.*, 2000). It was then applied in French colonial agricultural policy and, during the 1980s, to French industrial policy, particularly in electronics and telecommunications. Although there is no conceptual reason why this should have been the case, in general filiere analysis was confined to domestic value chains, thus stopping at national boundaries.

Although not linked in any explicit manner to the thinking on filieres, Porter's analysis of value streams after the mid 1980s (Porter, 1985, 1990) similarly identifies the significance of different links in the chain, but without any analysis of the power relations which this involves. His analysis of the value stream distinguished two important elements of modern value chain analysis.

First, he decomposed the different activities which occurred within particular links in the chain. Porter made the distinction between different *stages in the process of supply* (inbound logistics, operations, outbound logistics, marketing and sales, and after sales service), the *transformation of these inputs into outputs* (production, logistics, quality and continuous improvement processes) and the *support services the firm marshals to accomplish this task* (strategic planning, human resource management, technology development and procurement). Second, Porter observed that these functions need not be performed within a single link in the chain, but may be provided by other links (for example, by outsourcing). Confusingly, Porter refers to these essentially *intra-link* activities as the value chain and what is now referred to as the value chain (that is, all links in the chain), as the *value system*. Analysis which built on this tradition further confused nomenclature

by characterising Porter's 'value system' (which we call the 'value chain') as the 'value stream' (Womack and Jones, 1996).

A complementary stream of analysis on the structure of value chains is the literature on the distribution of rents along primary commodity value chains. During the 1970s and 1980s, in part responding to the growing recognition of the significance of transfer pricing, UNCTAD produced a number of reports charting the successive links in a series of commodity chains (Girvan, 1987). The relevance to the GVC framework was the fact that VCs crossed national borders and that the chain analysis could be used to understand comparative income growth, industrial diversification and employment creation. More recently, there has been a growing clamour for downstream linkages to be deepened in Africa's primary commodity sectors (UNECA, 2013), flying under the banner of 'beneficiation', a phrase coined in South Africa around the time of majority rule in 1994 to reflect the desire to deepen the downstream processing of minerals.

World Systems Analysis and the New International Division of Labour

In many respects, World Systems Analysis (Hopkins and Wallerstein, 1986; Wallerstein, 2000; Arrighi and Drangel, 1986) closely resembles the UNCTAD programme with its focus on sequential stages of value accretion in global chains and a concern with the global distribution of incomes (Bair, 2009). But it goes beyond this largely filiere-based framework to extend the discussion to long term dynamics in the global economy. It traces back the global division of labour in the primary sector to the origins of capitalist-driven trade in the seventeenth century. Referring to these as 'global commodity chains', it draws on this division of labour and the associated income returns to identify a world of an unchanging hierarchy of core and peripheral economies.

Putting flesh to the World Systems Analysis and similarly influenced by a radical critique of contemporary capitalism, the New International Division of Labour literature led the way in documenting the global fragmentation of production in the apparel VC (Frobel *et al.*, 1980). It focused on the German clothing sector, describing how labour-intensive stages of the production process had been outsourced to low wage economies.

From global commodity chains to global value chains

Drawing explicitly on the World Systems literature, in 1994 Gereffi made the decisive contribution which transformed the heuristic and descriptive analysis of Porter and others into an analytical framework (Gereffi *et al.*, 1994). As such he can be anointed as 'parent' of modern GVC theory. His key contribution was to move the discussion from a description of *what is* to an explanation of *why it is* and *how it is*. Observing the increasingly rapid fracturing of value chains, and the cross-national nature of the consequent outsourcing, his central insight was to place power and governance at the centre of these trends. Gereffi argued that these chains – invariably involving complex relationships between independent firms – required coordination, and that this coordination had embedded power relations in which lead firms controlled the dynamics of the chain.

Gereffi characterised these governed chains as 'global commodity chains' and this remained the primary lexicon until 1999, when he and colleagues joined up with a group of British researchers working on globalisation (Gereffi *et al.*, 2001). This collaboration advanced the GVC analytical and research agenda in three important respects. First, recognising the ambiguity of the word 'commodities' (used both to describe primary commodities and undifferentiated factors,

products and services), the nomenclature was altered from global *commodity* chains to global *value* chains. In so doing, it also sharpened the focus of the GVC framework on value creation, rents and their impact on distribution. Second, recognising the intensity of global competition and the danger that insertion in GVCs might in some cases lead to a race to the bottom, upgrading was placed at the centre of GVC analysis (Humphrey and Schmitz, 2000; Kaplinsky and Morris, 2001). Third, as the unfolding research focused increasingly on the role of labour in GVCs and the environmental and social sustainability of GVCs, a global consortium of researchers, working with large buyers in Europe, the International Labour Organization and non-government organisations, adopted a more synoptic and normatively driven approach addressing the extent of trade-offs between economic and social upgrading (Barrientos *et al.*, 2011; Capturing the Gains, 2014).

