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COMPETITIVE POSITION OF POLAND IN INTERNATIONAL TRADE IN HIGH-TECH GOODS AND SERVICES IN 2007 - 2012

Introduction

The rivalry and competition between entities at every- from micro- to macro-level have become a characteristic feature of global economy, and the trade in engineering knowledge in various areas plays an increasingly more important role. Poland's accession to EU, gradual economic integration and the liberalization of trading conditions within the WTO and other agreements result in new challenges that face our country and have impact on the rise of the interest in Poland's share in international trade, both within EU and with non-member countries.

The paper aims at the analysis of Poland's competitive position in the international trade of technologically advanced products and knowledge-based services in 2007-2012.

It presents the issue of international competitiveness from the point of view of the trade in technologies; then an attempt is made to determine the competitive position of Poland in high-tech goods trade in relation to EU. The final part of the paper deals with the changes that occur in the competitiveness of knowledge-based services.

1. International competitiveness and technology trade

So far, one commonly accepted definition of competitiveness has not been elaborated. The complexity and multidimensionality of the approach to this issue, as well as the diversity of definitions in the literature on the subject and the attempts to explain the concept emphasize its significance in the present-day global economy[1]. Thus, complexity is one of the

[1] The divesified attitude to the issue of competitiveness as well as some approaches to the concept were presented, among others in: J. Misala, *Międzynarodowa zdolność konkurencyjna i międzynarodowa konkurencyjność gospodarki narodowej*, Politechnika Radomska, Radom 2007, pp. 21-32, M. Gorynia, B. Jankowska, *Klastry a międzynarodowa konkurencyjność i internacjonalizacja przedsiębiorstwa*, Difin, Warszawa 2008, pp. 51-56, E. Mińska-Struzik, *Konkurencyjność handlu produktami wysokiej techniki nowych państw członkowskich Unii Europejskiej*, Zeszyty Naukowe Uniwersytetu Ekonomicznego w Poznaniu, Uniwersytet Ekonomiczny w Poznaniu, Poznań 2011, No. 213, pp.74-75; M. Olczyk, *Konkurencyjność. Teoria i praktyka*, Wyd. CeDeWu.pl. Wydawnictwa Fachowe, Warszawa 2008, pp. 15-21; Z. Wysokińska, *Konkurencyjność w międzynarodowym i globalnym handlu technologiami*, WN PWN, Warszawa-Łódź 2001, pp. 37-39

factors that determine and support the intensification of globalization processes that have been occurring for approx. 40 years.

If one takes into consideration the word competition, that is the desire to gain advantage over other competitors, competitiveness could be generally defined as the ability to cope with the competition. It also means adapting and treating hazards as challenges that are the condition for further development. Competitiveness is considered on four levels: micro (referring to companies and usually related to the effectiveness of their operation on the market), meso (concerning the attractiveness of a sector, branch of industry or services – and there are attempts to refer it to clusters or regions), macro (when a country and its ability to generate a dynamic economic growth in the long-term are subject to analysis) and mega (in relation to groups of countries, international blocks or international integration groups) [2]. In some articles micro-micro level is distinguished, which refers to a human being[3].

The approach to international competitiveness on the macro level may be narrow or broad. The narrow approach differentiates competitive position (the international position of a country on the market, the position of a country in the global/international trade in terms of the attractiveness of products and services and the movement of factors of production, with the consideration of quantitative and qualitative changes in their structures)[4] from the competitive ability of a national economy (which refers to the benefits from the resources of the possessed factors of production – both its own and foreign) with the consideration of the economical system (economic policy, the functioning of capital markets, legal regulations, social norms and the resulting behavior and motivations that cause mutual relationships between economical entities) in the conditions of open economy [5]. In the broad approach, competitiveness is referred to as the ability to struggle and compete for the benefits resulting from the participation in the international division of labor. Due to the complexity of this category, it is considered in relation to other countries and features typical for a given stage of social, economic, political and institutional development[6]. However, it is impossible to treat

[2] *Konkurencyjność. Poziom makro, mezo i mikro*, ed. N. Daszkiewicz, WN PWN, Warszawa 2008, pp. 13-14, J. Misala, *Międzynarodowa konkurencyjność gospodarki narodowej*, PWE, Warszawa 2011, pp. 14-15, Z. Pierścionek, *Strategie konkurencji i rozwoju przedsiębiorstwa*, WN PWN, Warszawa 2003, p. 166

