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Balancing Firm and Network-based Resources to Gain Competitive Advantage: A Case Study of an Artisanal Musical Instruments Cluster in Germany**

The question of whether firms gain competitiveness through local networks and clusters becomes more relevant than ever as globalization proceeds. This is particularly true for traditional and craft-based clusters, districts and business networks. A central question emerging for these types of networks is: (How) can they build competitive advantage using local production systems and network ties as core resources? The present article aims at shedding light on this issue by presenting a case study of an artisanal cluster operating in the manufacturing of classical musical instruments. Focusing on a resource-based perspective and using a qualitative research approach, the paper explores the critical resources necessary for generating competitive advantage through local networking. It critically investigates how competitive advantage is gained for the network and which are the drivers of sustaining competitive advantage in a dynamic view.

Key words: **artisanal clusters, competitive advantage, local versus global linkages, resource-based view**
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1. Introduction

Despite a vast body of research dealing with clusters, industrial districts (IDs), or business networks, and the issue of competitiveness (Pinch et al., 2003; Tallman et al., 2004; Giuliani, 2005), only a few studies pay attention to traditional, craft-based networks or clusters and the way competitive advantage is achieved through local and global linkages in these constellations (Parilli, 2009; Sacchetti & Tomlinson, 2009; Petrou & Daskalopoulou, 2009). Only recently researchers like Yan et al. (2011), Felzensztein et al. (2010a, b), Festing et al. (2010) and Staber (2009) have begun to explore the specific contexts and architectures of SME-based clusters in traditional industries (for example, agriculture or textiles) or craft-oriented niches (such as luxury watches or musical instruments). The central questions regarding networks and clusters operating in such industries is: To which extent and how do these traditional production systems use local network resources versus firm-specific resources to build competitive advantage for global markets?

The present article presents a case study of a German artisanal cluster of mainly small and medium-sized enterprises (SMEs), operating in the production of classical musical instruments. Using a resource-based perspective and a qualitative approach, the article elaborates the critical resources necessary for generating competitive advantage through local networking. It critically explores how competitive advantage is gained for the network versus the individual firm within the cluster and which are the drivers of sustaining competitive advantage in dynamically changing, global markets.

2. Theoretical considerations and research propositions

2.1 *Clusters, networks, IDs and the issue of competitiveness*

Localized production systems continue to play an important role for the competitiveness of firms and regions. Research on regional clusters, business networks, or IDs, and firms' competitive advantage has seen a strong revival (Porter, 2000; Becattini et al., 2009). Although these approaches are often investigated from different disciplinary angles, there is a common denominator depicting some overarching principles and hypotheses on how network/cluster interaction works and what the impact is on the firm's competitiveness.

Cluster theory, in essence, contends that firms integrated in clusters benefit from advantages of co-location with other firms and actors and from agglomeration economies within the cluster. In particular, Porter's "diamond" model of the competitiveness of regional clusters (Porter, 1990, 2000) establishes a link between a firm's cluster participation and its competitive position. In his model, economic advantages associated with geographical proximity and the nature of interaction of the cluster members, such as knowledge spillovers and innovation, specialized labour pools, access to technology and other resources, generate benefits to firms within clusters and add to their firm-level competitiveness. Interaction within regional clusters takes place as vertical, horizontal or diagonal inter-firm linkages and relations with institutions within and across industries (Asheim et al., 2006). Porter (2000) claims, in addition, that cluster relationships are characterized by a certain degree of rivalry that enhances the competitive advantage of the cluster. Rivalry among firms within clusters pressur-

izes firms to upgrade production and raises the innovative capacities of firms and the cluster as a whole; this is the case even if cluster actors are no direct competitors.

The related concept of business networks uses transaction cost economics to analyze localized inter-firm relationships. Compared with purely market-based contracts and hierarchical integration of corporate enterprises, business networks offer transaction-cost reductions and efficiency gains. From a market-oriented management perspective (Felzensztein et al., 2010a), networks may enable firms to establish collaborative arrangements, based on different network layers (including social relations). Sydow (1996) posits that regional business networks are typically set up by SMEs and governed by collective leadership, whereas global and strategic networks are usually dominated and steered by large and multinational lead firm. SME-based business networks lack a formalized structure and function through self-organization of the network participants (Sydow, 1996).

A third approach used here is the post-Fordist ID (Becattini, 1990; Brusco, 1990; Becattini et al., 2009), which emphasizes the specific socio-economic background of the network, its firms and local institutions as a crucial element for supporting the competitive advantage at the network and firm-level. The literature on IDs proposes that the way firms specialize within local network relations drives the competitiveness of the ID in the global marketplace. Small and often family-run firms operate in traditional, craft-based industries and market niches, while interacting with firms in close geographical vicinity through localized vertical and horizontal linkages. Similar to the concepts presented previously, firm-level competitive advantage is generated primarily through economies of scope and the collective usage of local resources that are shared within the district. The importance of collective resources is enhanced by the firms' embeddedness in their home region, common values and an idiosyncratic work culture that is spread across the ID members (Staber, 1996a). Locally embedded network relations between firms and entrepreneurs allow even micro businesses competing in the global marketplace. In the Italian context, researchers have investigated how SME-based networks in traditional sectors such as textiles, clothing, or furniture, evolve and change in globalized markets (Belfanti, 2009; Sacchetti & Tomlinson, 2009; Dei Ottati, 2009). These recent studies highlight that the dynamics of the competitive advantage that is gained in contemporary IDs lie in the district's ability to rapidly and flexibly adapt to changes in the external environment, such as fierce global competition, new market needs, technological shifts, etc.

2.2 Integrating resource-based theory into a network approach

The concepts presented posit that, beyond agglomeration economies and geographical proximity, social relationships and the idiosyncratic usage of collective resources within a local network crucially shape a firm's competitive advantage within clusters. These components, in turn, are elements of a resource-based perspective on firms in a network context.

