

Metropolis Logistics Challenges in the Formation of Inter-organizational Relationships

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Metropolis logistics is a new research issue that begins to play an important role in shaping inter-organizational relationships. The concept of logistics in metropolitan context is a contemporary term used primarily to identify issues that will improve the transformation of products and information in building inter-organizational efficiency. On the one hand, the issues of metropolitan logistics are based on shaping the flow of products and information in building inter-organizational efficiency. On the other hand, the formation of inter-organizational bonds has a complex and multidimensional structure that creates a specific network of interactions, in which metropolitan logistics determines their development in relation to the environment. The aim of the article is to identify the conditions that build up inter-organizational relations within the Silesian-Zagłębie (Ś-Z) metropolitan area. The article presents selected results of exploratory research carried out among logistic entities operating in the Silesian-Zagłębie metropolitan area. The authors attempted to answer the question: what are the challenges ahead of metropolitan logistics in shaping inter-organizational relationships?

Keywords: logistics, metropolis, relations, organization.

1. INTRODUCTION

The rise of metropolis is one of the key symptoms of civilization development today. The metropolises are the largest gathering of people in which the greatest economic activity of man is concentrated. Over the past twenty years there has been a significant evolution in the views about the importance of factors determining the development of the determinant of metropolis development. Of particular importance was the group of views that emphasized the importance of factors shaping the management of the flow of products and information among people - the effect of development of IT systems, i.e. the fields of knowledge and practical activities, integrating various technologies (computer hardware and software, telecommunication, tele-informatics) to obtain information, analysing, processing, storing,

managing and communicating to other people. Metropolis and processes of inter-organizational relations have entered a new era of development in which the pace of information and products flows has been subordinated to the previously unknown methods and tools that allow for modern solutions also in metropolitan logistics. The modern development of metropolitan logistics is conditioned by the strong diversification of product flows and the accompanying exchange of information, which is spreading even wider into the areas of relations between the inter-organizational functioning of the metropolis. Metropolis logistics is a relatively new research issue which has not found a broader reference in current discussions. On the one hand, the vast majority of conducted research focuses on the sphere of transport - freight forwarding - storage, and in this area builds the knowledge of the relationship between product transformation

and the accompanying information flows by constructing a picture of logistics through the prism of the sector. On the other hand, the ever-expanding logistics, including metropolitan logistics, is about new areas within which link building is shaped by broader inter-organizational relationships, covering the sphere of logistic policy. Novum logistics of the metropolis is, on the one hand, the power to shape flows of products and information in the metropolis, the home area within which the most efficient and efficient flow network is built, and on the other hand generates a significant problem of identifying these relationships with the environment - metropolitan administration, natural environment, etc.

2. THEORETICAL ASPECTS OF METROPOLITAN LOGISTICS

The theoretical aspects of metropolitan logistics can be seen through the prism of various concepts. However, the metropolis processes that are crucial for the purpose and subject of research seem to have been determined by the way in which products and information flow from the viewpoint of inter-organizational relations in the metropolis. Among the concepts which, in relation to the theoretical conditions of metropolitan logistics, can constitute an important point of reference in shaping theoretical foundations, lies shaping inter-organizational relations. Thus, in particular - J. Friedman's theory - world city hypothesis, S. Sassen - global city conception, M. Castells concept - and his theory of flow space and M.E. Porter - theory of grapes as well as the concept of R. Domański - an innovative city - Tab. 1.

The emergence and development of inter-organizational relationships in metropolitan logistics is a complex research problem that, on the one hand, manifests itself in the multifaceted nature of conditioning and, on the other, the complex structure of their internal and external connections that accompany the processes of shaping the metropolis as a whole. It should also be emphasized that the shaping of the multicentre network of great inter-organizational relationships is determined in metropolitan logistics, especially in three relations:

- an extensive network within which key elements are capital, information and technology used in logistics, shaping inter-organizational relationships;

- nodes in the logistics network of the metropolis in the structure of product flows and information - flow relationships are not centered on the location, and its base is the density of logistics connections of the metropolis with its surroundings, and
- dynamics of shaping the links of nodes and their couplings within the metropolitan logistics network, whose dynamics are mostly far from the state of equilibrium, but relations of relations are ordered according to certain conditions - they are the sets of states of individual inter-organizational ties. It is important, therefore, both from theoretical and practical point of view, to identify the inter-organizational bonds in metropolitan logistics.

