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TECHNOLOGICAL COOPERATION OF ENTERPRISES IN THE SINGLE EUROPEAN MARKET – THE SUPPORT OF THE ENTERPRISE EUROPE NETWORK¹

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The aim of this article is to examine the motivation and quality of technological cooperation of enterprises on the Single European Market, with emphasis on the support of the Enterprise Europe Network in establishing technological cooperation in the years 2008-2014. The article analyses the impact of technological cooperation on the competitiveness and attractiveness of enterprises in the SEM. The research process was based on data from the Enterprise Europe Network Activity Report 2008-2014, the results of a questionnaire conducted among the network's consultants, and participant observation. It was found that taking up international technological cooperation is influenced by the availability of systemic support instruments to the enterprise.

One of the conclusions of the study is that the policy of technological innovation support should focus on the creation and dissemination of public support instruments among enterprises, which leads to increased competitiveness on the Single European Market.

Keywords: cooperation, innovation, technology

1. INTRODUCTION

Taking up and enhancing technological cooperation by micro, small and medium-sized enterprises (SMEs) has become one of the key factors of their competitive advantage (Bonte, Keilbach, 2005; Hagedoorn, Albert, Vonortas, 2000; Laursen,

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Salter, 2006; Rosenfeld, 1996, Petroni, 1989; Gajowiak, 2016). Assumptions of the Lisbon Strategy and the features of the modern knowledge-based economy, and especially the acknowledgment of the role of science and technological progress in the economic development of both the European Union itself and individual countries and regions, contribute to the development of technological cooperation. Small and medium-sized companies are the source of innovation, which is the ability to search, implement and diffuse innovation, reflected, e.g., in creating new technologies and improving the existing ones. However, due to limited resources (especially financial), SMEs are willing to take up cooperation in terms of research and development (R&D) as well as technology transfer, by creating various associations and regional technology concentrations (Zakrzewska-Bielawska, 2012; Badzińska, 2016).

The aim of this paper is to examine the motivation and quality of technological cooperation of enterprises on the Single European Market (SEM), with emphasis on the impact of the Enterprise Europe Network's (EEN) support in establishing technological cooperation between the suppliers and buyers in 2008-2014. The paper analyzes the impact of technological cooperation on the competitiveness and attractiveness of enterprises on the SEM. The research process was based on data from the Enterprise Europe Network Activity Report 2008-2014, the results of a questionnaire conducted among the network consultants, and participant observation. To present the findings, we used the descriptive method, graphs and an amorphous cartogram.

2. CHARACTERISTICS OF TECHNOLOGICAL COOPERATION

2.1. Technological cooperation in the Single European Market

Currently, the framework for the functioning of the internal market is determined by Art. 26 of the TFEU. According to Par. 2 of this article, it is the various freedoms that constitute its foundation ("Treaty...", consolidated version). The document lists the following types of freedoms:

- free movement of goods (mainly in Title II of the TFEU, Art. 28 and 29, but also in Art. 30-32 of the TFEU, concerning the functioning of the customs union, in Art. 34-37 of the TFEU, concerning the prohibition of quantitative restrictions and issues relating to fiscal barriers, and specifically the prohibition of tax discrimination - as defined in art. 110-115 of the TFEU);
- freedom of movement (Art. 18-25 of the TFEU, which sets out the rights of EU citizens, and Art. 45-48, which sets out the rights of workers associated with the free movement of persons);

- freedom to provide services (Art. 56-62 of the TFEU); the free capital movement and current payments (Art. 63-66 of the TFEU);
- freedom of establishment (Art. 49-55 of the TFEU).

Implementation of the above mentioned freedoms is the determinant of establishing and effective implementation of technological cooperation in the Single European Market.