According to the resource-based view, resources are critical components that shape the competitive advantage of firms inside and outside network relationships. The resource-based view highlights how individual firms may use a bundle of their internal and organizational capabilities as resources to build competitive advantage and

differentiate them from their competitors (Barney, 1991, 2001). The properties of these resources, being subject to rivalry in the firm's external environment, play an important role according to the approach. Using a resource-based theory to analyze network and cluster relations has become common within strategy research and economic geography (De Oliveira Wilk & Fensterseifer, 2003; Pinch et al., 2003; Tallman et al., 2004; Hervas-Oliver & Albors-Garrigos, 2007). It is argued that resources that are collectively shared among network or cluster firms determine the competitive advantage of the whole network and the partaking firms. With this interpretation of the resource-based view as the point of departure, networks and clusters are considered as a strategy for firms to achieve important and critical resources (Staber, 1996a, p. 1).

2.3 Network-based resources for artisanal clusters: types and properties

For traditional, artisanal networks, different sources of locally available network resources can be distinguished that are critical to the competitive advantage at the network and firm-level. These network-based resources can be broadly subdivided into: (i) the nature of local resource pools shared among network members and access to network-based resources; (ii) the firms' embeddedness in the specific socio-cultural background, and (iii) trust built among the network members.

Local resource pools

Network resources that are locally available for collective usage enhance the competitive position of clusters and networks. They include qualified labour, (specific) knowledge and information, and local organizations such as research institutions, business associations, regional development agencies, and the like. Not only the quantity or the simple availability of these resources is important, but their quality and the degree to which network firms make use of them shape the "local buzz" (Bathelt et al., 2004) going on within the network. Hence, local resource pools and the way they are shared within the network determine the strengths and power of the relationships firms and other cluster members build.

Resources can be shared through simple input-output linkages or via knowledge-intensive relations. Malmberg & Maskell (2006) and Malmberg & Power (2005) propose that localized learning, knowledge creation and diffusion taking place among network members are characteristic of knowledge-intensive relations. In theory, spatial proximity of actors facilitates knowledge flows via personal contacts and face-to-face communication. Physical closeness, thus, spurs the exchange of existing knowledge and the generation of new knowledge, adding to the knowledge base of the network. However, Malmberg & Power (2006) also emphasize that the localization of knowledge creation/dissemination is no automatism. Indeed, learning and knowledge transfer are not confined to spatial cluster boundaries but take also place with partners at more distant places and across industries.

Another central question is whether all firms have equal and full access to local resource pools or if resources are limited to selected actors within the network. In this context, Felzensztein et al. (2010a) and Festing et al. (2010) highlight the mediating role of informal networks in facilitating more formalized or institutionalized resource-sharing within regional clusters. Accordingly, localized collaboration through which

resources can be shared is conceptualized as overlapping social networks within the cluster that shape network architectures and the way competitiveness is gained through these architectures (Festing et al., 2010; Tappi, 2005).

Embeddedness

Thus, social relationships that are integrated into a specific socio-economic context, coined “social embeddedness” (Tallman et al., 2004; Parilli 2009), are important network resources in the case of regional clusters and IDs. The contention that it is not the formal relations between firms’ organizations, but the social ties between persons with similar interests and ideas determining network performance can be traced back to Granovetter’s notion of “embeddedness” (Granovetter, 1985). Granovetter claims that the decisions and relationships of economic actors are crucially influenced by their social environment. Common social and cultural values shared by the members of the network and a functioning social community are essential elements of the “social embeddedness” as a network resource (Wolfe & Nelles, 2008, p. 375).

For craft-based networks, values like tradition, culture and identity are part of these specific network resources that govern the practices and actions of firms. Tradition can be defined as inherited sets of practices, institutional frameworks and routines that firms use. According to Pilon & De Bresson (2004, p. 24), a common culture within the social community of the network refers to “a confined repertoire of (more or less) shared heuristics among local firms” and is created through social interaction (Hospers & Beugelsdijk, 2002; Pilon & De Bresson, 2004). Similarly, identity is associated with the notion of being part of a social community and a region (Belussi, 2006, p. 97; Sammarra & Biggiero, 2001).

On the flip side, social values and norms enforced by the network may act as “social entry barriers” (Lorenzen, 2002, p. 28) for “outsiders” wishing to join the network. They can result in mental barriers, potentially lowering the competitiveness at the network level. As a result, the competitive advantage of a local network or cluster is generated primarily through social relationships enabling the interchange of resources (such as knowledge) to foster innovation and innovativeness of the firms and the cluster as a system. The functioning of this socially embedded interaction, however, requires reciprocal trust on the part of the network partners.

Trust

Trust has been discussed for the Italian IDs (Becattini et al., 2009) and for business networks in general (Lorenzen, 2002). Network theory assumes that mutual trust among cluster/network firms works as a governance mechanism, allowing efficiently exchange resources, reduce transaction costs and avoid opportunistic behaviour on the part of individual firms at the detriment of others (Staber, 1996b). Trust in the cluster, ID and network context is closely linked to the density and quality of interpersonal relationships (Lorenzen, 2002), i.e., a community of people sharing a common identity, joint beliefs, practices and routines, common values and culture (Parilli 2009, p. 7). Trust is then generated by rules that are taken for granted by the network members. This is particularly true for traditional clusters, where trust is associated with values, norms, and traditions embedded in the social and non-formalized relation-

ships. It can be presumed that trust-based networks are characterized by less formal relationships than. Based on this understanding, Storper (1997, p. 140, 144f.) posits that small social communities, such as small niche clusters, in principle offer limited scope for cheating.

As a resource, trust develops over time and involves learning about the behavior of other network members, about the network culture and values, etc. (Lorenzen, 2002; Pilon & DeBresson, 2004). Learning processes become particularly relevant in the case of entries of new network members. In addition, Jacobs and De Man (1996) argue that the process of trust-building depends on the strength of local competition: strong rivalry in the local network may prevent trust-building and impede networking.

2.4 Network-based resources and competitive advantage in artisanal, SME-based clusters

Firm-specific versus network-based resources

A resource-based explanation of firm behavior within networks posits that collective resources are available for the network members as commons and that these resources generate competitive advantages, adding to the competitive position of the individual firm. Due to resource constraints (Hollenstein, 2005), particularly small businesses operating in SME-based environments like artisanal clusters and IDs should benefit from using network resources to strengthen their competitive position. However, it is very likely to assume that internal, firm-specific resources are the primary source of the firm's internal competitive advantage within network or cluster relations (Festing et al., 2010). Internal resources are particularly important to differentiate the individual firm from rivals from within local cluster systems where rivalry matters (Enright, 2003). Since SMEs are especially vulnerable to rivalry from within a local network, firms inside SME-based networks will thus carefully balance the usage of network-based versus internal resources (Festing et al., 2010), i.e., they will use network resources mainly to supplement internal resources that primarily shape their competitive advantage. Hence, the first research proposition is established as follows:

Proposition 1: The extent, to which firms within artisanal, SME-based networks make use of collective network resources, adding to their individual competitive advantage, depends on their ability to sustain their individual competitiveness within the network.