3. THE AREA OF THE METROPOLITAN SILESIA – ZAGŁĘBIE

The Metropolis of Silesia and Zagłębiowska was established on 1 July 2017 under the Act of 9 March 2017. The Silesian-Zagłębie metropolitan area is inhabited by more than 2.2 million people in an area of 1,200 km², administered by 41 municipalities - Będzin, Bieruń, Bobrowniki, Bojszowy, Bytom, Chełm Śląskie, Chorzów, Czeladź, Gliwice, Imielin, Katowice, Knurów, Kobior, Łędziny, Łaziska Górne, Mierzęcice, Mikołów, Mysłówice, Ożarówice, Piekary Śląskie, Pilchowice, Psary, Pyskowice, Radzionków, Ruda Śląska, Rudziniec, Siemianowice Śląskie, Siewierz, Sławków, Sosnowiec, Sosnicowice, Świerklaniec, Świętochłowice, Tarnowskie Góry, Tychy, Wojkowice, Wry, Zabrze, Zbrosławice - Fig. 1.

In the area of 2,500 km², in 41 largest cities of Silesia and the Basin there are more than 2.2 million people. The area of the Silesian-Zagłębie metropolitan area is characterized by a significant level of logistic infrastructure development, a high population density of about 1,600 people per km² and the highest level of industrialization and urbanization in Poland. In addition, the Silesian-Zagłębie metropolitan area is very well connected with the European-wide logistic network. It is also worth noting that in the area of the Silesian-Zagłębie metropolis the main trans-European transport routes cross - corridor III: Berlin-Wrocław-Katowice-Krakow-Lviv and corridor VI: Gdansk-Katowice-Żylna.

Table. 1. Selected hypotheses, concepts, theories and typologies of metropolitan logistics shaping process

Author of hypotheses, concepts, theories, typology of metropolitan logistics shaping process	Assumptions of concepts, theories, typology of metropolitan logistics shaping process
J. Friedman – World city hypothesis) – 1986	The hypothesis of the world city concerned the organization of international division of labour, the relationship between the production of global governance and territorial interests, concentrated in seven theses: - the form and scope of city integration with the world economy and the functions assigned to the city within the spatial division of labour will determine the structural changes taking place in this city; Key cities in the world are used by global capital as "basing points" in spatial organization and the functioning of production and markets. Hence, the links allow to create a spatial hierarchy of world cities; - global control functions of world cities are directly reflected in the structure and dynamics of their manufacturing and employment sectors; - world cities are the main locations in the spatial concentration of international capital; - world cities are the destination for large internal and international flows; - the formation of world cities reveals the main contradictions of industrial capitalism, including spatial and class polarization; - the growth of world cities results in higher social costs exceeding national financial capacity.
S. Sassen – global city - 1991	Global cities have long history as centres of international trade and banking, and now display four characteristics: - provide a very focused place for control and regulation in the organization of the global economy; - are the main locations for finance and specialized service companies that have taken the place of manufacturing as the leading economic sector; - provide a location for production, especially innovation; - are markets for manufactured products and innovations.
M. Castells – space of flows - 1998	According to M. Castells flow theory, society and the whole of reality are described as a great network. The basis of this theory is the assumption that society is focused around flows: capital, information, technology, images, sounds and symbols. There are three layers of network support: - electronic exchange circuit, - nodes and concentrators of the flow space, - spatial organization of dominant management elites.
M.E. Porter - theory of grapes 1998	The theory of clusters implies the existence of clusters of companies, interrelated entities, entities, specialized suppliers, standardization units and industry associations in individual fields competing among themselves but also collaborating. Grapes are a common feature for creating external effects for the development of metropolises that generate complementarity in the industry: common technologies, skills and knowledge. The formation of clusters is conducive to the economic development of the metropolis and the emergence of a so-called multiplier effect (higher demand and production rather than capital expenditure) and the metropolitan economy's acceleration. The proximity of businesses increases competition which is an important determinant of improving their efficiency, and promotes cooperation with other players on the market, creating a network both inside and outside the metropolis.
R. Domański – concept of an innovative city 2000	In the concept of an innovative city, the analysis is particularly concerned with structural transformations, which are directly and indirectly influenced by scientific and economic policy. In modern large cities (metropolises), there is a strong concentration of creative and innovative scientific, technical and economic activity. The overheads of many systems operating in a metropolis, at one level, are linked to another, higher level, and create a new structure - a dissipative one - that can perform more complex functions of higher productivity;

