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JOANNA WYSZKOWSKA-KUNA*

Competitiveness In International Trade In Knowledge-Intensive Services – The Case Of Poland

Abstract

The aim of this paper is to study Poland's competitiveness in international trade in knowledge-intensive services (KIS). The author analyzes the trends in Polish KIS trade and tries to answer the question whether Poland is moving towards obtaining a comparative advantage in this field.

The first part of the paper presents a definition and classification of KIS, indicators to measure competitiveness in international services trade, and a short review of the research in this field. The second part of the study is empirical. The author uses traditional indicators of international competitiveness such as: export performance, trade balance, and the RCA index. The analysis also touches upon the impact of Poland's accession to the EU on its competitiveness in KIS trade. Finally, some possible determinants of Poland's competitiveness in particular KIS sectors are indicated.

The paper uses the Eurostat and WTO databases. The analyzed period for international transactions is usually 2000-2010, but for Poland the 1994-2010 period was used, i.e. since the European Agreement entered into force.

***Keywords**: international competitiveness, international trade in services, knowledge intensive services*

* Ph.D., University of Łódź, Faculty of Economics and Sociology, Department of World Economy and European Integration

1. Introduction

A modern competitive economy is defined as a service and knowledge-based economy, and it should come as no surprise the KIS play a key role in such an economy. Statistical data demonstrates that this is the case in the EU economies, including Poland. In addition, when the issue of competitiveness in international trade is discussed, it is generally considered that high-tech goods are its driving force. There are some studies indicating that KIS are an important source of productivity improvements, both in the service and manufacturing branches, and thus contribute to improving international competitiveness. There are also analyses showing the increasing importance of KIS in international trade. Nonetheless, in general the issue of competitiveness in international trade in KIS remains poorly investigated.

The problem discussed in this paper is especially important in the case of Poland, because professional services were indicated as a possible source of comparative advantage in Polish trade following its accession to the EU (Wyszkowska-Kuna 2004, p. 142), and were identified as priorities in Polish pro-export policy, owing to Poland's good performance in value added/export activities, and high-tech advancement and innovativeness (Chojna 2008, p. 52).

The question whether Poland has moved towards such a pattern of specialization is of great importance because Poland, in comparison with other developed countries, is characterized by a relatively low level of technological advancement and competitiveness in international trade in high-tech goods. On the other hand, Poland has a relatively large pool of relatively cheap and well-qualified labour, which has been perceived as a possible resource of comparative advantage in Polish export of KIS.

2. Definition and classification of knowledge-intensive services

The term "knowledge-intensive (or knowledge-based) industries" usually refers to those industries which are relatively intensive in their inputs of technology and/or human capital. While there are established methods for classifying manufacturing industries according to technological intensity, capturing the right service sectors to help measure the impact of knowledge has proved more challenging. The reasons for thus include the following: for a long time most countries provided data on services only at fairly aggregate levels; limited information in areas such as R&D expenditure and skill levels makes it

difficult to group them according to "knowledge-intensity"; countries/organizations record services using different classifications of technology/knowledge-intensive sectors (some may use no definition), and thus data coming from different sources may not be comparable (OECD 1999, p. 18).

In this paper Eurostat and WTO data are used.[1] Eurostat uses the sectoral approach for all indicators except for data on high-tech trade and patents (where it uses the product approach). The sectoral approach is an aggregation of the manufacturing industries according to technological intensity (R&D expenditure/value added), and it is based on the Statistical Classification of Economic Activities in the European Community (NACE). Manufacturing industries are classified into high-technology, medium-high technology, medium-low technology and low-technology industries. Services are aggregated based on the share of persons with a tertiary education persons, and they are classified into knowledge-intensive services (KIS) and less knowledge-intensive services (LKIS). Due to the revision of NACE Rev. 1.1 into NACE Rev. 2, the definition of high-technology industries and knowledge-intensive services, as well as knowledge-intensive activities, has changed (Eurostat 2011a).

Eurostat (2011b) defines four categories of knowledge-intensive services:

1. **Knowledge-intensive high-tech services (HTKIS):**
   Post and Telecommunications (NACE Rev. 1.1)/ Telecommunications (NACE Rev. 2); Computer and related activities; Research and development.
2. **Knowledge-intensive market services (excluding KIFS and HTKIS):** Water transport; Air transport; Real estate activities; Renting of machinery and equipment without an operator, and of personal and household goods; Other business activities;
3. **Knowledge-intensive financial services (KIFS):**
   Financial intermediation, except insurance and pension funding; Insurance and pension funding, except compulsory social security; Activities auxiliary to financial intermediation;
4. **Other knowledge-intensive services:**
   Education; Health and social work; Recreational, cultural and sporting activities.

In accordance with the definition of KIS presented above, statistics on output, employment and business activities are collected. We should keep in mind that statistics on international trade use a different set of categories. What's more, there is no official definition and no statistics on knowledge-intensive services trade (KIS trade) - there are only statistics on high-tech trade that refer to trade in high-tech manufacturing products.

