INTER-ORGANIZATIONAL PROXIMITY IN THE CONTEXT OF LOGISTICS – RESEARCH CHALLENGES

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ABSTRACT. Background: One of major areas of modern research connected with management issues covers inter-organizational networks (including supply chains) and cooperation processes aimed at improvement of the effectiveness of their performance to be found in such networks. The logistics is the main factor responsible for effectiveness of the supply chain. A possible and a quite new direction of research in the area of the performance of processes of the inter-organizational cooperation is the proximity hypothesis that is considered in five dimensions (geographical, organizational, social, cognitive, and institutional). However, according to many authors, there is a lack of research on supply chains conducted from the logistics point of view. The proximity hypothesis in this area of research can be seen as a kind of novum. Therefore, this paper presents the proximity concept from the perspective of the management science, the overview of prior research covering the inter-organizational proximity with supply chain from the logistics point of view as well as the possible future directions of the empirical efforts.

Methods: The aim of this paper is to present previous theoretical and empirical results of research covering inter-organizational proximity in logistics and to show current and up-to-date research challenges in this area. The method of the critical analysis of literature is used to realize the goal constructed this way.

Results: Knowledge about the influence of the inter-organizational proximity on the performance of supply chains is rather limited, and the research conducted so far, is rather fragmentary and not free of limitations of the conceptual and methodological nature. Additional rationales for further research in this area include knowledge and cognitive gaps indentified in this paper. According to authors the aim of future empirical research should be as follows: (1) unification and update of used conceptual and methodological approaches in research on the proximity in supply chains, (2) testing of theoretical hypotheses with attention paid to importance of the proximity for supply chains taking into account the significant heterogeneity of this form of inter-organizational cooperation, and (3) recognizing the role of the inter-organizational proximity for the practice of supply chain management and for the realization of the integration function of the logistics.

Conclusions: There is a shortage of scientific research (both in the theoretical and empirical dimension) explaining the importance of the proximity hypothesis for the performance of supply chains. Additionally, there are interesting gaps in existing scientific output, connecting the logistics output (effectiveness and performance of supply chains) and economic geography (the proximity hypothesis). Closing these gaps should increase our understanding of the supply chains performance and, therefore, this will be the area of further research of authors.

Key words: inter-organizational proximity, supply chain, logistics.

INTRODUCTION

The effective supply chains in modern economy, where the logistics is the main factor of their performance [Harrison, van Hoek 2010], are tools to be used while creating a competitive advantage [Soltysek, Świerczek 2009, Witkowski 2010, Ciesielki 2011]. The significance of supply chains for organizations is explained by the increasing importance of the inter-organization cooperation [Klimas 2014] and changing the level of the market competition from the inter-organizational one to the competition among supply chains [Li et al. 2006]. Therefore, it should be obvious, that
functioning of supply chains is one of current areas of scientific research [Soltyś, Świerczek 2009]. The proximity hypothesis is one of possible directions of the scientific exploration [Czakon 2010] and its application to supply chains can contribute to better understanding of the mechanism of their functioning and achieving a higher level of performance (meaning of the supply chains performance determined by the inter-organizational proximity lies outside the scope of this paper. This issue will be developed in subsequent publications of authors). The concentration on the proximity in the context of supply chains seems to be justified, taking into account the fact that it is called "a decisive factor of the competitive advantage" of supply chains [Hall, Jacobs 2010] and its dimensions are thought to be "fundamental dimensions" of the supply chain management [Carbone, Blanquart 2013].

The shortage of the scientific literature connecting the proximity with supply chains [Klimas, Twaróg 2013] was the reason for undertaking the considerations in this topic. The aim of this paper is to present previous theoretical and empirical works about proximity in the logistics, as well as pointing the most promising research challenges in this area.

The paper consists of the introduction, three main chapters and conclusions. The first main part gives some general ideas of proximity from the perspective of management sciences. The second part concentrates on the logistics area. It presents the previous empirical research connecting the topic of the proximity with supply chains. The third part shows possible directions of future research in the area of logistics covering implications of the inter-organizational proximity. The last part contains the conclusions of considerations made previously.

