Clusters, Local Districts, and Innovative Milieux

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Abstract

Over the last three decades, literature on industrial districts, innovative milieus, and industrial clusters has enriched our knowledge about endogenous factors and processes driving regional development and the role of the region as an important level of economic coordination. This class of stylized development concepts has emerged since the 1970s and attempts to account for successful regional adaptations to changes in the global economic environment. Each of these

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concepts grew out of specific inquiries into the causes of economic success to be found in the midst of general decline by building upon the early ideas of Alfred Marshall in several ways. Neo-Marshallian districts found in Italy highlight the importance of small firms supported by strong family and local ties, while the innovative milieu concept places great emphasis on the network structure of institutions to diffuse externally sourced innovations to the local economy. Clusters have become far more general in scope, fruitful in theoretical insights, and robust in application, informing the work of both academics and policy-makers around the world.

23.1 Introduction

When one first becomes interested in the growth or development implications for local or regional collections of firms and industries, a bewildering array of possibilities presents itself. One learns that external economies of scale accrue to firms that colocate and thereby stimulate growth, for example, pecuniary savings and intangible flows of information arise automatically from agglomeration benefiting resident firms. External economies of scale are defined as economies that are external to the firm but internal to the region. External economies of scale can be divided into localization economies (benefits from colocation accruing to firms operating in the same industry) and urbanization economies (benefits from collocation accruing to firms operating in different industries). A robust and widely ranging literature of this tradition does exist, guiding the theoretically inclined or those who wish to examine empirical tests of important propositions.

Then there are the development practitioners, academics, or students who rely upon a family of more stylized models to formulate development prospects. Such models frequently adopt the concepts that are most widely accepted or formulated in their home territories, the bulk of which date from the 1970s. The emergence of these concepts can be documented by Google Ngrams for books published in English between 1800 and 2000 (http://books.google.com/ngrams). The 1970s was a period in which traditional production methods and their centers lagged but more peripheral areas, focused increasingly on better or higher technologies and market niches, began to prosper from the bottom-up. Italians are quite familiar with "neo-Marshallian industrial districts," while the French and many Swiss prefer insights drawn from "innovative milieu," and contemporary English or German speakers – and many others – are most comfortable with the ideas borne of "industrial clusters." The concepts discussed in this chapter all go beyond a pure economic view on agglomerated industries (i.e., the argument of external economies of scale), drawing – although to varying degrees – attention to social and institutional factors that allow for coordination of economic actors. The preferred notions arose in specific contexts and circumstances, but are they essentially similar or are there elemental differences worth emphasizing?

In this chapter, we shall focus on both the common and distinctive elements of these concepts. To get under way, we shall first examine the core foundation on

which each of these rests, after which representative definitions will be drawn from the contemporary literature to distinguish between Marshallian and neo-Marshallian industrial districts, innovative milieux, and industrial clusters. We will then compare these with the definitions found in the emergence of their seminal literatures. Primary attention will be paid to features that reveal common overlaps and how each addresses these points, while also noting uniquely specific features that clearly distinguish among them. Finally, we will comment on challenges for future research and application.

23.2 Core Concepts

23.2.1 The Marshallian Concept

The English economist Alfred Marshall is seen as the "father" of the industrial district concept, and most contemporary work on agglomeration, localization, clustering, and the innovation-enhancing effects related with the geographical concentration of firms is explicitly or at least implicitly based on his writings. The key element in Marshall's theorizing about "localized industries" (defined as industries concentrated in certain localities) is the notion of external economies of scale (see Sect. 23.1). It is these effects that enable small firms colocated with others in a district to compete successfully with large vertically integrated firms, which take advantage of internal economies of scale (i.e., benefits of large-scale production). There were ample examples of such geographical settings in the late 1800s in Britain such as cotton and textile in Lancashire, cutlery in Sheffield, pottery in Staffordshire, or straw plaiting in Bedfordshire.

Marshall's writings contain both explanations for the rise of localized industries and their long-term "anchoring" in districts. According to Marshall, the initial localization of industries can have many sources such as the availability of raw material, the demand for goods of high quality or the immigration of people with specialized skills. However, once an industry is spatially concentrated in a particular locality, a set of agglomeration forces keeps it in place: "When an industry has thus chosen a locality for itself, it is likely to stay there long: so great are the advantages which people following the same skilled trade get from near neighbourhood to one another" (Marshall 1920, p. 225). These advantages are threefold, and they can be conceptualized as positive external economies of scale:

(i) Knowledge spillovers: Firms benefit from local knowledge circulation and manifold opportunities for monitoring, learning from, and imitation of innovative actions set by colocated firms. Marshall (1920, p. 225) notes: "The mysteries of trade become no mysteries; but are as it were in the air, and children learn many of them unconsciously. Good work is rightly appreciated, inventions and improvements in machinery, in processes and in general organization of the business have their merits promptly discussed: if one man starts a new idea, it is taken up by others and combined with suggestions of their own; and thus it becomes the source of further new ideas."

