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### Spatial Proximity and Intercompany Communication: Myths and Realities

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# Spatial Proximity and Intercompany Communication: Myths and Realities

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**ABSTRACT** *Spatial proximity is credited with numerous virtues in the economic literature. In particular, for a company to be located near other companies is seen as conducive to the development of business relations. Spatial proximity is also considered to contribute to the quality and efficiency of these relations by facilitating face-to-face meetings that foster the exchange of complex knowledge and, in particular, the emergence of innovation. This article explores the notion of spatial proximity in intercompany relations, its capacity to facilitate exchange, as well as the link with the methods of communication employed (information and communication technologies and face-to-face). It is based on a distinction between real proximity (the spatial distance between firms), perceived proximity (the spatial distance as evaluated by the firm itself) and active proximity (spatial proximity that facilitates the exchanges). The data come from a survey conducted in 2008 with more than 2000 firms located in the Brittany region (France). The findings emphasize the relative nature of the notion of spatial proximity and the distinction in some cases between real and active proximities, and show that the positive perception of the role of spatial proximity is sustained by the increased face-to-face contact it entails.*

## Introduction

There is abundant literature on the role of spatial proximity in the coordination of economic agents, in particular in the sphere of innovation (Crevoisier, 1996; Legendjik & Lorentzen, 2007; Sonn & Storper, 2008). Some works emphasize the positive externalities generated by this form of proximity, in particular because it allows face-to-face contacts (Weterings & Boschma, 2009) which contribute to facilitating the exchange of complex knowledge and foster the emergence of innovation (Oerlemans & Meeus, 2005; Jansson, 2008). Local production systems and clusters are seen as the concrete manifestation of the virtues of shared location.

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However, this thesis is controversial (Wang *et al.*, 2010; Fijtar & Rodriguez-Pose, 2011; Vissers & Dankbaar, 2013). Two main arguments are advanced. The first stresses the role of non-spatial proximities in the formation and effectiveness of links between economic agents (Boschma, 2005; Rallet & Torre, 2005; Grossetti, 2008; Huber, 2012). Depending on circumstances, these proximities may complement or supplant spatial proximity, even in relations that entail a high degree of coordination (Agrawal *et al.*, 2008; Aguilera *et al.*, 2012). The second emphasizes the importance of temporary geographical proximity, i.e. occasional face-to-face contacts arising from physical travel and combined with the use of information and communication technologies (ICT) (Bathelt & Scholdt, 2008; Torre, 2008; Rallet & Torre, 2009) in explaining why complex coordination needs do not necessarily require agents to be located permanently in the same place.

Given these differences of opinion, this article proposes to look at the role of spatial proximity in terms of how it is perceived and appreciated, two aspects somewhat neglected in the literature on proximity. In fact, proximity is a notion that is poorly defined and even more poorly measured. We thus propose to distinguish between real spatial proximity (spatial distance between the parties), perceived proximity (whether the parties consider that they are spatially close or not) and active proximity, defined as the appreciation of the role of spatial proximity in facilitating communication between the parties. Our hypothesis is that what counts is not so much real spatial proximity (measured in distance) as perceived and active proximities, or more precisely that there can be a mismatch between real, perceived and active proximities. Indeed, it is not because a firm is located near its partners that it considers, firstly, that they are spatially close, and secondly, that spatial proximity really facilitates exchanges between them (Bouba-Olga *et al.*, 2012; Aguilera & Lethiais, 2015).

The goals of this paper are then two-fold. Firstly, it explores the links between the three categories of spatial proximity defined above: real, perceived and active. Secondly the paper aims at identifying the factors that may affect the links between real proximity and active proximity. Among these factors, the roles of the complexity of the relation and of the use of different communication means (ICT and face-to-face) are particularly examined. Indeed, literature generally assumes that the more complex and the more face-to-face the relationship is, the more spatial proximity is needed. Hence real and active proximities should be associated when the relationship is complex and when the use of ICT is low. Another feature of the article is that we have not focused on innovation, as does most work on proximity, but on customer–supplier relations.