Technology transfer is a multidimensional process, which results in both the implementation and spread of technology in the new economic environment (Bartlett, Ghoshal, 2000; Boutellier et al., 2000; Firszt, 2007; Pomykalski, 2001). Transfer of foreign technology is referred to as international technology transfer (Balcerowicz, 1987; Nasierowski, Nowakowski, 1994).

In literature, this type of technology transfer is associated with the dissemination of innovation (Cichowski, 1998; Jewtuchowicz, 2005; Kosała, Wach, 2015; Kuboń, Krasnodębski, 2010), as the subject of the transfer process is in fact technology, i.e., the state of knowledge of production methods (Błaszczczyński, 1995; Szelağ-Sikora, Niemiec, Sikora, 2016). Considered the driving force of the economy, innovations are the result of the market implementation of new knowledge. Nowadays, knowledge is considered a key factor in determining the size and structure of production. The available resources of knowledge determine the competitive advantages of both individual companies and entire economies. Although innovation based on the transferred knowledge is not an absolute novelty, it nevertheless affects the technological level of the company, and the quality and speed of creating new knowledge. Above all, the transferred technology enables creating incremental innovations.

According to Hall and Johnson (1970), the technology transfer process occurs in two basic forms: the transfer of the physical elements (machinery, equipment, information, patents) and the personal contact between individuals and groups within the organization (agreements). An interesting taxonomy of technology transfer was proposed by Reisman (1989), who sees technology transfer as a process, in which the technology is transferred and transmitted through various activities, from the technology vendor to the recipient. As a result of technology transfer, the technological capabilities of the recipient may be increased. The process of technology transfer is synthesized into six main steps:

1. identification of the technological gap,
2. identification of the sources of technology,
3. choosing the technology,
4. choosing the technology vendor,
5. transfer of the technology, and
6. its implementation,

The character of technology transfer includes the transfer of specific technical or organizational knowledge, together with relevant skills, for the purpose of their economic (commercial) use. Therefore, technology transfer is a process of fueling the market with technologies, which is a special case of the interactive communica-

tion process, in which various feedback loops occur both between the vendors and recipients of knowledge, as well as between the new technological and organizational solutions (Matusiak, 2010).

2.2. Systemic instruments to support technological cooperation

One of the instruments supporting the process of technology transfer to the Single European Market is the Enterprise Europe Network (EEN). The Enterprise Europe Network has been operating since 1 January 2008. It was established as part of the Competitiveness and Innovation Framework Program 2007-2013 (CIP), and the new EU financial perspective for 2014-2020 in the framework of the Program for the Competitiveness of Enterprises and Small and Medium-sized Enterprises (COSME).

The network offers comprehensive services for small and medium-sized businesses to help them fully develop their potential and innovative capacity. The Enterprise Europe Network is also the medium that allows EU institutions a more complete understanding of the needs of small and medium-sized enterprises. Operating on a non-profit basis, the network's centers are affiliated with various organizations that support economic development, such as chambers of commerce, regional development agencies, or business assistance centers. The source of financing for the centers are EU and national funds. By the end of December 2016, over 600 centers of the Enterprise Europe Network operated worldwide. The EEN is more than individual centers located in various countries and regions. The multiplier effect of the network comes from close cooperation between the centers, including the exchange of information the entrepreneurs need and access to shared databases with profiles of companies seeking foreign partners (Nesterak, Gródek-Szostak, 2017).

In terms of support for technological cooperation of enterprises, the EEN offers the following instruments:

- meetings at brokerage events and missions – broker meetings accompanying exhibition fairs; their aim is to establish international cooperation,
- Partnership Proposal Data Base – database of international cooperation offers, held in English by the European Commission through the Enterprise Europe Network. It contains profiles of companies from more than 60 countries, in which EEN centers operate. Entrepreneurs searching for business partners have the opportunity to establish contacts, e.g., with foreign manufacturers, distributors, sales representatives and subcontractors. The database also contains technology offers. It allows searching for a cooperation partner in the field of technology transfer (e.g., sale/purchase of modern machinery and equipment, licenses), knowledge (know-how), and R&D (e.g., research and implementation works on new technologies/products),

- expressions of interest received,
- expressions of interest made,
- business agreements,
- technology transfer agreements.

