t. LXXV ■ nr 1/2023 ■ DOI 10.33226/1231-2037.2023.1.6

Dr Beata Andrzejczak
University of Lodz (Poland)
ORCID: 0000-001-5028-269X
e-mail: beata.andrzejczak@uni.lodz.pl

Motives and barriers to the development of logistics networks in the SME sector in Poland in the years 2019–2020

Motywy i bariery rozwoju sieci logistycznych w sektorze MŚP w Polsce w latach 2019–2020

Abstract

The aim of the paper is to discuss reasons and barriers to Tier 1 suppliers and customers of the SME sector in Poland focusing on the Łódzkie Province. The first part of the work provides theoretical approach to the identification of circumstances conditioning the development of logistics networks relying on subject-matter literature and data from the reports of Bundesvereinigung Logistik (BVL). The second part of the paper contains author's questionnaire-based studies of reasons and barriers to the development of logistics networks in the SME sector in the Łódzkie Province and the characteristics of companies from the SME sector participating in the studies.

Keywords:
logistic networks, SME sector, supply chain management, networked enterprise

Streszczenie

Celem artykułu jest zaprezentowanie motywów i barier współpracy z dostawcami i odbiorcami pierwszego rzędu w sektorze MŚP w Polsce ze szczególnym uwzględnieniem województwa łódzkiego. W pierwszej części artykułu zostały zaprezentowane uwarunkowania rozwoju sieci logistycznych w ujęciu teoretycznym, na podstawie literatury przedmiotu oraz informacji zawartych w raportach Bundesvereinigung Logistyk (BVL). W drugiej części artykułu zostały przedstawione badania własne (ankietowe) na temat motywów i barier rozwoju sieci logistycznych sektora MSP w województwie łódzkim oraz charakterystyka firm sektora MŚP biorących udział w badaniach ankietowych.

Słowa kluczowe:
sieci logistyczne, sektor MŚP, zarządzanie łańcuchem dostaw, przedsiębiorstwo w sieci

JEL: D22, L20, L91

Introduction

The development of logistics is largely dependent on changes in external and internal conditions in which an enterprise operates. Therefore, its growth is influenced not only by factors related to the emergence of, e.g., new types of enterprises and management profiles (such as business networks, logistics networks), but also by factors shaping the investment climate of individual countries and regions of the world.

From the point of view of the scale and scope of the development of logistics networks, the question concerns large enterprises as well as small and medium-sized ones. Therefore, it is worth looking at the development of logistics networks in the SME sector in Poland, mainly because the overwhelming majority of all enterprises in Poland (99.8% in 2019) belong to this sector and generate three quarters of the GDP (72.7% in 2018) (PARP, 2021, pp. 12, 18; European Commission, 2019, pp. 2–3; OECD, 2022). These companies also reveal increasing involvement in business cooperation with other entities, e.g. in the field of innovative activities: in Poland in 2018–2020 this held true to 18.8% of small enterprises, and 29.6% of medium-sized enterprises (PARP, 2022, p. 57).

Logistics networks and the growth of SMEs – theoretical approach

The network exerts a powerful impact on the shape and changes in inter-organisational relationships (Ciesielski, 2002, p. 13). These changes concern, inter alia, relationships between suppliers and customers which D. Kempna describes as "A network of independent companies, suppliers and customers, sometimes former competitors (…), linked with (…) information technologies to share skills, costs, and shares in different markets" (Matwiejczuk, 2005, p. 108). According to J. Witkowski, a network should be understood as "a group of independent companies competing and cooperating in order to improve the efficiency and effectiveness of the flow of products and accompanying information in accordance with the expectations of customers" (Witkowski, 2003, p. 19). That is why the growth of networks can take place when resources for logistics can impact the development of business networks (such as electronic or automotive industry), which have historically contributed to bringing forward the question of network development (Ciesielski, 2002, p. 20), as well as when companies offering services within the TSL field develop and intensify their operations. The development of business networks, including logistics networks, was influenced by many factors related to: company development (companies entering into partnerships to create network links, which was also influenced by the emergence of new methods of company management, e.g. logistics-marketing partnerships and outsourcing), logistics and globalisation and the development of the world economy.