Source: own elaboration based on: J. Friedman 1986, The world city hypothesis, Development and Change, 17; Sassen S., 1991. The global city. Princeton University Press, Princeton N; M. Castells 1989, The informational city: information technology, economic restructuring, and the urban regional process, Blackwell, Oxford, UK, Cambridge, Mass; M.E Porter, Clusters and the New Economics of Competition, Harvard Business Review, 1998. R. Domański, Miasto innowacyjne, Studia, Komitet Przestrzennego Zagospodarowania Kraju PAN, t.109, Warszawa 2000.

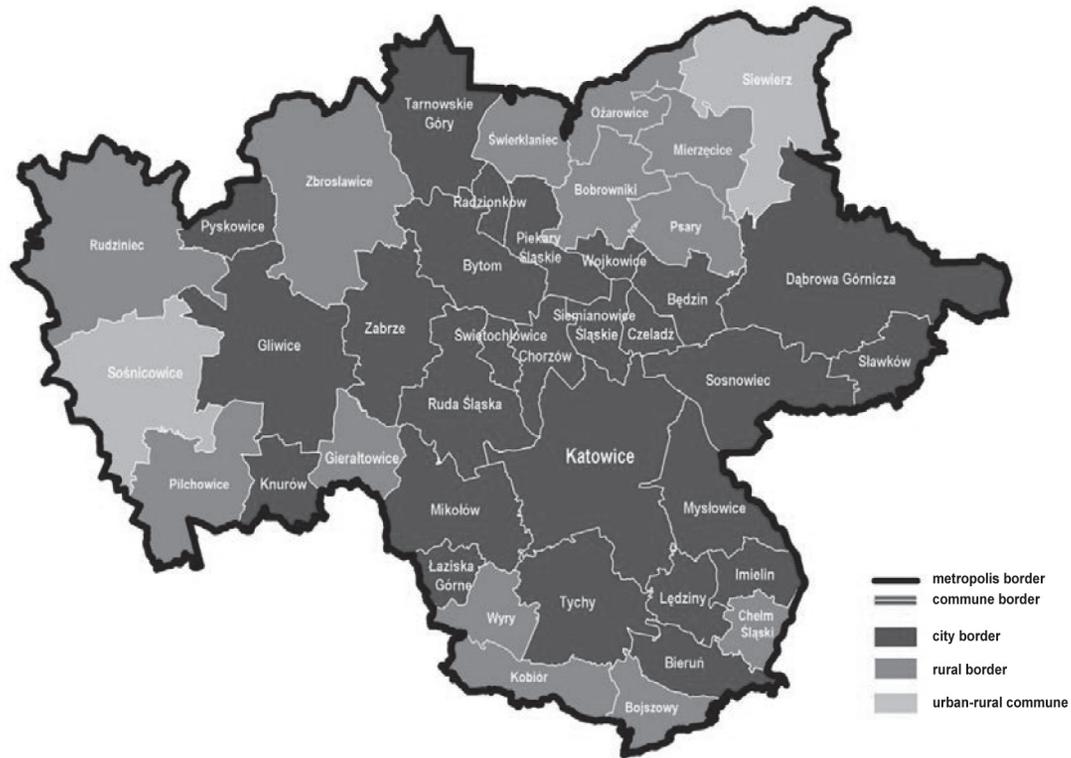


Fig. 1. The area of the Silesian-Zagłębie metropolitan area

4. METHODOLOGY OF RESEARCH

4.1. PURPOSE AND OBJECTIVES OF THE PROJECT

The metropolitan logistics challenge posed a challenge to shape inter-organizational relations with the establishment of the Silesian-Zagłębie metropolitan area, gaining new significance. The interaction between the inter-organizational diversity of entities in the Silesian-Zagłębie metropolis was subordinated to the attempt to create more effective and efficient actions aimed at improving the quality of life and competitiveness in Poland and Europe. The creation of the Silesian-Zagłębie metropolis also gave rise to a more favourable shaping of the relations between the inter-organizational entities of the TFL sector operating within the Silesian-Zagłębie metropolitan area. The purpose of the research is to identify the conditions that build up the inter-organizational relations of entities of the TFL sector operating within the Silesian-Zagłębie metropolitan area. On the one hand it has become important to recognize the determinants of inter-organizational

relations, which are important for shaping the tools of logistic policy for the development of the Silesian-Zagłębie metropolitan area. On the other hand, it is not without significance to address the challenge of building better relationships between actors and their relationships with the metropolitan environment.

4.2. METHOD OF CARRYING OUT RESEARCH

Metropolis logistics is an important challenge for shaping inter-organizational relations, one of the research projects carried out at the Department of Transport at the University of Economics in Katowice. The metropolitan logistics research project was divided into two parts. The first part - quantitative - covered direct observation - personal interviews with representatives of entities of the TFL sector and indirect ones in the form of a questionnaire conducted among the entities of the TFL sector operating in the Silesian-Zagłębie metropolitan area. The second part - qualitative - consisted in conducting expert interviews among entrepreneurs performing services connected with the TFL sector in the Silesian-Zagłębie metropolitan area.