[3] M. Gorynia, B. Jankowska, Klastry *a międzynarodowa konkurencyjność i internacjonalizacja przedsiębiorstwa,* op. cit., p.52

[4] J. Misala, *Międzynarodowa konkurencyjność gospodarki narodowej*, op. cit., p. 80

[5] M.A. Weresa, *Systemy innowacyjne we współczesnej gospodarce światowej*, WN PWN, Warszawa 2012, pp.220-221

[6] J. Misala, *Międzynarodowa zdolność konkurencyjna i międzynarodowa konkurencyjność gospodarki narodowej. Podstawy teoretyczne*, op. cit., p. 34

the global economy as the subject of the investigation of competitiveness as there is no level of reference[7].

In the literature on the subject one more category can be found. It is a sensu stricto international competitiveness, also referred to as international competitive advantage, which includes – as above – the real and regulatory sphere but is restricted to the determination of the degree and direction of trends in the international rivalry for benefits[8].

The complexity and multidimensionality of international competitiveness is presented best by the number of determinants accepted to determine the competitive ability of a country that are applied to measure this category by the International Institute for Management Development in Lausanne (IMD). IMD publishes annual reports with the so called Competitiveness Index for 60 countries. The index is currently based on over 300 criteria of competitive environment assessment that are divided into four groups: economic results, effectiveness of country functioning, business effectiveness and infrastructure. In each of the groups 5 subgroups with equal weights are distinguished[9].

Another measurement method of the international economic competitiveness was elaborated by World Economic Forum (WEF). Since 2017, Global Competitiveness Index (GCI) has been based on static and dynamic elements that are grouped in 12, the so called, pillars of competitiveness that are interrelated and have impact on one another. They include institutions, infrastructure, macro-economic stability, health and primary education, higher education and training, commodity market efficiency, labor market efficiency, financial market sophistication, technological readiness, market size, business sophistication, innovation. The synthetic GCI distinguishes three basic components: basic requirements (that are accounted for by institutions, infrastructure, macro-economic environment, health and primary education), increasing efficiency (higher education and training, commodity market efficiency, labor market efficiency, financial market sophistication, technological readiness, market size) and innovativeness (participation in sophisticated business, innovations) [10]. The first sub-index provides the information on the competitiveness of a country resulting from its natural resources. The second one concentrates on the economic features that result from processes increasing manufacturing efficiency. The third one presents the competitiveness of

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[7] M. Gorynia, B. Jankowska, *Klastry a międzynarodowa konkurencyjność i internacjonalizacja przedsiębiorstwa*, op. cit., pp.52-53

[8] J. Misala, *Międzynarodowa zdolność konkurencyjna i międzynarodowa konkurencyjność gospodarki narodowej*, op. cit., pp. 36-37, 38-39

[9] International Institute for Management Development – http://www.imd.ch, (accessed:20 August, 2013)

[10] The Global Competitiveness Report 2013-2014, World Economic Forum, Geneva 2013, pp. 4-8, http://www3.weforum.org, , (Accessed 20 August 2013)

countries on the basis of innovation. When grouping the countries, two intermediate transition stages were taken into account: transition from economic competitiveness based on natural resources to efficiency generated competitiveness and then to competitiveness based on innovations and modern technologies[11]. With regard to the level of economic development measured by GDP per capita, different weights were attributed to particular sub-indexes; for example, from a 60% share in the total sub-index value for the last country of the least developed ones to 20% for countries of the highest level of development. In the case of the third sub-index that considers innovation and advanced technologies, the weight for the index is the highest for the most developed countries and accounts for 30% of the synthetic GCI value. The report for 2013 included 148 economies and 116 variables were applied to measure their competitiveness[12].

The increasing significance of knowledge, the opportunities of its transfer, the implementation and dissemination, as well as the technological advance and the development of information and communication technologies were key factors that had an impact on organizations and, consequently, on national economies. These factors are also considered when investigating the competitiveness of economies.; their influence is reflected not only in high-tech goods production and knowledge-based services but also in the growth of their share in trade. These issues are investigated in the further parts of the paper, which focus on Poland's competitive position in the area of the international trade in technologies sensu stricto.

