Local Clusters in Global Value Chains
Linking Actors and Territories Through Manufacturing and Innovation

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New frontiers for competitiveness and innovation in clusters and value-chains research

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Starting from different premises, both studies on industrial districts (IDs) or clusters and on global value chains (GVCs) have witnessed a profound transformation over the last decade in how value chain activities are structured at the local and global levels and where those activities are performed. In addition, studies have discussed who are the actors involved in such dynamics and the implications in terms of what activities are controlled by firms in the pre-production, production and post-production scheme over time (when). In this concluding chapter, we present the key contributions emerging from the chapters in this book, focusing on four key cross-cutting themes: 1) the co-evolution of IDs driven by insertion in GVCs; 2) the diverse actors driving such heterogeneous outcomes; 3) the role of manufacturing and upgrading in IDs in the new global scenario; and 4) the future of globalization.

The co-evolution of clusters and global value chains

The increasing heterogeneity between and within IDs

Based on fresh analyses from clusters in the countries where this type of industrial organization formed the backbone for development starting in the 1980s, this book provides evidence that contemporary clusters are quite heterogeneous. Reviewing the recent literature on Italian industrial districts, in Chapter 3 De Marchi et al. suggest that the major dimensions of ID differences include: 1) the degree of concentration of cluster resources within few firms; 2) the rate of decline in the population of cluster firms; and 3) the ability of the ID to produce local added value in order to remain competitive. Together these phenomena drive three different trajectories: decline, hierarchization and resilience. Industrial districts that resemble the hierarchization and resilience trajectories are still performing well in final markets and can retain a large portion of value-added in the ID. In the hierarchization case, such capacity is concentrated in only a few companies, whereas in the resilience trajectory, growth is driven and value is spread among a larger range of actors, often small and medium-sized enterprises (SMEs).

Giuliani and Rabello (Chapter 2) take a different perspective in analyzing the heterogeneity across IDs, focusing on the value chain activities performed and the value added at the district level. In their model, locally rooted GVC-led IDs as well as outward-oriented GVC-led IDs are outperforming low-road IDs because they are able to engage in pre- and/or post-production activities along the smile curve, entailing the possibility to capture higher value-added activities.

Drawing on the examples of well-studied districts such as Riviera del Brenta footwear, Montebelluna sportsystems, and Belluno eyewear, both chapters clearly suggest that Italian
IDs are nowadays quite distinct from the traditional model that made Italy a benchmark for local development until the 2000s. Two key insights are emerging from their analyses. First, within-ID heterogeneity has increased. The Italian ID landscape is no longer homogeneous: some IDs are better able to cope with global challenges than others, which has important policy implications. Second, within-ID heterogeneity is related to between-ID heterogeneity: the “cluster effect” has been substituted by the increased ability of local companies to take advantage of ID characteristics to cope with global markets. This is reinforced by a higher prevalence of large firms within IDs, which is even more dramatic if one considers the business group phenomena described in Chapter 2.1

Drivers in the co-evolution of IDs and GVCs

Globalization has played a crucial role in the deep transformations of the cluster model. Clusters that proved to be resilient in the new scenario are better able to cope with and adapt to the needs of global markets. Adopting a term increasingly used in GVC studies (Lee and Gereffi, 2013; Sturgeon and Lee, 2005), we propose that a key contribution emerging from our book is the co-evolution of IDs and GVCs – i.e. the competences and specialization of firms based in local districts co-evolve with the needs and features of their global buyers and production partners, who are playing a more prominent role in most clusters. In other words, phenomena related to both IDs and GVCs have jointly shaped the emergence of the three evolutionary trajectories, reinforcing each other.