PROXIMITY IN THE LIGHT OF MANAGEMENT SCIENCES - DEFINITION AND MEANING

The inter-organizational proximity is understood as "consistency in attributes of organisations cooperating with each other" [Boschma, Frenken 2010] and is considered with reference to "physical space, psychological and social relations, cultural values or institutional conditions of actions" [Czakon, 2010]. From such a point of view, proximity is a multidimensional category, covering five separate (from an analytical point of view) dimensions [Boschma 2005]: geographical, cognitive, institutional, social and organizational ones. The five-dimensional approach, proposed by Boschma [2005], is the most often cited one, but it is not the only existing model of the proximity structure [Knoben and Oerlemans 2006; Klimas 2014]. A different point of view is presented by Rallet and Torre [1999], Petruzzelli, Albino and Carbonara [2007], De Oliveira et al. [2011], Carbone and Blanquart [2013], or by Kebir and Torre [2013]. The proximity hypothesis assumes that the closer the organizations are in particular dimensions, the more effective their cooperation will be [Boschma 2005, Rallet, Torre 1999]. The changes in the level of the performance of cooperation resulting from changing the proximity level among organizations are explained by an increase in work productivity, generating a comparative cost advantage as well as improvement of effectiveness of innovation processes [Czakon, 2010]. Looking for more detailed explanations of the significance of proximity for effectiveness of modern organizations, it is possible to conclude that this proximity is used as a variable that is used to help better understand such processes as: knowledge management, innovation management, inter-organizational cooperation as well as inter-organisational networking (Table 1).

Assuming the strategic management perspective, it seems that areas of identifiable meaning of the proximity concentrate on processes that are key factors of the competitive advantage in globalized and knowledge-based economy [Klimas, 2014]. From such a point of view, proximity can help improve market positions of modern companies.
Table 1. Directions of considerations on proximity from a point of view of management sciences

<table>
<thead>
<tr>
<th>Conceptual area of considerations</th>
<th>Variables explained by inter-organizational proximity</th>
</tr>
</thead>
<tbody>
<tr>
<td>knowledge management</td>
<td>absorption of knowledge [Mattes 2012], access to knowledge [Harorimana, Harebamungu 2013], diffusion of knowledge [Dangelico, Garavelli, Petruzzelli 2010], transfer of knowledge [Herrmann et al. 2012], coordination of knowledge processes [Capaldo &amp; Petruzzelli 2014], creation of knowledge [Petruzzelli, Albino, Carbonara 2007], exchange of knowledge [Broekel, Boschma 2012], mutual learning [Harorimana, Harebamungu 2013], absorptive capabilities [Hall &amp; Jacobs 2010]</td>
</tr>
<tr>
<td>Innovativeness and innovation management</td>
<td>effectiveness of innovation activities [Broekel, Boschma 2012], product innovations [Letaifa, Rabeau 2013], transfer of technology [Huynge et al. 2014]</td>
</tr>
<tr>
<td>inter-organizational cooperation</td>
<td>effectiveness of inter-organizational relations [Haykghe et al. 2014], intensity of cooperation [Cunningham, Werker 2012], coordination of cooperation [Kechidi, Talbot 2010], establishment of cooperation [Mattes 2012], effectiveness of cooperation [Rodríguez-Cohard, Parras 2011]</td>
</tr>
<tr>
<td>networking</td>
<td>strength of ties [Jones, Search 2009], effectiveness of knowledge network [Broekel, Boschma 2012], network structure [Broekel, Hartog, 2011], symmetry and power of ties [Jones, Search 2009]</td>
</tr>
</tbody>
</table>

The implications confirmed by scientific research are in bold font, the others are only of theoretical nature.

Source: own work

Concluding, the proximity concept attracted researchers’ (of management area) interest relatively late, i.e. at the beginning of the twenty first century. Additionally at the beginning, some attention was paid to processes of inter-organizational cooperation, including network cooperation. After that, research started to be connected closely with processes of knowledge management and innovation management discussed with reference to various types of inter-organizational cooperation, i.e. clusters [Canda, Vázques 2005], industry and technology districts [Petruzzelli, Albino, Carbonara 2007] and innovation networks [Broekel, Boschma 2012; Klimas 2014].