2. Exports competitiveness of technologically advanced goods in Poland in the light of trade exchange in EU

The volume of production and exchange of technologically advanced products play a crucial role in the times of knowledge-based economies. Their significant share in trade exchange is typical mainly for well-developed countries. However, they are also important in the economies of some developing countries[13]. The table below presents the analysis of the significance of high-tech products and their structure in Poland in comparison to EU. The

[11] The Global Competitiveness Report 2013-2014, World Economic Report, Geneva 2013, p. 11, http://www3.weforum.org, , (na dzień 20 sierpnia 2013 r.)
[12] The Global Competitiveness Report 2013-2014, World Economic Forum, Geneva 2013, p. 10,
[13] M. A. Weresa, *Liderzy konkurencyjności w międzynarodowym handlu technologiami*, [in:] *Innowacyjność i wiedza we współczesnym handlu międzynarodowym*, ed. S. Wydymus, M. Maciejewski, UE w Krakowie, Fundacja UEK, Kraków 2012, pp. 270-273

presented data take into consideration both the total trade of high-tech products within the EU and with other countries.

Table 1. The significance of high-tech trade of Poland and EU in 2007-2012 (%)

	2007	2008	2009	2010	2011	2012
Total share of high-tech products in Polish exports	3,0	4,3	5,7	6,0	5,1	5,9
Total share of high-tech products in Polish imports	9,3	9,9	11,8	11,6	10,2	10,5
Total share of high-tech products in EU exports (UE-27)	12,6	12,1	13,7	13,4	12,6	13,1
Total share of high-tech products in EU imports (UE-27)	12,9	12,2	13,8	14,1	12,7	12,8

Source:Author's computations based on Eurostat [htec_trd_tot4], http://epp.eurostat.ec.europa.eu, (accessed: 16 August 2013)

The share of high-tech goods in Polish exports and imports was considerably lower than in the case of EU. In 2007-2010 there was a gradual – double – increase of the share of Polish exports of technology goods. In 2011 there was a drop of sales on foreign markets by almost 1 pp, but in the last year of the analysis, it reached approximately the level of 2010. Despite favorable changes in the value of the indicator for Polish exports, its value remained on the level over twice as low as for EU. Contrary to the exports, the share of the high-tech imports was on a significantly higher level and its values were comparable to EU figures and differed approx. 2 – 3 pp. The highest value of the indicator occurred in 2009, which testifies to the fact that the group of technologically advanced products was much more resistant to the recession caused by the global financial crisis. In the period of the biggest economic slump the values as regards EU reached the highest levels. A significant difference between the share of the imports and exports of high-tech goods proves that Poland still belongs to countries imitators, which is in line with the theory of technological gap (table 1)

Subsequently, analysis will be conducted of the structure of the exports and imports of technologically advanced products, both in the Polish and EU trades. The groups of high-tech products were distinguished on the basis of the OECD list, in line with the Standard International Trade Classification (SITC Rev.4)[14].

Table 2. Exports of technologically advanced goods from Poland and EU by products in 2007-2012 (%)

High-tech goods group	**Exports from Poland**						**Expoorts from EU**					
	2007	2008	2009	2010	2011	2012	2007	2008	2009	2010	2011	2012
Aerospace	9,3	8,3	10,5	12,9	13,1	13,5	13,7	14,8	16,3	16,0	16,1	18,0

[14] *Nauka i technika 2011*, GUS, Warszawa 2013, p. 183

Computers, Office machines	8,3	30,0	42,0	41,3	35,9	31,8	19,3	17,7	16,5	15,3	13,9	13,7
Electronics, telecommunication	46,5	35,7	28,0	27,5	29,4	33,7	32,3	31,5	28,4	30,7	30,2	27,6
Pharmacy	4,4	2,6	2,6	2,6	2,7	3,4	10,2	10,6	13,7	13,3	14,0	15,8
Scientific instruments	11,7	9,4	7,1	7,8	10,2	8,7	12,8	12,9	13,0	13,3	13,8	13,4
Electric machines	3,2	2,3	1,4	1,4	1,6	1,3	2,2	2,2	2,0	2,0	2,2	2,0
Non-electric machines	7,3	5,2	2,9	2,1	2,6	3,8	4,5	4,9	4,6	4,1	4,5	4,5
Chemicals	5,8	3,9	3,1	3,1	4,1	3,5	4,4	4,8	4,8	4,7	4,8	4,5
Armament	3,6	2,6	2,3	1,3	0,4	0,3	0,7	0,7	0,8	0,6	0,6	0,6