Entrepreneurship and entrepreneurial dynamics are among the main drivers of cluster evolution, referring both to the birth of new companies and to the ability of existing firms to discover and exploit international business opportunities (Oviatt and McDougall, 2005). The traditional Marshallian cluster model, which earned Italy global renown for its diversified and vibrant local development, featured the rise of new firms, particularly through spin-off processes. Studies presented in this book suggest that clusters facing difficulties in coping with international competition have witnessed a decrease in their rate of new-firm formations and actual reductions of active firms (as in the Vicenza gold jewellery case presented in Chapter 3 in this book). In other cases, entrepreneurship is still a key driver of local development, such as the case of Prato where the cluster proved particularly attractive for Chinese entrepreneurs to open up new businesses by exploiting socio-communitarian dynamics linked to foreign communities (Chapter 8 in this book). The presence of dynamic local companies, some of which became lead firms that succeeded in leveraging local knowledge while managing global supply chains, is another factor in explaining ID trajectories, which we will delve into below.

Gereffi (2014) sees several major elements shaping the current phase of the global economy: 1) the increasing role of emerging economies as economic and political powers; 2) the geographic consolidation and value chain concentration in the global supply base; and 3) a shift in GVC end markets (growing consumption in emerging economies and increasing attention to corporate responsibility, supply chain transparency, customization and flexibility in developed countries). These global drivers shape the evolution of industrial districts analysed in this book. Veneto IDs (investigated in Chapters 2, 3 and 9 in this book) are particularly illuminating in this regard. The consolidation in the gold jewellery value chain and the disappearing middle segment in the EU and US markets have been identified as key transformations of the industry, to which the Vicenza ID firms have not been able to cope (De Marchi et al., 2014). Similarly, the push by consolidated global buyers to preside over the distribution phase in the luxury footwear industry co-evolved with the abandonment
riviera del Brenta ID firms of post-production activities to focus on production and reduction activities within their local hub. In the Belluno eyewear cluster, similar trends co-evolved with the increasing relevance of local original brand manufacturers (OBMs), which developed into global lead firms for that industry.

The evolution of clusters, there is a tension between place-based variables, on the one hand, and global drivers, on the other. The studies in this book reinforce the insight that the real matter, in the sense that localization of activities within ID boundaries offers an opportunity to grasp local know-how and exploit economic and social relationships for innovation purposes. At the same time, the internationalization of local firms (home-grown national enterprises or MNEs) as well as the entrance of foreign MNEs transforms clusters both internally and externally by creating different evolutionary paths among them. The evidence by Belussi et al. (Chapter 5 in this book) suggests that the impact of the entrance of MNEs at the cluster level depends on the cluster life cycle, i.e. whether MNEs were the key actors that gave rise to the cluster or they entered during the maturity phase. Thus, transformation at the cluster level may signal an evolution that occurs also at the local level and the two processes are mutually reinforcing. To sum up, we should view the stories of both clusters and GVCs as interdependent, which results in their co-evolution.

Studying the Evolution of IDs in GVCs

The co-evolution of local clusters and global chains calls for an increasing effort by scholars to adopt both perspectives in the analysis of development dynamics. Indeed, all chapters suggest the need to analyse local and global forces in an integrated way, and Chapter 3 explicitly estimates the joint impact of ID-related and GVC-related elements as determinants of ID evolution.