In the first part, we look at the controversies around the concept and role of spatial proximity in intercompany relations. The second part describes the data and the methodology, i.e. the variables used in the empirical analysis, which are drawn from an original survey including a section on customer-supplier relations in small- and medium-sized enterprises (SMEs) in the Brittany region (located in the north-west of France). The third part describes the geography of the customer-supplier relationships in Brittany. The fourth part analyses the relationships between real, perceived and active spatial proximities: we first highlight the relativity of the notion of spatial proximity, then analyse the complexity of its role in facilitating exchanges, and finally link it with the methods of communication used between customers and suppliers. The conclusion sets out the main findings in terms of the potential lines of research they open up.

## Controversies Regarding the Role of Spatial Proximity in Intercompany Relations

### *The Positive Externalities Associated with Spatial Proximity*

The spatial concentration of companies at the local level (clusters) or wider scales (metropolitan areas) are often explained in the economic literature by the existence of positive externalities associated with the spatial proximity of agents operating in the same business sector (economies of location) or complementary sectors (economies of urbanization, i.e. specific to urban areas). The easy contact afforded by closeness (combined with a sufficient density of companies) is the first of these externalities. It makes it easier to find an appropriate interlocutor (partner, customer, supplier), which in return has a positive effect on the performance of economic agents (Oerlemans & Meeus, 2005).

The second source of positive externalities is a smoother flow of information and knowledge, in particular complex knowledge, between nearby economic agents. In this view, face-to-face is seen as the necessary medium for the exchange and co-construction of tacit or relatively non-codified knowledge. By reducing the cost of face-to-face meetings, spatial proximity is then believed to increase the intensity of relations between economic actors (Storper & Venables, 2004) and hence to foster innovation (Oerlemans *et al.*, 2001; Gertler, 2003).

### *The Controversies*

This literature can be criticized on several grounds. First, the notion of spatial proximity is never really discussed in empirical studies, and in reality it refers to a wide variety of spatial scales, ranging from the business park to the metropolitan or even regional scale. But below what threshold of distance or travel time does a firm really become close to another, in a world where transport systems sometimes put two cities closer together in time than two municipalities within a single metropolitan area? Geographers have always been very aware of the distortion in geographical space wrought by transport time (anamorphic maps), but economists have rarely incorporated it into their reasoning.

A second criticism relates to the assimilation of observed spatial proximities to co-location strategies designed to establish economic relations. For a company, being spatially close to other companies does not necessarily mean that it has, or intends to have, relations with them. Nor does it mean that it has more relations with these nearby companies than with (very) distant companies, even when it is located in a cluster (Bathelt *et al.*, 2004).

Indeed, the dominant role of non-spatial proximities in the establishment and quality of the relations between companies is now well established, and casts doubt on the role of spatial proximity alone (Boschma, 2005; Rallet & Torre, 2005; Moodysson & Jonsson, 2007). Moreover, there are complex links between non-spatial proximities (cultural, institutional, social, technological, etc.) and spatial proximity. These proximities can be configured in varied ways in intercompany relations (Aguilera *et al.*, 2012). In addition, face-to-face interactions (i.e. physical proximity) can be only temporary, based on occasional meetings of varying frequency, even if they include the exchange of complex knowledge (Rallet & Torre, 2009). The use of ICT, combined with occasional travel, increases the possibilities for long-distance coordination (Gallaud & Torre, 2005; Rallet & Torre, 2005). Moreover, the beneficial impact of the intensity of face-to-face meetings on the

production of innovation is subject to debates (Weterings & Boschma, 2009), whereas spatial proximity can have negative effects on innovation dynamics (Boschma, 2005).

### *Hypotheses and Objectives*

The aim of this paper is to better understand the notion of spatial proximity, how it is perceived by firms, particularly as a way to facilitate their relations. More specifically, four objectives are pursued.

First, the paper presents the geography of the customer-supplier relations of SMEs in a French region: Brittany. If the space scale of the relations is very large (from the local to the international level), the one of each firm relations tends to be a mono-scale horizon.

Secondly, we highlight the relativity of the notion of spatial proximity: the geographical distance under which a firm considers it shares spatial proximity with its partner varies from one firm to another.