Network resources and competitiveness from a dynamic viewpoint

Building competitive advantage within “low tech”, craft-based networks and declining clusters at the global scale is challenging in several respects. Typically, traditional clusters operate in highly competitive global environments and have to cope with the saturation of their markets (Yan et al., 2011; Becattini et al., 2009). These challenges and other external drivers force traditional industrial clusters to actively search for new products and markets, and to innovate in order to survive in globalized market niches (Tappi, 2005). In addition, traditional IDs and clusters with decade- or even century-long operations often face strong organizational inertia and a low degree of efficiency (Yan et al., 2011; Tappi, 2005). Grabher (1993) shows how established, “mature” industrial clusters relied on strong local ties for a long period and faced a deep resistance

to technological shifts. New organizational structures and new firm- and cluster-level adaptive strategies are therefore vital to increase the firms' and the network's innovative capacities, to escape global competition based on cost advantages and imitation and to upgrade into a knowledge-intensive craft-oriented local production system (Lagendijk, 2000; Tödtling & Trippel, 2004). In turn, Schamp (2005) posits that clusters that stick to their established paths of development may certainly survive in a shrinking total market, but are always in danger of decline. Resistance to change and adaptation is, hence, a danger to traditional clusters and IDs.

Notions like change, adaptation and path-dependency have been discussed in recent evolutionary approaches (Buensdorf, 2007; Jones, 2004). For traditional clusters and artisanal networks, renewal and adaptation are seen as important processes to generate sustained competitive advantage (Barney, 1991; Johnson et al., 2008, p. 107) in dynamically changing environments. Renewal of traditional production systems may take different trajectories, i.e., through generating and using highly specialized and valuable local resources, effectuating changes in the organizational architectures, absorbing new knowledge and technologies from external sources and/or developing new products and markets. It is also influenced by the individual knowledge and technology bases of single firms (Tappi, 2005). The capability to renew and adapt thus depends on the "absorptive capacity" of the firms and the cluster (Hervas-Oliver & Albers-Garrigos, 2007, p.116; Giuliani, 2005). A critical perspective in cluster research looks, in more detail, at the properties of the knowledge that is created and accumulated within the cluster (Tallman et al., 2004; Hervas-Oliver & Albers-Garrigos, 2007). Tappi (2005) shows how an Italian musical instruments cluster adapted to changing contexts by applying new technologies, absorbing external knowledge and entering a new market for electronic instruments, just at a time when this technology was on the rise. Scholars concerned with "cluster life cycle" models (such as Menzel & Fornahl, 2009) emphasize that the renewal of a cluster is characterized by a specialization of firms on new fields of activities, the use of new technologies or a diversification of its business activities.

Applying a resource-based perspective to dynamic contexts such as a changing, global marketplace, it can be presumed that resources common to the local network need to be supportive of the adaptation of individual firms and the cluster alike to generate sustained competitive advantage at the firm-level. Thus, the second proposition is established as follows:

Proposition 2: Network-based resources that support firm-level adaptation to dynamically changing markets contribute to the competitive advantage of the firms.

3. The evolution and structure of the musical instruments district

The musical instruments district, called "MusiconValley", has historical roots in the East German Vogtland region, close to the Czech border. Since the 18th century small-scale manufacturers settled in the area and specialized in the crafting of classical musical instruments. In the 19th and 20th centuries the district was a major center of production for orchestra instruments in Europe. During that time, the entrepreneurial landscape was characterized by a co-existence of small family-owned artisanry and lar-

ger, industrial-scale producers. After World War II large-scale mass production and state-owned manufacturers focusing on middle-class and middle-quality instruments dominated. The small artisans survived that period, partly integrated in the larger units, and served an upscale niche of the market. Exports were centrally organized by a state-owned trade agency. With the end of the socialist period, the industry underwent a period of tremendous structural change in the early 1990s with massive de-industrialisation, layoffs, and corporate restructuring. Notably the larger firms had to face a loss of their skilled labour. Irrespective of size or structure, all producers were confronted with a breakdown of their sales markets. During this period of transition, firms needed to seek new foreign markets and build up new customer relationships.

Albeit affected by this break, the core of the local cluster stayed in the market, consisting of the bulk of smaller and, now again, privately run craft-oriented firms and a couple of industrial-scale manufacturers. Despite the survival of the cluster, the musical instruments industry, as a whole, can be regarded as a declining sector and, with a focus on classical instruments, as a niche industry. Even since the end of the transition period, the Vogtland-based musical instruments cluster kept to its traditional way of production and markets, instead of adopting new technologies or entering new market segments, as was the case for the Italian musical instruments clusters (Tappi, 2005). Stringed and bowed, plucked and wind instruments, accordions and bandoneons are still the main products of the region. Slightly more than 100 enterprises (producers, suppliers of accessories and service providers) belong to the musical instruments cluster nowadays.

The majority of the enterprises are small and micro businesses. They heavily rely on inherited sets of manual, sometimes century-old techniques of artisan manufacturing. The specific knowledge firms accumulate in their shops constitute their core competencies and firm-specific resources. In these organizations, knowledge is usually transferred from generation to generation (Yan et al., 2011). These family-run manufacturers produce in small batches. They offer high-end master-level instruments that are tailored to the customers' needs and sold over the counter to artists, lecturers, students at conservatoires, etc. Although craft-based and labour-intensive traditional manufacturing dominates the cluster, firms use technical mastery and sometimes high technology to craft and design their products. Generally, R&D within the musical instruments cluster is typically conducted "on the shop floor" as incremental improvements (Ettlie et al., 1984) of production technology, design, and promotion. Notably the craft-based firms exhibit low investments in R&D. Besides this core of the cluster, a handful of industrial manufacturers are engaged in larger-scale production of instruments, exhibit higher R&D expenditures, and explore to a larger extent new products and markets. These producers serve a medium- to high-quality market segment, but sell their instruments mainly through retail or wholesale channels.