(ii) Rise of supplier industries: Colocated firms operating in the same industry also take advantage from the growth of specialized supplier industries in their neighborhood, supplying the localized industry with raw materials, intermediate products, and services.
(iii) Labor market effects: Localization of industries promotes the emergence of a highly specialized labor market that attracts both firms and workers. Employers benefit from the ready availability of highly skilled workers with the required special qualifications, and workers can take advantage of the rich employment opportunities, allowing them to find adequate jobs rather easily.

According to Marshall, the spatial concentration of firms of moderate size in districts was a widespread phenomenon – it was the typical form of industrial organization – of the English economy in the late nineteenth century, that is, a phenomenon that could be observed in many different industries and not merely a few.

Marshall's formulation of the industrial district concept contains a profound analysis of the linkages that knit collocated small firms together. His work points to knowledge spillovers, producer-supplier relations, and labor mobility among district firms and conceptualizes such relations as key factors underpinning the innovation capacity of localized industries. Marshall's work went beyond pure economic factors and considered also sociocultural and institutional assets to explain the economic vibrancy of industrial districts. A key notion in his writings is that of an "industrial atmosphere," that is, the presence of a collective identity and shared industrial expertise that gradually develops in industrial districts and facilitates interaction, localized knowledge circulation, and the creation and diffusion of innovation.

Marshall was also aware of the potential dangers of specialized local development, anticipating the downturn of many English districts in the first decades of the twentieth century as well as what has happened many years later in old industrial areas characterized by economic mono-structures (i.e., overspecialization in mature sectors such as shipbuilding, coal and steel industries). He considered districts that are dependent on one industry as being extremely vulnerable, pointing to the risk of depression, crisis, and decline in case of changing context conditions such as, for instance, a fall in demand for its products or changes in technology.

In the era of mass production organized within large hierarchical firms, Marshall's ideas lost importance. His work on localized external economies of scale was brought to new life from the 1960s onward. Kenneth Arrow (1962) and Paul Romer (1986) extended Marshall's reasoning on knowledge spillovers as key source of innovation and growth. Such positive localization effects resulting from colocation of firms belonging to the same industry (intra-industry spillovers) are now known as Marshall-Arrow-Romer (MAR) externalities in regional science (Glaeser et al. 1992). They can and should be clearly distinguished from Jacobs externalities, that is, urbanization effects which arise from the presence of firms operating in different industries (interindustry spillovers).

The MAR literature provides a pure economic view of agglomeration phenomena, decoupled from Marshall's accounts of the supporting role of social and

cultural factors referred to as "industrial atmosphere" in his writings. However, Arrow and Romer were not the only scholars who have rediscovered Marshall. In the 1970s and early 1980s, Italian researchers started to draw extensively on his ideas, extending rather than downplaying the weight of the sociocultural underpinning of localized specialized economic activity in their conceptual and empirical analyses.

23.2.2 The Neo-Marshallian Industrial District Concept

The end of the golden age of mass production and the crisis of the large hierarchically organized firm in the 1970s provoked a renewed interest in Alfred Marshall's work on external economies of scale and industrial districts. His basic ideas were revitalized and further developed by a group of Italian researchers who studied the industrial development in the central and northeastern part of Italy (the so-called Third Italy with its main regions Emilia-Romagna, Tuscany, and Veneto). This group was dealing with a somewhat puzzling phenomenon, that is, the economic success of industries with seemingly outdated organizational forms (family-owned small companies) belonging to mature sectors with limited growth prospects (such as textiles, footwear, leather goods, furniture).

Giacomo Becattini is one of the leading exponents of research on neo-Marshallian industrial districts. He rediscovered Marshall's concept of industrial districts and reformulated it for the specific context of the Third Italy. Becattini's article "From the industrial 'sector' to the industrial 'district'" (published in Italian in the journal Rivista di economia e politica industriale (Becattini 1979) and in English 1989 in a book edited by Edward Goodman and Julia Bamford) is usually considered as the "starting point" of scholarly work on neo-Marshallian industrial districts (Landström 2005). The international dissemination of the concept was essentially promoted by Michael Piore and Charles Sabel. In their book *The Second Industrial Divide* (1984), they drew heavily on the example of neo-Marshallian industrial districts in the Third Italy to support their thesis of a major transformation from the Fordist mass production toward a model of flexible specialization. Looking at the Tuscan economy, Becattini (2003, p. 17) noted: "To employ a concept much used by Alfred Marshall, the course of Tuscan history leads to a form, still incomplete but already clear in outline, of "industrial district" . . . which produces economies external to the single firm and even to the industrial sector defined by technology, but internal to the "sectorial-social-territorial" network."

