Handbook of Local and Regional Development

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Innovation, learning and knowledge creation in co-localised and distant contexts

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Introduction

Since the 1990s, reflexive processes of knowledge generation have become key factors in globalisation, and what Giddens (1990) calls the radicalisation of modernity. While knowledge has developed into a core resource shaping the so-called knowledge-based economy (Lundvall and Johnson 1994), learning is the key process driving knowledge generation and innovation (Lundvall 1988; Gertler 1995). A substantial part of the literature has focused on analysing interactive learning processes in localised contexts, even though radical innovations in information and communication technologies (ICTs) have generated new possibilities of transferring knowledge around the globe. Despite the potential of ICTs to open up new opportunities for economic interaction, as emphasised by a growing body of literature (e.g. Leamer and Storper 2001; Moriset and Malecki 2008), knowledge regarding the effects of these changes on the geographies of learning, production and innovation is still limited. I use this as a starting point for my analysis of the effects of new communication technologies and organisational forms on processes of learning and knowledge creation.

As highlighted by Pike (2007), there are at least two opposing strands in the literature suggesting that innovation and learning are either focused on local and regional contexts, or driven by global connectivities through relational ties (Allen et al. 1998; Amin 2004). This chapter contributes to a relational perspective of economic action (Bathelt 2006) by arguing that an analytical focus on any distinct geographical entity, or a binary discussion of the advantages of local versus global or regional versus extra-regional linkages, would result in an over-simplification of the multi-faceted and multi-tiered processes of learning and knowledge creation. Much of this discussion on the role of the region in the global knowledge economy also suffers from focusing on territorial units while neglecting the individual and collective agents at the heart of economic decision-making processes.

In this context, this research questions the assumed priority of local over non-local interaction that is still, at least implicitly, characteristic of some of the cluster literature. As Oinas (1999) recognised, there is relatively little empirical evidence to support broad claims on the predominance of proximate relations and localised learning in economic interaction. Others have argued that the “local” cannot be seen in isolation from other spatial levels in that local knowledge and
competencies are continuously and systematically enriched and challenged by global linkages (Amin 2004). Such work suggests that the “local” and the “global” are inseparably interwoven (Amin and Thrift 1992). The argument put forward in this chapter suggests that permanent co-location and face-to-face (F2F) interaction may be efficient in some economic contexts but not in others. Business leaders located in one region, for example, simply may not like one another or have opposing goals, thus hampering opportunities for regional interaction. Conversely, interaction and learning in global production contexts have become quite widespread. Therefore, different settings can be structured in a way so as to enable efficient processes of economic interaction and knowledge generation, even over a large distance. The goal of this chapter, thus, is to move beyond a simple dichotomy of local versus global spheres and, instead, inform a broader discussion concerning the potentialities for learning and knowledge generation in settings not characterised by permanent co-location.

Rather than emphasising the advantages of proximity per se, I argue that it is important to analyse the preconditions, characteristics and outcomes incurred through F2F and other forms of interaction in different spatial settings. Temporary proximity through regular business travel and intensive meetings during international trade fairs may, for instance, suffice to replace the need for permanent co-location. Furthermore, new communication media combined with specific settings for interaction might mitigate, and even overcome, the need for permanent co-location. In order to more fully develop this argument, I integrate economic geography literature and studies in the field of social psychology (Bathelt and Turi 2008). Such studies shed light on how F2F interaction operates, and how computer-mediated communication (CMC) can make up for some of the problems arising during remote collaboration. Experiments conducted by social psychologists are well suited to enquire about the potentialities of virtual interaction and their spatial consequences, as they are designed to overcome the role existing institutions have in stabilising prior communication patterns.

Structurally, this chapter next highlights important findings from the literature about the role of F2F interaction in section two. Section three emphasises the advantages of permanent co-location and regular F2F contacts in clusters creating what I refer to as “local buzz”. Section four argues that permanent co-location should be viewed as an exception rather than a rule in complex production chains which have a global reach. Section five shows that temporary F2F interaction and “global buzz” during international trade fairs provide opportunities to overcome possible problems in communication and knowledge exchange between agents located in different regional, cultural, or national contexts. Section six argues that computer-mediated interaction across locations can open new potentialities in innovation, not likely available to permanent F2F encounters within groups and corporations. Finally, section seven draws conclusions arguing that the combination of different forms of F2F-based and virtual interaction generates new opportunities for integrating production and innovation processes at the global scale.