According to many authors there is a shortage of research conducted in the supply chains context, taking into consideration the synthesis of logistics and proximity points of view.

PREVIOUS EMPIRICAL WORKS IN THE AREA OF INTER-ORGANIZATIONAL PROXIMITY IN THE CONTEXT OF LOGISTICS

The concept of proximity is quite new regarding the area of logistics understood as the art of modeling flows of goods and information [Szoltysek, 2012]. To be more detailed, first papers connecting multidimensional inter-organizational proximity with logistics were published approximately 10 years after the topic had started to be interesting for researchers in the area of the management. Novelty of this topic is the reason why scientific literature in this area is scarce, fragmentary and mainly of the conceptual nature. The existing empirical studies are mainly of exploratory nature and (rather) were conducted qualitatively in the form of a case study only (table 2).

From the logistics point of view, the key benefits of proximity can be indentified in regard to the concept of supply chains. Firstly, according to the scientific literature, in case of entities functioning as links in a supply chain, proximity enables to improve the processes of the coordination of the inter-organizational cooperation, to intensify mutual learning and to improve innovation processes [Hall, Jacobs, 2010]. Secondly, much emphasis is put on the importance of the proximity for the integration of supply chains [Klimas, Twaróg 2013] and efficient management of these chains [De Oliveira et al. 2011]. Positive implications of optimization of the proximity of entities within supply chains are multidimensional (e.g. costs, social, time, quality related ones) and depend on the considered dimension of the inter-organizational proximity (table 3).
Table 2. The review of studies connecting inter-organizational proximity with supply chains

<table>
<thead>
<tr>
<th>Authors</th>
<th>Topic of research</th>
<th>Methodological approach</th>
<th>Dimensions of proximity</th>
<th>Issues</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hall and Jacobs [2010]</td>
<td>links of a global supply chain</td>
<td>qualitative – case study</td>
<td>organizational, institutional, cognitive, social and geographical</td>
<td>meaning of dimensions of proximity, consequences of their insufficient or excessive level</td>
</tr>
<tr>
<td>Kechidi and Talbot [2010]</td>
<td>Airbus and network of its subcontractors</td>
<td>qualitative – case study</td>
<td>organizational, institutional and geographical</td>
<td>dimensions of proximity as reasons of conflicts and motives for common actions</td>
</tr>
<tr>
<td>De Oliveira et al. [2011]</td>
<td>members of Supply Chain Council</td>
<td>quantitative – descriptive statistics and structural equation modeling</td>
<td>digital</td>
<td>meaning for the cooperation within supply chains (direct effect) and the performance of the organizations (indirect effect)</td>
</tr>
<tr>
<td>Carbone and Blanquart [2013]</td>
<td>links of green supply chains</td>
<td>qualitative – 7 case studies</td>
<td>organizational, institutional and geographical</td>
<td>typology of cooperation practices with regard to types of proximity and types of environmental practices</td>
</tr>
<tr>
<td>Galli and Brunori [2013]</td>
<td>short (lean) supply chains</td>
<td>qualitative – 19 case studies</td>
<td>social and geographical</td>
<td>criterion of identification of lean supply chains, importance for the balanced development of sustainable products provided by the supply chain</td>
</tr>
<tr>
<td>Klimas [2014]</td>
<td>links of supply chains organized as networks of innovations</td>
<td>qualitative and quantitative – analysis of interviews, descriptive statistics and regression analysis</td>
<td>organizational</td>
<td>meaning for network cooperation and organizational innovation</td>
</tr>
</tbody>
</table>