Global production networks and embeddedness

Once the analytical framework moved beyond the push-factors driving outsourcing and the extension of GVCs, more attention was given to the determinants of successful incorporation in economies where outsourced production was located. Why were some low income economies more gainfully inserted in value chains than others, and why did production often occur in locations involving agglomerated clusters of producers? Thus, it was argued, 'place' and 'agency' belong more centrally to the analysis of the dispersion of GVCs, as does an analysis of industrial districts and industrial regions (Schmitz and Nadvi, 1999). In so doing, the networks associated with GVCs have to be taken account. This led to a family of research on global production networks (GPNs) (Henderson *et al.*, 2002: Coe *et al.*, 2008; Rainnie *et al.*, 2011). More recently, the analysis of embeddedness has been explicitly linked to the International Business literature on FDI, and has focused on the extent to which the embeddedness of subcontracting firms contributes to the sustainability of subcontracted production in footloose GVCs (Morris and Staritz, 2014 – refer to 'Embeddedness' below). Although often describing itself as presenting an independent perspective, in reality, good GPN research focuses also on vertical chain relationships, and good GVC research also addresses the embeddedness of local actors and the importance of national and regional systems of innovation (Parrilli *et al.*, 2013).

Economists[4]

Arriving relatively late on the stage (and around the turn of the millennium), economists began to take note of the significance of GVCs. Their concern was driven by the recognition that the aggregates which they were using for measuring production and trade were increasingly meaningless in a world of fragmentation. Moreover, they had come to recognise that world trade was increasingly dominated by trade in intermediate rather than finished products and that firms and countries were specialising in capabilities rather than products. This trend towards capability-specialisation poses a particular challenge to the Heckscher–Ohlin framework which has long dominated trade theory and which assumes that international competitiveness is explained by factor endowments.

There have been a variety of attempts to measure the importance of intermediates in trade (Miroudot *et al.*, 2009: Sturgeon and Memedovic, 2010),[5] and the difference between 'gross' and 'net' aggregates in measures of 'vertical specialization' (Hummels *et al.*, 2001). Extensive use is made of input–output analysis in the literature charting the complex flows of intermediate products in GVCs, albeit hindered by the fact that the sector classifications used in even the most disaggregated input–output tables are too blunt to capture the sorts of flows evidenced in

the detailed analysis of the iPhone described above. Drawing on these input–output tables, the World Trade Organisation and the OECD are together developing methodologies to capture these trends.[6] At the time of writing these are early attempts at cleaning up trade data, but they do hold potential and are crucial to a better understanding of the evolving nature of global trade and production for trade, particularly in relation to manufacturing (refer to UNCTAD, 2013b).

The analytical underpinning of GVC analysis

As observed earlier, the heuristic family of GVC analysis is strong on description and light on analysis. It tells us little of the why, the where and the how of GVCs, and does not provide substantive insights into policy. *Per contra*, by being analytically rooted, contemporary GVC literature is more useful in helping us to understand the dynamics of the global economy. In this section we consider six of these analytical underpinnings – the nature of final markets; core competences, outsourcing and rents, chain governance; the complexity of upgrading, embeddedness in production, and the subordination of labour as a determinant of location.

Market dynamics

The textbooks driving mainstream economic theory begin with an analysis of markets made up of arms-length transactions between anonymous partners. They also assume homogeneity and substitutability of undifferentiated output. Taken together these two assumptions were helpful in explaining industrial structure in the global economy until the late 1960s. This reflected a supply-pushed world in which producers sold into price-sensitive, predictable and relatively unchanging final markets generally characterised (in the post World War Two environment) by a shortage of supply.

This final market structure in the now high income markets began to change radically from the 1970s. It reflected the end of relative scarcity and the emergence of customers seeking for branded and individualised products. It also reflected a world of intensifying competition as trade barriers were lowered and global producers began to emerge. At the same time, new structures of production allowed producers to tailor their final products to these increasingly differentiating markets. In their path-breaking book, *The Second Industrial Divide* (the first divide being the transition to mass production in the first half of the twentieth century) Piore and Sabel (1984) characterised this as a process of flexible specialisation. The title of the book captures the increasingly niched basis of dynamic markets. But this fragmented market structure was subject also to increasing volatility and time to market became an imperative for profitable production (Stalk and Hout, 1990).

These changing market requirements placed enormous pressure on firms which had been accustomed to a world of stable and predictable markets which largely accepted their product offerings. They consequently had to find a way of adapting to this new competition, and one path to this was to refine and specialise their roles in their value chains. They did this in part by focusing on their core competences.

Core competences, outsourcing and rents

Core competences describe a series of capabilities which satisfy three basic conditions – they are unique to the firm, they are difficult to copy and they have a value in the marketplace (Hamel and Prahalad, 1994). In a world of growing knowledge-intensity in production, there is increasing space for unique capabilities. But at the same time, in a world of intensifying competition, there

is increasing pressure on what is unique to the firm. Unless firms can identify and protect these core competences they will find themselves subject to increasing competition and diminishing returns.

The logical outcome of the need to identify and exploit core competences is to give up on those parts of the chain which are not unique to the firm and/or which are easily copied. These non-core competences can then be outsourced to other parties in the value chain, subject of course to the firms capacity to manage this outsourcing structure (see below). In a world of falling trade barriers, declining transport costs (Kaplinsky and Morris, 2008) and the growing capabilities of information processing and communicating technologies, this outsourcing was increasingly global in nature. For many of the world's largest producers who had previously offshored parts of their internal operations to foreign subsidiaries to reduce production costs, this global outsourcing was a natural development of trajectories which they already had in place. For other key actors in global final markets – particularly in the increasingly concentrated retail sector in the USA and Europe (Hamilton and Gereffi, 2009; Kaplinsky, 2005) – global outsourcing had to be learned. But it was a lesson rapidly learned in highly competitive final markets.