The corporate landscape is complemented by local institutions, some of which have historical roots in the region. Professional schools for training musical-instruments making have already been established in the 19th century, and one vocational training college is still located in the area. A former engineering training college for musical instruments manufacturing, now a local university college, and an applied R&D institute have its operations in the region. Besides research and training institu-

tions, several smaller musical orchestras, bands and associations, a museum for historical musical instruments and international musical contests are other institutions belonging to the cluster infrastructure.

4. Methodology and sample

The approach of the present study is exploratory and qualitative with the purpose to develop a refined understanding of network interaction and resources for the case under review. Interviews were conducted in 2009 with 11 firms and six institutions (such as research institutions and universities, network managers, business development agencies) from the cluster at the owner-manager or senior executive level. The selection of the firms aimed at representing different perspectives within the cluster landscape, in terms of firm size, organization of production, internationalization, research activities, and local versus global orientation (Yin, 2008). The firm demographics (Table 1) highlight that although most case firms have strong export orientation, local

Table 1: Demographics of case firms

<i>Firm</i>	<i>Founding year</i>	<i>Corporate integration</i>	<i>Main products</i>	<i>Production</i>	<i>No. of employees</i>	<i>Export ratio (% of annual sales 2008)</i>	<i>Price level</i>	<i>Global versus local suppliers</i>	<i>R&D share (% of annual sales 2008)</i>
A	1925	Independent	String/plucked instruments, wind instruments, drums and percussion, accessories, amplifiers and audio systems	Small-series and customized make-to-order	250	50%	~ WM	Global suppliers	5%
B	1949	Independent	Accordions, harmonicas, repair services	Small-series and customized make-to-order	73	50%	~ WM	Global and local suppliers	n.i.
C	2004	Independent	String instruments, wholesale with accessories	Small-series and customized make-to-order	8	50%	>WM	Global suppliers	5%
D	1894	Independent	Plucked stringed instruments, repair services	Customized make-to-order	4	20-25%	~ WM	Global and local suppliers	n.i.
E	1960s	Independent	Boxes and amplifier systems	Small-series	28	49%	~ WM	Global and local suppliers	8-10%
F	1928	Subsidiary of domestic corporation	Woodwind and brass instruments	Small-series and mass production	320	40%	~ WM	Global and local suppliers	2%
G	1847	Independent	Harmonicas, triolas	Small-series	22	60%	>WM	Mainly local suppliers	10%
H	2001	Subsidiary of foreign corporation	String instruments	Small-series and mass production	12	95%	>WM	Global and local suppliers	0-1%
I	1988	Independent	Brass instruments, historical wind instruments, accessories	Small-series	28	15%	>WM	Global and local suppliers	15%
J	1994	Independent	Wholesaler, instruments and accessories	n.i.	5	100%	~ WM	Global and local suppliers	0%

WM: world market

Source: Own illustration.

linkages matter for many of them. Data from the interviews were supplemented by secondary material, such as information on the firms' and other web pages, leaflets, and the like. In some cases, follow-up phone calls were conducted in 2010. The interpretation of the material gathered takes place across cases as in-depth case studies. All interviews were transcribed and are presented anonymously.

5. Empirical findings

5.1 Firm-specific versus network resources

Concerning the first research proposition, the findings suggest that firms within the musical instruments cluster indeed carefully balance their internal versus network-based resources to sustain their firm-level competitiveness. More specifically, firms rather rely on their internal core resources to build competitive advantage than gaining competitiveness through the usage of network resources. There are several phenomena that are associated to this result:

Weak local ties, sub-divided networks and rivalry

Network interaction in the cluster is characterized by "weak" ties, a finding which is in accordance with other studies on regional clusters (Festing et al., 2010; Malmberg & Power, 2005). In many cases, inter-firm relationships are constituted of informal, loosely coupled arm's length supplier relations, small-scale co-production, licensing, or pooling of purchasing/sales activities. There are isolated cases of knowledge-intensive network relations, such as innovation- and R&D-based collaboration. A few – typically industrial and technology-intensive – manufacturers have established linkages with local research institutions and universities. Local networking among firms inside the cluster architecture is overall operational, project-based, and informal, or focused on simple trade and producer-supplier relations.

As many respondents state, strategic networking among small artisans aiming at achieving synergies and gaining competitiveness does not take place locally: "*Small local manufacturers are typically not interested in strategic networks*" (Enterprise I) and "*The small artisans do not wish to collaborate and fear to lose their knowledge inside networks, but the larger firms collaborate, also over strategic issues.*" (Local business development agency) Here the low strategic outset of many artisan producers acts as a barrier towards establishing strategic networks. Rivalry among local producers also lowers the potential for strategic networking (Enright, 2003), as is expressed by the manager of a larger producer, Enterprise A: "*The local micro-businesses view me as an important competitor.*" As a result, for many firms it is easier to establish knowledge-intensive and strategic networks with firms and institutions outside the cluster boundaries. The locality is not the main focus of the cluster firms' network activities and social networks span across more distant regions, as one small artisan summarizes: "*Local contacts are important, but not sufficient for my shop. I need global contacts and partners*" (Enterprise D). Thus, the local "business" and its contribution towards generating competitive advantage at the cluster level are rather limited due to the "weak tie" character of local network activities and strong rivalry.

This is partly due to significant structural differences between the cluster firms, in terms of organization, production techniques and scale, target market or market seg-

ment, sales, distribution and marketing channels. Two informal sub-networks emerge within the cluster: the small and micro businesses as purely craft-based manufacturers versus the larger, industrial-scale producers. Some interviewees even claim that differences between those networks form a “*divide between the local enterprises?*”, reducing the collaborative potential.

Social barriers and limited access to social networks

Social embeddedness is a key resource that is made available through informal and formalized network interaction. The findings from the cluster case confirm that value-added networks are established between individuals rather than between the firms’ organizations, and locational advantages are rooted to a large extent in the social embeddedness of the cluster. “Embeddedness” strongly refers to the idea of jointly being part of a group of manufacturers with decade- or century-old roots in the region and being affiliated to the traditional values of the region. In addition, the reputation and image of the cluster as a historical local production system of high-quality classical instruments, decade-long experience and competencies in this field and the brand “Made in Germany” are important social values for the cluster firms.