We then test the assumption that the spatial proximity observed between partner companies needs to be distinguished from its impact as a genuine resource in their economic relationship. We want to show that partner companies can be spatially close without them perceiving this proximity as a factor that facilitates exchanges. Conversely, the objective is to show that, in certain cases, companies report that spatial proximity is a factor that facilitates exchanges, despite the fact that they are spatially far apart. This means that companies can exploit proximity in their exchanges without that proximity needing to imply co-location but only temporary physical encounters.

The second assumption is that both the complexity of the relationship and the use of ICT contribute to explain why there is, or is not, a correspondence between the spatial distance between the partners and the actual impact of proximity as an element that facilitates exchanges.

## **Data and Methodology**

### *The Survey*

In 2008, the M@rsouin research team conducted a survey with a representative sample of 2000 SMEs (10–250 employees) located in the Brittany region, in the industrial (excluding agriculture), commercial and service sectors.<sup>1</sup> The subject of this survey was the possession and use of ICT. The respondents were primarily chief executives, sometimes assisted by their IT managers in the section relating specifically to ICT use.

We took part in the survey by devising a specific set of questions on the relations between these companies and their main partner. The latter was defined explicitly as the firm with which company had the most exchanges, whether as customer or supplier. Of the 2000 companies that answered the questionnaire, 1655 identified a relationship with a partner and answered all the corresponding questions. These 1655 firms constitute our analytical sample.

In addition to the characteristics of the respondent company (size, business sector, membership of a group, annual sales, etc.) the survey provides additional information on the nature of the relationship with the main partner, particularly with regard to the methods of communication used in their exchanges, distinguishing between face-to-face contact and several categories of ICT. It also characterizes the spatial proximity between the

company and its partner in two ways, allowing a distinction between effective and perceived spatial proximities. We now describe the variables used.

### *Characteristics of the Relationship*

The nature of the relationship between the two partners can be assessed through several types of variables: the first type of variable measures, objectively but also more subjectively, the spatial proximity between them. The second type is used to assess the complexity of the relation. In the literature, the latter is a predominant explanatory factor for the use of the different forms of proximity. The third type of variable provides information on the methods of communication actually used in exchanges between the survey company and its main partner. Finally, a last category of variables specifies certain other features of the relationship.

### *Three Assessments of Spatial Proximity*

In this survey, we have three measurements of spatial proximity. The first is an “objective” measurement which tells us about the spatial distance between the company and its main partner, divided into the following five categories: less than 5 km (ultra-local), 5–50 km (local), 50–250 km (regional),<sup>2</sup> more than 250 km in the country (national scale) and outside the country (international scale). As the measure is limited to the distance between the partners and is an objective one, we will call this dimension real spatial proximity.

The two other measurements are subjective. The companies were asked whether proximity characterizes the relationship with their main partner. And when the answer was positive (proximity is applicable) the companies had to be precise if proximity had facilitated exchanges with its main partner. The possible answers were: a lot, a little or not at all. Hence the survey tells us firstly whether or not the company has the impression of being spatially close to its partner (perceived proximity), and secondly whether or not this form of proximity contributes to facilitate their exchanges (active proximity).

### *The Complexity of the Relationship*

Many studies on the knowledge economy emphasize the role of the nature of knowledge in the need for spatial proximity. As the nature of knowledge is very difficult to implement in a quantitative survey, we tried to measure the complexity of the relation. The underlying assumption is that a more complex relation implies the exchange of a larger part of tacit knowledge and then will require more spatial proximity. The survey provides two distinct measurements of the complexity of the relationship. A subjective one: the companies were asked about the level of coordination required in the relationship. There were four possible responses: very strong coordination, strong coordination, weak coordination and finally no coordination. The second measure is more objective as it is based on facts: it is the degree of specificity of the product or service supplied by the partner (in the case of a supplier) or supplied to the partner (in the case of a customer). This variable is divided into three types: standard product or service, adapted to the demand of the customer or specially developed for the customer. This constitutes a second measurement of the complexity of the relationship as we can assume that the more specific is the product or service, the more complex is the relation.

*Means of Communication Used*

The M@rsouin survey offered two complementary ways of measuring the role of the different methods of communication in the relationship with the main partner. The first was based on the sense the companies had of the degree of importance of the different methods of communication (in their relationship with their partner), i.e. physical meetings, traditional technologies (telephone, e-mail, fax) and finally the “new” ICT (e-mail, video conferencing, collaborative working tools, etc.), which we refer to in this article as advanced or recent technologies. Each of these methods of communication could be identified by the respondent as the main tool, the secondary tool or the least used tool in their relationship with their main partner.