From the point of view of company development, A. Sulejewicz in his publication analysed a number of factors, presented by many authors (S. V. Berg, J. Dunacan, P. Freidman, K. R. Harrigan, F. Contractor, P. Lorange, J. F. Blumenthal, J. Hagedoorn, A. Sulejewicz), which contributed to the development of the networking of companies through entering into alliance relationships and included, inter alia, the following groups of objectives and motives related to: the acquisition of knowledge and exchange of technology, risk reduction, shortening of the product life cycle and overcoming trade barriers, the effectiveness of economies of scale, or the increase in revenue of companies (Ciesielski, 2002, pp. 10–13; Sulejewicz, 1997, p. 157).

A similar approach to the analysis of determinants based on literature review, but from the point of view of the development of logistics over the period 1992–2004, was presented in the publication by P. Blaik. In his publication, the author focused on the determinants presented by many authors (I. Kulis-Randa, W. Darr, E. Wolfram, M. Christopher, I. Fechner, A. Kuhn, B. Helingrath, J. J. Coyle, E. J. Bardi, C. J. Langley Jr, M. Sołtysik) that affect the development of the supply chain, its change, forms of integration and cooperation of supply chains, including the development of logistics networks. According to P. Blaik's proposals concerning the factors determining the development of logistics, the following principal ones are mentioned: the increase in importance of customer service, globalisation and interna--tionalisation of markets, shortening of the product life cycle, deregulation and liberalisation, technological progress (development of information technologies, and cooperation (Blaik, 2017, pp. 51–52; Blaik, 2007, pp. 270–273; Coyle et al., 2007, pp. 34–40; Fechner, 2000, p. 14; Christopher, 1992, pp. 27–33).

The motivations for logistics development, including logistics networks, are also the subject of systematic empirical research (questionnaire and survey) in western countries, especially in Germany. One of the best-known research centres for this kind of studies in Europe is the Bundesvereinigung Logistik (BVL). According to the latest BVL report, the motivations for logistics development, referred to as logistics development megatrends, are shaped, among others, by the following factors: fluctuating flows, global trade volumes, demographic changes (ageing population, immigration, urbanisation), new lifestyles (e-commerce), increasing importance of customer service, sustainable development, new risks (changes in political and economic circumstances, climate change, terrorism, cybercrime), modern technologies, and new markets (Schwemmer et al., 2020, pp. 2–9).

The above-mentioned factors have a great impact on the development of logistics networks, and some of them can be found in more than one classification presented in the article, for example, customer service, development of modern technologies or shortening the product life cycle.

The development of networking in logistics may depend on many determinants other than the development of logistics and the global economy, including the development and specificity of, e.g., regional or local determinants, which may provide a more detailed insight into the issue of logistics network development. Therefore, the second part of the article presents motivations for the development of logistics networks in small and medium-sized enterprises from the perspective of regional development on the example of the Łódzkie Province. The main research problem in the article will be an attempt to answer the question about the similarities and differences in the development of logistics networks of the SME sector between companies providing services in the field of TSL and companies from the production industry and providing services from outside the TSL sector, always on the example of the Łódzkie Province.

Results of the survey on the development of logistics networks in the SME sector in particular in the Łódzkie Province

The survey technique relied on an original questionnaire developed by the author and distributed to 33 companies. 32 copies were returned and approved for further research. SMEs that participated in the survey exhibited the following features (Table 1) (Andrzejczak, 2020, pp. 1–7):

- most of the survey was conducted in the Łódzkie Province (28 companies), the remaining companies being based in Mazowieckie, Opolskie and Śląskie provinces;
- half of the SMEs are involved in the provision of TSL services, the other half are active in manufacturing and services (other than TSL) and operate in fields related, among others, to: agriculture, trade, advertising, recycling, wholesale, electrical engineering industry, etc.
- the companies were established within the last thirty years: 11 companies launched their operations between 1990 and 2000, 10 companies – between 2001–2010, and 11 companies – in the years 2011–2019;
- 44% of the companies surveyed are micro-enterprises (employing up to 10), 41% are small enterprises (employing fewer than 50), and only 15% were categorized as medium-sized enterprises (less than 250 employees);
- the majority of the companies surveyed operate at an international level and it refers to both TSL and non-TSL service providers and manufacturing enterprises; the number of businesses carrying out international operations is 13 and 9 companies, respectively.