However, the findings also confirm the existence of social barriers among firms with different structural, organizational backgrounds and diverging social, cultural and historical contexts. These barriers limit access to network resources such as personal contacts or, more generally, opportunities of local co-operation. In particular, managers from the larger producers that emerged as re-privatized parts of the former state-owned enterprises, that have relocated their facilities to the region or have been founded recently state that they encounter strong social barriers established by local “insiders” and that they are not integrated in the social and inter-personal network of these “insiders”. Since collaboration is often initiated by personal contacts, “outsiders” wishing to collaborate need to invest time and other resources to build up local contacts. For them, the transaction costs of local networking are higher compared to alternative options, and prevailing social values and culture, such as tradition, history, and a common identity, build strong social barriers. Two cases illustrate these findings: The general manager of Enterprise A, a manufacturer who recently moved his facilities from the South of Germany to the region, states that he “*is not inside the local network of persons?*”. As a result, the firm is not engaged in any local activities, except for some small-scale purchasing collaboration and contract manufacturing. In a second case, the manager of Enterprise B who personally moved from Western Germany to the Vogtland area depicts his difficulties with “*coping with the low openness of many traditional local firms towards collaboration?*”.

(Mis-)trust within the cluster

The evidence discussed above shows that trust between network members is built through the common identity of belonging to the established cluster core. Due to the social barriers found between managers and firms, mutual trust among the network members is, however, limited. This is in particular the case for “outsiders”, as described previously. Some of the respondents even speak of “*mistrust and jealousy?*” (Enterprise I) among different sub-networks inside the cluster. The interviews confirm

that, in addition, strong rivalry among manufacturers operating in the same market segment is another factor impeding trust-building (this finding is confirmed by Boari et al., 2003, and Festing et al., 2010).

In part, the existence of mistrust and social barriers is located in the transformational heritage of the cluster. Since production organization had been centrally planned for decades, the end of the socialist period forced enterprises not only to cope with structural change within the economy and the industry, but also to act now as a private and single organization that had to build new business-related networks on its own. Some interviewees, indeed, state that this process has produced a mentality of artisans seeing themselves as “*lone fighters*” with their own way of producing, promoting and selling their instruments, rather than as a collective of firms with similar aims and targets competing in dynamically changing, globalized markets.

5.2 Network resources for adaptation and renewal in changing environments

For craft-based and traditional sectors, adaptability to a changing external environment in terms of market, technology, and competition, etc., is a crucial issue towards sustaining their competitiveness. As is claimed by proposition 2, resources need to be supportive of the firm-level adaptation to generate sustained competitive advantage. The interviews, however, demonstrate that adaptation and renewal processes using network-based resources play only a minor role for many cluster firms. Nevertheless, individual cases emphasize the potential of network-based resources towards supporting firm-level adaptation and achieving sustained competitive advantage in dynamic contexts.

Adaptation and renewal through localized knowledge-sharing and innovation

For the cluster case, artisanal producers use knowledge that is, to a large extent, tacit, individual and highly specialized. Thus, the capacity of the network as a holistic system to innovate depends on the firms’ willingness and capabilities to share idiosyncratic knowledge, to foster the circulation of this type of knowledge within the network and to generate new knowledge, adding to the local knowledge base.

This rather ideal-type picture of a localized value-adding knowledge base is certainly not true for the cluster. Several respondents find that the willingness to externally collaborate and share knowledge is particularly low with small, family-run artisans. These craft-based producers apply sophisticated manual techniques and use specific material and technologies, which constitute their core competencies and differentiate them from local and foreign competitors. Hence, they are not open to uncover idiosyncratic knowledge that is mainly encoded in their practices. One interviewee (Enterprise D) summarizes this mentality as: “*Craftsmen prefer experiencing on their own in their shops instead of (...) collaborating.*” By contrast, the larger industrial producers are more willing to collectively share knowledge and to implement new technologies inside collaborative R&D relationships. Network-based interaction inside the cluster mainly builds on the exploitation of existing knowledge and capabilities, but does not increase the local value-adding knowledge base. The cluster thus shows limited capabilities for knowledge creation, dissemination and innovation through collaborating.

Adaptive capacities of individual network firms using network-based resources

Knowledge-driven adaptation rests on the few larger producers which use local collaborative partners including research-oriented institutions to a higher extent than the bulk of the craftsmen. The case studies illustrate that these firms seek to explore new products and market segments through collaborative activities. Examples are R&D collaboration that is established between a local subsidiary of a multinational corporation (Enterprise H) and a craft-based producer (Enterprise C) to jointly develop a new product line. Innovation in terms of process improvements through collaboration is also found with a larger, industrial-scale producer (Enterprise F) and a family-owned artisan manufacturer (Enterprise I). There are moreover cases of knowledge-intensive collaboration across industries (for example, with firms from the machinery, metal or electrical engineering industries in the area). The local research institute is involved in intensive, long-term network relations with the larger producers inside the musical instruments cluster and technology-intensive manufacturers from related industries (Enterprise E). Initiating knowledge- and R&D-intensive collaboration between (artisan) producers and high-technology firms from related industries, the research institute particularly acts as a driver of the knowledge-driven adaptation of the cluster.

Public funding supported these formalized networks in the field of production and R&D in the 2000s (see Leick, 2012). Funding has been received at that time by a newly founded, professional network management that focused its activities on network-building as innovation and R&D-based collaboration of larger cluster firms, a handful of smaller manufacturers and external actors. To this aim formalized project-based networks had been established in these fields. After funding had run out in the late 2000s, local collaboration persisted at the firm-level.

Beyond R&D-based collaboration and adaptation, the interviews also demonstrate the ability of inter-related firms within the cluster to upgrade their activities in non-R&D related fields (Gottardi, 1996), combining resources from within the network with internal, firm-specific resources. As entrepreneurs and opportunity-seekers, these case firms explore new markets, develop new products and increase their learning capacities through collaboration. Existing trust-based social networks facilitate these processes through the reliability and commitment of local partners. An interesting case in point is Enterprise C, an artisan with a shop in Munich and a web store for instruments and accessories made in the cluster. The firm collaborates with a couple of local producers on a long-term basis. As rivals, they collaborate over non-core activities (for instance, purchasing, sales and promotion) that are not as sensitive to rivalry as production and R&D. Within their collaboration, Enterprise C distributes the products of other producers over its store. This case shows how small firms create value through local networks and enhance their innovativeness. Geographical proximity within the local system plays an important role as a trust-building mechanism, and collaboration touches non-core fields of activities, where firms – as rivals – are more open to share knowledge.