As noted in Chapter 1 by the editors, the GVC and ID perspectives are complementary and not contradictory. In the former approach, GVCs can be conceived as nested structures in which clusters are agglomerations of firms whose specialization in manufacturing activities was amplified by the global sourcing strategies of lead firms and first-tier suppliers (Rugman et al., 2008). In the ID perspective, the connection with external firms and the relevance of ‘downstream’ internationalization has been a constituent feature of clusters. However, the co-evolution of both levels in the current scenario requires improving our capacity to interpret how industries are globally structured, allowing for novel empirical approaches. The study by Golini and Boffelli (Chapter 11 in this book) is a clear case in point, as it provides an original methodology to capture the intertwined relationships between clusters and GVCs with respect to divisions of labour and value production. Cluster studies have usually approached internal divisions of labour in terms of supplier-client relationships, focusing on the implications for innovation and development spin-offs. GVC studies focus on value chain mapping to identify the main activities needed to make a product and how value is created and captured by firms, according to the range of activities performed (production, production and post-production). Golini and Boffelli apply the methodology of value chain mapping at the local level to analyse the evolutionary processes of clusters and cluster in Bergamo (Italy), they define the stages of the value chain and the activities within each stage that are carried out at the local level, and assess how many actors perform these activities. This methodology, based on detailed firm-level data, captures the variety of activities performed by each firm and their level of uniqueness, as well as the internal connections of such activities.
Another methodological contribution is found in Chapter 7 by Molina-Morales and colleagues, which evaluates the role of internal and external connections in support of ID development analyzing the network of the firm. Finally, it is worth mentioning the attempt by De Marchi et al. (Chapter 3 in this book) to suggest a parsimonious set of variables, which can be easily adopted in other empirical contexts, to classify the evolutionary trajectories of IDs and measure their heterogeneity.

The diversity of key actors

The heterogeneity within and among clusters centres around the evolution of the firms based within clusters and their strategies to cope with globalization. Indeed, the chapters of this book suggest that it is not possible to understand ID evolution without focusing on the main actors highlighted in both the ID and GVC literatures. However, ID studies have tended to ignore the role of global buyers or MNE producers, while GVC studies often overlooked the specificities and strategies of local firms. A cross-cutting theme emerging from this book is the diversity of local and global actors that are determining the evolution of IDs.

Home-grown vs. foreign global lead firms

A first set of relevant actors to understand cluster evolution are global lead firms (GLFs), defined by GVC studies as buyers or producers that exert power in the chain to shape the development of their industry, and how, where, when and by whom value is added and captured (Gereffi, 1994; Gibbon et al., 2008). Many GVC studies have focused on learning possibilities and upgrading trajectories for developing country clusters or regions by participating in GVCs with GLFs (Gereffi, 1999; Navas-Alemán, 2011; Pietrobelli and Rabelotti, 2011; Staritz et al., 2011). Studies on IDs based in developed countries, including contributions in this book, have stressed the other direction of learning: clusters offer crucial knowledge to GLFs so that cluster firms in GVCs can be knowledge-providers rather than just knowledge-seekers. In most districts, lead firms—both foreign and home-grown—play a key role in ID evolution (in Chapters 2 and 3 in this book, their presence is a major determinant of cluster resiliency).

A wide literature (spanning both the GVC and ID traditions) describes clusters as preferred destinations for foreign MNEs. Analyzing the entrance of foreign MNEs in different clusters in Italy, Romania and China using a cluster-life cycle approach, Belussi et al. suggest in Chapter 5 that there is not a singular impact of such firms on cluster trajectories. When the cluster is built around pioneering MNEs whose goal is to discover and exploit local resources, the MNEs' intention is to create "place-anchored" value chains, with direct connections between MNE subsidiaries and headquarters. Under these circumstances, knowledge spillovers are quite limited and local SMEs are usually excluded. By contrast, in the maturity phase when the local engines of innovation and growth are slowing down, MNEs are interested in rejuvenating cluster competences and we see different results (i.e. hierarchization, functional downgrading, etc.). Hence clusters are heterogeneous because of the different exposure to and goals of foreign MNEs.

In the early ID literature, local firms were viewed as largely homogeneous. In some cases, specific firms were considered crucial in influencing the origin and development of IDs, often a solo firm or pioneer company (Belussi, 2015; Lazerson and Lorenzoni, 1999). Cluster firms have become more differentiated, as medium and large firms have started to internationalize, which affects the structure of cluster networks. Following Pisano and Shih (2009,
2012), Barzotto and colleagues argue that by maintaining activities at the cluster level, such home-grown MNEs not only benefit from but also nurture the local industrial commons (labour pool, supply networks etc.). These firms thus choose to anchor their actions in the cluster. Because of their simultaneous role as local and multinational companies, they transfer to the cluster knowledge acquired globally, while also investing and maintaining local assets through global market opportunities. The cases of ceramic production in Sassuolo (Italy) and Castellon (Spain) developed in Chapter 10 suggest two-way flows of foreign investments across the two IDs, with the large Italian MNEs specialized in the production of ceramic equipment making investments in the Castellon cluster, and vice versa, generating deep knowledge flows across the two IDs.