Source:Author's computations based on Eurostat [htec_trd_tot4], http://epp.eurostat.ec.europa.eu, (accessed: 16 August 2013)

In the structure of Polish exports of high-tech goods, the dominating products were the ones belonging to the group: *Computers, office machines* and *Electronics, communication*, which accounted for over 2/3 of the value of technologically advanced products sold by Poland on foreign markets. In the exports from EU, both these groups also played an important role. However, their total share accounted for slightly over 50% of the total value of the exported high-tech goods and decreased by 10 pp in 2012, as compared to 2007. The other important groups of products exported from Poland were spare parts, components in plane industry, scientific instruments, which accounted for approx. 15% of high-tech goods exported abroad. (table 2).

As regards the EU trade of technologically advanced goods, the biggest share both in the imports and the exports concerned the same groups of products. The imports of scientific instruments to Poland was much higher than the exports, while the imports of aerospace products was significantly lower than the exports (table 3).

Table 3. Product structure of imports of technologically advanced goods to Poland and EU in 2007-2012 (%)

High-tech goods group	**Imports to Poland**						**Imports to EU**					
	2007	2008	2009	2010	2011	2012	2007	2008	2009	2010	2011	2012
Aerospace	2,5	1,6	3,9	5,0	5,5	8,9	10,7	11,2	12,5	11,5	10,2	11,9
Computers, Office machines	20,5	25,1	23,6	23,4	21,1	23,9	25,6	24,0	22,0	21,7	20,4	20,9
Electronics, telecommunication	39,2	35,2	34,8	34,9	33,9	34,4	34,6	34,9	33,1	36,7	36,8	34,0
Pharmacy	7,8	7,8	7,6	7,0	7,4	7,3	9,0	8,9	11,7	10,9	11,7	12,8

Scientific instruments	17,1	18,1	19,2	19,3	20,4	13,6	9,9	10,3	10,5	10,0	10,5	10,4
Electric machines	2,4	2,2	2,3	2,3	2,4	2,7	2,3	2,3	2,0	2,1	2,3	2,2
Non-electric machines	3,1	2,8	2,2	1,8	2,1	2,5	3,0	3,4	2,9	2,5	2,9	2,9
Chemicals	6,0	6,1	5,6	5,5	6,2	5,8	4,5	4,6	4,8	4,3	4,7	4,4
Armament	1,4	1,1	0,9	0,8	1,1	1,0	0,5	0,5	0,5	0,5	0,4	0,4

Source:Author's computations based on Eurostat [htec_trd_tot4], http://epp.eurostat.ec.europa.eu, (accessed: 16 August 2013)

The presentation and analysis of the imports and exports structure of technologically advanced goods will make it possible to determine products groups in which comparative advantage occurred. In the analysis two indicators were considered: trade balance[15] and the revealed comparative advantage (RCA) index in a modified form in relation to the measurement measure provided by B.Balassa[16]. It was assumed that competitive advantage occurs in a given product group if both indicators indicate its occurrence. In the analysis, the significance of a given product group in Poland's trade was taken into consideration.

Table 4. Trade balance of high-tech goods in 2007-2012 (EUR billions)