6. Discussion and policy implications

6.1 Key findings: Summary and discussion

The empirical findings highlight that individual resources of the firms are critical towards achieving competitive advantage and the firms' willingness to share firm-level resources for the sake of gaining network-based resources is limited (Table 2). As a result, knowledge flows within the cluster play only a minor role towards gaining sustained competitive advantage, given that firm-specific knowledge is rather retained to safeguard one's core competencies and resources that differentiate notably the craftsmen from other local producers. Because their sources of competitiveness lie in their knowledge generating/processing mechanisms that are not only used for producing, but also for promoting and selling their individualized and customized products, the small artisans show a clear resistance towards network activities. Often, customer loyalty is strong and network-based marketing, promotion and sales activities are therefore subject to strong local rivalry. Operating as a sole producer with a strong individual brand that differentiates the artisan from (local) competitors offers more advantages than collaborating (locally). The very character of the local production system thus builds strong barriers to networking.

Two disintegrated networks coexist within the cluster. Value-adding network resources that enhance firm-level competitive advantage are fully exploited only by one sub-network of larger industrial producers taking advantage of innovation- and R&D-based collaboration within the cluster infrastructure. Many of the small businesses are not fitting into the system of formalized production or R&D-oriented networks and might become discouraged from joining such collaboration. Their feelings of being "lone fighters" on the global market instead of collaborators from within the same cluster affect trust-building adversely. In addition, firms being attached to the different social networks do not share common values. As a consequence, a lack of trust prevents that cluster firms gain equal and full access to network resources, especially such resources that support the firms' innovativeness. Therefore strong rivalry, a lack of sufficient network benefits and mistrust prevent many firms from using network-based resources to enhance their competitive advantage. This finding correlates with evidence from other mature clusters (Staber, 2009). However, trust is a necessary element to overcome the persistent social barriers found for the cluster case.

From a dynamic perspective, the mature and niche-based cluster needs to grow in new markets, develop new products and gain innovativeness to compete in the global marketplace. Global competition and low-cost mass production from Asia (for example, China) put pressure on established Western production systems. The saturation of the markets limits the potential benefits of large-scale production. Still, the manufacturing of individualized, tailor-made "luxury goods" can be identified as a stable or even growing market niche (as was observed for the Glashuette cluster of luxury-watches, Festing et al., 2010). The Glashuette case illustrates how niche-based products may survive through adaptation and renewal, through focusing on a luxury segment of the market and a cluster brand that is associated with notions like dedication, passion, tradition, design, and quality.

A small core of technology-oriented producers, indeed, increases its innovativeness, upgrades its production/products using local collaboration (Table 3). These firms embark on knowledge-driven and R&D-based renewal and adaptation; they certainly drive the innovativeness of the cluster. Given the overall artisanal character of the cluster, local ties, however, offer limited benefits for R&D-intensive collaboration, and firms possessing strong technological capabilities show a greater outward orientation for strategic collaboration in the fields of production, R&D and innovation. For the bulk of the traditional artisan manufacturers, the perspective emerging from this case study is thus less clear. They are as well knowledge-intensive producers, but use highly-specialized, tacit knowledge to design high-end products for individual artists. Almost all of the small artisans have survived the transition from planned economy to market-based economy in the early 1990s. Hence, these firms already showed strong perseverance and the ability to renew and adapt to new external conditions. Firms developed individual adjustment strategies, changed their organizational routines and embarked on new markets during that period, while benefiting from dense social networks that persisted over time. These components – the firms’ individual entrepreneurial spirit and adaptability, and their personal, social networks – are clearly relevant for their contemporary development path.

Generally, networks and the resources they provide should particularly support the small artisans’ adaptation to global market conditions that continue to be rather unfavourable due to fierce global competition. However, renewal through the usage of network-based resources needs different network infrastructures in these cases (Table 3). Network resources should complement individual resources in a way that firms might explore synergies, for instance, in non-core areas where knowledge sharing is not immediately related to their technologies, techniques, or their individual brand. In constellations where tacit and idiosyncratic knowledge is paramount to the firm’s competitiveness, informal networks can play an important role as a facilitator of more formalized collaboration (Felzensztein et al., 2010a; Staber, 2009). Thus network architectures should be modified towards informal networking and a focus on non-core areas. In many respects, these architectures should be based on social rather than on geographical proximity (Boschma, 2005), aiming at setting off perceived network risks and offering strong network benefits to the artisanal firms.

Table 2: Resources and competitive advantage in the case of the musical instruments cluster (I)

<i>Individual versus network-based resources</i>
Weak, operational and informal informal networks prevail
Limited capacities for local strategic networking
Significant structural and organizational differences among firms
Social barriers, resulting in sub-divided social networks
Low integration of “outsiders” in established social networks
Limited trust, mistrust
Strong rivalry
Mentality of “lone fighters”
➔ Internal resources more important than network-based resources to gain competitive advantage on global markets

Table 3: Resources and competitive advantage in the case of the musical instruments cluster (II)

<i>Resources, adaptation and renewal</i>
Unwillingness to share idiosyncratic knowledge inside networks with most artisans
Tacit knowledge and specialized practices as core resources of artisans
Knowledge creation mainly as exploitation of existing local knowledge base
Local generation of new knowledge limited
Isolated case firms and local institutions as drivers of cluster innovativeness, adaptation and renewal
Collaboration in non-R&D- and production-related areas as a corporate renewal strategy
➔ Knowledge-driven adaptation of a few industrial producers
➔ Potential of firm-level adaptation through local networks based on non-core resources

6.2 Implications for public policy management

Which lessons can be drawn from this case study for public policy management? A first conclusion pertains to the funding options for traditional, artisanal clusters. One important lesson that can be learned from the cluster case is that public funding should not only offer financial assistance to production- and R&D-related network-building, but incorporate the core activities of the bulk of non-industrial firms, such as marketing and promotion, branding, customer relations, design and customization of products. Formalized networks that have been established using public funds did not pay attention to the underlying social networks in the cluster. Hence most micro businesses did not apply for such formalized network collaboration. Funding should also pay attention to the different learning and absorptive capacities of the firms (Tappi, 2005). It should also take into account that sophisticated techniques involving intensive tacit knowledge are paramount for that kind of local production systems and that this knowledge will not be easily shared. Policy should therefore consider the sensitivities of the individual craftsmen and their preferences for non-collaboration in production-related fields. Fostering informal and social networks can be a first step towards eliminating the social, cultural and mental barriers and is an important policy implication of this study.