Becattini and other protagonists of the neo-Marshallian industrial district notion (such as Gabi Dei Ottati, Sebastiano Brusco, Marco Bellandi, and Patrizio Bianci to name just a few) reject a purely economic view on local industrial growth and an exclusive focus on the economic effects of agglomeration. They suggest a much broader perspective that takes into consideration the social, cultural, and institutional foundations of local development. Becattini has advanced the idea of neo-Marshallian industrial districts as complex socioeconomic settings and highlighted the relation between efficiency and competitiveness of production and the

sociocultural conditions prevailing at the regional level. Becattini (1990, p. 36) defines neo-Marshallian industrial districts as "...a socio-territorial entity which is characterised by the active presence of both a community of people and a population of firms in one naturally and historically bounded area. In the district, unlike in other environments, such as manufacturing towns, community and firms tend to merge."

Neo-Marshallian industrial districts in the Third Italy are characterized by a set of common features (see also Landström 2005). First (and accordingly emphasized in the definition presented above), in these districts, production activities and the "daily life" tend to merge. This merger is the outcome of a pattern of intensive interactions between the community of firms and families in a variety of dimensions. Second, there is a high division of labor among small companies, which are specialized in specific phases of the production process and work together in flexible teams. The manufacturer of the final good (the so-called impannatore) usually leads these teams and interacts with the market. Third, a widely shared value system (e.g., a specific ethic of work, principles of reciprocity) shapes action and interaction in the local community. These values are diffused throughout the district by a dense network of institutions (such as the firm, the family, the church, the local government, business associations). Fourth, in Third Italy's neo-Marshallian industrial districts, competition and cooperation tend to coexist. The firms are linked to each other by manifold relationships, competing in some fields and collaborating in other ones. Finally, neo-Marshallian industrial districts benefit from a credit system with locally and socially embedded banks, which have a deep knowledge about and close linkages to the community of the districts' firms.

From the 1980s onward, one could observe a rise in importance of local and regional policy interventions in Italian industrial districts. Policy-makers supported the evolution of districts by providing infrastructure (industrial parks, real service centers) and collective services (financing, education, marketing) and by performing the role of "social coordinators" (bringing actors together to solve common problems).

The 1990s has seen a growing skepticism about the long-term competitiveness and growth dynamics of neo-Marshallian industrial districts. Radical technological innovation and the globalization of the economy have led many authors to raise doubts about the extent to which they are a superior and stable spatial configuration of industrial production (see, for instance, Guerrieri et al. 2001). Critics have pointed to the limitations of self-sustaining production systems dominated by small firms in the global economy. Furthermore, the attempt made by Piore and Sabel (1984) to draw from very unique (and hardly generalizable) cases such as the Third Italy to develop their notion of flexible specialization has been viewed with extreme skepticism (see, for instance, Storper 1997).

Over the past years, a rich body of empirical work (for a review, see Rabellotti et al. 2009) emerged, documenting and analyzing ongoing structural changes in Italian districts. Based on a review of this literature, Rabellotti et al. (2009) found that some districts disappeared as a result of crises in their area of specialization (e.g., textile districts in Lombardy and Veneto). In most cases, these districts were

specialized in low-cost production and failed to compete successfully with manufacturers in newly emerging countries. Other districts have changed specialization, shifting from the production of final goods to the production of the machinery required for their manufacture. There are also districts which have conquered international luxury markets by upgrading the quality of their products, while others have enhanced their technological capabilities. Interestingly, the typical small Italian industrial district firm seems to lose importance. Indeed, the evidence suggests that it is medium-sized companies and groups of firms which are now the most dynamic agents and perform as key driving forces of structural changes (Rabellotti et al. 2009).

23.2.3 The Innovative Milieu Concept

The decline of many traditional industrial centers throughout Europe in the 1970s coupled with the subsequent rise of technological advances in industry and the emergence of innovative peripheral regions prompted serious rethinking of centrally directed and supported industrial development poles, often French in origin, in favor of innovatively driven indigenous growth. In the mid-1980s, Philippe Aydalot's hypothesized that there is "something" localized and intangible that permits innovation and dynamic development to proceed in certain regions and not in others (Crevoisier 2004). This observation set in motion a series of research efforts titled GREMI (Groupe de Recherche Européen sur les Milieux Innovateurs) to investigate and promote the dynamism seen in what became known as "innovative milieu." The concept of innovative milieu, however, has never ventured much beyond Francophone readers.