Source: own study

Table 3. Dimensions of proximity and functioning of supply chains

<table>
<thead>
<tr>
<th>Dimension of proximity</th>
<th>Foundation of proximity</th>
<th>Importance for integrations and functioning of supply chains</th>
</tr>
</thead>
<tbody>
<tr>
<td>geographical</td>
<td>spatial and time distance of entities</td>
<td>bigger possibilities of direct contacts, lower transport costs, quicker access to resources</td>
</tr>
<tr>
<td>organizational</td>
<td>organizational similarity and membership to inter-organizational networks</td>
<td>easier cooperation (including communications) due to common and shared approaches to management, philosophy of activity, organizational culture, organizational structure, and strategic orientation, and vision of the future (including convergence of goals). The similarities in the above mentioned aspects can be a source of mutual understanding and inter-organizational trust, as well as of reduction of the risk of opportunistic behaviors</td>
</tr>
<tr>
<td>social</td>
<td>interpersonal relationships connecting workers of members of particular supply chain</td>
<td>an increase in effectiveness of communication (utilization of both formal and informal communication channels) and limitation of risks of opportunistic behaviors (e.g. by relationships of friendship, sympathy, family, common values and standards)</td>
</tr>
<tr>
<td>cognitive</td>
<td>similarity of mental models and of cognitive processes, homogeneity and heterogeneity of knowledge databases, technologies applied and domain of activity</td>
<td>synchronization of manufacturing processes based on common technological processes, production and quality standards applied, an increase in communication performance through use of understandable jargon and technological slang and affiliation to the same group of the practice (e.g. community of practice)</td>
</tr>
<tr>
<td>institutional</td>
<td>institutional environment (including cultural issues) of members of supply chain</td>
<td>possibility of easier and more flexible cooperation as the members of supply chain work under similar law framework (same book-keeping rules, labor law, WHS standards) or cultural conditions (lack of cultural differences and conflicts hampering the cooperation)</td>
</tr>
</tbody>
</table>

Source: own study

Concluding, the meaning of proximity in the context of logistics results from the fact that the proximity in question can be a factor that can explain [Hall & Jacobs, 2010] both gaining new competences by members of supply chains and effective management along with coordination of complex and collective activities and logistic processes to be found in
the supply chain. Based on the above and assuming that logistics is an activity of coordination of flows of goods and information within the supply chain [Harrison, van Hoek 2010], which leads to improvement of its effectiveness.

**RESEARCH CHALLENGES IN THE AREA OF INTER-ORGANIZATIONAL PROXIMITY IN THE CONTEXT OF LOGISTICS**

Based on significant and interesting theoretical and empirical works regarding the influence of the proximity on the performance of the inter-organizational cooperation (see Table 1), it can be concluded that the proximity hypothesis is believed to perform the role of a significant determinant of performance of contemporary supply chains. However, according to authors, there is a deficiency of research restricting the empirical perspective to functioning of supply chains. The authors propose the following three directions of research.

**First direction**

Many of existing postulates pointing out the influence of proximity on the cooperation processes are only of theoretical nature and therefore need to be verified empirically (see variables that are not bold font in Table 1).

**Second direction**

Prior scientific works linking the proximity hypothesis with activity of supply chains are quite inconsistent regarding the theoretical assumptions adopted (e.g. lack of coherence and high level of ambiguities in the field of number and types of proximity dimensions). Additionally, in many cases the conceptual [e.g. De Oliveira et al. 2011] or measurement [e.g. Hall Jacobson 2010] assumptions adopted during research on proximity within supply chains do not agree with the recent knowledge in the area of the inter-organizational proximity (see remarks in Table 4).