More recently, the growth of within-district heterogeneity has received more attention. The IDs described in this book are characterized not only by GLFs, but also by the presence of local firms that have been called cluster lead firms (CLFs) (or as suggested in Chapter 3, local dynamic actors). Smaller in size than GLFs, CLFs are usually specialized in niche markets where they are recognized for specialized technical knowledge and advanced production, design or branding capabilities (see Chapter 6 in this book). Cluster lead firms shape the evolutionary processes of the cluster by modifying the set of activities carried out at the local level (Camuffo, 2003). Even if they do not exert power the way GLFs do, CLFs occupy a distinctive position beyond their district boundaries (e.g. driving the innovation frontier of the industry and being internationalized upstream and downstream – see e.g. Chapters 3 and 8 in this book).

Cluster lead firms can also become global lead firms. Perhaps the clearest (and maybe exceptional) example is Italian MNE Luxottica (see Chapters 3 and 9 in this book) in the eyewear cluster of Belluno (Italy), which recently merged with French group Essilor to create the largest eyewear group in the world with more than 50 billion Euro and 140,000 employees worldwide (Reuters, 2017). From a GVC perspective, CLFs can become global players if they have an impact on the governance of the GVC and shape the evolution of the industry beyond their impact at the cluster level. In general terms, home-grown MNEs (Chapter 5 in this book) are companies born in the district that still take part in the activities there; they have developed specific strategies to combine global and local sourcing as well as to approach foreign markets, gaining a leadership position in their global industries. In Chapter 6 Barzotto et al. suggest that home-grown MNEs developed by exploiting the industrial commons characterizing clusters.

In conclusion, home-grown and foreign MNEs are important players in our co-evolutionary model: they connect the local (cluster) and the global (GVC) levels and they can both impact the evolutionary trends of clusters and GVC.

**Cluster actors beyond global lead firms**

Large multinationals are not the only actors that shape the evolutionary paths of clusters. Chapters 5, 6 and 9 in this book suggest that internationalization is a peculiar characteristic of CLFs since they are able to structure appropriate strategies that impact on their local supply base and knowledge repositories. Internationalization may refer to downstream or upstream activities and include pre-production, production or post-production processes. However, not all cluster firms that become internationalized can be considered lead firms. Cluster lead firms developed a distinctive bundle of capabilities that may include manufacturing-related capabilities, pre-production (i.e. design) and/or post-production activities (brand, retail) that support their roles within and outside the district (see Chapters 9 and 3).
In many cases, CLFs are medium or large-sized firms, even though size is not the only proxy to identify them (unlike in GVC studies where GLFs tend to be quite large). In Italian clusters, where firms often grow through mergers, acquisitions and the creation of business groups (Cainelli et al., 2006), it is also important to explore changes in ownership. Local companies can become members of global groups via inward foreign direct investment (FDI) at the cluster level, or they can extend their organizational (and cluster) boundaries through outward FDI. This issue, like the distinction between home-grown and foreign MNEs, is a central contribution of this book.

From a knowledge-management point of view, CLFs can play the role of gatekeepers transferring external knowledge to the cluster and their local suppliers, thereby facilitating upgrading processes. In their analysis of the Spanish clusters of ceramic tiles and toys in Chapter 7, Molina-Morales et al. suggest that cluster firms may play different brokerage roles and that networks accessing technical or market knowledge do not necessarily overlap. As far as complex technical knowledge is concerned, the global connections of cluster actors (brokers) is key and such firms – oriented externally, beyond cluster boundaries – are the main contributors to the system. Interestingly, they report that only brokerage positions providing access to diverse repositories of knowledge provide valuable systemic contributions, which highlights the importance of within-ID heterogeneity.