Underlying these linked processes of core competences and outsourcing is the concept of rent. A rent is an attribute which is protected from competition. In Ricardo's original conception, rents were natural endowments, gifts of nature reflected in the differential productivity of parcels of land (Ricardo, 1817). But developments of the theory of rent see it as an outcome of agency – rents can be created or augmented. In the Schumpeterian and Marxian frameworks it is the pursuit of rent which drives innovation (Kaplinsky, 2005). But the capacity to generate rents through purposeful activity needs to complemented by the capacity to protect and appropriate rents, and it is here that intellectual property rights (patents, copyright and brand names) play such an important role in a world of intensive global competition.

A final characteristic of rents which helps to understand the extension of GVCs is that they are inherently dynamic. A special attribute today, despite intensive attempts to protect rents, may become a commodity tomorrow, that is, a product or service which has few barriers to entry. This understanding of commodities as activities and products without barriers to entry can be applied to factors as well as products. For example, labour and skills are inherently subject to rents. Some years ago, countries with developed primary education systems were able to generate rents from their labour forces. Nowadays it is vocational and tertiary skills, and the capacity of firm to develop internal routines and management practices (Teece *et al.*, 1994) which provide sustainable human resource rents.

Thus, rents are distributed through the chain and the core imperative is to focus on areas of high rent protected from competition. The balance of chain activities is outsourced. But this outsourcing has to be managed to both ensure systemic chain efficiency and to institute processes which ensure that the chain as a whole responds to changing market conditions. The management of these chain relations is characterised in the GVC literature as governance.

Governance in GVCs

During the 1970s and the 1980s, the Japanese auto firms rapidly penetrated the US motor industry. The initial reaction of the three major corporations was that this was a consequence of more rapid rates of automation in Japan and a subsidised yen. However, once they began to unpick the source of Japanese competitiveness, they came to understand that it arose largely from a series of organisational competences. These were both within the firm (for example, just-in-time production and total quality control) and in the management of

the supply chain (Cusumano, 1985; Hoffman and Kaplinsky, 1988; Womack *et al.*, 1990). Whereas the American firms were buying-in less than 30 per cent of their components and services, their Japanese competitors were outsourcing more than 40 per cent of these purchases. This enabled the Japanese industry to innovate more quickly, to respond more flexibly to final market volatility and to lower production costs. But to work effectively, it required tight control of supply chains, that is, a process of chain governance.

Governance is central to the GVC framework, but there is some confusion in the literature. Whilst it is generally taken to include the governance of offshored operations within globally dispersed firms, most of the discussion of governance is focused on the management of chains involving relations between firms with little or no equity links.

Initially, in his seminal contribution in 1994, Gereffi distinguished two major types of governance. The first was buyer-driven chains, where the lead firms were final buyers such as retail chains and branded product producers. These mostly characterised non-durable final consumer products such as clothing, footwear and food. The second governance type identified by Gereffi was producer-driven chains. Here the technological competences of the lead firms (generally upstream in the chain) defined the chain's competitiveness. Subsequently, Gereffi identified the emergence of 'triangular' chains in which the lead firm specified product requirements, and a systems coordinator took control of the outsourcing function and the management of the supply chain (Gereffi, 1999). Typically, in these triangular chains, the lead firms were based in final northern markets, much of the chain produced in dispersed locations in low income economies, and the network coordinators were based in Hong Kong (for example, Li and Fung in garments) and Taiwan (for example, Foxconn in mobile telephony).

However, since the buyer- and producer-driven archetypes were posed, GVCs have evolved in multiple directions, and it is now widely acknowledged that individual chains can be subject to multiple forms of governance. The most widely used framework for characterising governance types is that contributed by Gereffi and colleagues in 2005 (Gereffi *et al.*, 2005) (Figure 11.2). This identifies five different sets of relationships between firms in the chain. At the one extreme are the classic arms-length relationships in commodity markets; at the other extreme are the fully internalised operations of vertically integrated firms. Between these two extremes are various degrees of networked governance. Modular governance (for example in triangular governance) involves durable relations between lead firms and their suppliers and customers in the chain, but with low levels of chain governance. This is because characteristically, the key suppliers in the chain possess their own unique competences and this means that they are able to operate reasonably independently of the lead firm. Relational chains are chains with somewhat higher levels of governance, but where suppliers and/or intermediate suppliers possess competences of their own. They require less 'hand-holding' from lead firms than in modular chains. Finally, captive chains, involve suppliers or intermediate customers with low levels of capabilities, who require high levels of support and are the subject of well-developed supply chain management from lead firms.

In the early years of the extension of GVCs, outside of arms-length and internalised operations, chain governance more often than not involved captive suppliers and intermediate customers. But as capabilities have grown in many low and middle income economies, chain governance has tended to veer more towards the modular type. In many respects lead firms prefer this form of governance. It reduces the costs of supply chain management and allows lead firms to promote competition in their supply chains. The flip side, though is that many of the key chain intermediaries have begun to develop considerable competences of their own, and are emerging as competitors to the lead firms who have historically driven these chains.