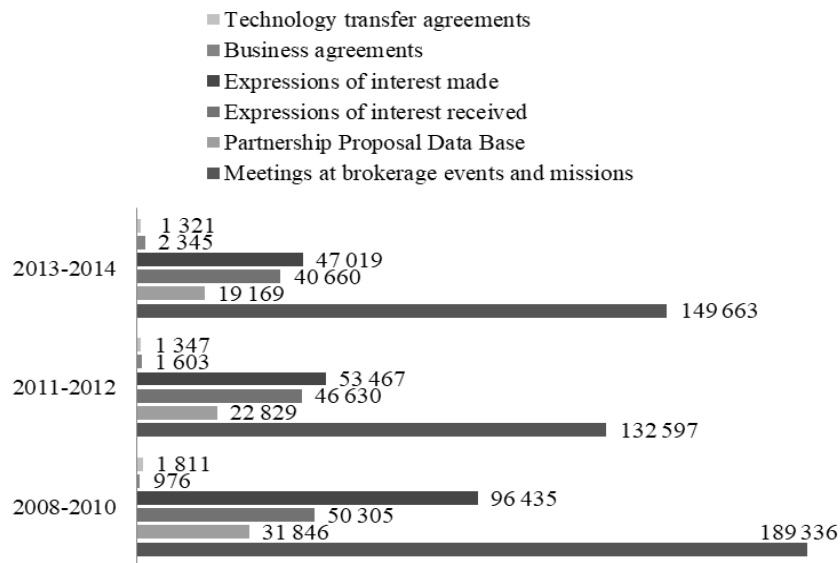


Fig. 1. Support instruments for technological cooperation within the framework of the EEN project, in numbers (own study based on the Enterprise Europe Network Activity Report 2008-2014)

Figure 1 demonstrates the structure of entrepreneurs' interest in the support instruments offered by the EEN. In the analyzed period, the most popular were meetings at brokerage events and missions, reaching: in 2008-2010 – 189,336; in 2011-2012 – 132,597; and in 2013-2014 – 149,663. In the analyzed period, the number of technology transfer agreements was respectively: 1,811, 1,347 and 1,321.

2.3. Technological cooperation in the Single European Market

The visualization of data from the reports of the Enterprise Europe Network was made with a Gastner-Newman amorphous (eumorphic) cartogram (Fig. 2 and Fig. 3) using ArcMap 10.4.1 (ESRI Inc., ArcGIS 10.4.1, 2016).