Entrepreneurship is also relevant. The study of Prato by Guercini (Chapter 8 in this book) is particularly revealing. Through immigration from China, the Italian Prato cluster has witnessed a deep internal transformation with the rise of numerous Chinese firms specializing in textile activities. Through upgrading processes, those firms have been able to acquire more knowledge and extend their activities (product and process upgrading), and control more value. Most importantly, Chinese companies have acted as mediators between the cluster level (Prato) and the global level (China), impacting the role of native Italian firms in the cluster.

Hence, clusters are heterogeneous both internally (due to different communities of entrepreneurs and firms) and externally (due to different degrees of immigration at the local level). This offers an additional layer to the relationship between clusters and GVCs by taking into account international mobility and the role of foreigners in establishing globally oriented business activities.

In their analysis of the evolutionary trajectories of clusters, De Marchi et al. (Chapter 3) recommend the adoption of a broader framework to include so-called Local Dynamic Actors (LDAs), beyond just CLFs. They propose a classification of the local actors supporting ID resiliency that includes: 1) original equipment or original design manufacturers (OEMs or ODMs), with advanced production capabilities; 2) original brand manufacturers (OBMs) with advanced post-production capabilities; 3) highly specialized suppliers with distinctive manufacturing or service capabilities; and 4) local institutions, which support cluster development by providing technical and market knowledge. Evidence on the roles of LDAs spans the ID literature and incorporates theoretical concepts employed in GVC studies (e.g. Gereffi, 1999), thereby providing a bridge across the two literatures and enriching our comprehension of cluster evolution and the heterogeneity of local actors. (In Chapter 3, the authors suggest that global and local actors jointly sustain the ID resilient trajectory, while their absence is associated with the decline of IDs.)

The role of manufacturing and upgrading

In the GVC perspective, clusters have been identified as agglomerations of firms whose specialization in manufacturing activities has coincided with the global sourcing strategies
of lead firms (Sturgeon et al., 2008). With reference to the smile curve (Gereffi and Fernandez-Stark, 2016; Mudambi, 2008), GVC scholars have stressed a clear division of labour between advanced countries and emerging economies, where manufacturing activities are considered low value-added activities as compared to innovation/R&D, marketing, retail management, and logistics. In this context, analyzing clusters specialized in low-tech industries in developing countries, early GVC contributions suggested that cluster upgrading trajectories were associated with moving away from assembly manufacturing to perform pre-production or post-production activities, thanks to the knowledge absorbed from the global buyers (Gereffi, 1999; Bair and Gereffi, 2001; Humphrey and Schmitz, 2002; Schmitz and Knorringer, 2000).

Analyzing highly competent clusters located in advanced economies, this book contests this perspective in several respects. First, it is shown that the “linear” upgrading scheme suggested in traditional GVC contributions – from assembly to higher value-added activities – is just one of the possible upgrading trajectories, as suggested in recent GVC studies (Cattaneo et al., 2010; Gereffi, 2015; Low and Pasadilla, 2016). For cluster firms to be competitive in the global context, they must focus on a meaningful bundle of capabilities. Different capabilities might reflect both the starting position of each of the IDs (i.e., local history, culture and institutions matter), as well as understanding the shifting context of global structures and players. In this sense, the smile approach is just one possible representation of the relative importance of different value chain activities.

In Chapter 4, Parris and Blažek suggest that upgrading can be interpreted as a manifold process where the variety of activities distributed among suppliers is intertwined with the streamlining of the lead firms’ supply base. Consistent with the rise of global suppliers mentioned in other GVC studies (e.g. Azmeh and Nadvi, 2014; Gereffi, 2014), these two authors highlight specific implications at the cluster level: in some cases, cluster second-tier suppliers are developing new functions voluntarily transferred from first-tier suppliers; in other cases, the process of mergers and acquisitions allows cluster suppliers to cope with efficiency requests of GLFs.