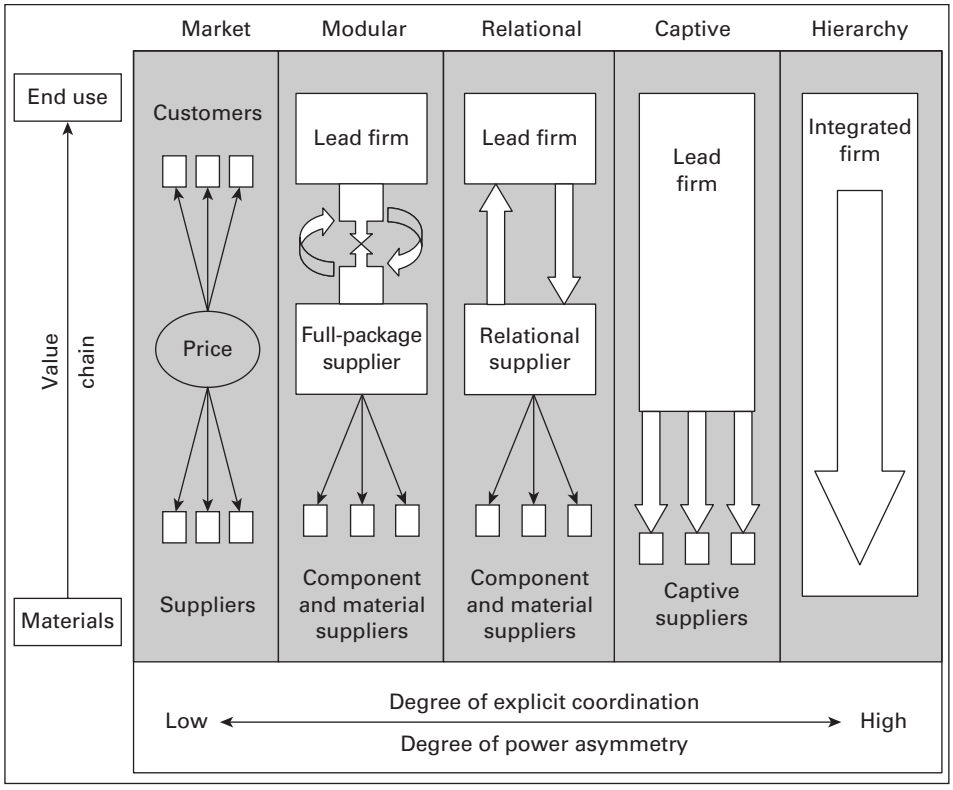

Figure 11.2 Five types of value chain governance.

Source: Gereffi *et al.* (2005: 89).

Whatever the pros and cons of modular chains, the result has been a growing global concentration of both buying and supplying functions. Both involve a considerable increase in size which acts as a barrier to entry for new producers, for small producers and for technologically weak producers (Gereffi and Lee, 2012). China may have found it easy to enter GVCs in the 1980s and 1990s; the same can probably not be said to be the case for emergent potential suppliers in Africa and elsewhere in the early decades of the twenty-first century (Gereffi, 2013).

Standards are a central component of governance in virtually all chains. These standards play a critical role in deciding who is incorporated in the chain, what they do in the chain and how they perform their allotted tasks. There are four sets of standards which perform these allocative functions (Kaplinsky, 2010):

- The first is corporate standards which are internal to the chain. Typically they address quality, cost and delivery (QCD), and increasingly also environmental processes. These are used to specify the requirements of the lead firm for supplier firms to ensure systemic chain competitiveness. An ability to innovate is another critical component of supplier performance, but is typically not measured in the same way as quality (parts per million defects), 'cost-down' (a specified annual decrease in unit prices) and delivery (percentage on time delivery, agreed batch-sizes). Some of these standards may be firm specific.
- The second set of standards is generic, and may be industry specific or relevant across a range of sectors such as ISO9000 standards on quality and ISO14000 on the environment.

The two other sets of standards are defined externally from the chain:

- The third consists of those set by governments (for example food safety standards) and international bodies (for example, EU farm-to-fork standards).
- The fourth category of standards is those emerging from civil society, such as labour standards, organic standards and fairtrade certification.

As a general rule, corporate, industry and regulatory standards are non-negotiable – the supplier either performs or does not perform, and the product either does or does not qualify for market entry. By contrast, civil society standards are seldom mandatory but affect the market niche in which the VC inserts itself. Typically, civil society standards tend to involve participation in higher margin niche markets.

However, whether optional or mandatory, a common characteristic of standards is that they involve upfront expenditure (even though many of the corporate standards do ultimately reduce costs) and generally require a literate and numerate labour force. These requirements often act to exclude small scale and informal producers, who are further disadvantaged by the costs of (generally renewable) accreditation. On the other hand, standards are often an important conduit for capability-building, hence diminishing the learning involved in exporting.

A recent phenomenon of potentially high significance is the extent to which standards are involved in GVCs which sell into low and middle income markets (Kaplinsky *et al.*, 2011). Lead firms from these importing economies may have fewer and less exacting corporate standards; the regulations affecting entry into these markets (for example, those governing food safety) may be less well developed, and the pressure exerted by civil society groups in low and middle income economies tends to be lower. One consequence of the lower standards-intensity of southern markets is that it reduces the barriers to entry for small scale suppliers in these chains.

The complexity of upgrading

As observed above, in the context of intense global competition, rents are inherently dynamic. The degree of dynamism is a function of the depth of rents (that is, the margins which they provide) and the strength of barriers to entry. Even within intellectual property rights the relative strength of different barriers may vary – brand names, for example, effectively exist in perpetuity, whereas patents are time-bound. But even brand names are subject to erosion without heavy investments in promotion and in the development and consolidation of product attributes.