Role of proximity and F2F interaction

While ICTs have provided new and unprecedented opportunities for knowledge transfers over distance, a large body of literature continues to stress the benefits stemming from geographic proximity between economic agents. Studies in economic geography have made a concerted effort to advance our understanding of the importance of “being there” (e.g. Gertler 1995), with respect to stimulating “local buzz” and transferring and implementing new technologies (Bathelt et al. 2004). Social psychologists have similarly
examined remote and proximate collaboration, especially since the advent of modern ICTs. In examining the efficiency of CMC on group processes and outcomes, this research has lent special attention to the social and cognitive factors arising during F2F interaction. In explaining how integrational and informational aspects of F2F interaction afford the transfer of complex messages and the stimulation of trust under conditions of uncertainty, studies in social psychology provide a deeper understanding of the processes underlying “being there”.

In their foundational analysis on the social psychology of telecommunications, Short et al. (1976) have identified a range of non-verbal cues such as facial expression, direction of gaze, posture and physical distance arising during F2F interaction. They distinguish two types of functions played by these non-verbal cues. First, the informational function is concerned with the passage of information from one individual to another through illustrative and emblemic gestures, and other non-verbal cues. Second, the integrative function refers to “all the behaviour that keeps the system in operation, regulates the interaction process, cross references particular messages to comprehensibility in a particular context, and relates the particular context to the larger contexts of which the interaction is but a special situation” (Birdwhistell 1970: 26).

While these aspects of F2F encounters enable the transfer of complex messages, collectively they serve to reduce uncertainties between communicators and, in turn, engender trust. The latter point is particularly important in economic contexts of learning and knowledge exchange (Leamer and Storper 2001). Studies have shown that cooperative work environments and successful business transactions require the development of trust (Nelson and Cooprider 1996; Dasgupta 2000). In such situations, geographical proximity acts as a factor of cohesion by supporting long-lasting cooperative behaviour thanks to the repetition of commitment. As discussed next, this is prominent in successful clusters which are characterised by permanent co-presence and F2F interaction between agents. In contrast, distant agents have fewer opportunities for the kinds of interaction that maintain and develop personal or emotional trust (Ettlinger 2003).

Furthermore, F2F interaction creates opportunities for controlling the performance of other agents (Crang 1994), and can become a mechanism to exercise power over others (Allen 1997). The absence of a visual channel reduces possibilities for an accurate expression of the socio-emotional context and decreases the information available about the self-images, attitudes, moods and reactions of others. The benefits and shortcomings of mediums other than F2F interaction, thus, hinge upon their ability to allow for the actualisation and transfer of non-verbal cues. As argued below, different configurations of learning and knowledge creation exist that involve a different mixture of co-location, F2F meetings and virtual communication.

**Permanent co-presence in clusters and local buzz**

Much of the research in economic geography has been led by the assumption that spatial proximity is of key importance to understand economic interaction because it “is still a fundamental way to bring people and firms together, to share knowledge and to solve problems” (Storper and Walker 1989: 80). As pointed out by Hudson (2007), the new regionalism literature that has developed since the 1990s emphasises the role of within-region growth, institutional and learning dynamics. There is significant empirical evidence which supports this view. In the context of urban or regional agglomerations of industries, or clusters (Porter 1990; Gordon and McCann 2000; Malmberg and Maskell 2002), recent research has linked the importance of proximate relations to the thick web of information and knowledge connecting
local agents and circulating between them. The resulting knowledge flows establish a rich information and communication ecology referred to as “noise” (Grabher 2002) or “buzz” (Storper and Venables 2004). This local buzz consists of specific information flows, knowledge transfers and continuous updates, as well as opportunities for learning in organised and spontaneous meetings (Bathelt et al. 2004). The importance and quality of a cluster’s buzz is related to a number of features which are partly overlapping and make this setting especially valuable for processes of learning and knowledge creation.

First, the co-presence of many specialised firms of a particular value chain and regular F2F contacts between specialists from these firms generate a specific milieu for the exchange of experiences, information and knowledge within a cluster. In this milieu, F2F encounters and the associated non-verbal cues generate informational and integrational advantages in communication. This enables in-depth knowledge exchange as specific information about technologies, markets and strategies is circulated in a variety of ways in planned and unplanned meetings. This can lead to a strong local embeddedness of firms, supporting fine-grained information flows and interactive learning (Granovetter 1985).