Second, contributions in this book challenge the view of manufacturing as a low value-added activity for firms based in developed countries, a discussion that recently has become a hot topic in the current global political and economic agenda. Recent discussions about backshoring and re-shoring scrutinize the consolidated position of advanced and emerging countries in the “smile” curve (Gray et al., 2013; Fratocchi et al., 2014), notwithstanding the challenges to relocate manufacturing activities in domestic economies (Bailey and De Propris, 2014). The new scenario suggests the need for a more fine-grained analysis of the linkages between pre-production, production and post-production activities in terms of actors, geography and value generated. It requires a conceptualization of the role of manufacturing in advanced economies, which takes into account both the sources of competitiveness of local contexts as well as its connection with innovation capabilities (Berger, 2013; Buciu and Finotto, 2016; Cano-Kollmann et al., 2016).

**The value of manufacturing and its link with innovation**

To understand cluster and GVC co-evolution, the relationship between manufacturing and geography is important. A first issue involves understanding how labour and value are distributed within IDs. As shown by Golini and Boffelli (Chapter 11), one important contribution of GVC studies to the evolution of clusters is to map which activities (and stages of activities) are located at the cluster or global levels. This is particularly relevant from an
evolutionary perspective, since one can explore upgrading trajectories and also the profiles of LDAs and their impact on the evolution of the cluster itself.

A second and related issue concerns those activities that should remain at the local level within the ID to support its growth or resilience. Giuliani and Rabellotti (Chapter 2) suggest that not all production activities are equally relevant for the competitiveness of ID firms in each of the three possible development trajectories they identify (low-road, locally rooted GVC-led, and outward-oriented GVC-led IDs). From a geographic point of view, there is a dynamic process between local and global manufacturing. On the one hand, clusters are the receivers of the location choices of foreign-MNE lead firms; on the other hand, cluster firms also dynamically change their own - and collectively the entire cluster's - value chain. This dynamic process can be better understood by adopting the GVC lens, which identifies the specific activities and governance structures that link IDs and GVCs within an industry.

A third issue concerns the relevance of manufacturing competences to nurture the ID's innovation capability. As suggested by Bucini and Finotto (2016), the proximity between R&D and production activities is an important spur for innovation; cutting such links because of offshoring may affect the firms' and cluster's ability to innovate. Similarly, Berger (2012) shows the importance of control over manufacturing for innovation and how knowledge transfer (or loss) relates to the physical and organizational separation between R&D and manufacturing. The disadvantages refer not only to single firms, but also to entire territories (i.e. regions) where the possibilities for firms to benefit from the industrial commons will be reduced (Pisano and Shih, 2012).

Contributions in Part III of this book provide fresh evidence from diverse empirical settings in support of this idea. Hervas-Oliver and Parrilli (Chapter 10) suggest that the control of key manufacturing activities (and knowledge) by ceramic tile producers in Castellon (Spain) is what allowed them to understand the innovation possibilities linked with the inkjet applications developed for other industries in the UK. This introduced a break-through innovation with the potential to completely transform ceramic production worldwide. It is exactly this strong connection that has generated difficulties in the case of the Prato cluster for the adjoining communities of Chinese immigrants and native firms, the former extending the control over manufacturing activities to the detriment of the latter (Chapter 8).

When investing in specialized manufacturing activities to generate high value-added products, clusters can build a sustainable role in the global economy. The discussion about manufacturing in GVCs is crucial not only for emerging economies and developing countries, but even more so for advanced economies. Countries explored in this book, such as Italy or Spain – which over the years accumulated important competences and manufacturing know-how in manufacturing products and processes – could leverage such assets to support their competitiveness at the global level, especially considering their primacy vis-à-vis countries such as the USA or UK, where many manufacturing skills have been lost due to decades of offshoring (Bailey and Propris, 2014). Developing place-anchored strategies (as suggested in Chapters 5 and 6) can be a fruitful solution to maintain critical knowledge at the local level through the control of manufacturing activities.