It should also be observed, considering the research, that companies from the SME sector providing TSL services cooperate with a smaller number of business partners than those from the manufacturing sector and those providing services outside the TSL sector. In case of the former, the companies have the largest number of Tier 1 suppliers, between 5 and 20 companies (11), and in case of Tier 1 customers the number is 8 (Figure 1). On the other hand, for companies from other industries, the highest number of business partners is below 10, i.e. 6 for Tier 1 suppliers and 13 for Tier 1customers, out of which as many as 7 have between 50 and 100 Tier 1 customers (Figure 2).

To the survey question: "Will you aim at developing logistics in your company", most respondents answered affirmatively. Companies involved in the provision of TSL services justified their answer mainly by their desire for further development. However, in the case of SME companies which do not provide TSL services, the answer to this question was additionally justified by aspects related to, e.g., the need to be competitive in the market and to the fact that logistics is one of the core components of business operations.

The selection of motives and barriers to the development of logistics networks of the SME sector in the survey relied on literature in the field and interviews conducted during the classes for the 2nd and 3rd year part-time students of the undergraduate course in Management, major in Logistics, at the Faculty of the Branch of the University of Łódź in Tomaszów Mazowiecki in the academic years 2018/2019 and 2019/2020. Most of the part-time students work in companies related to the TSL sector or in companies in which they use TSL services and therefore, in the discussion during the classes, they mainly considered the factors that determine the development of logistics networks of the SME sector in Poland, with a particular focus on the Łódzkie Province, and on factors which pose a great challenge for the development of the activities of these companies in the market (Andrzejczak, 2020, pp. 1–7).

Table 2 lists motives that determine the development of links with Tier 1 business partners, i.e. suppliers and customers. A higher percentage of responses to survey questions indicating motives for logistics development within the framework of cooperation with logistics partners was reported by companies providing TSL services, compared to manufacturing and non-TSL companies. The group of motives, for which the companies surveyed gave the most positive answers (between 90% and 100%) included: reputation of Tier 1 suppliers and customers (94% and 100%), increase in the number of Tier 1 suppliers and customers with whom SME companies could start to cooperate (94% and 94%), and strictly defined norms of dealing with Tier 1 suppliers and customers (such as, e.g., legal regulations, and mutual responsibility, accounting for 94% and 100%, respectively). The latter factor also received the highest rate of positive answers to survey questions for both SME companies providing TSL services and companies for which logistics is one of the elements of the supply chain; this amounted to 89% and 88%, respectively. On the other hand, in case of other motives for logistics development resulting from cooperation with partners for manufacturing and service companies, the highest number of answers were within the range of 70–80% (as, e.g., in case of high competence in services provided by suppliers – 87%, and customers – 75%).

Other high scores for the motives determining the development of logistics overlap considerably when it comes to the services provided by the companies, but differ from the point of view of the type of business partnership, and these are: smooth flow of

Table 1
Characteristics of SMEs involved in questionnaire-based studies

Characteristics	Transport–shipment–logistics			Other industries that consider logistics in their strategies		
	Micro-enterprises	Small enterprises	Medium-sized enterprises	Micro-enterprises	Small enterprises	Medium-sized enterprises
Based in	Łódź, Wolbórz, Tomaszów Mazowiecki (2), Opoczno, Brudzewice Kolonia, Piotrków Trybunalski, Opole	Piotrków Trybunalski, Nowe Chrusty, Tomaszów Mazowiecki (3), Zduńska Wola, Świerczów	Tomaszów Mazowiecki	Tomaszów Mazowiecki (2), Łódź, Koluszki, Inowłódz, Gałkówek	Opoczno, Tomaszów Mazowiecki, Wolbórz, Łódź, Skierniewice, Aleksandrów Łódzki	Ujazd, Opoczno, Dąbrówka Nowa, Teresin
Operations launched between:						
1990–2000	–	1	1	2	5	2
2001–2010	1	6	–	–	1	2
2010–2019	7	–	–	4	–	–
Business profile	Transportation services (2) Road transport (1) Transport – shipment (3) Transport – logistics (1) Transport – services (1)	Transportation services (3) Road transport (3) Transport – shipment (1)	Transport – shipment (1)	Cosmetics services (1) Manufacture of sawmill products (1) Innovation, electric energy distribution (1) Trade (1) Carpentry services (1) Electric industry (1)	Trade (2) Disposal (1) Wholesale trade (1) Advertising (1) Textiles (1)	Agricultural and construction services (1) Manufacturing of advertising expositions (1) Exports of fruit and vegetables (1) Manufacturing of packaging and man-made plastic (1)
Total	8	7	1	6	6	4
	32					

Source: author's own compilation based on the survey (Andrzejczak, 2020, pp. 1–7).