Research on milieus tends to be strongly focused on high-tech industries and on growth regions with extensive innovation intensity, although a few studies on conservative milieus in stagnating or declining traditional industrial regions and their restructuring processes also exist (see, for instance, Aydalot 1988; Maillat et al. 1997).

Definitions of innovative milieu vary, but most protagonists of this concept share the view that a milieu may be described as a set of region-specific rules, practices, and institutions that enhances the capacity of regional actors to innovate and to coordinate with other innovative actors (Storper 1997). In the writings of the GREMI group, the milieu is not always clearly distinguished from networks. As Storper (1997, p. 17) notes: "Many of the milieu theorists use the 'network' as their principal organizational metaphor. For some, the milieu is itself a network of actors . . . in a region. For others, the network concerns the input-output system; it is the network that is embedded in a milieu, and the milieu provides members of the network what they need for coordination, adjustment and successful innovation."

The directions taken by GREMI members reflect what Benko and Desbiens (2004, p. 325) "see as a genuine 'territorial turn' that can be characterized by a movement from economics toward geography; this renewal is influenced by the cultural turn. . .that has been expanded through the influence of traditional

economics and sociology." This reorientation has profound implications for how one looks at regional development. Accordingly, the focus moves away from MAR externalities enjoyed by individual economic units or agents and their industrial interactions to instead gravitate toward an examination of the full pattern of structural linkages among institutions that diffuse and enhance the innovative potential of a territory. Rather than product, supply, labor, or material flows among firms that constitute a local economy, one looks to the overarching structure of institutional networks through which innovations and ideas – often external in origin – pulse and bring prosperity to regions.

For example, Camagni (1991a, p. 3) sees an innovative milieu as "the set, or the complex network of mainly informal social relationships on a limited geographical area, often determining a specific external 'image' and a specific internal 'representation' and sense of belonging, which enhance the local innovative capability through synergetic and collective learning processes... The attraction of external energies and know-how is exactly the objective we assign to innovative networks: through formalized and selective linkages with the outside world...local firms may attract the complementary assets they need to proceed in the economic and technological race."

This network is not seen as passive or merely contextual, but rather as a robust, proactive, and enabling agent-like presence: "...it is often *the local environment which is, in effect, the entrepreneur and innovator, rather than the firm.* The firm is not an isolated agent of innovation: it is *one* element within the local industrial milieu which supports it" (Aydalot and Keeble, 1988, p. 9). Despite considerable research from subsequent GREMI investigations, the question of how desirable externalities arose initially remains unclear; Simmie (2005, p. 793) concludes from his survey of the literature that "Explanations slip all too easily into the argument that innovative milieu assist innovative firms while at the same time the presence of innovative firms create the innovative milieu that are supposed to be assisting them."

However one reads this literature, it would seem that firms and industries have become secondary or complementary components of a local economy, which rely upon the linked institutions of their innovative milieu to acquire key technological assets. Crevoisier and Maillat (1991) have traced some of the possible connections between the innovative milieu and the underlying markets, sectors, industrial organization, etc., giving rise to what has become more generally known as a *territorial production system*. However, the territorial production system (TPS) remains a largely unspecified "black box" of idealized categorical types (e.g., industrial organization), which does not clearly identify the agents, elements, or incentives that constitute a working local economy. Storper (1997) notes that one of the key shortcomings of the literature on innovative milieus is that it fails to identify the economic logic by which a milieu promotes regional innovation. Little is said about why localization and territorial specificity should promote technological dynamics.

Camagni (1991b) goes further in seeing the innovative milieu as an uncertainty-reducing mechanism that permits firms to better assess and deploy innovative

resources, although he does not refer to a TPS in specifying several gaps to be overcome. The innovative milieu concept first launched important ideas about how innovations are introduced and exploited in local economies, but it was eventually overtaken by other more convincing accounts of how innovation systems are populated and operate within regions.

23.2.4 The Industrial Cluster Concept

From the 1990s onward, the term "cluster" has become increasingly prevalent to denote spatial concentrations of firms. There are many different branches of this notion. As the term "cluster" is rather imprecise and meanings could differ, various authors have attached to it the adjectives "industrial," "regional," "business," and "economic." It is beyond the scope of this chapter to deal with all these variants (for an overview, see Iammarino and McCann (2006) and Cruz and Teixeira (2010)). In this chapter, we focus on Michael Porter's cluster approach which has become the most popular one. In 1990, Porter published his highly influential book "*The Competitive Advantage of Nations*," which introduced his *industrial* cluster concept broadly to business and policy officials, and he rapidly propelled awareness of the concept well beyond the previous academic audience in a subsequent outpouring of books and articles. Clusters are defined as "... geographic concentrations of interconnected companies, specialized suppliers, service providers, firms in related industries, and associated institutions (for example, universities, standards agencies, and trade associations) in particular fields that compete but also cooperate" (Porter 1998, p. 197). Porter claims that clusters are a dominant feature of the landscape, that is, they could be found in virtually all countries and industries. The concept is rather flexible as regards the types of firms involved. Some clusters are made up of small firms only, while other host both small and larger ones (Porter 1990).