Of course, this should not be considered an impediment for local firms to internationalize. Cluster lead firms can structure their internationalization to maintain part of their production within the firms, and at the local level to combine the genius loci with the advantages of scale at the global level (Chapter 9). The six case studies presented by Bettiol et al. in Chapter 9 seek to capture – from an inside-out perspective – how cluster firms in GVCs can structure their own manufacturing activities in terms of employment within the cluster boundaries. A recent study by Barzotto et al. (2016) provided a different measure to describe
the implications at the local level of foreign MNEs, showing how those firms can contribute to the (re)generation of host country labour markets and investments in high-skilled workers, with greater effectiveness than national firms. The implication on the skills available at the cluster (or regional) level within the GVC scheme is an important and up-to-date research domain that could be further explored.

Manufacturing, services and new technologies

An important trend that will impact how manufacturing activities produce value in the global scenario is the importance of services, especially manufacturing-related services, including pre-manufacturing, manufacturing, post-manufacture, back office or post-sales services (Low and Pasadilla, 2016). Low value-added or labour-intensive services (e.g. call centres) are increasingly outsourced and offshored (Fernandez-Stark et al., 2011).

The cluster cases scrutinized in this book provide fresh evidence to explore the role and the strategies of manufacturing-related services located in LIDs, and in particular those focused on innovation, such as design or R&D, which have been called Knowledge-Intensive Business Services or KIBS (Di Maria et al., 2012; Miles, 2005). In Chapter 3, De Marchi et al. include them within the LIDAs that might support the development of resilient ID trajectories. Indeed, having developed a strong know-how about the manufacturing process (technology, product, materials etc.), they nurture the cluster competitiveness of manufacturing firms through knowledge transfer and knowledge sharing (Camuffo and Grandinetti, 2011; Grandinetti, 2011). With internationalization, they become important knowledge gatekeepers between the local and the global contexts (e.g. Claudio Franco Design & Develop, reported in Chapter 3).

The increasing relevance of service activities is not confined just to service firms. Due to new technologies, the border between goods and services is blurring, and the process of servitization of products is a notable trend (Roy et al., 2009). Classifying and measuring manufacturing activities and their international organization becomes difficult. For instance, Nike as a brand vendor in GVC terms is not a manufacturing company but a service company since it carries out only service activities — by focusing on R&D, marketing and retailing. At the same time, Decathlon (and the French group Oxylane) is not only one of the world’s largest sporting goods retailers, but it is also involved in managing manufacturing activities directly. Such examples show that classification of goods and services (NACE classification) should be updated to take into account the evolutionary trends of manufacturing firms. Macro analysis can be misleading. In this sense, the application of the GVC mapping approach, such as proposed in Chapter 11, could contribute to the theoretical discussion about the relationship between manufacturing and services by showing exactly which activities are insourced or not by firms and hence depicting the real nature of firms (beyond an ex-ante classification).

Another research frontier is the implications for GVCs and clusters of new technological developments that go under the label of “Industry 4.0”. Emerging digital technologies such as 3D printing are enabling a new paradigm, known as Industry 4.0 (Rühmann et al., 2015), characterized by customization and distributed-manufacturing processes. This will impact the organization of value-chain activities, both in terms of the geographic location of activities and the role of national labour markets (Rehnberg and Ponte, 2017). The adoption of additive manufacturing may modify location choice of manufacturing activities to exploit the advantages of customer proximity. Indeed, digitalization of manufacturing production via 3D printing firms can increase product customization and create scale-free production processes. New market opportunities arise for SMEs, with a potential decrease in the market
power of large MNEs. This will impact the future of GVCs shaped by GLFs, with important implications for a value-chain governance perspective. Based on new consumer interfaces and "big data" enabled by technological solutions such as the smart grid (i.e. Internet of Things), firms can enrich their innovation potential.