[1] The WTO has no official definition of knowledge-intensive industries, and its data refers only to international trade.

In this paper KIS trade includes: Communications services;[2] Insurance services; Financial services; Computer and information services; Royalties and license fees; other business services;[3] and Personal, cultural and recreational services. Other business services consist of: Merchanting and other trade-related services; Operational leasing services and Miscellaneous business, professional and technical services (including: Legal services; Business and management consultancy, public relations services; Accounting, auditing, book-keeping and tax consulting services; Advertising, market research and public opinion polling; Research and development services; Architectural, engineering and other technical consultancy; Agricultural, mining, and on-site processing; Other miscellaneous business, professional and technical services; and Services between affiliated enterprises, n.i.e.). Eurostat's definition of KIS also includes Inland waterway transport, Air transport, and Personal spending on education and health services by foreign students and visitors, but these data are available only from Eurostat (and for Poland mainly since 2004)[4], thus we exclude them.

The Balance of Payments records transactions between resident and non-resident entities, which covers to a varying extent three of four modes of service trade defined under the General Agreement on Trade in Services (GATS 1994, pp. 285-286). Thus, the analysis refers only to international KIS trade through cross-border transactions and temporary movement of service recipients (modes 1 and 2) and that part of temporary movement of natural persons (mode 4) which takes place through service transactions. We exclude trade through commercial presence (mode 3 –separate data on Foreign affiliates statistics), and that part of mode 4 that takes place through temporary employment (Borchsenius 2010, p.7).

[2] Communications services consist of Telecommunications, postal and courier services – KIS should include only Telecommunications, but this data is incomplete (e.g. for Poland there is no such data before 2004).

[3] Other business services – the sub-category Merchanting and other trade-related services should be excluded here, but statistics on this category are available only in Eurostat databases (mainly for the EU countries), thus for comparability with international data (WTO), the entire category was included in KIS trade.

[4] The OECD statistics exclude these transport subcategories from the definition of KIS.

3. Measuring competitiveness in international trade

Competitiveness, unlike comparative advantage, was not rigorously defined in the early economic literature, and even after many attempts to define it,[5] it remains a somewhat ambiguous concept (Siggel 2007, p. 5).

Because this paper analyses competitiveness in international trade in KIS, we need definitions and indicators to measure this field of competitiveness.

Competitiveness in international trade is a measure of a country's advantage or disadvantage in selling its products in international markets (OECD, 2005). Indicators of competitiveness in international trade can measure the size or increase of market shares (e.g. De la Guardia, Molero, Valadez 2004, pp. 5-7), export performance (e.g. Balassa 1965), price ratios (e.g. Durand, Giorno 1987, p.153), cost competitiveness (e.g. Turner, Gollup1997, pp. 5-7; Cockburn, Siggel 1999, pp. 5-10), or more complex dimensions (multi-dimensional indicators, e.g. Porter 1990, pp. 73-91; Oral 1993, pp. 9-22). Bieńkowski (2008, pp. 23-29). They may be categorized into: (a) indicators measuring benefits from international trade (factorial or price terms of trade, labour and capital productivity, a sector's share in a country's total export); (b) indicators measuring market domination (export performance, market share, relative market share, hypothetical export index, constant market share, revealed comparative advantage); and (c) indicators combining the previous ones (composite competitiveness indicators). The theoretical studies on the international service trade are not very extensive, but they generally demonstrate that export-based indices of competitiveness can also be used to study competitiveness in international service trade (Misala 2001, pp. 153-168; Wyszkowska-Kuna 2005, pp. 15-30).

One of the most commonly used indicators of competitiveness in international trade is the Balassa (1965) index of revealed comparative advantage (RCA) (Wysokińska 1995, p. 106; Misala 2001, p. 245; Bieńkowski 2008, p. 28). This index was designed to analyze competitiveness in international merchandise trade, but as Nusbaumer (1987, pp. 60-61) noted, it can be also used with respect to service trade. At the same time Barras and Peterson (1987, pp. 139-140) proved that the RCA index, together with adjusted export shares, are conceptually superior measures of competitiveness in international service trade compared with observed export shares. Therefore, in this paper Poland's competitiveness in KIS trade is measured by the RCA index, as well as by its export performance and trade balance.

[5] In the broader literature we can find some classifications of different concepts and indicators of competitiveness e.g. (Siggel 1997, pp. 6-16; Misala 2001, 242-255; Bieńkowski 2008, pp. 18-23).

Finally, we should stress that the measurement of competitiveness is - even within a well-defined conceptual framework - very much a matter of compromises with the available data, and entails a number of trade-offs among different criteria and objectives (Durand, Giorno 1987, p. 153; Durand, Simon, Webb 1992, p. 6; Chen 2011, p. 342). This is especially visible in the case of services trade, where data is scarce, often incomplete, recorded at a high level of aggregation, and difficult to compare since it comes from different sources – generally of much poorer quality than in the case of merchandise trade. Additionally, as Peterson and Barras (1987, pp. 137-142) noted, measuring competitiveness in services is severely limited by the problem of accurately measuring the output of service industries (Peterson and Barras 1987, p. 133).