A second implication is associated with the time dimension of adaptation. Network-building emerges as a gradual approach, and network resources need time to evolve. Policies supporting network-building thus need a long-term perspective to bear fruits. This is specifically true for the case presented, where many SMEs and traditional artisans assume a critical air towards networking and funding opportunities. Some important components of the long-term development for the cluster under review are: building a common cluster identity for all members, overcoming the divide between the sub-networks and promoting local development. Indeed, these issues are the most important levers for policy approaches focused on network-based resources that generate sustained competitive advantage in a dynamic environment.

References

- Asheim, B., Cooke, P., & Martin, R. (2006). The rise of the cluster concept in regional analysis and policy: a critical assessment. In B. Asheim, P. Cooke, & R. Martin (eds.), *Clusters and regional development: critical reflections and explorations* (pp. 1-30). London: Routledge.

- Barney, J.M. (1991). Firm resources and sustained competitive advantage. *Journal of Management*, 17(1), 99-120.
- Barney, J.M. (2001). Resource-based theories of competitive advantage: a ten-year retrospective on the resource-based view. *Strategic Management Journal*, 27(6), 643-650.
- Bathelt, H., Malmberg, A., & Maskell, P. (2004). Clusters and knowledge: local buzz, global pipelines and the process of knowledge creation. *Progress in Human Geography*, 28(1), 31-56.
- Becattini, G. (1990). The Marshallian industrial district as a socio-economic notion. In F. Pyke, G. Becattini, & W. Sengenberger (eds.), *Industrial districts and inter-firm co-operation in Italy* (pp. 37-51). Geneva: International Institute for Labour Studies.
- Becattini, G., Bellandi, M., & DePropris, L. (2009). Critical nodes and contemporary reflections on industrial districts: an introduction. In G. Becattini, M. Bellandi, & L. DePropris (eds.), *A handbook of industrial districts* (pp. xv-xxxv). Cheltenham: Edward Elgar.
- Belfanti, C.M. (2009). The genesis of a hybrid: early industrial districts between craft culture and factory training. In G. Becattini, M. Bellandi, & L. DePropris (eds.), *A handbook of industrial districts* (pp. 10-17). Cheltenham: Edward Elgar.
- Belussi, F. (2006). In search of a useful theory of spatial clustering. Agglomeration versus active clustering. In B. Asheim, P. Cooke, & R. Martin (eds.), *Clusters and regional development: critical reflections and explorations* (pp. 69-89). London: Routledge.
- Boari, C., Odorici, V., & Zamarian, M. (2003). Clusters and rivalry: does localization really matter? *Scandinavian Journal of Management*, 19(4), 467-489.
- Boschma, R.A. (2005). Proximity and innovation: a critical assessment. *Regional Studies*, 39(1), 61-74.
- Brusco, S. (1990). The idea of the industrial district: its genesis. In F. Pyke, G. Becattini, & W. Sengenberger (eds.), *Industrial districts and inter-firm co-operation in Italy* (pp. 10-19). Geneva: International Institute for Labour Studies.
- Buensdorf, G. (2007). Creation and pursuit of entrepreneurial opportunities: an evolutionary economics perspective. *Small Business Economics*, 28(4), 323-337.
- Enright, M.J. (2003). Regional clusters and firm strategy. In A.D. Chandler, P. Hagström, & Ö. Sölvell (eds.), *The dynamic firm. The role of technology, strategy, organization, and regions* (pp. 315-342). Oxford: Oxford University Press.
- Ettlie, J.E., Bridges, W.P., & O'Keefe, R.D. (1984). Organisation strategy and structural differences for radical versus incremental innovation. *Management Science*, 30(6), 682-695.
- Felzensztein, C., Gimmon, E., & Carter, S. (2010a). Geographical co-location, social networks and inter-firm marketing cooperation: the case of the salmon industry. *Long Range Planning*, 43(5-6), 675-690.
- Felzensztein, C., Huemer, L., & Gimmon, E. (2010b). The effects of co-location on marketing externalities in the salmon-farming industry. *Journal of Business & Industrial Marketing*, 25(1), 73-82.
- Festing, M., Royer, S., & Steffen, C. (2010). Können Unternehmen durch Cluster Wettbewerbsvorteile realisieren? Eine ressourcenbasierte Analyse des Uhrenclusters Glashütte. *Zeitschrift für Management*, 5(2), 165-185.
- Giuliani, E. (2005). Cluster absorptive capacity: why do some clusters forge ahead and others lag behind? *European Urban and Regional Studies*, 12(3), 269-288.
- Gottardi, G. (1996). Technology strategies, innovation without R&D and the creation of knowledge within industrial districts. *Journal of Industry Studies*, 3(2), 119-134.
- Grabher, G. (1993). The weakness of strong ties: the lock-in of regional development in the Ruhr area. In G. Grabher (ed.), *The embedded firm – On the socioeconomics of industrial networks* (pp. 255-278). Routledge: London.
- Granovetter, M. (1985). Economic action and social structure: the problem of embeddedness. *American Journal of Sociology*, 91(3), 481-510.
- Hervas-Oliver, J.L., & Albers-Garrigos, J. (2007). Do clusters capabilities matter? An empirical application of the resource-based view in clusters. *Entrepreneurship & Regional Development*, 19(2), 113-136.
- Hollenstein, H. (2005). Determinants of international activities: are SMEs different? *Small Business Economics*, 24(5), 431-450.