Second, the agents in a cluster share similar technical traditions and views which have developed over time. They are based on similar day-to-day routines and problem-solving, and a joint history of regular F2F communication. Through this, new information and technologies are easily understood. When people of a similar technological background and realm of experience in a region converse with one another, they almost automatically know what others are talking about. Highly skilled experienced specialists, who have lived in a region for a longer time period, know one another and may have become acquainted with several firms as a result of switching jobs in the area. As positions change hands, knowledge that would be difficult to acquire by other means is transferred between firms (Malmberg and Power 2005).

Third, the diversity of the relationships and contacts within a cluster strengthens and enriches tight networks of information flows, common problem solutions and the development of trust. Within these networks, agents are linked in multiple ways with each other as business partners, colleagues, peers, friends or community members. As a result, resources can be transferred from one type of relationship to another (Uzzi 1997). Multiplex ties help firms to quickly access new information and speed up its circulation within the cluster.

Fourth, through the shared history of relationships firms learn how to interpret local buzz and make good use of it. As a result, communities of practice become more rooted over time (Wenger 1998). This helps to transfer knowledge in a precise manner, interpret new information in the context of a cluster’s technological competence and extract those knowledge parts that might be valuable in future applications. All of this is possible because co-presence and ongoing F2F encounters in a cluster enhance the likelihood that people develop compatible technology outlooks and interpretative schemes.

Interaction and learning are, of course, also related to ongoing transaction relations between regional firms, even if their extent is limited. They are, furthermore, enhanced through cross-corporate involvement in community activities, industry associations, clubs and the like. The advantages of permanent co-presence and frequent F2F interaction are supported by the fact that firms draw from a joint regional labour market characterised by job mobility and overlapping competencies (Malmberg and Maskell 1997; Malmberg and Power 2005). Through these processes, local buzz is circulated and reinforced in powerful ways. Permanent co-location can translate integrational and informational advantages of F2F interaction to become part of the wider institutional repertoire available to all local agents. In many ways, this serves to establish
and deepen relational proximity and trust (Amin and Cohendet 2004; Bathelt 2006). It helps to establish reliable conditions for interactive learning and durable inter-firm relationships.

From research on path-dependent developments we know, however, that problems can develop if local communication patterns become too rigid and inward-looking, preventing trans-local knowledge flows and necessary adaptations to market and technology changes. From a spatial perspective, negative lock-in can result in a situation where localised industrial systems collectively run into problems due to rigid technological and organisational structures (Grabher 1993; Asheim et al. 2006). Too much local interaction may lead agents to rely too heavily on existing technologies and well-established problem solutions (Granovetter 1973). Through this, they may lose their openness for new solutions. Clusters might, in turn, become insular systems that are vulnerable to external shifts. As argued next, this may require that important inputs be acquired through systematic outside-cluster interaction.

**Organisational co-presence in global networks**

In a cluster, spatial proximity and shared institutional, social and cultural characteristics can create conditions for firms to engage in economic transactions and develop long-term producer–user relations (Rallet and Torre 1999). Yet, focusing on internal cluster interaction is not sufficient to generate long-term growth and competitiveness. Of course, much research has shown that the national level is still key in providing the institutional conditions for economic and social well-being (Gertler 1995; Pike and Tomaney 2004). To overcome limitations, firms may strive for strengthening interregional and international linkages, which is, however, not a routine process with guaranteed success. One way of trying to accomplish this is to establish organisational proximity by merging with or acquiring complementary firms in other parts of the world to create reliable conditions for future interaction and wider market access (Boschma 2005; Torre and Rallet 2005). This requires that international mergers and acquisitions share a certain degree of cognitive proximity between the firms to enable the respective agents to interact with one another, and integrate their different cultures into a new overarching structure (Nooteboom 2000). At the same time, their respective capabilities must be sufficiently different to allow them to benefit from interactive learning. While international mergers and acquisitions can be viewed as processes of bridging multiple distances and establishing a framework for closer inter-firm linkages at an international scale, the same processes also create stress on existing network relations at the regional level. The argument put forward here is that a simple binary of local versus global relationships is simply not enough. Relational ties stretch across regional and national territories while, at the same time, being embedded into these entities (Bathelt 2006; Hudson 2007). As emphasised by Allen and colleagues (1998: 5), regions are “series of open, discontinuous spaces constituted by the social relationships which stretch across them in a variety of ways”.