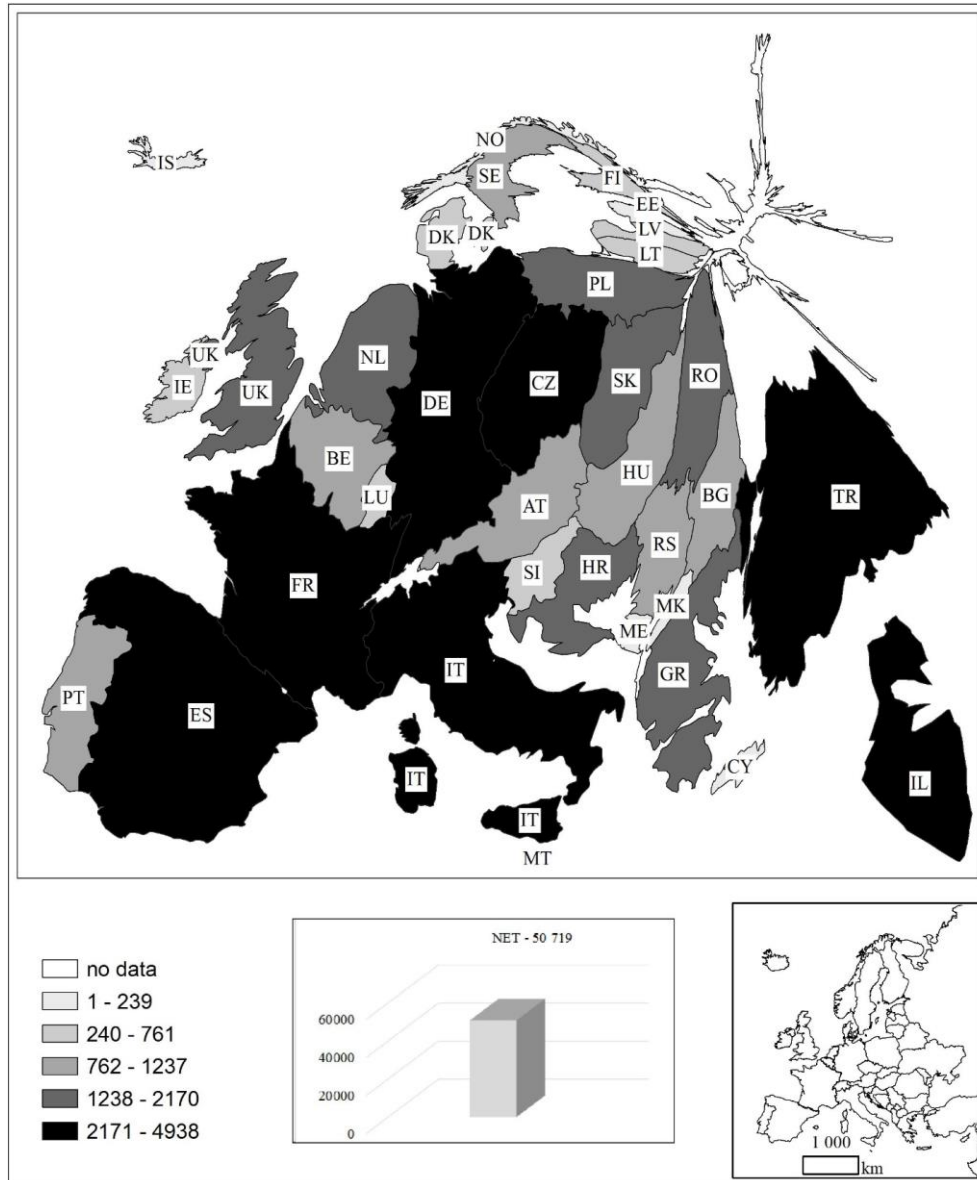


Fig. 2. Client and brokerage events and missions (own study based on the Enterprise Europe Network Activity Report 2008-2014)