High-tech goods group	**Poland**						**EU**					
	2007	2008	2009	2010	2011	2012	2007	2008	2009	2010	2011	2012
Aerospace	0,01	0,2	0,1	0,2	0,1	-0,3	11,5	14,8	15,2	19,1	30,9	36,6
Computers, Office machines	-2,0	-2,0	-0,6	-0,6	-0,7	-1,1	-38,7	-37,1	-27,7	-42,3	-38,9	-41,2
Electronics, telecommunication	-2,9	-3,2	-2,8	-3,4	-3,2	-2,6	-21,9	-25,2	-25,8	-46,4	-42,0	-35,3
Pharmacy	-0,7	-1,0	-0,8	-0,9	-0,9	-0,9	3,07	6,3	7,3	8,4	11,1	18,6
Scientific instruments	-1,6	-2,1	-2,0	-2,4	-2,4	-1,4	11,4	10,0	10,1	13,5	16,5	18,6
Electric machines	-0,2	-0,2	-0,2	-0,3	-0,2	-0,3	-1,1	-0,9	-0,3	-1,0	-1,1	-1,1
Non-electric machines	-0,1	-0,1	-0,1	-0,1	-0,1	-0,1	6,3	6,5	7,1	7,6	8,3	9,2
Chemicals	-0,5	-0,7	-0,5	-0,6	-0,7	-0,6	-1,7	-0,1	-0,4	0,2	-0,2	0,9
Armament	-0,05	-0,02	0,02	-0,03	-0,1	-0,1	0,8	1,0	1,3	0,5	0,7	0,9

Source:Author's computations based on Eurostat [htec_trd_tot4], http://epp.eurostat.ec.europa.eu, (accessed: 16 August 2013)

[15] Surplus of exports over imports indicates a competitive advantage, while a deficit implies its lack.

[16] *RCA (modified.)* = $(x_{ij}/\Sigma X_j) / (m_{ij}/\Sigma M_j)$, where: x_{ij} – indicates the value of the exports of product group *i* from country/country group *j*;; ΣX_j– total value of exports from a given country/group of countries, m_{ij} – value of imports of product group *i* to country/group of countries *j*, ΣM_j – total value of imports to country/group of countries *j*.
Indicator's value exceeding unity indicates the existence of a comparative advantage in foreign trade; if below 1, the advantage does not occur .

According to the table above, there was a deficit in Polish foreign trade in technologically advanced goods in the case of eight out of nine product groups (with the exception of aerospace products in 2007-2011 and armaments in 2009). The figures show that there is a technological gap in the trade in this type of commodity. As regards EU, the negative balance that occurred in the two most important high-tech product groups (*Computers, office machines* and *Electronics – telecommunication*) intensified almost in the whole period under analysis. An insignificant deficit showed in two much less important groups of high-tech product groups (*Electric machines* and *Chemicals*) , with the exception of 2010 and 2012.

Table 5. Analysis of the RCA index in Poland's trade of high-tech products as compared to EU in 2007-2012

High-tech goods group	**Poland**						**EU**					
	2007	2008	2009	2010	2011	2012	2007	2008	2009	2010	2011	2012
Aerospace	1,23	2,13	1,29	1,34	1,20	0,85	1,25	1,18	1,29	1,33	1,57	1,54
Computers, Office machines	0,13	0,48	0,86	0,92	0,86	0,75	0,74	0,66	0,74	0,67	0,68	0,67
Electronics, telecommunication	0,39	0,41	0,39	0,41	0,44	0,55	0,91	0,81	0,85	0,80	0,82	0,83
Pharmacy	0,18	0,14	0,17	0,20	0,19	0,26	1,10	1,07	1,16	1,17	1,19	1,26
Scientific instruments	0,22	0,21	0,18	0,21	0,25	0,36	1,26	1,11	1,23	1,27	1,31	1,32
Electric machines	0,44	0,43	0,29	0,31	0,35	0,26	0,93	0,86	0,99	0,94	0,93	0,92
Non-electric machines	0,76	0,73	0,63	0,62	0,63	0,86	1,46	1,29	1,55	1,59	1,54	1,55
Chemicals	0,31	0,25	0,27	0,29	0,34	0,34	0,96	0,93	1,00	1,04	1,01	1,04
Armament	0,83	0,98	1,28	0,87	0,17	0,17	1,39	1,32	1,62	1,22	1,35	1,42

Source:Author's computations based on Eurostat [htec_trd_tot4], http://epp.eurostat.ec.europa.eu, (accessed: 16 August 2013)