At a global scale, this argument of different types of proximities, which can be substituted for one another, may distract from the limitations to interaction that exist due to particular spatial structures. In the context of global production configurations or peripheral locations, for instance, firms may not easily find adequate partners for close-by transactions. They have no choice but to establish linkages over space providing access to distant markets and technologies developed elsewhere. F2F interactions in local context are often not an option for these firms. In global value chains, interaction does not build upon permanent F2F contact (Dicken et al. 2001; Gereffi et al. 2005). It often
relied on a mixture of different types of more or less hierarchical network relations associated with existing personal ties, organizational bonds, and/or repeated visits at international trade fairs.

A single specific distance to be minimised in order to establish regular F2F interaction usually does not exist in complex production networks. Firms serve global markets and cooperate with partners located in different parts of the world. From the perspective of market access, it might be imperative for a firm to be reasonably close to its major markets to be able to customise products and learn from interaction with customers. From the view of research and development (R&D), it might be more important to have R&D facilities close to production to benefit from constant feedback and learning-by-doing. Depending on which aspect dominates, the locational structure of firms can be quite different. No matter how and where marketing, production or R&D are established, any setting is likely to be associated with proximities on one end and distances on the other. To have a single large plant within one cluster could under these circumstances cause problems in producer-user interaction because of large distances to international markets.

In sum, geographical proximity and “being there” are important issues of corporate organisation (Gertler 1995), but it has to be specified exactly which proximities are key: proximity to specific markets, production, or knowledge pools. In reality, spatial proximity and permanent F2F interaction might be possible with some relevant agents but not with all. As a consequence, there is no predefined territorial or non-territorial level which is best suited to support knowledge creation and innovation (Pike 2007). There is clearly no simple “either/or” between local and global learning dynamics as both are often intrinsically intertwined (Amin 2004). Many firms have learned how to organise economic action without permanent co-presence and have developed alternative settings which work well without requiring co-location and F2F interaction on a daily basis. These settings have become expressions of new geographies of circulation through which knowledge can be created and exchanged at a distance (Thrift 2000; Amin and Cohendet 2004). An example for such interaction encompasses multinational firms within which managers go back and forth on a regular basis between different sites and countries. Through this, they generate a context similar to co-presence, but between distant places. Another example is given by learning processes and knowledge exchange during international trade fairs, as discussed in the next section.

**Temporary F2F interaction and global buzz**

A specific setting through which global knowledge flows are circulated and new linkages explored exists at leading international trade fairs (Borghini et al. 2004; Maskell et al. 2006). These events open up many possibilities for knowledge creation, network and market development at a global basis. F2F meetings with other participants at trade fairs enable firms to systematically acquire information and knowledge about competitors, suppliers, customers, and their technological and strategic choices (Bathelt and Schuldt 2008a). Temporary F2F contacts provide a sufficient basis to reassure ongoing interaction, even involving complex communication and learning.

Through different routes, global information concerning trends and ideas in an industry, as well as all sorts of news and gossip, flow back and forth between the participants who are temporarily clustered at trade fairs. Agents benefit from integrational and informational cues transported through repeated, intensive, often short F2F encounters which lead to a specific communication and information ecology referred to as “global buzz” (Bathelt and Schuldt 2008b). Similar to local buzz,
global buzz is a multidimensional concept which enables unique processes of knowledge dissemination and creation through interactive learning and learning-by-observation. Its constitutive components are related to the dedicated co-presence of global supply and demand, intensive temporary F2F interaction, a variety of possibilities for observation, intersecting interpretative communities, and multiplex meetings and relationships. Central to these processes are verbal and non-verbal cues, visual stimuli, feelings and emotions, which are omnipresent during these events (Entwistle and Rocamora 2006).

International trade fairs bring together leading, as well as less well-known, agents from an entire industry or technology for the primary purpose of exchanging knowledge and learning about the present and future development of their industry, centred around displays of products, prototypes and innovations. This enables agents to get an overview of the developments and trends in the world market, and provides myriad opportunities to make contact, ask questions and engage in F2F communication with other agents from the same value chain (Rosson and Seringhaus 1995; Sharland and Balogh 1996; Prüser 2003). Exhibitors and visitors benefit enormously from the large variety of different types of informal and formal meetings held with a large variety of agents (Bathelt and Schuldt 2008a).

During these trade fairs, focused communities with similar technical traditions and educational backgrounds meet, which have developed over time based on similar day-to-day experiences. Participation within these communities helps reduce uncertainties and the degree of complexity in fast-changing product and technology markets. Within their contact networks, agents are linked in different ways and exchange facts, impressions, gossip, as well as small talk. This helps transmit experiences with existing products and interpretations of new developments in understandable ways (Borghini et al. 2006; Entwistle and Rocamora 2006).