- Hospers, G.J., & Beugelsdijk, S. (2002). Regional cluster policies: learning by comparing? *Kyklos*, 55(3), 381-402.
- Jacobs, D., & De Man, A.P. (1996). Clusters, industrial policy and firm strategy: a menu approach. *Technology Analysis & Strategic Management*, 8(4), 425-437.
- Johnson, G., Scholes, K., & Whittington, R. (2008). *Exploring corporate strategy*. Edinborough: Prentice Hall.
- Jones, C. (2004). An alternative view of small firm adaptation. *Journal of Small Business and Enterprise Development*, 11(3), 362-370.
- Lagendijk, A. (2000). Learning in non-core regions: towards 'intelligent clusters', addressing business and regional needs. In F. Boekema, K. Morgan, S. Bakkers, & R. Rutten (eds.), *Knowledge, innovation and economic growth: the theory and practice of learning regions* (pp. 165-191). Cheltenham: Edward Elgar.
- Leick, B. (2012). Wirkungen und Wirkungsgrenzen innovationsbasierter Clusterförderung am Beispiel eines traditionell handwerklichen Netzwerks. In M. Brachert & S. Henn (eds.), *Cluster in Mittelddeutschland. Strukturen, Potenziale, Förderung* (pp. 79-103). IWH Sonderheft 5/2012, Halle: Institut für Wirtschaftsforschung Halle.
- Lorenzen, M. (2002). Ties, trust, and trade. Elements of a theory of coordination in industrial clusters. *International Studies of Management and Organization*, 31(4), 14-34.
- Malmberg, A., & Maskell, P. (2006). Localized learning revisited. *Growth and Change*, 37(1), 1-18.
- Malmberg, A., & Power, D. (2006). True clusters. A severe case of conceptual headache. In B. Asheim, P. Cooke, & R. Martin (eds.), *Clusters and regional development: critical reflections and explorations* (pp. 51-68). London: Routledge.
- Malmberg, A., & Power, D. (2005). (How) do (firms) in clusters create knowledge? *Industry and Innovation*, 12(4), 409-431.
- Menzel, M.P., & Fornahl, D. (2010). Cluster life cycles - dimensions and rationales of cluster evolution, *Industrial and Corporate Change*, 19(1), 205-238.
- De Oliveira Wilk, E., & Fensterseifer, J.E. (2003). Use of resource-based view in industrial cluster strategic analysis. *International Journal of Operations and Production Management*, 23(9), 995-1009.
- Dei Ottati, G. (2009). An industrial district facing the challenges of globalization: Prato today, *European Planning Studies*, 17(12), 1817-1835.
- Parilli, M.D. (2009). Collective efficiency, policy inducement and social embeddedness: drivers for the development of industrial districts. *Entrepreneurship & Regional Development*, 21(1), 1-24.
- Petrou, A., & Daskalopoulou, I. (2009). Innovation and small firms' growth prospects: relational proximity and knowledge dynamics in a low-tech industry. *European Planning Studies*, 17(11), 1592-1604.
- Pilon, S., & DeBresson, C. (2004). Local culture and regional innovation networks: some propositions. In D. Fornahl & T. Brenner (eds.), *Co-operation, networks, and institutions in regional innovation systems* (p.15-37). Cheltenham: Edward Elgar.
- Pinch, S., Henry, N., Jenkins, M., & Tallman, S. (2003). From 'industrial districts' to 'knowledge clusters': a model of knowledge dissemination and competitive advantage in industrial agglomerations. *Journal of Economic Geography*, 3(4), 373-388.
- Porter, M.E. (2000). Location, competition, and economic development: local clusters in a global economy. *Economic Development Quarterly*, 14(1), 15-34.
- Porter, M.E. (1990). *The competitive advantage of nations*. New York: The Free Press.
- Sacchetti, S., & Tomlinson, P.R. (2009). Economic governance and the evolution of industrial districts under globalization: the case of two mature European industrial districts. *European Planning Studies*, 17(12), 1837-1859.
- Sammarra, A., & Biggiero, L. (2001). Identity and identification in industrial districts. *Journal of Management and Governance*, 5(1), 61-82.
- Schamp, E.W. (2005). Decline of the district, renewal of firms: an evolutionary approach to footwear production in the Pirmasens area, Germany. *Environment and Planning A*, 37(4), 617-634.
- Staber, U. (2009). Collective learning in clusters: mechanisms and biases. *Entrepreneurship & Regional Development*, 21(5-6), 553-573.

- Staber, U.H. (1996a). Networks and regional development: perspectives and unresolved issues. In U.H. Staber, N.V. Schaefer, & B. Sharma (eds.), *Business networks: prospects for regional development* (pp. 1-23). Berlin: de Gruyter.
- Staber, U.H. (1996b). The social embeddedness of industrial district networks. In U.H. Staber, N.V. Schaefer, & B. Sharma (eds.), *Business networks: prospects for regional development* (pp. 148-174). Berlin: de Gruyter.
- Storper, M. (1997). *The regional world: territorial development in a global economy*. New York: Guilford Press.
- Sydow, J. (1996). Flexible specialization in regional networks. In U.H. Staber, N.V. Schaefer, & B. Sharma (eds.), *Business networks: prospects for regional development* (pp. 24-40). Berlin: de Gruyter.
- Tallman, S., Jenkins, M., Henry, N., & Pinch, S. (2004). Knowledge, clusters, and competitive advantage. *The Academy of Management Review*, 29(2), 258-271.
- Tappi, D. (2005). Clusters, adaptation and extroversion: a cognitive and entrepreneurial analysis of the marche music cluster. *European Urban and Regional Studies*, 12(3), 289-307.
- Tödting, F., & Trippel, M. (2004). Like Phoenix from the ashes? The renewal of clusters in old industrial areas. *Urban Studies*, 41(5/6), 1175-1195.
- Wolfe, D.A., & Nelles, J. (2008). The role of civic capital and civic associations in cluster policy. In C. Karlsson (ed.), *Handbook of research on innovation and clusters: case and policies* (pp. 374-392). Cheltenham: Edward Elgar.
- Yan, H.D., Kuo, Y.C., & Chen, S.Y. (2011). Entrepreneurship and an apprentice-based cluster: the evolution of Houli's saxophone cluster in Taiwan. *Global Economic Review: Perspectives on East Asian Economies and Industries*, 40(4), 483-502.
- Yin, R.K. (2008). *Case study research: design and method*. Thousand Oaks: Sage.