The continuous pressure on rents therefore means that throughout the GVC there is a continuous drive towards upgrading. In the past, innovation theory and the economics of innovation have focused on two major components of upgrading. The first of these is improvements in process, which may take an embodied form or reflect changes to organisation, within specific links in the chain or in the chain as a whole. The second of these more established forms of upgrading is improvements in products, which as in the case of process, may be in tangible products or services.

GVC theory adds two additional dimensions to this upgrading agenda (Humphrey and Schmitz, 2000; Kaplinsky and Morris, 2001). The first of these is functional upgrading, that is, changing position in the chain. This may mean engaging in links which are new to the firm – for example, moving beyond assembly to the manufacture of components, or developing capabilities in design or marketing. But it may also involve the vacating of existing links so that the firm moves out of manufacturing into design, rather than engaging in both manufacturing and

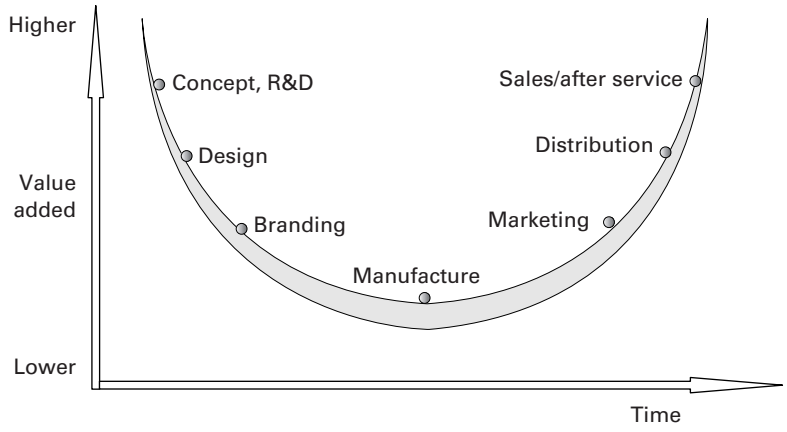

Figure 11.3 Functional upgrading and the Smile Curve.

Source: Park *et al.* (2013).

design. The final component of upgrading in the GVC framework is to move from one chain to another, in the way that Nokia progressed from rubber boots, through timber machinery to mobile telephony.

A widely used graphic which illustrates the nature of functional upgrading in GVCs is that developed by Stan Shih, the founder of the Taiwanese electronics and computer company Acer (Figure 11.3). This points to a strategy in which the firm moves from manufacturing (seen as 'low value added') to related services in the VC.[7] As a general rule though and as a direct consequence of the growth of manufacturing competences in China and other low and middle income countries, there has been a distinct trend across GVCs in very many manufacturing, agricultural and services sectors for the rents to shift from the embodied manufacturing processes to the knowledge-intensive disembodied links in the chain.

Embeddedness

GVC analysis takes a vertical slice of production and distribution and, as we have seen, addresses chains where these different activities cross national boundaries. At about the same time as the GVC framework was emerging, there was a complementary set of literature on the significance of industrial districts (sometimes referred to as clusters) (Best, 1990). Initially the focus was on the clusters in high income economies (the Emilia Romania region in Italy, Hollywood, Silicon Valley), but increasingly it became apparent that clusters were an important phenomenon in low income economies as well (Schmitz and Nadvi, 1999). These clusters described environments in which producers gain from their interaction with each other, from the proximity of buyers and sellers and from the local and national systems of innovation.

Thus whilst the GVC framework focuses on the 'stickiness' of vertical relations in the chain the cluster literature highlights the importance of horizontal 'stickiness'. The empirical literature suggests that, often, insertion into GVCs weakens the 'glue' in horizontal relations (Nadvi and Halder, 2005). Nevertheless, the importance of clusters in capability-building remains, and their significance has grown as lead firms increasingly search for dynamic suppliers which allows them to move from relational to modular governance. It not only removes the imperative for supplier development for the lead firms, but enables them to play suppliers off against each other. Hence, gainful insertion into GVCs increasingly requires the attributes which

clustering supports and it is for this reason that rigorous GVC analysis necessarily incorporates a focus on embeddedness.

Another reason why embeddedness is a core component of GVC dynamics is because it sharpens the focus on ownership. This is a neglected topic in much of the GVC literature, perhaps reflecting the transition from the dirigisme of the 1970s to the neoliberal orthodoxy of the 1980s and 1990s. Neoliberalism abjures nationalism and identity, viewing firms as homogenous entities driven by market parameters. But in fact, the location and sustainability of production in many GVCs, and its volatility, is crucially affected by the embeddedness of the key local actors. This, for example, has clearly been the case in Madagascar in recent years where the export-oriented garments industry, after years of dynamism, was heavily affected by the loss of market preferences after a military coup in 2012. The upshot was that many foreign investors withdrew from the sector. In contrast, locally embedded firms, made up of second and third generation non-citizen residents, continued to export by developing new markets. Regionally embedded firms, centred in Mauritius and offshoring labour-intensive activities to Madagascar, were also much less footloose than the Asian foreign investors (Morris and Staritz, 2014). A similar story can be told for Jordanian and Egyptian garment exports after the 2008 financial crisis. The Egyptian industry was dominated by embedded local actors and sustained exports. By contrast, the Jordanian industry comprised footloose Asian investors, producing with thin levels of value added, and this resulted in a more than 30 per cent fall in exports between 2008 and 2010 (Azmeh, 2013).