Mixing different types of business-related and other information also helps to check out other agents and establish initial communication which can be continued later on. Through regular attendance at international trade fairs, firms are able to find suitable partners to complement their needs, learn about new developments, and undertake the first steps towards the establishment of durable inter-firm networks with distant partners. In the next section, the arguments about knowledge creation and learning are extended to contexts without F2F interaction.

**CMC vs. F2F collaboration in economic interaction and learning**

While the above arguments suggest that permanent, regular or temporary F2F contacts are of central importance to processes of economic interaction, learning and knowledge creation, such encounters are still limited in global production contexts. Instead, many firms rely to a great extent on virtual communication through ICTs to organise production, research and market interaction. Traditional studies in social psychology have emphasised the structural differences that exist between CMC and F2F interaction, pointing at different learning and networking potentials. Social presence theory, for instance, suggests that the absence of non-verbal, vocal and physical cues denies users important information about the characteristics, emotions and attitudes of other agents; thus resulting in communication that is less social, understandable and effective (Walther et al. 2005).

As argued below, however, potentialities of CMC might be much greater than suggested in social presence theory. Interaction patterns based on new ICTs have challenged established interpretations which emphasise the disadvantages of CMC compared to F2F settings. A growing body of research has, in fact, contested the presumed differentiation of
verbal and non-verbal cue functionalities, at least with respect to their outcome. Social information-processing theory, for instance, rejects the position that CMC is inherently impersonal and that relational information is inaccessible to CMC users (Walther et al. 2005). Instead, it assumes that individuals deploy whatever communication cues they have at their disposal when motivated to develop relationships. This can provide the basis for the establishment of social relations, as is also the position of equilibrium theory (Olson and Olson 2003).

These conceptions raise questions regarding the general superiority of local F2F-based encounters over CMC in distant interaction and learning. In the context of corporate innovation projects and group collaboration, contextual differences between F2F interaction and CMC have been shown to affect the process and outcome of communication in sometimes unexpected ways. For example, Wainfan and Davis (2004) show that the group structure in CMC is often broader, yet more agile than in F2F teams. Accordingly, there is greater breadth in collaboration themes due to a wider involvement of experts. Although it might be harder to form social networks, it is also more difficult to distract or deflect the participants’ attention by involving them in side conversations. In reducing non-verbal cues, other factors such as common ground, power and status become much less important in CMC. In the localised context of a firm, contextual cues such as seating position, office location, and even clothing have been found to influence communication patterns during employee meetings (Dubrovsky et al. 1991). As shown by Sproull and Kiesler (1991), individuals using CMC feel less constrained by conventional norms and rules of behaviour. The lack of “social baggage” attached to electronic messaging can help overcome some detrimental hierarchical and social structures impeding decision making within a group setting.

Studies have shown that CMC participants make more explicit proposals, defer less to high-status members, and are less inhibited than F2F collaborators (Dubrovsky et al. 1991; Hollingshead and McGrath 1995). Rice (1984) has found that when faced with a dilemma, F2F groups begin by analysing the problem, whereas CMC collaborators tend to start a discussion by proposing a solution. Studies have suggested that anonymity decreases conformance pressure in CMC settings and allows group members to be less inhibited in their expression of ideas (Baltes et al. 2002). Furthermore, ideas expressed under anonymous conditions are more likely to be evaluated based on their merit, rather than the status of the person presenting them. This points at the potential of CMC settings to break with existing problem solutions and generate opportunities for innovation, analogous to the weak-tie argument of Granovetter (1973).

Although there are also clear limitations to interaction, these studies indicate that the systematic use of CMC enables complex interaction, and can stimulate learning and network formation even without frequent F2F contact. When including opportunities of using video-based CMC formats and the combination of these virtual encounters with occasional planned F2F meetings, the range of possibly efficient spatial configurations involving local and non-local F2F and computer-mediated exchanges drastically widens.

In the context of innovation projects in multinational firms, Song et al. (2007) have documented that knowledge dissemination between agents is greatest when both settings are combined. There appear to be parts of innovation processes where F2F meetings are key to the development of new ideas and concepts, while other parts benefit from work at dispersed workplaces with regular CMC adjustments. Permanent co-location may foster knowledge dissemination within R&D but impede knowledge dissemination between R&D and production. In global production contexts, co-localisation of R&D staff conversely may lead to the separation of R&D and production. At the corporate level,
efficient learning requires that uncertainties and ambiguities are reduced, and that both explicit and tacit knowledge in both weak and strong relationships, planned and unplanned meetings, and both nearby and far away are transferred. This heterogeneity suggests that optimal innovation conditions require that co-location is complemented by CMC technologies (Nonaka and Takeuchi 1995). Similar conclusions can be drawn regarding inter-firm interaction.