4.3. RESEARCH AREA AND STRUCTURE

The analysis of metropolitan logistics in the formation of inter-organizational relations in the Silesian-Zagłębie metropolitan area has led to the isolation of research question sets. Question sets were included in the questionnaire addressed to the entities of the TFL sector operating in the Silesian-Zagłębie metropolitan area. The study was carried out on a group of 86 entities of the TFL sector operating in the area of the Silesian-Zagłębie metropolis, which were deliberately chosen for the research sample, in the period January - October 2017. On the one hand, the purpose and object of research was determined on the one hand, and on the other, it was important to carry out analyses facilitating reconnaissance of the metropolitan logistics conditions in shaping inter-organizational relations on the example of Silesian-Zagłębie metropolis.

The current development of metropolitan logistics also determined the subject structure of the study, which was divided into two groups of criteria. The first group included the conditions connected with the opportunities and threats of the development of the logistics of the Silesian-Zagłębie metropolis:

Conditions that create opportunities:

- increasing the importance of integration processes - creating a metropolis,
- development of logistical investments that strengthen the metropolitan tangibility,
- the importance of the intellectual potential of the metropolis,
- innovation of logistics solutions metropolis.

Hazard determinants:

- development of destabilization processes - disintegration of metropolis,
- increased metropolitan bureaucracy,
- the local logistics policy of the metropolis.

The second group of criteria includes conditions (endo and exogenous). The group of endogenous conditions of the logistics of the Silesian-Zagłębie metropolis were:

- the capital of social capital logistics metropolis,
- logistics infrastructure resources,
- the activity of the intellectual potential developing the competence of logistics,
- level of logistics investment in the metropolis,

The group of exogenous conditions of metropolitan logistics were:

- the amount of funds raised for logistics investments from the EU and the Polish government,
- level of inter-organizational cooperation - logistics - environment,
- withdrawal of foreign investors to the metropolis,
- building a coherent metropolitan logistics policy.