Aerospace products were the only commodity group where a comparative advantage appeared (2007-2011) in the Polish trade in high-tech goods. With regard to the situation that these products play a crucial role in the Polish exports of high-tech goods and that the trade balance in this product group is positive, one can state that these products are a Polish specialty as far as the sales of high-tech goods abroad is concerned. However, it should be remembered that in the last year of the analysis the advantage was lost and for the first time in 5 years the imports exceeded the exports. The development of this branch of the processing industry depends significantly on the inflow of foreign capital and supporting technologies. On should also mention the creation and development of the Aviation Valley in southeastern Poland. In 2007-2008 and 2000 a relatively small absence of the advantage appeared within

the product group of *Armaments*; however, in 2009 the advantage appeared. Nevertheless, this group does not belong to significant ones in the Polish high-tech goods exports. One should also point out to the group of *Computers, office machines*, which constitutes a much more significant commodity group in the Polish foreign trade of high-tech goods, which in 2009-2012 enjoyed a less intensive lack of advantage in comparison to other groups. Among the groups with a low share in the exports, the best results were achieved by the group of *Non-electric machines* (table 5), yet without gaining an advantage.

EU as a unit of global economy reached much better results than Poland. However, the advantages did not also appear in the two most important product groups (*Computers, office machines* and *Electronics – telecommunication*) that were subject to the exports. In all other groups, with the exception of Electric machines (an insignificant lack of advantage) the European Union noted a revealed comparative advantage in the period under analysis. The results do not only indicate the existence of a technological gap but also a significant distance between the economic development of Poland and the leading EU countries, which have the potentials and are engaged in high-tech goods trade to a much greater degree than our country.

4. Competitive position of trade in knowledge-based services

The last part of the article aims at the presentation of trade in knowledge-based services. It is conducted on the basis of the Extended Balance of Payments Services Classification (EBOPS). Due to the accessibility of data, the period of 2007-2011 was analyzed and it was restricted to the imports and exports of knowledge-based services from/to Poland.

Table 6. Significance of knowledge-based services in Polish foreign trade in 2007-2011 (%)

	2007	2008	2009	2010	2011
Services provided to Poland	30,8	38,1	41,4	48,5	46,1
Services acquired from Poland	43,7	43,6	46,3	49,5	51,6

Source: Computations based on UNCTAD database,, http://unstats.un.org/unsd/servicetrade, (Accessed: 2 September 2013)

The share of knowledge-based services in international trade in services increased significantly both in the exports (with the exception of 2011) and in the imports in 2007-2011.

The share of the acquired knowledge-intensive services from Poland was higher than the share of such services provided to Poland by approx. 5 pp , except 2010 (table 6).

Table 7. Exports and imports structure of knowledge-based services from/to Poland in 2007-2011 (%)

	Services provided to Poland					Services acquired from Poland				
	2007	2008	2009	2010	2011	2007	2008	2009	2010	2011
Telecommunication	1,6	1,5	1,8	1,4	1,3	2,8	2,4	2,9	1,8	1,5
Insurance	0,1	0,4	0,1	0,5	1,1	1,9	1,6	1,9	1,2	2,6
Finance	1,4	1,6	1,5	1,7	1,3	2,1	2,8	3,6	2,9	2,3
Computer and information	2,3	2,6	3,1	4,7	5,7	3,6	3,3	3,5	5,6	6,0
Royalties and license fees	0,3	0,7	0,4	0,7	0,7	6,5	5,8	6,4	7,6	7,5
Other economic services	18,7	22,7	25,5	29,5	26,5	20,6	21,3	22,1	24,9	25,7
Advertizing, market research, public opinion polling	3,3	4,6	4,9	5,4	5,1	1,6	1,7	1,3	1,6	2,1
Research and Development	0,9	1,0	1,1	1,7	2,0	0,5	0,9	0,9	0,5	0,6
Architectural, engineering and other technical services	2,2	3,0	3,1	2,8	2,5	4,0	3,7	3,7	3,4	3,1

Source: Computations based on UNCTAD database,, http://unstats.un.org/unsd/servicetrade, (Accessed: 2 September 2013)

Both the exports and the imports were dominated by the so called *other business services*, related to – among others – administration and management of service centers of international corporations as Poland is considered an attractive place in this respect. Such services are listed in the group of knowledge-intensive services; however they do not constitute the so called high-tech, which includes such services as production of motion pictures, video recording, TV programs, sound and music recordings, broadcasting, telecommunication, software services, advisory services in the field of computer science and related, IT services and R&D[17]. Companies that operate on the territory of Poland frequently acquired services related to the purchase of licenses, which resulted in the payments of royalties and license fees. As regards exports, the services included market research, public opinion polling and advertising. In the period under analysis an insignificant yet increasing share in the exports can be also observed in the group of R&D. However, the imports of such services did not exceed 1% of the total value of services acquired (table 7).