**Conclusion**

This chapter aims to demonstrate that advancements in ICTs are drastically changing the ways in which firms conduct business and link practices of regional and cross-regional learning (Leamer and Storper 2001; Grabher et al. 2008). It puts forward a relational argument suggesting that the region and other geographical entities are not a priori bounded spaces of economic action (Amin 2004). Instead, as argued by Bathelt (2006), learning and knowledge creation in such a perspective are systematically influenced by structures of social and institutional relations (contextuality), the past legacies of such relationships (path dependence), as well as the principal open-endedness of potential decision making (contingency). In a spatial perspective, relational action is not limited to, and indeed cuts across, specific territories. Relational linkages might be grounded in local or regional development paths; however, they likely extend well beyond these boundaries through personal ties or organisational networks which have been established in the past or result from global production contexts. As such, this chapter suggests that there is no “either/or” dichotomy of local versus global learning dynamics (Hudson 2007) but that relational bonds are capable of benefiting from both: discrete territorial advantages as well as trans-territorial relationships and networked competencies. Therefore, there is no simple proximity to be minimised in economic production and innovation. Proximities at one end of the production context will likely produce distances at another.

Studies examining F2F interaction and CMC demonstrate that the two mediums possess unique properties. Each medium has its relative strengths and weaknesses, which play themselves out differently during different tasks. On the one hand, when analysing corporate work processes and project groups, CMC is weaker under time constraints and tends to produce poorer decisions. That being said, it allows for knowledge dissemination between more people, and does so quicker. F2F interaction, on the other hand, is stronger in conveying tacit knowledge, which is critical in periods of uncertainty and ambiguity. However, the social baggage which accompanies F2F interaction can be a burden to successful innovation.

In response to inefficiencies of CMC and the importance of geographic proximity, corporate actors explore organisational structures combining both aspects, thus enabling knowledge generation over distance. For Torre and Rallet (2005), a solution lies in the temporary mobility of individuals. The need for F2F interaction in terms of learning and knowledge exchange does not necessitate that individuals permanently co-locate. What it requires is that individuals meet regularly in certain time intervals. In some circumstances, problems can be solved through the mobility of individuals, as in the case of business travel. In other circumstances, individuals collaborating in projects only need to meet F2F during particular phases of the innovation process, especially during times of high complexity and uncertainty. During these periods, F2F interaction as “organised proximity” is critical. In other stages of the innovation process, it may suffice or even be more efficient to rely on CMC settings for interaction. Organised proximity, of course, is not a purely geographical concept: it is relational and urges greater interaction among the members of a project, organisation or
value chain (Bathelt 2006). It refers to the establishment of a collective culture that generates shared interpretations of new information even if the agents are located in different places. Such commonality in thinking and solving problems is critical to learning and knowledge generation.

In scenarios where proximity is simply untenable, the value of virtual interaction using modern ICTs dramatically increases. In these cases, actors are quite willing to put up with and overcome the deficiencies of virtual interaction. Trade-offs are inevitable and staying competitive requires pinpointing a firm’s own mixture of settings for interacting in production, distribution and innovation (Bathelt and Turi 2008). Under all circumstances, one has to keep in mind that one decisive disadvantage of CMC compared to F2F communication is related to difficulties in establishing initial trust. While this may require that complex innovation projects over distance have to involve agents already sharing trust from former cooperation in a co-localised setting, it does not rule out other projects based on CMC even in complex contexts. In fact, the combination of CMC with other interactive settings may overcome the dilemma of establishing trust.

Just as sound innovation strategies incorporate advantages of both local and global integration, so too do firms increasingly rely on CMC and F2F interaction in combination with each other. To argue that virtual interaction will eventually eliminate the benefits accrued from geographic proximity makes little sense when evaluating complex economic realities. It also appears misleading to assume a general superiority of local over non-local economic networks. Instead, modern ICTs have allowed distant and close collaboration to occur simultaneously. Both phenomena incur different costs, and generate different benefits. The firms and networks best able to make use of both options will likely develop sophisticated learning capabilities and an “integrative competitive advantage” in the globalising knowledge economy in the future.

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References


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Further reading