Unlike the previous descriptive accounts of colocation from which causal factors might be inferred, Porter brings both normative and positive insights to his cluster definition from long experience as a theorist of corporate strategy at Harvard Business School. His cluster view essentially complements the importance of corporate strategies to remain prepared to dismantle and reinvest/relocate individual components of the corporate value chain (headquarters, distribution, production, etc.) in clusters of competitive and productive enterprises, which are comprised of similar or related firm components.

Porter's main interest is in explaining the sources of enduring competitive advantages in a global economy. He argues that competitive advantage is strongly localized; it arises from clusters and is shaped by four determinants: (i) factor conditions (human capital, natural resources, infrastructure, etc.), (ii) demand conditions (sophisticated and demanding local customers), (iii) related and supporting industries (presence of capable suppliers and competitive related industries), and (iv) firm strategy, structure, and competition. These four determinants of competitiveness are interrelated and form a self-reinforcing system, the so-called diamond. Among all elements of the diamond, rivalry among cluster actors is seen

as the most important one because it has a stimulating effect on all others. Fierce rivalry promotes the development of highly specialized input factors, it upgrades domestic demand, and it spurs the rise of related and supporting industries (Porter 1998).

Vigorous competition among locally based rival firms is, thus, the main driving force in Porter's cluster model. However, he also states that clusters represent a combination of competition and cooperation, although the cooperative dimension of clusters is seen as less important compared to the competitive one. Porter's view on cooperation is rather specific. His writings reflect a deep skepticism when it comes to horizontal collaboration, pointing to a set of harmful effects that potentially arise from cooperation among competitors. Vertical cooperation (i.e., collaboration and knowledge exchange with suppliers, customers, and actors from related and supporting industries) in contrast is seen to be beneficial. Porter's work contains only some vague cues on the importance of social factors (more precisely, social capital) that facilitate interaction and collaboration between actors located in a cluster. Social (as well as cultural and institutional) features of clusters are clearly undertheorized in Porter's approach.

Other points of critique that have been raised (Martin and Sunley 2003) include – among other things – that Porter has failed to provide a clear specification of the geographical and industrial boundaries of clusters, related difficulties to identify clusters, and the uncritical reception of the approach in policy circles.

The undeniable attraction of Porter's cluster concept results from its twofold usefulness in providing answers to these questions: (i) What advice should a firm or corporate component consider in its corporate strategy to maintain maximum competitiveness when considering alternative business environments, and (ii) what advice should subnational regions consider when designing economic development policies aimed at providing attractive production sites and a sustainable employment base? Accordingly, many of the most ardent followers of this concept are business or economic development consultants and policy officials.

23.3 Similarities and Dissimilarities

It is already apparent from the brief outlines above that important differences but also similarities exist among the concepts considered in this chapter. To deal with these differences and overlaps more systematically and thereby reveal more about each, we will rely on a series of important features that are summarized in Table 23.1.

23.3.1 Geographies and Space

All concepts are based upon a specific understanding of space and certain geographic factors that help bound and define each in particular ways. The *Marshallian district* was essentially limited by distances that could be economically traversed

Table 23.1 Key features of concepts

	Marshallian industrial districts	Neo-Marshallian industrial districts	Innovative milieus	Industrial clusters
Geographies and space	Geographical distance/ neighborhoods	Common political district occupancy	Relational "space" coextensive with network	MAR + globalized factors
Core actors	Small firms	Family/fluid firms, local officials	Social and political institutions, knowledge producers	Firms of all size + industry groups
Agent motivation	Profit maximization	"Mastery of craft" + place/product pride; consolidate high-value, luxury/income-elastic consumer markets	Growth, place/product pride; gain greater prominence in tech-based development initiatives	MAR + ROI, seize market and production opportunities afforded by globalization
Interactions (relationships between actors)	MAR	MAR, long-term, trust-based local networks	Informal social relations, collective learning within the milieu, formalized extra-local networks	MAR, supply/value chains, vertical forms of exchange, project alliances
Industries, technological intensity of products, and markets	All industries prevailing in the nineteenth century	Consumer discretionary/low-medium craft	High-tech intensive	Export-intensive industries/ high-tech and low-tech
Innovation	Diffusion of ideas, localized spilling over of trade secrecies	Craft refinement and perpetuation, flexible organizations, incremental innovation	Adoption of extrinsically produced innovations that can be regionally exploited	MAR externalities, pre-commercial joint ventures, knowledge sourcing
Environment (cultural and institutional context, extra-economic factors)	"Industrial atmosphere"	Strong family and community values / identity, blurred boundaries between business and community spheres	Shared values and visions – regional cohesion	Trust and social capital forms the "glue" that binds cluster actors together
Competition and cooperation	Mix of competition (driving force of districts) and cooperation (precondition for collective innovation benefits)	Complex mix of competition and cooperation/high importance of cooperation as coordination mechanism	(Poorly specified) balance of competition and cooperation	Fierce competition as key driving force/cooperation less important