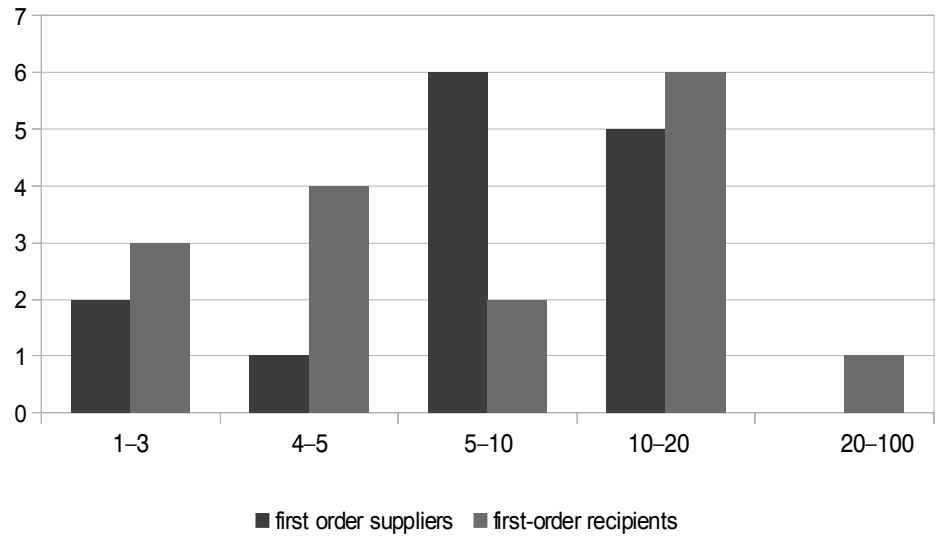
products (it mainly concerns Tier 1 suppliers and appears in 94% of responses for companies providing TSL services and 75% for companies for which logistics is one of the elements of the supply chain), and trust in cooperation with business partners. The latter is mainly noticeable in the case of Tier 1 customers of TSL service providers (94% of the answers) and Tier 1 suppliers for other SME companies (81%). This, to a large extent, is characteristic for the trends observed in business cooperation with partners of the companies examined in the article and combined with the decreasing relevance of the distance between an SME company and Tier 1 suppliers and customers for cooperation with business partners.

As regards motivations behind the development of logistics networks of SME enterprises, it is also worth looking at the barriers to their development (Table 3). According to the ranking of entrepreneurship performance in individual provinces of Poland, the SME sector in the Łódzkie Province ranks only 9th among 16 provinces of Poland (PARP, 2021, p. 38).

Between 50% and 60% of the survey answers list the largest number of factors hindering the operations of companies from the SME sector.

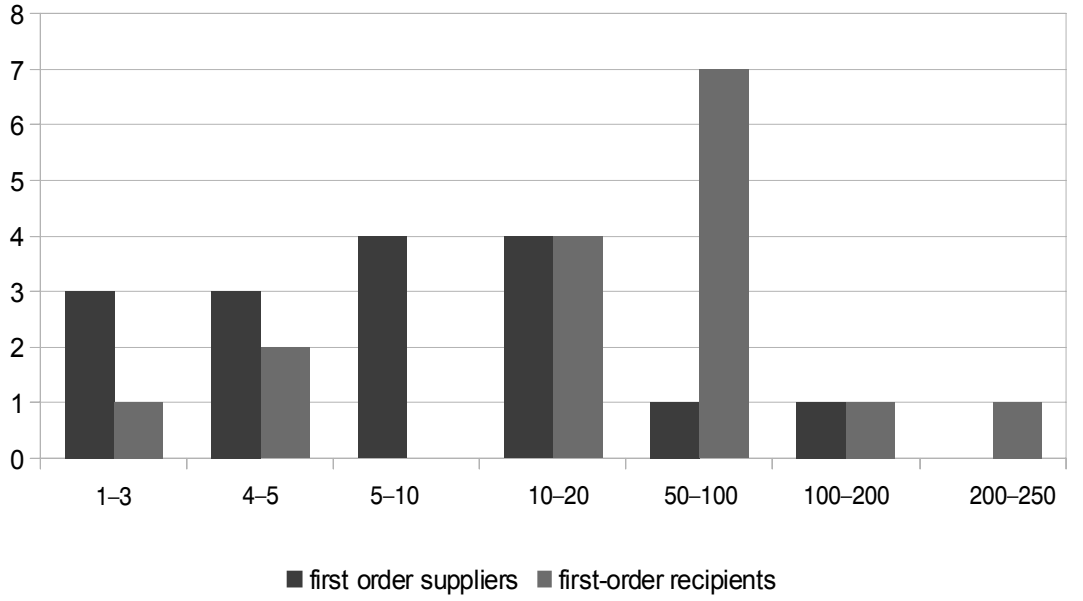
There is a consensus in the statements of companies dealing with the provision of TSL services, manufacturing and services from outside the logistics sector, that the biggest obstacles to cooperation with business partners concern the suppliers and consumers' failure to meet contract terms and the increased costs of warehousing and transport of business partners. These account for, respectively, 75% and 65% on the suppliers' side,