4.4. SELECTED RESULTS OF EMPIRICAL RESEARCH

Therefore, the selected results of empirical research included the identification of four identified metropolitan logistics conditionalities as a part of broader impact assessments on shaping relations between TFL sectoral interlocutors. The first conditioning identified in the research was that of the group that created opportunities for the development of the logistics of the Silesian-Zagłębie metropolis, as an element shaping inter-organizational relations, focused on four issues: increasing the importance of integration processes - creating a metropolis, developing logistical investments that strengthen the metropolis's concreteness, the importance of intellectual capital for the metropolis, and the innovation of metropolitan logistics solutions. The results of the research indicate that among the identified issues, the significance of integration processes in the creation of a metropolis is 34%. However, it should be noted that the remaining two conditions, the development of logistics investments in 32% of the metropolitan areas of competitiveness and the intellectual capital of the metropolis of 25% - Fig. 2.

The determinants of the diagnoses were the determinants of metropolitan logistics in the formation of inter-organizational relations, including: the development of destabilization processes, the breakdown of metropolis, the increase of the metropolitan bureaucracy, the destabilization of the logistic policy of the Silesian-Zagłębie metropolitan area. Quite a surprising result of research in the group of examined entities in the TFL sector, is the high level of determinants of the development of destabilization processes - disintegration of the metropolis 59%. The remaining two conditions, ie 21% increase in the metropolitan

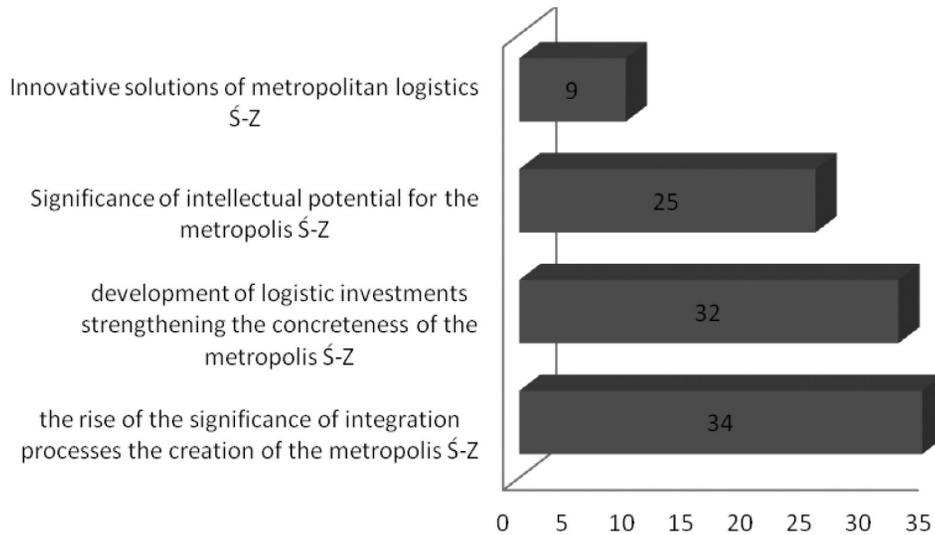


Fig. 2. The structure of conditions determining the chances of logistics of the Silesian-Zagłębie metropolitan area in shaping inter-organizational relations

bureaucracy and the destabilization of the logistic policy of the Silesian-Zagłębie metropolis 20%, were similarly obtained - Fig. 3.

metropolitan area, which has reached the level of 32%, on the other hand the group of infrastructure conditions of 25% and social capital of metropolitan