The second, more objective measurement concerns the frequency of actual use, with the main partner, of the different communication methods or tools, i.e. face-to-face, telephone, ordinary post or fax, e-mail, videoconferencing, collaborative working tools (database sharing, filesharing, forums, etc.) and finally collaboration management tools (shared diaries, distribution lists, task management tools, etc.). From this measurement, we built additional variables. Since certain tools were scarcely used, it was not always relevant to use frequency variables in the data analysis. So for each of the tools, we built a binary variable indicating whether or not it was used by the company. In addition, we designed an “advanced ICT use” variable, corresponding to the frequency of use of the advanced ICT tool that was used the most.

*Other Characteristics of the Relationship*

With the survey, different forms of non-spatial proximity between the partners can be measured. We thus know: whether the company knew its partner before the business relationship began (a little, well, not at all); how long the company had been working with that partner (less than 2 years, between 2 and 5 years, between 5 and 10 years, more than 10 years); the level of trust in the partner (a lot, little, none at all); whether or not the partner belonged to the same group, and finally whether it belonged to the same sector. These variables were used as non spatial forms of proximity.

**Geography of Intercompany Relations**

The first step of the paper is to identify the geography of the customer-supplier relations of SMEs in the Brittany region. Table 1 gives a qualified picture of the relative importance of strict spatial proximity in intercompany relations, as have a whole series of works over the last decade or so (Bathelt *et al.*, 2004; Boschma, 2005; Knoben & Oerlemans, 2006;

**Table 1.** Distance from the main partner (by percentage of respondents)

Less than 5 km Ultra-local	5–50 km Local	50–250 km Regional	More than 250 km National	International scale	No response	Total
7.79%	30.80%	17.84%	33.71%	9.62%	0.24%	100%

Source: “Companies and ICT” survey, Marsouin 2008.



Autant-Bernard *et al.*, 2007). We show that a significant proportion of the customer-supplier relations are outside the region in accordance with literature.

It is very rare for the partner to be located less than 5 km away (only 8% of cases). The 5–50 km range is better represented. Nevertheless, only slightly over one third of Breton companies work with a partner located less than 50 km away. In almost two thirds of the sample, therefore, the partner is a relatively long distance away and, in fact, in a majority of cases outside the region (more than 250 km away), though in France. Conversely, there are relatively few (less than 1 in 10) Breton companies whose main partner is located abroad.

These results confirm those obtained by other studies, which have shown that intercompany relations do not necessarily involve a very high degree of spatial proximity. Firstly, physical mobility and ICT can help to counterbalance spatial separation, either through remote communication or through temporary forms of spatial proximity (business travel) (Rallet & Torre, 2005). Secondly, the geography of intercompany relations is strongly influenced up front by the methods used to find a partner: depending on whether these methods entail mediation (e.g. institutional) mechanisms, social networks or previous partnerships, the probability of finding a partner who is nearby or distant will vary (Bouba-Olga *et al.*, 2012).

Another interesting result concerns the distance between the company and most of the companies with which it has relations (both customers and suppliers). Indeed, the survey also provides information on the distance between the respondent company and its main suppliers and customers. Results of cross tabulations of the distance from the main partner and from the main customers (when the main partner is a customer) or the main suppliers (when the main partner is a supplier) and the chi-squared statistical prove the independence of the variables. It appears that, with the exception of the ultra-local scale, the large majority of the companies that identified a supplier as their main partner reported that their main suppliers were located at the same scale of distance away as that main partner. The same observation can be made for customers. In other words, in most cases the location of the main partner is representative of the location of all the company's partners. Therefore, if SMEs cannot be characterized by the spatial scale of their commercial relations, it seems they have a common feature: the mono-scale of these relations. Thus the difference between the spatial models of big companies and SMEs seems to relate less to the spatial scale of their economic areas (long distance for large companies, local for SMEs) than to the difference in their capacity to operate simultaneously on different scales (multi-scale for big companies, mono-scale for SMEs).