The subordination of labour as a determinant of location[8]

The mobility of capital is central to the GVC framework. The outsourcing of non-core tasks is partly about the division of labour between different knowledge-intensive firms and is thus a story of maximising innovative potential in the chain. But it is also a story about cost-minimisation. The ability to outsource production to sites of low labour costs is evidenced within the core economies (for example, the migration of industry from the 'rustbelt' to new sites with low levels of labour organisation in the USA – Storper and Walker, 1989). Export processing zones are a manifestation of this (global) flight of capital to sites of low wages and weak labour organisation.

However, the location of production is not only determined by the mobility of capital; labour mobility is also a crucial determinant of place. At the national level, much of the production in export processing zones occurs through the shift of labour from rural to urban areas. This is particularly prominent in the case of China (where until very recently, residence in urban areas was denied to rural residents unless they were employed in export-oriented processing zones). But the mobility is also an important determinant of global location within GVCs. Outsourced production in many chains depends heavily on skilled labour which is mobile and which can readily cross national boundaries. In this context, skilled labour includes not only high level skills from the core northern economies but also, and perhaps more importantly, intermediate and artisanal skills from low and middle income economies. The triangular systems which coordinate production in many GVCs are particularly prominent in marshalling these mobile skills. However, it is not only skilled labour which is mobile so that, in the most extreme form, the large export-oriented Jordanian garments industry is almost wholly staffed by unskilled Asian contract workers.

Bringing labour into the equation as a determinant of location necessarily requires the analysis to focus on the social construction of the labour force. In this sense, the discussion

is analogous to the incorporation of embeddedness in the understanding of the stickiness of offshored production in times of economic, political and industry turmoil. Migrant labour – particularly unskilled migrant labour – invariably involves the 'push' of 'surplus labour' from the rural areas, and their ghetto-isation in hostels in export processing zones. The working conditions and the low levels of end-of-contract pay in many of these export processing zones is less a matter of supply-and-demand than one of the subordination of labour. For whilst supply-and-demand may be a necessary condition for the flow of migrant labour, the effective harnessing of this labour force requires close collaboration between capital and the state.

The dynamics of contemporary GVCs

As we observed in the Introduction, GVCs are a phenomenon of the last four decades. They represent a new stage in globalisation – the 'second great unbundling' – involving the fracturing, decomposition and global dispersion of chain activities, driven by advances in information technology and the lowering of transport and coordination costs. The question is where this second great unbundling is going – what are the dominant trajectories which currently frame the global division of labour? Given the length-limitations for this chapter, this discussion will focus briefly on three dynamic characteristics involving GVCs – the thinning of value added at the firm and national level; the trajectory of functional upgrading; and the potential impact on GVCs in a world in which the increase in global demand is driven by middle and lower income economies. It goes without saying that this paints a broad-brush picture, and there will be many chains which will not reflect these trends.

The thinning of value added

Economies and firms on a growth path have historically sought to deepen their presence along the chain. In the clothing and textile sector, firms have targeted 'full package production' and governments have promoted industrial policies designed to foster production within the whole textiles and clothing VC. Their individual and collective ambition has been to deepen their share of the value added in final product value. We might refer to this as a 'classic' industrial policy designed to build full production capabilities (Figure 11.4).

However, entry into GVCs turns this classic strategy on its head. Instead of seeking full production capabilities with a deep share of chain value added, individual producers (and the economy) specialise in discrete outsourced segments of these value chains. At the extreme this may involve the mere assembly of shoes (yielding a value added per shoe of $0.23 in the Dominican Republic in the early 1990s – Kaplinsky, 1993) or the $6.50 share of the iPhone4 accruing to China in 2010 (Xing and Detert, 2010). But as time goes by, firms and countries which had begun by severely thinning their presence in GVCs deepen their participation beyond simple assembly, and seek to augment their share of final product value added. But, however great, this augmented share seldom reaches the levels sought (and sometimes realised) in the classic pre-GVC full production package strategy.

Linked to this shallowing, and subsequent deepening, of participation in the value chain and drawing on the insights which GVC analysis offers on upgrading (see 'The complexity of upgrading' in the second section above), it is possible to identify an upgrading trajectory which has been pursued in many successful Asian economies (Kaplinsky and Morris, 2008). This suggests a hierarchy of upgrading which is illustrated in Figure 11.5 through the example of the manufacturing sector. The firm enters the GVC by merely assembling to the designs of

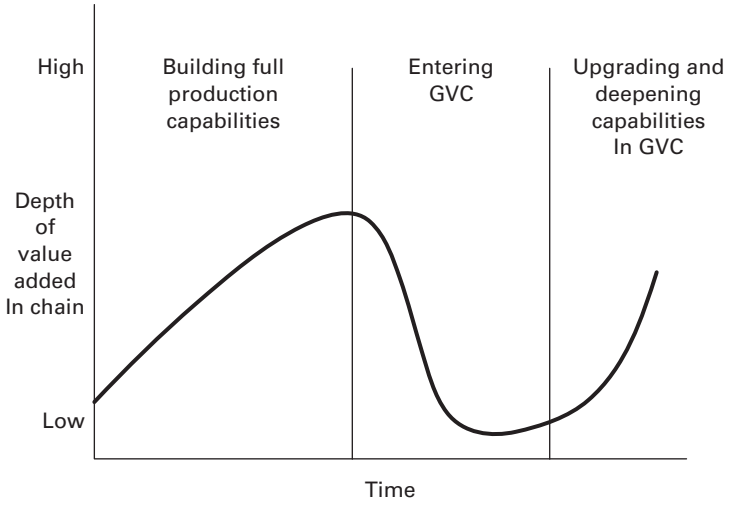

Figure 11.4 Shallowing and deepening in the global value chain.