From this point of view, the control of retail becomes a crucial asset. Rehberg and Ponte (2017) suggest that 3D printing technologies may lead to two opposing scenarios: 1) such technologies will become complementary to others, hence increasing efficiency within mass-oriented manufacturing production; and 2) the substitution of traditional manufacturing with 3D printing technologies. In the second scenario, the distance between extraction, process and consumption decreases, modifying the smile curve. Value-chain activities will be closer to end-users, often reducing the need for low-skill, labour-intensive functions in the processing (manufacturing) stage. (For an early analysis of the Internet's impact on consumer choice and governance structures in GVCs, see Gereffi, 2001.)

Cluster firms may be ready to adopt such technologies, particularly in advanced countries, since they are accustomed to organization of manufacturing and innovation activities based on collaboration and have developed the competencies to translate a client's requests into products. This book has not explored these issues widely. However, the cluster model can indeed embrace new technologies at the manufacturing level - even disruptive ones (as in the case of inkjet applications in the Castellon ceramic tiles cluster described in Chapter 10) - through adoption and adaptation to the local context. This can be done via GLFs entering into the cluster as well as through LDAs, in particular cluster lead firms. This is also supported by strong local (diffused) competencies on how to manage manufacturing processes and collaborative innovation. As the evidence is very recent, future research should further explore whether clusters can sustain the renovation and upgrading of local competencies to cope with such technological trends in an industrial commons framework (Barzotto et al., Chapter 6 in this book; Pisano and Shih, 2009).

The future of globalization

The interplay between the local and global elements that support cluster development, and the recent challenges to the role of manufacturing, spur a discussion about the future of globalization, especially considering the recent evidence of stagnation in world trade starting at the end of 2016. It is too early to depict whether we are going towards the conclusion of the globalization era, but certainly globalization dynamics will be different from what we have observed in the last 20–25 years.

In its Outlook 2017, the Credit Suisse Research Group (2017) examines the end of globalization as we know it and describes a potentially new scenario that stresses the rise of a multipolar world. Trade and manufacturing activities become more regional. The power of GLFs decreases while regional champions emerge. In this scenario, clusters – particularly those located in advanced countries – might increase their relevance within regional value chains, led by cluster lead firms and home-grown GLFs.

The recent focus on the economic relevance of manufacturing activities – both through direct and indirect impacts – heightens our attention on the places where such activities are carried out. The chapters in this book emphasize the utility of the cluster model within local manufacturing systems, where manufacturing and innovation reinforce each other within a set of favourable local conditions. This is true for both advanced and developing countries.

The growth of South-South trade over the last decade (UNCTAD, 2015) is a signal of a transformation in the well-established North-South interactions shaped by GLFs in the
GVC perspective (Lee, 2016). The technological and political scenario is opening new trajectories characterized by the decreased relevance of being global and the rise of regional value chains (Gereffi, 2014; Ferrantino and Taglioni, 2014). In addition to “multipolar” governance within GVCs (Ponte and Sturgeon, 2013), we are likely to see multiple geographical centres – namely, North America, Europe, and East Asia (Credit Suisse, 2017).

Based on the competencies among suppliers and lead firms in different countries, GVC studies have identified regional divisions of labour within industries (Sturgeon et al., 2008; Gereffi and Frederick, 2010), which leads to a production hierarchy where manufacturers may have an impact at the regional level. In the coming years, this may strengthen the competencies embedded in specific territories and become an important asset for economic development and for sustaining competitiveness at the global level. The experiences of local clusters and the transformations in advanced countries described in this book provide powerful examples of the strengths and limitations of local production and innovation systems. The co-evolution of clusters and GVCs analysed here could be an ideal observatory to explore the complexity of globalization in the next decade.

Notes
1 Business groups are groups of firms with the same ownership but which are legally independent; they are more likely to be widespread in district than in non-district areas.
2 Data available at: www.cpbl.nl/

References