<table>
<thead>
<tr>
<th>Authors</th>
<th>Topic of research</th>
<th>Dimensions of proximity</th>
<th>Remarks referring to conceptualization and operationalization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hall and Jacobs [2010]</td>
<td>links of global supply chain</td>
<td>organizational, institutional, cognitive, social and geographical</td>
<td>narrow approach to organizational dimension of proximity covering only to the method of the control during the cooperation</td>
</tr>
<tr>
<td>Kechidi and Talbot [2010]</td>
<td>Airbus and network of its subcontractors</td>
<td>organizational, institutional and geographical</td>
<td>organizational dimension of proximity perceived as a type of institutional proximity; narrow approach to institutional dimension of proximity including only cultural aspects; only three dimensions of proximity were taken into consideration</td>
</tr>
<tr>
<td>De Oliveira et al. [2011]</td>
<td>members of Supply Chain Council</td>
<td>digital</td>
<td>digital proximity as a type of the organizational dimension of proximity; only one dimension of proximity was taken into consideration</td>
</tr>
<tr>
<td>Carbone and Blanquart [2013]</td>
<td>links of green supply chains</td>
<td>organizational, institutional and geographical</td>
<td>narrow approach to institutional dimension of proximity including only cultural aspects; organizational cultures included to institutional dimension of proximity instead of to organizational proximity; only three dimensions of proximity were taken into consideration</td>
</tr>
<tr>
<td>Galli and Brunori [2013]</td>
<td>short (lean) supply chains</td>
<td>social and geographical</td>
<td>geographical proximity limited to spatial distance while the time and infrastructure issues remain outside the consideration; only two dimensions of proximity were taken into consideration</td>
</tr>
<tr>
<td>Klimas [2014]</td>
<td>links of supply chains organized as networks of innovations</td>
<td>organizational</td>
<td>only one dimension of proximity was taken into consideration</td>
</tr>
</tbody>
</table>

Source: own study
Third direction

The previous empirical works should be described as fragmentary and there is a possibility to point few important research gaps. The recommended directions of future research on proximity in the context of the inter-organizational cooperation should be as follows: dynamics of proximity, relationships and interdependencies among dimensions of proximity, nature and the scope of implications of proximity for cooperation and networking cooperation [Klimas, 2014]. Additionally, research gaps are also experienced in relation to cooperation within the supply chain. In particular, some attention is paid to the need of further research that would broaden knowledge of the essence as well as types of management of supply chains through consideration of the significance of proximity dimensions [Li et al. 2006] or comparative research on significance of proximity for the performance of different types of supply chains that are diversified by means of their criterion of proximity in particular dimensions [Kechidi, Talbot, 2010]. Additionally, due to the lack of this type of research, it seems to be justified to focus future research efforts on recognizing the importance of proximity in different types of supply chains, in supply chains functioning in various economic areas, or in supply chains of different geographical locations. It is worth mentioning that at present such topics as significance of proximity and its individual dimensions for realization and the flow of the integration function of the logistics [Szoltysek, 2011] in organizations of the supply chains status, are out of scope of the research.

CONCLUSIONS

Based on scientific literature, there is a lack of scientific research (theoretical and empirical ones) narrowing the considerations on the significance of the hypothesis of the proximity for performance of functioning of supply chains. The researchers of the proximity point out that the inter-organizational proximity is one of fundaments of the inter-organizational cooperation and its importance for the logistics has not been explained entirely and needs further research [Nikkanen, 2005]. According to authors, regarding the existing scientific literature connecting the logistics area (functioning of supply chains), strategic management (effectiveness of inter-organizational cooperation) and economic geography (the hypothesis of the proximity) there are interesting cognitive gaps. Closing the gaps in question should lead to better understanding and improvement of performance of supply chains, which will be subject to further research of authors.

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Ciesielski M., 2011. Rozwój i integracja łańcuchów dostaw [Development and integration of supply chains], in: Zarządzanie łańcuchami dostaw [Management of supply chains], red. M. Cie-


Li S., Ragu-Nathan B., Ragu-Nathan T.S., Subba Rao S., 2006. The impact of supply chain management practices on
BLISKOŚĆ MIĘDZYZORGANIZACYJNA W KONTEKŚCIE LOGISTYKI - WYZWANIA BADAWCZE