### **Real, Perceived and Active Spatial Proximities: Complex Links**

Apart from the real spatial distance from the partner, the data we have collected enabled us to determine whether the companies surveyed think that, first they share spatial proximity with their partner (what we call perceived proximity) and second, whether this proximity has, or has not, helped to facilitate exchanges (what we call active proximity). In this way, we were able to determine to what extent there is a correlation between actual spatial proximity (geographical distance) and first the perceived spatial proximity and second the assessment of the impact of this proximity on the quality of exchanges. Finally, a fourth question relates to the nature of the variables that explain whether or not there is a “match” between real and active proximities.



Table 2 presents the results of the cross tabulation between the three spatial proximity measures. The first line (factor absent) gives us the link between the real and the perceived spatial proximities. The three following lines indicate the relation between the real and the active spatial proximities.

*Spatial Proximity: A Relative Concept*

The first finding, based on the comparison of real and perceived spatial proximities is that the notion of spatial proximity is quite relative.

Indeed, of the companies which report that spatial proximity is not a factor in the relationship, there is a nonzero proportion (7%) for which the distance from the main partner is in reality less than 50 km and even some (2.6%) where it is less than 5 km. Conversely, only a small proportion of companies whose main partner is located at national or international scales perceive this physical distance as an absence of spatial proximity: only 15.8% and 21.2% of the companies whose main relationship relates to the national and international scales, respectively, consider that spatial proximity is not a factor in the relationship. In other words, a percentage of the companies that are spatially very close to their partner do not perceive themselves as close, whereas companies located a very long way from their main partner consider themselves to be close.

One explanation is that the companies consider the spatial proximity with their main partner relative to their proximity to all their partners. We have shown that the main partner did not generally differ from the company’s other partners in terms of distance scale (ultra-local, local, regional, national and international). However, within each distance scale, a partner can be located nearer or further away than the majority of the partners. In addition, even if the main partner is a long way away, it may be closer than the

**Table 2.** Cross tabulation of the figures for the variables partner distance and spatial proximity variables as a facilitator of exchanges

		Location of main partner					
		Less than 5 km	5–50 km	50–250 km	More than 250 km		
		Ultra-local	Local	Regional	National	International	Total
Spatial proximity as a facilitator of exchanges	Factor	2.6%	7.1%	10.3%	57.4%	22.6%	100%
	absent	3.3%	2.1%	5.5%	15.8%	21.2%	(155)
	Not at all	1.2%	9.4%	15.6%	57.5%	16.3%	100%
		4.1%	7.8%	22.5%	43.4%	41.8%	(424)
	A little	2.5%	37.6%	23.7%	29.6%	6.6%	100%
		5.7%	20.1%	22.2%	14.4%	10.9%	(274)
	A lot	16.6%	50.3%	18.6%	11.6%	2.9%	100%
		78.0%	56.8%	36.9%	11.9%	10.3%	(579)
	No	4.9%	30.0%	17.0%	36.3%	11.7%	100%
	response	8.9%	13.1%	12.9%	14.4%	15.8%	(223)
Total		100%	100%	100%	100%	100%	
		(123)	(512)	(293)	(562)	(165)	(1655)

Source: “Companies and ICT” survey, Marsouin 2008.

other main partners and therefore perceived as nearby (19% of the companies that identified a national scale customer as their main partner report that their main customers are situated outside the country; this percentage is 15% in the case of suppliers).

### *Ambiguous Links Between Real and Active Spatial Proximities*

The second finding, based on the analysis of the correlation between actual distance between the partners and the assessment of the level of importance of spatial proximity in facilitating exchanges (active proximity), is that geographical distance is not always associated with a low assessment of the role of spatial proximity in exchanges. Nonetheless, we find a diminishing connection between the distance from the partner and the perception of spatial proximity as a factor that facilitates exchanges, a connection that is very marked at the infra-regional scale. Thus, only 4.1% of the companies whose main partner is less than 5 km away say that spatial proximity does not facilitate their exchanges, as compared with 7.8% of the companies whose partner is situated at the local scale and 22.5% of those identifying a main partner at regional level. In addition, the percentage of companies who answer that spatial proximity greatly facilitates their exchanges with their partner also decreases with distance: 70% if the partner is less than 5 km away, 56.8% if the partner is local (less than 50 km) and 36.9% if it is in the same region.