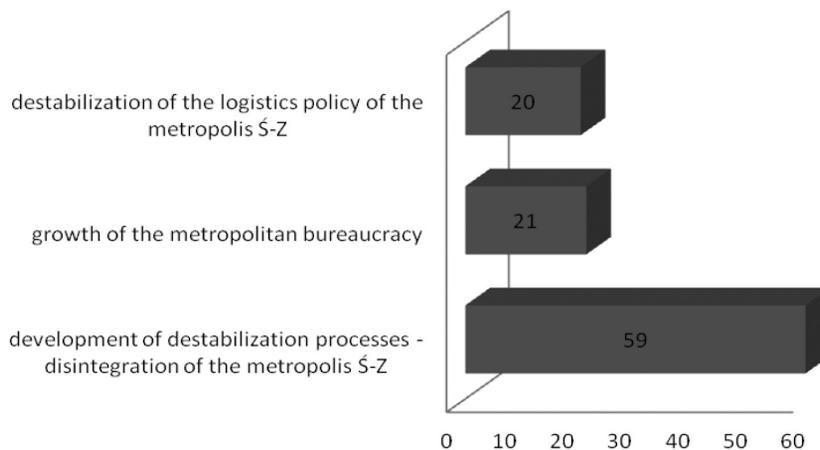


Fig. 3. The structure of the conditions constituting the threat of logistics of the Silesian-Zagłębie metropolis in the formation of inter-organizational relations

The second group was composed of the endo- and exogenous determinants of metropolitan logistics in shaping relations between the inter-regional metropolitan Silesia and Zagłębie. The endogenous factors shaping inter-organizational relations included the resources of social capital of metropolitan logistics, logistics infrastructure resources, the activity of the intellectual potential developing the metropolitan logistics and the level of logistic investments in the Silesian-Zagłębie metropolitan area. On the one hand, it is the level of logistic investments in the Silesian-Zagłębie

logistics 22%, and the activity of intellectual capacity developing competence metropolitan logistics 21% - Fig. 4.

The exogenous conditions identified during the research were the volume of acquired logistic investments from the EU and the Polish government, the level of inter-organizational logistical cooperation - the environment, the withdrawal of foreign investors to the metropolis and the construction of a coherent logistics policy of the Silesian-Zagłębie metropolitan area. Among the surveyed group, the share of foreign investors

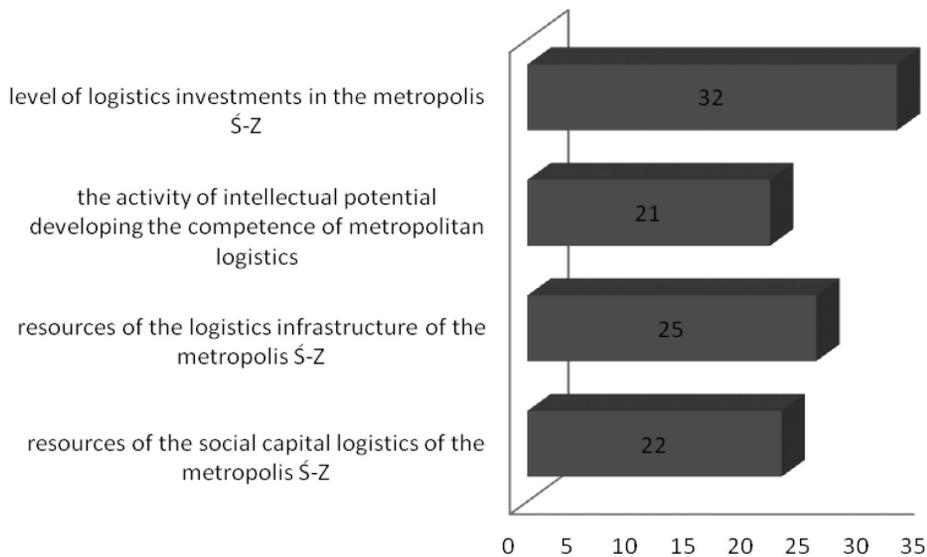


Fig. 4. Structure of endogenous conditions of logistics of Silesian-Zagłębie metropolis in shaping inter-organizational relations