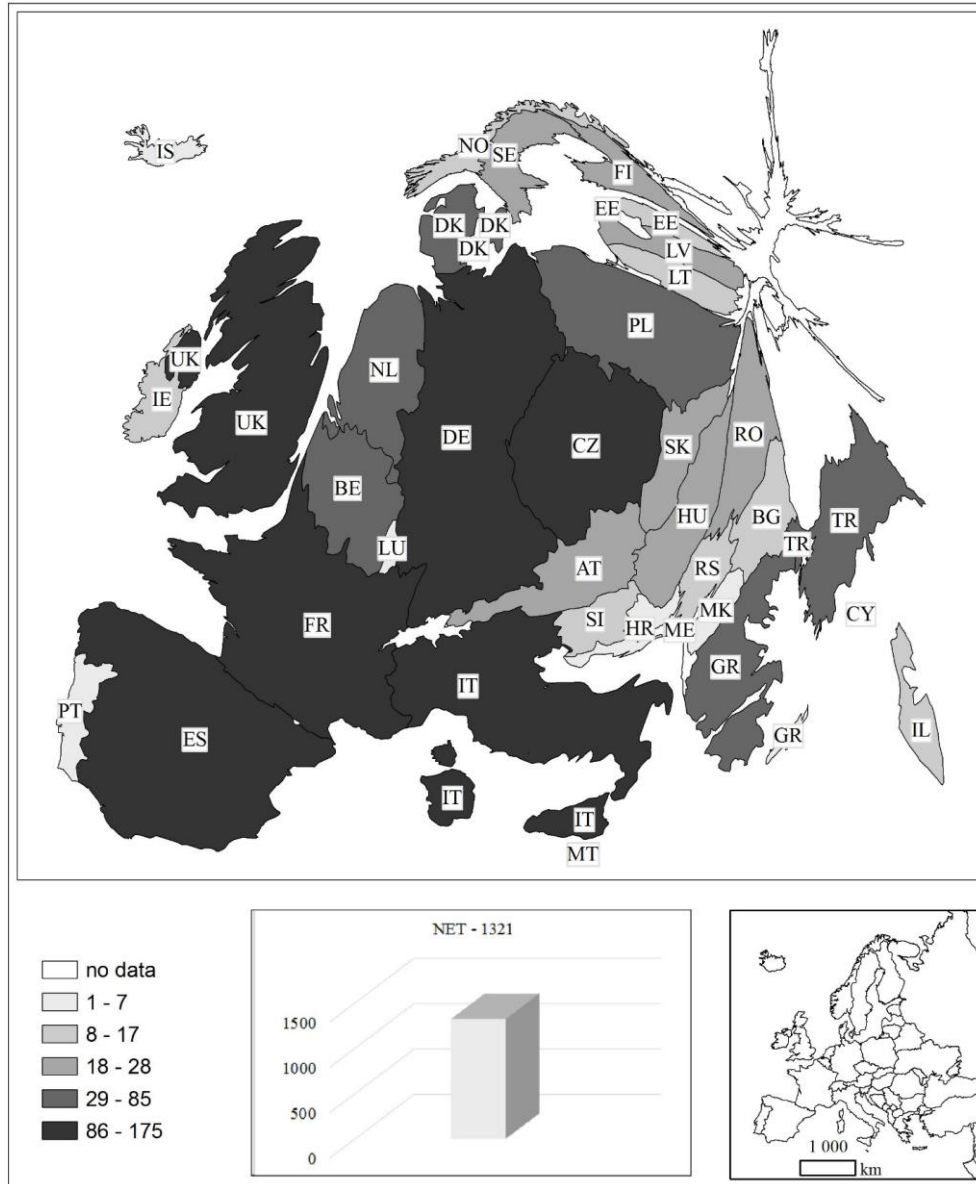


Fig. 3. Technology transfer agreements (own study based on the Enterprise Europe Network Activity Report 2008-2014)

Due to the large linear dispersion of data, the classification was done in quantiles (Ratajski, 1989; Faliszewska, 2012), which means that each class contains the same number of objects, and no classes are empty. However, in the interpretation

of the resulting map, one should take into account the fact that similar data values can be assigned to adjacent classes, and data with very different values, to the same class. The amorphous cartogram is reversed, which means that the map that the resulting map presents is the scale of the phenomenon by the variability of the size and shape of the reference unit (state). Grayscale was used to emphasize the regionalization of the phenomenon's course. The maps illustrate the phenomenon in a clear, simple and perceptive way (the use of instruments to support the initiation of technological cooperation and its finalization in the form of a contract). The amorphous cartogram was presented in relation to a classic cartogram. Distribution of the phenomenon is presented as per continent (Europe plus Israel).