By contrast, the difference in responses between the national and international scale is less marked. So of the companies which identified a national partnership, 43.4% reported that spatial proximity did not facilitate exchanges, 14.4% that it facilitated them a little and 11.92% that it facilitated them a lot. Applied to international partnerships, these same percentages stand respectively at 41.8%, 10.9% and 10.3%, differences that are relatively small. Moreover, it should be noted that there is still a large proportion of companies whose partner is situated outside the region, but which report that spatial proximity with the partner facilitates their exchanges greatly or only a little.

Given these results, the association between the spatial proximity with the partner and the efficiency of the exchanges, on which many works in the economic literature are based, appears questionable, in the case of customer-supplier relationships. Symmetrically, spatial distance does not always mean, in the same context, difficult or even impossible relationships. To go further in this analysis, we now determine whether the fact that companies say that spatial proximity has or has not facilitated exchanges with the partner depends firstly on the complexity of the relationship, and secondly on the methods of communication used.

### *The Gap Between Real and Active Spatial Proximities: What Explanatory Factors?*

Here, we try to identify the reasons why a company considered that spatial proximity did not facilitate exchanges, in a relationship that we would describe as one of proximity (situated at the local or ultra-local scale) and, conversely, why a company judged that spatial proximity facilitated exchanges with a partner that we would describe as distant (located at the national or international scale).

The analysis of the factors associated with the perception of the role of proximity for companies involved in relations of proximity (local or ultra-local that we will call local relations) reveals an interesting result. While overall, these companies employed face-to-face contact more than the others, we show that those of them that reported that

spatial proximity greatly facilitated exchanges were also those that had most frequent face-to-face contact and considered this method of communication as most important in their relationship. This implies that spatial proximity must be genuinely used, i.e. be reflected in more face-to-face contacts, to be perceived as a factor that facilitates exchanges. Moreover, these frequent physical meetings are most often accompanied with a daily use of traditional communication tools: telephone and mail. The use of advanced communication technologies is not relevant in the perception of the spatial proximity as facilitating the exchanges, for firms engaged in local and ultra-local relations. This point is very important. It means that spatial proximity matters, i.e. is perceived as playing an active role in exchanges, only when it is associated with face-to-face relationships complemented by uses of non-sophisticated ICTs. In the traditional view, this assertion is considered as a kind of tautology: when they are close, agents can meet easily and then have face-to-face relationships. In this respect, there is *de facto* an equivalence between spatial proximity and face-to-face relationships. Our interpretation is quite different: spatial proximity matters “because” agents have intensive face-to-face relationships. If not, spatial proximity does not matter. The nature of relationships determines the role of spatial proximity. That is not the spatial proximity which determines the nature of relationships.

The same phenomenon (spatial proximity perceived as an enabler of exchanges in case of more intensive face-to-face contacts) is observed even when agents are distant, but in a different way. Indeed, data highlight that companies involved in distant relations (national or international scales) and which reported that spatial proximity facilitated exchanges, also had more frequent face-to-face meetings. This confirms the thesis of temporary proximity (Rallet & Torre, 2005) which, in relations with a remote partner, can partly compensate for spatial distance. Even companies a long way apart draw on physical mobility to communicate face-to-face. It would seem, however, that this temporary proximity is combined with the use of sophisticated ICT tools, in particular Skype and remote working tools. In parallel, companies involved in distant relations which reported that spatial proximity had not facilitated exchanges, have little recourse either to physical meetings or ICT.

Regarding the complexity of the relation, the results exhibit a weak impact of this dimension of the relation. First, the variable measuring the specificity of the good or service is not significant in the analysis. Only the subjective measure of the complexity of the relation (the level of coordination perceived by firms) seems to have an impact on the gap between the real and the active proximities. Indeed, for the companies involved in national and international scale relations, a high level of coordination was associated with the fact that they reported that spatial proximity did facilitate exchanges. As the other variables associated with the same modality are frequent face-to-face contacts and frequent use of ICT, it shows that remote relationships are feasible, even in the case of complex relations, if they are sustained by the use of sophisticated ICT tools and regular face-to-face meetings (temporary geographical proximity).