Source: I am grateful to Wil Milberg for the central idea underlying this figure (Milberg and Winkler, 2013).

the lead firm (for example, the iPhone4 in China). Its upgrading trajectory in this early stage is one of process improvement. Subsequently, as capabilities increase, the firm moves from assembly to manufacturing, that is the transforming of materials and incorporating a greater degree of local components.[9] As capabilities deepen, the firm develops the capacity to design its own products (for example, laptop computers in Taiwan and China sold under the brand names of global firms). After a while, the firm then builds its own brand-presence, either in its own right (Samsung) or by acquiring the brand name of a recognised firm (Lenovo purchasing IBM computers and marketing the Thinkpad). Finally, once chain capabilities are mastered by

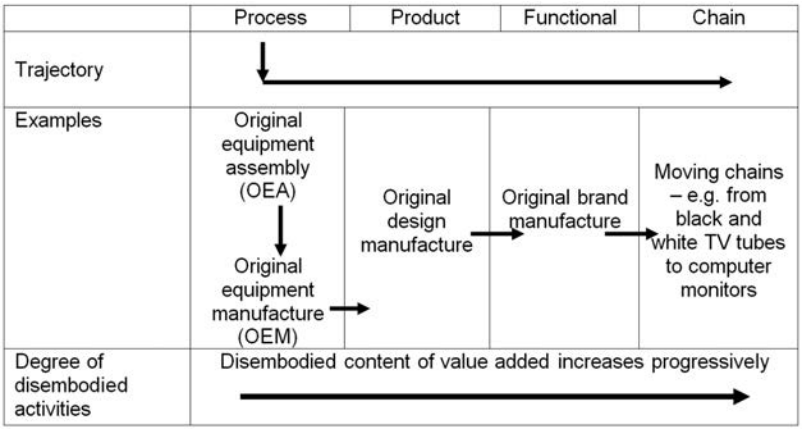

Figure 11.5 Is there a hierarchy of upgrading?

Source: Kaplinsky and Morris (2001).

competitors, the firm moves to a new chain. An underlying trend along this trajectory is one of growing knowledge-intensity and an increase in the share of disembodied activities.

When demand shifts to the south

The world economy as we came to know it in the late twentieth century was cast in the image of the northern OECD economies. They dominated global production and consumption. Their high income markets were the target of innovating firms, and their factor prices moulded technological change. Their civil society organisations played an important role in the rolling out of global standards governing labour, the environment and products (for example, in the promotion of organic standards in many GVCs). Their lead firms either dominated global buying or set the standards which were to be met by triangular systems integrators and their dispersed global suppliers.

Even before the 2008 global financial crisis began to have an impact on the trajectory of the global economy, this hegemonic dominance of the north was being eroded. Until the early nineteenth century, China and India had together accounted for more than half of global output (Figure 11.6). Their combined share sank to a nadir of less than 7 per cent in 1969, but thereafter grew sharply. By 2006 their share had grown to more than 20 per cent and there is every expectation that it will expand further to more than 30 per cent by 2030. If we add to this the contribution of other large rapidly growing rising powers such as Brazil, Mexico, Indonesia, Vietnam, Nigeria and South Africa, it is clear that within a very short time the major share of global consumption will take place in low and middle income economies. We are also likely to observe the growing presence of low and middle income firms such as Lenovo and Haier (from China), Tata (India), Vale (Brazil) and MTN (South Africa), each of whom will be playing a lead role in the extension of their own GVCs.

It is less clear whether this shift in the centre of gravity of global production will be reflected in the structure of GVCs. As observed above, there is evidence that markets in the south are less demanding of environmental and labour standards than markets in the north (Kaplinsky *et al.*, 2011). But at the same time, there are pockets of high income demand in these southern countries which are largely indistinguishable from those in the north. There is also evidence that when markets shift to the south, the degree of value added in commodity exporting southern economies falls (Kaplinsky *et al.*, 2011).

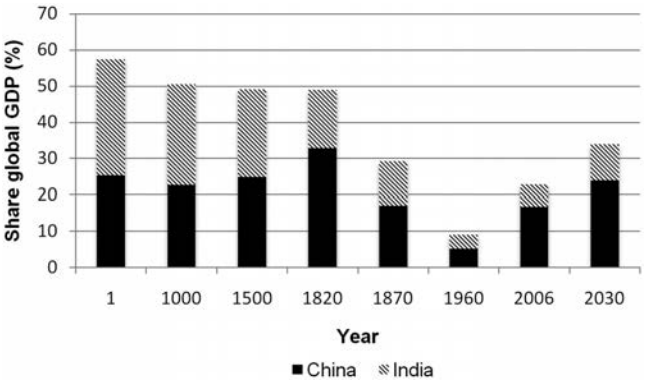

Figure 11.6 The combined share of China and India in global GDP, years 1–2030.