Figure 1
Business partners cooperating with SMEs which provide TSL services



Source: author's own compilation based on the survey.

Figure 2
Business partners cooperating with companies from the manufacturing and service (outside the TSL) industries



Source: as in Figure 1.

and 65% and 69% on the customers' side. On the other hand, in questionnaire-based studies more barriers connected with cooperation with business partners are revealed by the companies providing services within the TSL. These include: small number of suppliers and customers with whom they could launch cooperation, lack of transparency and flexibility in cooperation with suppliers and customers.

Responses listing the above barriers accounted for 50–65% negative survey responses. However, when it comes to companies involved in manufacturing and provision of services outside the logistics industry, the greatest number of barriers was noted on the suppliers' side of the survey. As for the remaining barriers identified by the surveyed SME companies, those related to business cooperation with suppliers rather than Tier 1

Table 2
Motives that determine the development of logistics with business partners (Tier 1 suppliers and customers, in %)

Motives that determine the development of logistic links with business partners	SME in the TSL sector		Manufacturing and non-TSL SME	
	survey responses for Tier 1 suppliers	survey responses for Tier 1 customers	survey responses for Tier 1 suppliers	survey responses for Tier 1 customers
Competences of suppliers and customers	88	88	81	75
Reputation of suppliers and customers	94	100	69	75
The increase in the number of suppliers and customers, with whom we could start cooperation	94	94	69	88
Established rules of cooperation/cooperation with suppliers and customers	81	81	81	69
Strictly defined standards of conduct (legal regulations, mutual responsibility) with suppliers and customers	94	100	89	88
Close geographical distance between the company and suppliers and customers	44	44	50	38
Increasing the efficiency of product flow in cooperation with suppliers and customers	94	88	75	69
Trust in suppliers and customers	88	94	81	69
Increasing the use of infrastructure (storage, transport) in cooperation with suppliers and customers	75	81	63	56

Source: as in Table 1.

Table 3
Barriers restricting the development of logistics with business partners (for Tier 1 suppliers and customers, in %)

Barriers to development of logistic links with business partners	SME in the TSL sector		Manufacturing and non-TSL SME	
	survey responses for Tier 1 suppliers	survey responses for Tier 1 customers	survey responses for Tier 1 suppliers	survey responses for Tier 1 customers
Long distances between suppliers and recipients in the supply chain	44	38	50	44
Incompatible IT systems of suppliers, customers	56	50	50	44
Lack of transparency in cooperation with suppliers and customers	50	63	50	44
Failure of suppliers and recipients to meet the terms of the contract	75	69	56	63
Lack of flexibility in cooperation with suppliers and customers	63	50	44	44
Increase in the costs of storage and transport for business partners	63	88	50	69
A small number of suppliers, customers with whom we could start cooperation	63	56	44	50

Source: as in Table 1.

customers are mentioned, and include: incompatible IT systems, lack of transparency in cooperation, and large distances between the company and Tier 1 customers.