We observe that the analysis brings out little evidence of the variables associated with the sharing of non-spatial forms of proximity. In relations of proximity, the feeling that spatial proximity facilitated exchanges was usually associated with familiarity with the partner before the beginning of a relationship, but also with the more recent nature of the relationship (less than two years). In the analysis of the distant relations, none of the characteristic variables of the relationship is significant. Sharing forms of non-spatial proximity thus seems to have little effect on the perception of spatial proximity as facilitating exchanges, and only at a short-distance scale.

Finally, the characteristics of the firms have no, or little, impact on the gap between the two measurements of spatial proximity. The specific features of the firms, such as the size or the business sector may affect the location of the partners (as they necessarily play a role in the ability of the firm to find business partners in a more or less close spatial horizon). However, as the active spatial proximity relies on the perception of the firm concerning its relationship with its partner, it is necessarily less dependent on its objective characteristics.

## **Conclusion**

In this conclusion, we highlight findings that call for further work.

The first relates to the homogeneity of the spatial scale in the company's relations with its partners. If the survey confirms that the customer–supplier relations are not limited to close relations, a more original result is that a company's main suppliers and customers are mostly located at the same scale of distance (ultra-local, local, regional, national, international) as the main partner. Now, our sample essentially comprises SMEs. We confirm that the size of these companies does not force them to restrict their economic horizon to local or regional areas, but we observe that this tends to be a mono-scale rather than a multi-scale horizon. Could this be an effect of their limited size? Can we conclude that the difference between SMEs and larger firms is not the spatial scale of their relations but their ability to operate simultaneously on different scales? It would mean that SMEs are less able to exploit one of the characteristics of space, i.e. its differential nature.

The second finding relates to the partial but real distinction between real and active spatial proximities. In short: partner companies located close to each other (30% of the companies situated less than 50 km away) do not consider their proximity to be a major facilitator of exchanges, whereas paradoxically, companies located a long way from each other (33% of companies situated more than 50 km away), say that spatial proximity does facilitate exchanges. These findings have important implications, as in the literature, spatial proximity is always considered as facilitating the exchanges. Actors that are geographically close are supposed to cooperate easily whereas cooperation become more difficult as far as the partner is located. Our results highlight the questionable nature of this assumption.

Finally, our results confirm the ability of temporary geographical proximity to replace co-location in the case of customer-supplier relationships. When partners are located far away (at the national or regional scale) we show that frequent face-to-face meetings combined with the use of sophisticated technological tools contribute to make firms feel close to their partner and consider that it facilitates the relations, even if the need of coordination is high.

This leads us to conclude that perceptions of mobility are important in the decisions of economic agents. Through the analysis of perceptions sketched out here through the distinction between real and active proximities, it should be possible to move beyond certain debates on the role of spatial proximity in the explanation of clustering phenomena and on the use of distance and transport costs in the appreciation of geographical proximity.

Of course, this work presents several limitations. The first concerns the scope of the data which is limited to a region and to SMEs. However, if Brittany is statistically not representative of France, the geographic and economic characteristics of the region (density of population, distribution of population and economic activity on the territory,

distribution of economic activity by sectors) can differ from those of other French regions (particularly the Ile de France which constitutes the French exception) but are not very different from those of the country as a whole. Moreover, the empirical measurement of some factors could be improved. Particularly, the role of complexity of the relation, which is measured by the specificity of the good and the level of coordination of the relation, gives poor results. It could be interesting to complete our quantitative approach with a qualitative one, to collect more detailed information of the nature of the relation between the firm and its partner. The measurement of the distance to the main partner could also be improved in a future survey. In particular, the travel time between the partners, or even the cost of the travel, could complete the measure of the spatial distance.

## Notes

1. The criteria of representativity are: the location of the firm in the 4 *départements* of the Brittany region (a *département* is equivalent to a county) and the size and business sector in each *département*.
2. Note that using the term “regional” for the scale 50–250 km is a misnomer: if the geographical specificity of the Brittany region (it is a peninsula) implies that this is equivalent for a large number of firms, for firms located at the east of the region, a partner far from 50 to 250 km can be situated in another region. So the reader has to keep in mind that the regional scale corresponds to a distance from 50 to 250 km and not systematically to a location in Brittany.

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