STRESZCZENIE. Wstęp: Jednym z głównych obszarów badań współczesnej nauki o zarządzaniu są sieci międzyorganizacyjne (w tym łańcuchy dostaw) oraz zachodzące w ich ramach procesy współdziałania zmierzające do poprawy sprawności ich funkcjonowania. Podstawowym czynnikiem sprawności łańcucha dostaw jest logistyka. Możliwym i stosunkowo nowym kierunkiem badań w obszarze sprawności procesów współdziałania międzyorganizacyjnego jest hipoteza bliskości rozpatrywana w pięciu wymiarach (geograficznym, organizacyjnym, społecznym, poznawczym oraz instytucjonalnym). W opinii autorów brakuje jednak badań prowadzonych w kontekście łańcuchów dostaw przyjmujących logistyczny punkt widzenia w tym obszarze. Hipoteza bliskości wciąż stanowi swoiste novum. Dlatego też, w artykule przybliżono koncepcję bliskości z perspektywy nauk o zarządzaniu. Przedstawiono przegląd dotychczasowych badań wiążących bliskość międzyorganizacyjną z łańcuchami dostaw z punktu widzenia logistyki oraz nakreślono możliwe kierunki dalszych badań.

Wyniki: Stan wiedzy dotyczące znaczenia bliskości międzyorganizacyjnej dla sprawnego funkcjonowania łańcuchów dostaw jest dość skromny, a dotychczasowe badania empiryczne są fragmentaryczne i nie są wolne od ograniczeń koncepcyjno-metodycznych. Dodatkowym uzasadnieniem potrzeby dalszej i głębszej eksploracji naukowej są zidentyfikowane w artykule luki badawcze. Zdaniem autorów przyszłe badania empiryczne powinny służyć: (1) ujednoliceniu oraz aktualizacji wykorzystywanych podejść koncepcyjno-metodycznych w badaniach nad bliskością w łańcuchach dostaw, (2) testowaniu postulatów teoretycznych wskazujących na znaczenie bliskości dla funkcjonowania łańcuchów dostaw z uwzględnieniem znaczącej heterogeniczności tej formy współdziałania międzyorganizacyjnego, a także (3) rozpoznaniu roli bliskości międzyorganizacyjnej dla praktyk zarządzania łańcuchami dostaw oraz dla realizacji integracyjnej funkcji logistyki.

BIBLIOTEKA


Wnioski: W literaturze widoczny jest deficyt badań naukowych (teoretycznych oraz empirycznych) zawierających rozważania nad znaczeniem hipotezy bliskości do sprawności funkcjonowania łańcuchów dostaw. Co więcej, w istniejącym dorobku naukowym łączącym dorobek logistyki (sprawność łańcuchów dostaw) oraz geografii ekonomicznej (hipoteza bliskości) występują interesujące luki poznawcze, których zapelnienie powinno przyczynić się do głębszego zrozumienia sprawności łańcuchów dostaw - co będzie przedmiotem dalszych badań autorów.

Słowa kluczowe: bliskość międzyorganizacyjna, łańcuch dostaw, logistyka

**INTERORGANISATIONALE NÄHE IM KONTEXT DER LOGISTIK - FORSCHUNGSAUSFORDERUNGEN**


Methoden: Das Ziel des vorliegenden Artikels ist es, die bisherigen, theoretischen und empirischen Errungenschaften im Bereich der interorganisationalen Nähe mit dem Hinweis auf die aktuellen Forschungsausforderungen auf diesem Gebiet darzubieten. Für die Ausführung des so abgezeichneten Zieles hat man die Methode für kritische Auswertung der Gegenstandsliteratur in Anspruch genommen.


Fazit: In der Gegenstandsliteratur ist ein Mangel von sowohl theoretischen, als auch empirischen Forschungen, die die Erkundungen über die Bedeutung der Hypothese der Nähe für die Funktionalität der Lieferkette einengen würden, erkennlich. Darüber hinaus treten im wissenschaftlichen, die Leistung der Logistik (Funktionalität der Lieferketten) und die Leistung der Wirtschaftsgeographie (Hypothese der Nähe) verbindenden Erwerb interessante Erkundungslücken auf, die möglichst schnell geschlossen werden sollen, was zu einem besseren Verständnis der Funktionalitätsfrage innerhalb der Lieferketten beitragen und auch zum Gegenstand der weiterhin von den Autoren zu betätigenden, betreffenden Forschungen werden sollte.

Codewörter: interorganisationale Nähe, Lieferkette, Logistik

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