daily by workers and suppliers in the late nineteenth century, the densities of which were sufficiently high and distances sufficiently short that districts could often be referred to as "neighborhoods." The late twentieth-century versions of *neo-Marshallian industrial districts* found in Italy are bounded instead within small governmental units known as political districts. The political boundaries are not matters of definitional convenience or regulatory requirement; rather, the local unit of government is an active partner and facilitator in the functioning of a neo-Marshallian industrial district. *Innovative milieus* are defined not at all by frictions of distance that separate the factors from individual producers or by official boundaries but instead by the "relational space" enclosed within a specific networked pattern of contacts among key institutions engaged in promulgating innovative impulses. *Industrial clusters* have perhaps the most flexible geographies, although they build upon Marshallian and MAR principles of market interaction that – with recent transportation and communication improvements – have expanded outward to include the "daily urban system" of entire metropolitan areas and regions. Indeed, Porter even speaks of a "California wine cluster," although this is almost certainly comprised of several smaller, distinctive clusters of wine producers organized around a particular "terroir" that can take advantage of California's full resources.

23.3.2 Actors and Interactions

Small- and medium-sized independent firms are the core agents in *Marshallian districts*. They are essentially profit-maximizing market actors who find greater market advantages by being located in industrial districts than if located apart. The prototypical *neo-Marshallian industrial district* found in the Third Italy consists of multiple agents: small family firms that expand or contract in various business arrangements with other firms, employees who may switch or hold jobs in multiple firms, and the local political district that establishes policies and practices. Profit maximization is but one of several motivations, which it shares with a mastery of craft, pride of place, and external recognition by consumers of luxury and income-elastic products. Agents are more difficult to isolate in the case of an *innovative milieu* because its constitutive networks engage many different institutions in a structure where specific roles go unremarked, although such institutions are said to be motivated by pride in their region and their efforts to promote innovation. Individual market and political agents operating lower down, at the level of the local economy, are seen as part of a "territorial production system" that interacts with and depends upon the innovative milieu, but these generally go unacknowledged as its core agents. *Industrial clusters* are essentially populated by firms and firm branches of all size and forms of corporate organization as their principal agents. It is often the case that the cluster itself acquires agent status and takes on a loose organizational form of institutional governance to promote the cluster, but this varies widely with fewer cluster organizations in Anglo-Saxon and more in continental European and Asian clusters. Return on investment, productivity growth, and market shares are principal agent motivations.

Looking at interactions, one finds that *Marshallian districts* are knit together by supplier linkages and often unconscious flows of knowledge, ideas, and workers (i.e., knowledge spillovers) among firms located nearby. The *neo-Marshallian industrial districts* theory puts due emphasis on long-term trust-based collaborative networks of small firms (and supporting organizations) that promote an easy exchange of tacit knowledge, joint purchase of materials, or joint initiatives to get access to technical or financial services. The literature on *innovative milieus* stresses the importance of mainly informal social relationships at the regional level which promote collective learning and, thus, the innovation capacity of companies. Collective learning is based on three mechanisms of knowledge transmission (see, for instance, Keeble 2000): (i) intra-regional mobility of labor, (ii) spin-offs, and (iii) formal and informal networks. It is noteworthy that the milieu literature specifically considers the role of extra-regional linkages. Such links to the outside world are more often than not formal in nature and considered as crucial in order to get access to complementary knowledge, markets, and technologies that are not available within the limited context of the milieu. The *industrial cluster concept* considers links of companies to demanding customers, suppliers, and vertical forms of exchange and interaction among companies. Both input-output relations and flows of knowledge are discussed in Porter's conceptual cluster model.

23.3.3 Industries and Innovation

Marshall did not specify the full range of 19th century industries, products, or technologies expected in his industrial districts, but it seems clear that any industrial process under way in England during that period could benefit from being located in a district. In short, the market interactions in *Marshallian districts* apply to all industries. Contrast this to the *neo-Marshallian industrial districts* of the Third Italy, which are very highly focused on mature industries and a more limited range of goods, markets, and production technologies. High-quality personal or household goods, often fashion- and design-intensive products, are intended for international markets of discerning consumers. Such goods are often craft-based or limited in production, which requires highly skilled artisans and quality-conscious production that takes advantage of incremental improvements in basic technologies. In comparison, the very idea of *innovative milieu* hinges on the defining importance of high technology, whose reemergence in the 1980s was seen as necessary to revive old (Maillat et al. 1997) and propel new production centers. Apart from the stress placed on links between high technology and industrial innovation, there appear to be no specific industries or markets implied. *Industrial clusters* are considered relevant to any industry or product where competitive forces require producers to enjoy MAR or Porterian diamond advantages. These are most acutely felt by firms competing in international markets, although locally competing firms are also said to benefit from cluster advantages.