Summary

Attention should be paid to changes in supply chain management consisting in the departure from traditional supply chain management and in putting in place the whole flow of supplies from customers to the final consumer through a company (leader), and the commencement of cooperation with various suppliers and customers in the supply chain under, e.g., outsourcing and cooperation format with suppliers and customers thus forming supply networks. Research studies conducted on groups of SMEs in the Łódzkie Province provide an insight into these changes characteristic of companies' supply networks, which concern not only large companies but also the SME sector, since each of them has its own suppliers and customers, some of them cooperating with as many as 100 and 200 business partners. Changes in the external environment are also taking place, mentioned among motives which influence companies when choosing to establish cooperation with business partners. Transport costs and geographical proximity to the supplier are becoming less important in the selection of Tier 1 suppliers and customers. According to BVL research, these changes also coincide with major megatrends of logistics development worldwide. On the other hand, the established principles of cooperation with Tier 1 suppliers and customers, both for TSL companies providing logistics services and non-TSL companies, play an increasingly important role in the development of logistics in cooperation with logistics partners. These motives can mainly be attributed to barriers, the biggest of which is non-compliance of suppliers and customers with contractual terms. This barrier is also mentioned as one of the main ones in the PARP (Polish Agency for Enterprise Development) report for the SME sector of 2021 (PARP, 2021, p. 101).

References/Bibliografia

Andrzejczak, B. (2020). Determinants of the development of logistics in SMEs in Poland, especially in the Łódź province in the years 2019–2020. In: *Economic and Social Development*. 59th International Scientific Conference on Economic and Social Development, 10.09.2020, Varazdin Development and Entrepreneurship Agency and University North in cooperation with: Faculty of Management, University of Warsaw; Faculty of Law, Economics and Social Sciences – Mohammed V University in Rabat; Polytechnic of Medimurje in Cakovec.

Blaik, P. (2007). Identyfikacja determinant rozwoju i zmian w systemie logistyki. In: S. Kauf, (ed.), *Polityka regionalna w okresie transformacji – cele, doświadczenia, perspektywy*. Uniwersytet Opolski.

Blaik, P. (2017). *Logistyka. Koncepcja zintegrowanego zarządzania*. PWE.

Christopher, M. (1992). *Logistyka i zarządzanie łańcuchem podaży. Jak obniżyć koszty i poprawić jakość obsługi*. Wydawnictwo Profesjonalnej Szkoły Biznesu.

Ciesielski, M. (2002). *Sieci logistyczne*. Wydawnictwo Akademii Ekonomicznej w Poznaniu.

Coyle, J. J., Bardi, E. J., Langley, Jr. C. J. (2007). *Zarządzanie logistyczne*. PWE.

European Commission. (2019). *2019 SBA Fact Sheet*. Poland. https://ec.europa.eu/

Fechner, I. (2000). Logistyka na progu nowego stulecia. *Logistyka*, (1). https://www.logistyka.net.pl/bank-wiedzy/

Matwiejczuk, R. (2005). Tworzenie wartości w ramach organizacji sieciowych. In: J. Witkowski (ed.), *Strategie i logistyka organizacji sieciowych*. Wydawnictwo Akademii Ekonomicznej im. Oskara Langego we Wrocławiu.

OECD. (2022). *Financing SMEs and Enterpreneurs 2022. An OECD Scorebord. 35*. Poland. https://www.oecd-ilibrary.org/sites/99753307-en/index.html?itemId=/content/component/99753307-en

PARP (2021). *Raport o stanie sektora małych i średnich przedsiębiorstw w Polsce 2021*. https://en.parp.gov.pl/publications/publication/raport-o-stanie-sektora-malych-i-srednich-przedsiebiorstw-w-polsce-2021?sort=default&term%5B%5D=1&text_search=

PARP (2022). *Raport o stanie sektora małych i średnich przedsiębiorstw w Polsce 2022*. https://www.parp.gov.pl/component/publications/publication/raport-o-stanie-sektora-malych-i-srednich-przedsiebiorstw-w-polsce-2022?sort=default&term%5B%5D=1&text_search=

Schwemmer, M., Klaus, P., & Durnbeck, K. (2020). *Top 100 der Logistik: Marktgrößen, Marktsegmente und Marktführer; eine Studie der Fraunhofer-Arbeitsgruppe für Supply-Chain-Services*. DVV Media Group, BVL, Dt. Verkehrs-Verl.

Sulejewicz, A. (1997). Partnerstwo strategiczne: modelowanie współpracy przedsiębiorstw. *Monografie i Opracowania* (427). Oficyna Wydawnicza Szkoły Głównej Handlowej.

Witkowski, J. (2003). *Zarządzanie łańcuchem dostaw; koncepcje, procedury, doświadczenia*. PWE.

Dr Beata Andrzejczak

Adiunkt, wykładowca w Katedrze Badań Regionalnych Uniwersytetu Łódzkiego.

Dr Beata Andrzejczak

Assistant professor, lecturer, University of Lodz, Department of Regional Studies.