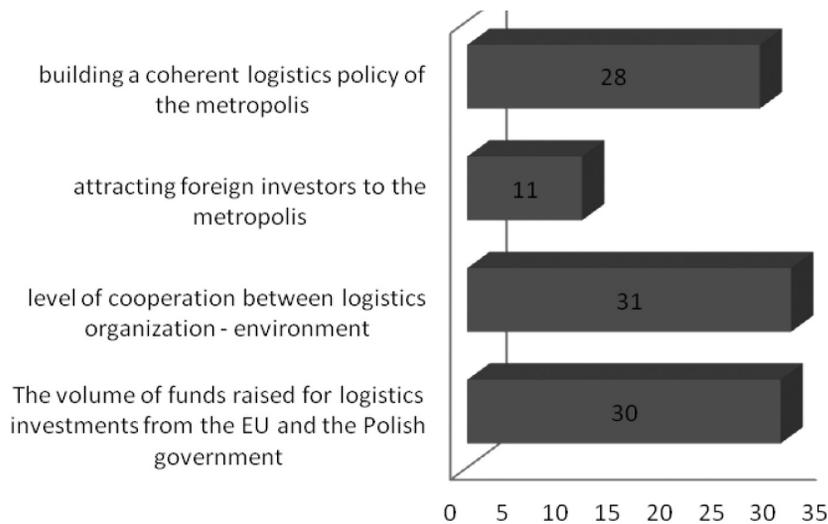


Fig. 5. Structure of exogenous conditions of logistics of the Silesian-Zagłębie metropolis in shaping inter-organizational relations

was 11%, which may mean that the subjective structure of the TFL sector in the Silesian-Zagłębie metropolis has not yet reached its saturation point. The remaining plane in the group of exogenous determinants was a combination of three conditions - respectively the level of cooperation between the logistics organization - the environment of 31%, the amount of funds for logistics investments 30% and the construction of a coherent logistics policy of the metropolis 28%, the value of individual conditions is quite close to each other - Fig. 5.

5. SUMMARY

The results of the survey of the Silesian-Zagłębie metropolis in shaping inter-organizational relations constitute a new direction of recognition. The development of the metropolitan spatial and socio - economic environment also influences the inter - organizational relations and their characteristic feature is the development of European - level logistic connections. The conducted research, especially in the field of empirical research, indicates that the development of the Silesian-Zagłębie metropolis should significantly develop the conditions

connected with the shaping of the opportunities, as well as monitor the level of threats and develop the endo- and exogenous inter-organizational relations connected with the metropolitan logistics. Furthermore, shaping relations in metropolitan logistics is a factor that fosters the development of inter-organizational flows and information.

REFERENCES:

- [1] Castells N, M., 1989, *The informational city: information technology, economic restructuring, and the urban regional process*, Blackwell, Oxford, UK, Cambridge, Mass.
- [2] Domański R., 2000., *Miasto innowacyjne, Studia, Komitet Przestrzennego Zagospodarowania Kraju PAN*, t. 109, Warszawa.
- [3] Domański R., 2012, *Ewolucyjna gospodarka przestrzenna*, Wydawnictwo Uniwersytetu Ekonomicznego w Poznaniu. Poznań.
- [4] Dz. U. poz. 730 z dnia 6 kwietnia 2017 r.
- [5] Friedman J. 1986, *The world city hypothesis, Development and Change*.
- [6] Markowski T., Marszał T., 2006, *Metropolie, obszary metropolitalne, metropolizacja. Problemy i pojęcia podstawowe*, Warszawa.
- [7] Porter M.E., *Clusters and the New Economics of Competition*, Harvard Business Review.
- [8] Sassen S., 1991. *The global city*. Princeton University Press, Princeton.
- [9] Sposób na Metropolie. I-, red. R. Pyka, UM Katowice, RSS MSNP US Katowice 2010.
- [10] Unia Metropolii Polskich, dostępny w: <http://www.metropolie.pl> (data dostępu: 16 września 2017).
- [11] www.gzm.org.pl

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