Source: Drawn from Maddison (2007).

Moreover, we are also uncertain whether lead firms which originate in low and middle income economies will fracture their value chains to the same extent and engage in global sourcing in the same way and to the same degree as do the lead firms from the north. On the one hand, triangular systems integrators such as Foxconn in electronics and Li and Fung in garments appear to be following in the footsteps of their northern buyers. But on the other hand the pressures promoting the hollowing out of manufacturing which have gutted much of the manufacturing sector in northern economies may not apply in low and middle income economies. Their lead firms in these sectors may therefore behave rather differently to northern lead firms. Therefore, whilst we can hypothesise that GVCs governed by lead firms from southern economies and selling into low and middle income markets may in many respects differ from those which currently dominate the global economy and sell into high income markets, it is too early to determine whether this hypothesis will be sustained.

Re-shoring and near-shoring

Whilst the competitive strategies promoting the outsourcing of non-core competences are likely to remain in place for some time, there is less certainty about the future location of these outsourced chain links. As we have seen, over the past four decades, in both manufacturing and services, an increasing share of global production shifted to low and middle income economies. This was in order to take advantage of low wage costs, the relative neglect of environmental and social considerations and the capacity to make physical capital 'sweat' (that is, to be used intensively) in the south. The question is whether this locational trajectory will be sustained. This does not mean that the positioning of particular economies in this global division of labour will be frozen (for example, China as a low wage economy), but rather whether outsourcing as a phenomenon will continue to gravitate globally. In other words, under what circumstances might *global* value chains become *local*, or perhaps *regional* value chains?

Three sets of factors might affect this locational trajectory. The first is that new technologies, and particularly 3D additive manufacturing, provide the potential for capital- and labour-saving decentralised production (Livesey and Thompson, 2013). This will reduce the need to ship components in large volumes over long distances and to incur large inventory costs. The second is that rising energy prices (Dobbs *et al.*, 2011; Farooki and Kaplinsky, 2012) reduce the cost incentive to locate outsourced activities far from consuming markets. And the third is that global social and political insecurity creates uncertainties and pecuniary costs which undermine the attractiveness of dispersed production systems (Kaplinsky, 2005).

Whilst none of these three factors reduces the incentive for firms to outsource, they do affect the optimal location of these outsourced activities. If they hold, a premium will be placed on proximity to consumption, and hence to nearsourcing. In some cases, this might lead to the re-shoring of previously offshored activities. This occurred in 2012 when General Electric, America's largest industrial firm, brought back production of some white goods to the USA, even though it had committed itself to shifting the locus of much of its innovation activities to China and India (Immelt *et al.*, 2009). In 2013, Apple also brought back some previously offshored assembly to the USA. Beyond the re-shoring of previously offshored activities lies the potentially reduced likelihood of offshoring outsourced activities in the future.

In summary, whilst the global trade–GDP ratio at the end of the nineteenth century was not dissimilar from that at the end of the twentieth century, it had a distinctly different structural form. The recent globalisation era – the 'second great unbundling' – was driven by the fracturing and global dispersion of value chains, particularly in manufacturing. In so doing these chains contributed to the hollowing out of manufacturing in the previously industrialised north

and the very rapid rise of manufacturing capabilities and value added in the south, particularly in north- and south-east Asia. In the process of this unbundling, the centre of gravity of global growth and manufacturing production has begun to shift from the north to the south. Although it is still too early to determine their significance, a series of recent developments – notably the vibrancy of middle income economy markets, technological change, rising energy costs and growing global insecurity – suggest that the nature of GVCs and their impact on global manufacturing in the future may be rather different to that of the past.

Notes

1 Calculated from statistics accessed at UNCTAD (2013a).
2 This widely cited example does not tell the full story of the complexity of GVCs, since many of the intermediates and capital goods involved in the production of components imported into China for assembly into the iPhone were in part also processed in China. The headline $6.50 figure consequently underestimates the real value added in China.
3 Histories of the GVC framework can also be obtained from Bair (2009) and Park *et al.* (2013).
4 For a rigorous critique of mainstream economics neglect and misunderstanding of the fracturing of GVCs, see Milberg and Winkler (2013).
5 See, also, from outside of the economists ghetto, Sturgeon and Memodovic (2010).
6 Measuring Trade in Value Added: An OECD-WTO Joint Initiative, http://www.oecd.org/industry/ind/measuringtradeinvalue-addedanoecd-wtojointinitiative.htm, accessed 16 October 2013.
7 In fact, the vertical axis in this widely cited Smile Curve is unhelpful, since strategic positioning in the chain is not driven by a share of overall chain value added, but by the rents which accrue, that is, the incomes which the activity support. For example, if manufacturing is highly specialised and employs very few people, it would not be at the base of this Smile Curve.
8 The discussion in informed by the PhD dissertation of Shameh Azmeh (Azmeh, 2013).
9 For example, between 2011 and 2013, the number of firms supplying batteries for the iPhone in China doubled from 8 to 16, and local firms began to produce formerly imported inputs such as acoustic components (Mishkin, 2013). Although undocumented, the value added in China in the production of the iPhone5 almost certainly is much greater than the $6.50 incorporated in the early versions of the iPhone4.

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