[17] *Nauka i technika 2011*, op. cit., p. 181

Finally, as in the case of technologically advanced commodities, competitiveness indices for selected knowledge-based services should be given.

Table 8. Knowledge-based services competitiveness indices in Polish foreign trade in 2007-2011

	Balance (bln USD)					RCA				
	2007	2008	2009	2010	2011	2007	2008	2009	2010	2011
Telecommunication	-0,21	-0,17	-18	-0,07	0,00	0,57	0,65	0,62	0,80	0,85
Insurance	-0,44	-0,35	-0,42	-0,19	-0,43	0,04	0,25	0,05	0,44	0,42
Finance	-0,12	-0,30	-0,45	-0,29	-0,26	0,64	0,56	0,41	0,59	0,55
Computer and information	-0,21	-0,05	0,03	-0,12	0,20	0,64	0,81	0,87	0,84	0,94
Royalties and licence fees	-1,57	-1,54	-1,44	-2,01	-2,14	0,05	0,11	0,06	0,09	0,10
Other economic services	4,30	1,61	2,06	2,29	1,73	0,91	1,06	1,16	1,19	1,03
Advertizing, market research, public opinion surveys	0,58	1,13	1,11	1,27	1,25	2,13	2,67	3,75	3,27	2,43
Research and Development	0,13	0,10	0,11	0,41	0,54	1,67	1,19	1,24	3,28	3,27
Architecture, engineering, technical investigations and analyses	-0,33	-0,08	0,00	-0,09	-0,06	0,56	0,79	0,83	0,82	0,80

Source: Computations based on UNCTAD database,, http://unstats.un.org/unsd/servicetrade, (Accessed: 2 September 2013)

The analysis confirmed that Poland specializes in rendering the so called *other business services.* In this group, the value of services provided not only exceeded the services acquired but also some insignificant competitive advantages occurred in 2008-20011. Significantly more intensive competitive advantages appeared in the groups of *advertising, market research and public opinion polling* and *R&D;* this was particularly visible in the last two years of the period under analysis (table 8). The lack of the point of reference for EU in the whole period under investigation makes it difficult to conduct investigations in a similar range as in the case of high-tech goods. However, it seems, , that the situation in knowledge-based services is much better when compared to commodity trade, which may be confirmed by the revealed competitive advantages in the case of 3 service groups (table 8).

Conclusion

Competitive advantage of a country in the international trade in commodities and services constitutes a very narrow aspect of the issue of the international competitiveness of an economy which is a complex and multidimensional category. The development and transfer of modern technologies in present-day global economy does not only contribute to the increase of competition trends between economic entities at every level but also has an impact on the changes that occur in the structure of trade in commodities and knowledge-based services.

Technologically advanced products do not play a crucial role in Poland's trade. The article presents their particularly low share in the exports in comparison to EU. The analysis showed a competitive advantage only in one out of nine commodity groups.

As regards the trade in knowledge-based services, where more than only high-tech services are considered, the situation seems to be slightly more advantageous as competitive advantages were revealed in 3 types of services. However, the lack of accessible data made it impossible to compare the figures with the average values regarding EU.

Moreover, the analysis of the trade in commodities and knowledge-based services proved the existence of a technological gap and significant distance between the economic level of development between Poland and EU.

The analysis presented in the article only outlines the problem of a very weak competitive position of Poland in the trade in high-tech goods and knowledge-based services. Thus, it constitutes only an introduction to further research.

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Abstract

Poland's increasing economic integration with EU and dynamic processes of internationalization and globalization in the world economy resulted in a further and stronger involvement of our country in the international labor share. Rivalry and competition between entities operating in present-day global economy are its typical features. The progress in engineering and technological revolution result in changes in trade, where commodities and high-tech services gain in importance.

The aim of the article is to analyze Poland's competitive advantage in the international trade in high-tech goods and knowledge-based services in 2007-2012.

The article presents the nature of international competitiveness from the point of view of the trade in high-tech goods and knowledge-based services. An attempt is made to determine Poland’s competitive position in this area.