In his analysis of British industrial districts in the nineteenth century, Alfred Marshall is remarkably clear about the sources and types of innovation arising in

highly localized industries. Innovation in *Marshallian districts* is seen to be essentially underpinned by a rapid diffusion of novel ideas and best practice solutions, spillovers of trade secrecies, and a large stock of industry-specific knowledge which is constantly further improved by combinations of ideas of colocated firms and intergenerational knowledge transfer. Interestingly, Marshall seems to employ a rather broad definition of innovation that encompasses not only new products and processes but also "inventions and improvements . . . in general organization of the business . . ." (Marshall 1920, p. 225), that is, organizational innovations. Innovation in the *neo-Marshallian industrial districts* of the Third Italy is mainly incremental in nature (Asheim 2000). Small firm size, specialization in traditional industries, and little investment in formal research and development are seen as the main reasons for modest levels of technological innovation activity and radical innovation. Firms in Italy's neo-Marshallian industrial districts tend to rely more on improving product quality, upgrading, and incremental process innovation (Rabellotti et al. 2009). Innovation activities are highly collaborative in nature (see Sect. 23.2) and typically oriented on craft refinement and perpetuation as well as on enhancing flexible organization structures. Protagonists of the *innovative milieu* concept stress both the importance of local collective learning processes (see Sect. 23.3.2) and the inflow of extra-local competences and complementary knowledge about technologies and markets. Innovation in milieus is essentially – although not exclusively – about the regional adoption and exploitation of knowledge, technologies, and innovations generated elsewhere. Innovation in *industrial clusters* is the outcome of the working of MAR externalities and conscious actions undertaken by firms such as pre-commercial joint ventures and acquisition of knowledge from a variety of sources. Elements of the diamond are seen to have substantial innovation-enhancing effects. Demanding customers, for instance, force cluster firms to carry out permanent improvements and innovation. Knowledge exchange and joint development projects with supplier and related industries provide essential inputs for innovative activities, and strong local competitors perform a critically important role in generating a high pressure to innovate. Taken together, these factors and conditions are supposed to constitute a fertile ground for continuous improvements and more radical innovations of products, processes, and organizations.

23.3.4 Environment, Competition, and Cooperation

The concepts under consideration here share an emphasis of the role that the environment, or more precisely, the cultural and institutional context, can play in regional development, competitiveness, and innovation. Marshall employs the notion of "industrial atmosphere" to highlight the role of social and cultural factors in supporting localized knowledge flows and industrial development. Colocation of similar firms in the same community implies that in *Marshallian industrial districts* "the secrets of industry are in the air." A strong local cultural identity and shared industrial expertise are seen to form essential institutional foundations of the

evolution of Marshallian industrial districts. The literature on *neo-Marshallian industrial districts* clearly supports this view. Soft noneconomic factors such as a set of shared values, norms, trust, and collective identity are seen as fundamentally important to the economic success of industrial districts. The boundaries between the local community and industry are porous and often difficult to identify. Social and economic relations tend to be highly interwoven. Mutual trust, the identification with the region, and the products of a district, etc. are regarded as utmost significant. These factors enable and stabilize different types of collaboration and allow for a fruitful combination of cooperation and competition (see below). In a very similar vein, the *milieu approach* stresses the importance of the sociocultural dimension of innovation and development. A set of common values and shared visions (such as an orientation on long-term development goals instead of a short-term profit) and a willingness to collaborate reflect sound levels of regional cohesion and underpin high rates of innovation. It is important to note, however, that potential negative effects of too much cohesion on long-term innovation and adaption capacities of regions are also considered in the milieu literature. The *industrial cluster concept* proposed by Porter does not totally ignore noneconomic factors, but they are much less emphasized in his analysis when compared with the other approaches. He notes that trust and social capital are prerequisites for close interaction of cluster actors: "Social glue binds clusters together, contributing to the value creation process. Many of the competitive advantages of clusters depend on the free flow of information, the discovery of value-adding exchanges or transactions, the willingness to align agendas and to work across organizations, and strong motivation for improvement. Relationships, networks, and a sense of common interest undergird these circumstances. The social structure of clusters thus takes on central importance" (Porter 1998, p. 225).