Fig. 2 shows the analysis of the interest of entrepreneurs in participating in brokerage events and trade missions in the years 2013-2014. Countries with comparable intensity of the number of customers were grouped in reference units (regions). The spatial (geographic) context is conditioned by the culture of entrepreneurship and the level of openness to take up and establish technology transfer cooperation, in terms of research, science and business. The south-central belt (the darkest color) assembles countries with the highest potential (of actual use) of enterprises (the number between 2171–4938) which benefit from such instruments of internationalization of technological cooperation through brokerage meetings and economic missions (Spain, France, Italy, Germany, Czech Republic, Turkey, and Israel). The north-eastern belt (Iceland, Norway, Finland, Estonia, Lithuania, Latvia) includes countries with the lowest number of entities benefiting from the brokerage events and trade missions between 1–761. The European Network average value (NET = 50,719) is presented in Fig. 2 as a bar graph. The class interval 762–2170 represents most countries of western and central Europe, such as: UK, Netherlands, Belgium, Austria, Poland, Slovakia, Romania, Hungary, Bulgaria, Greece, Croatia, and Republic of Serbia.

Please note Fig. 3 demonstrates the spatial distribution of regions where entrepreneurs usually finalize technological cooperation in the form of a contract. The southwestern belt (Spain, France, Italy, UK, Germany and the Czech Republic) shows the largest number of technology transfer agreements in the reporting period; the values achieved are in the range 86–175. The north-central belt (Belgium, the Netherlands, Poland, Denmark and Greece) is made up of countries, in which entrepreneurs are only just developing cooperation, which results in the transfer of rights to the technology.

3. CONCLUSION

Support for the process of technological cooperation between enterprises, and managing it in a company, requires a number of different instruments and processes, including the involvement of public support. Ensuring the availability and

quality of services provided on the basis of standardized procedures is an important instrument of support for companies in the SME sector (Gródek, 2010; Nesterak, 2013). The offer of the Enterprise Europe Network in the area of support for technological cooperation, including, e.g., a search for foreign partners, preparation of commercial and technology offers to foreign markets, or the publication of tenders in international databases, is a unique combination of the support system services. The distribution of approaches to the implementation of innovations that are a result of technological cooperation between countries should also be considered in the context of the EEN's system of support. Dedicated support instruments provide traders with the free-of-charge use of the services of specialized units, which mediate in establishing and finalizing technological cooperation.

Research conducted by the authors in the area of legitimacy, reasonableness, appropriateness and effectiveness of public spending allocated to support the process of initiating and implementing technology transfers, confirms the purpose of the support system. An important role in the process of innovative services is fulfilled by business environment institutions, which are a key link in the innovation ecosystem by providing specialized innovation support services.

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**WSPÓLPRACA TECHNOLOGICZNA PRZEDSIĘBIORSTW NA JEDNYM
EUROPEJSKIM RYNKU – WSPIERANIE SIECI EUROPEJSKIEJ
PRZEDSIĘBIORSTWA**

Streszczenie

Celem artykułu jest zbadanie motywów i jakości współpracy technologicznej przedsiębiorstw na Jednolitym Rynku Europejskim. Analizie poddano wpływ wsparcia sieci Enterprise Europe Network na nawiązywanie współpracy technologicznej w latach 2008-2014. W artykule analizuje się wpływ współpracy technologicznej na konkurencyjność i atrakcyjność przedsiębiorstw na JRE. W procesie badawczym wykorzystano dane jednostkowe pochodzące z Enterprise Europe Network Activity Report 2008-2014, wyniki badań kwestionariuszowych przeprowadzonych wśród konsultantów sieci oraz obserwację uczestniczącą. Stwierdzono, że na podejmowanie przez przedsiębiorstwa międzynarodowej współpracy technologicznej wpływa dostępność systemowych instrumentów wsparcia.

Wnioskiem wynikającym z artykułu jest, że polityka wsparcia innowacyjności technologicznej powinna się koncentrować na kreowaniu i upowszechnianiu w przedsiębiorstwach publicznych instrumentów wsparcia, co prowadzi do wzrostu konkurencyjności na Jednolitym Rynku Europejskim.

Słowa kluczowe: współpraca, innowacja, technologia