One finds strong differences between the key concepts under review in this chapter when it comes to determining the relative importance of competition and cooperation as coordination mechanisms and key source of competitiveness. *Marshallian industrial districts* rely on both competition and cooperation. In Marshall's view, it is competition that is the key driving force of industrial districts, while district benefits in knowledge creation and innovation are a result of collaboration (Newland 2003). According to Marshall, cooperation can take two forms: it may be conscious and intentional (an example is the formation of industry associations) or unconscious and automatic (knowledge spillovers). In *neo-Marshallian industrial districts*, firms' willingness to cooperate is of critical importance for innovation and competitive advantage. In Third Italy's districts, "a complex mix of competition and cooperation" (Brusco 1990, p. 1) tends to prevail. "The efficient co-ordination of the district's activities and the promotion of dynamic growth is not simply a product of the unfettered operation of classic competitive market principles; on the contrary, what is at work is a complex amalgam of both competitive and co-operative principles . . . co-operation is at least as important as competition for organizing the district" (Sengenberger and Pyke 1992, p. 16). Protagonists of the concept of *innovative milieu* also emphasize the balance between competition and cooperation. The nature of this balance is, however, not clearly specified, and in

most contributions to the milieu school, the cooperative dimension seems to be rated as more important than the competitive one (Newlands 2003).

The *industrial cluster* concept – at least Michael Porter's version of it – does not emphasize the role of cooperation to the same extent. On the contrary, it is fierce competition and not cooperation that determines competitive advantage. Porter and Ketels (2009) even argue that a large number of cluster benefits occur simply due to collocation, that is, for most benefits to unfold, no conscious and active collaboration by cluster firms is required. This does not mean, however, that cooperation is completely unimportant in Porter's analysis. He recognizes some advantages in vertical forms of exchange, while cooperation between competitors is seen as harmful. "Clusters clearly represent a combination of competition and cooperation. Vigorous competition occurs in winning customers and retaining them . . . Yet cooperation must occur in a variety of areas . . . Much of it is vertical, involves related industries and is with local institutions. Competition and cooperation can coexist because they occur on different dimensions and between different players; cooperation in some dimensions aids successful competition in others" (Porter 1998, pp. 222). While cooperation is important, it does not have the same significance as competition. This argument is clearly supported by the fact that cooperation is not part of Porter's diamond, while competition performs as the most crucial element in the diamond model because of the supposed stimulating effect it has on the other ones.

23.4 Conclusions

In this chapter, we have provided an overview on what is known about neo-Marshallian industrial districts, innovative milieus, and industrial clusters. From the 1970s onward, protagonists of these three concepts have essentially enhanced one's understanding of the main sources of regional competitiveness and innovation. In the concluding section, we want to move beyond presenting past achievements made by adherents of the three concepts, glancing at the potential future of the notions under consideration. In our view, two aspects of future development deserve attention. The first concerns theoretical challenges; the second one is about the applicability of the concepts to other contexts and environments than those from which they have emerged.

A key issue for future theoretical work on neo-Marshallian industrial districts, innovative milieus, and industrial clusters will be to provide a more dynamic view on spatially concentrated industries and their institutional underpinnings. Although efforts are under way to understand their evolution, the literature on clusters and neo-Marshallian industrial districts in particular have been criticized sharply for relying too heavily upon static analysis and saying little about the development of regional collections of firms and industries over extended time periods. Consequently, a proper conceptualization of the evolution and transformation of agglomerated industries is urgently needed and should be a core topic of future research.

What is the potential future of the three concepts assessed by their transferability to other regions and countries than those from which they have emanated? Given the fact that the cluster notion provides a broader framework that allows for

capturing very different forms of geographical concentrations, one might argue that it will have the edge over the neo-Marshallian industrial district and milieu concepts. We see the cluster concept as the most fruitful one for cities and regions in Europe, North America, and Oceania and continuing in the near future, but it is unclear whether it will apply as convincingly in the more distant future or to other rapidly emerging economies of Latin America, Asia, or perhaps Africa. Is it a foregone conclusion that clusters as we now know them will arise in clearly identifiable forms in East Siberia, Mumbai, Jakarta, Amazonas, or Szechuan by 2050? Or will local circumstances – as was the case for neo-Marshallian industrial districts, innovative milieus, or industrial clusters – produce a rich variety of stylized models of local economic development to meet new challenges? Emergent countries may eventually come to differ rather considerably from the so-called Western models that presently operate within a relatively narrow range of characteristic democratic and market institutions. As the world's economies struggle to adjust to new monetary regimes, altered financial regulations, and impending resource frontiers, one cannot be certain how the systems of global production and international markets may change or how their knock-on effects may require the further repositioning of urban and regional economies.

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