4. A review of related studies

Few research projects are focused on the impact of some producer services (FC&BS - financial, communication and business services, KIS or KIBS - Knowledge Intensive Business Services) on productivity and growth. These services are recognized as providers of strategic inputs to the rest of the system (manufacturing and service industries), and therefore as important contributors to increasing productivity in these sectors, and as a consequence increasing competitiveness in international trade. They are also recognized as sectors with a high potential growth (Antonelli 1998, p. 181, 192; Katsoulacos, Tsounis 2000, p. 192; Windrum, Tomlinson 1999, p. 393-394, 401-402; Balaz 2004, pp. 478-487; Di Cagno, Meliciani 2005, p. 161). Windrum and Tomlinson also state that the impact of KIS on a country's output and productivity is higher if there is strong degree of integration between services and other economic activities (most notably manufacturing). The importance of intersectoral linkages for export specialization is also stressed by Laursen and Drejer (1997, pp. 16-17). They conclude that the two types of technological activities, namely technological activities within a single 'own' sector, and inter-sectoral linkages, are both important in the determination of national export specialisation patterns.

There are also few studies analyzing the issue of competitiveness in international KIS trade. Guerrieri and Meliciani (2005, pp. 489-502) test the determinants of trade specialisation and competitiveness in FC&BS. They find that a country's ability to develop a competitive service economy depends on the structure of its manufacturing sector, as some manufacturing industries are more intensive users of these services. They also state that knowledge-intensive industries (office&computing machinery, professional goods, electrical apparatuses&radio, TV&communication equipment, chemicals and drugs) are

the main users of producer services, and thus countries which specialise in these industries are in a favourable position to develop a comparative and absolute advantage in producer services. They also prove that domestic specialisation in the service industries that are important users of FC&BS positively contributes to international specialisation in FC&BS. Finally, they find that ICT has a positive and significant impact on trade performance in FC&BS.

Di Cagno and Meliciani (2005, p. 151, 161) look at spillovers through trade in services in the context of the literature on the role of trade in economic growth. They show that both domestic and imported producer services (especially communication, business, financial and transport services), contribute to fostering technological change and increasing productivity. They also prove that the importance of these services varies across industries.

Yap Co (2007, p. 893-900) studies the determinants of US KIS exports and finds that affiliated services exports (e.g. research, development, and testing services) generally arise to support other firm activities (e.g. manufacturing) in the importing countries, whereas non-affiliated services exports do not require the presence of other activities. Thus affiliated services exports may be more sensitive to the characteristics of importing countries.

Brinkley (2007, pp 7-26) shows that the UK economy has experienced a major structural change in its trade with the rest of the world, from trade in other manufactured goods towards exports in KIS and high tech manufacturing. This has been driven by the rising global demand for KIS, and it has been achieved by: (a) consolidation of traditional strengths such as the City, business services, and higher education; (b) moving into rapidly growing areas such as computer and information services and the creative industries; (c) the transformation of parts of manufacturing from pure production to offering a manufacturing and services package; and (d) the development of global brands and expertise across a range of knowledge-based service industries. Brinkley claims that the UK has developed as an unrivalled world-leader in KIS trade, but there is a possible threat from increased competition from high wage economies in the EU and North America, as well as from lower wage economies such as India.

Javalgi, Gross, Joseph and Granot (2011) assess and compare the comparative performance of major emerging markets in KIBS exports. They indicate that while the major emerging markets are building competitive advantage by focusing on KIBS, their progress differs sharply – e.g. China has the lead, followed by India, Brazil, Russia, Mexico, Turkey, and Indonesia, whereas smaller nations lag behind. They also show that the leading emerging economies have not reached parity with the highly industrialized countries.

In the studies referring to China, we learn that KIS trade contributed more to the economic growth in China than the labour-intensive and capital-intensive

services trade (the University of International Business & Economics 2010). On the other hand Chen (2011, pp. 343-346), using the TC and MI indices, shows that China lacks international competitiveness in the KIS trade, which is related to some extent with the immaturity of its KIS industries. Chen states that the KIS sector in China is relatively backward and lacks independent innovation capacity, and in addition is unfamiliar with foreign laws, international conventions and the market environment closely associated with KIS industries, such as insurance, consulting, financial and other professional services. Thus, it is difficult for China to adapt to international market demand.

5. Poland in international trade in knowledge intensive services

The data in the Table 1 shows that, between 2000 and 2010 (earlier data is unavailable),the dynamics of growth in KIS exports was higher than of world services exports, world merchandise exports and the world GDP. KIS exports increased threefold, whereas world services exports increased 2.5 times, world merchandise exports nearly 2.5 times, and world GDP doubled. As a result KIS increased their share in total services exports from 41.9% to 50.3%; in exports of goods & services from 8% to 10.1%; and in world GDP from 2% to 3.1%.

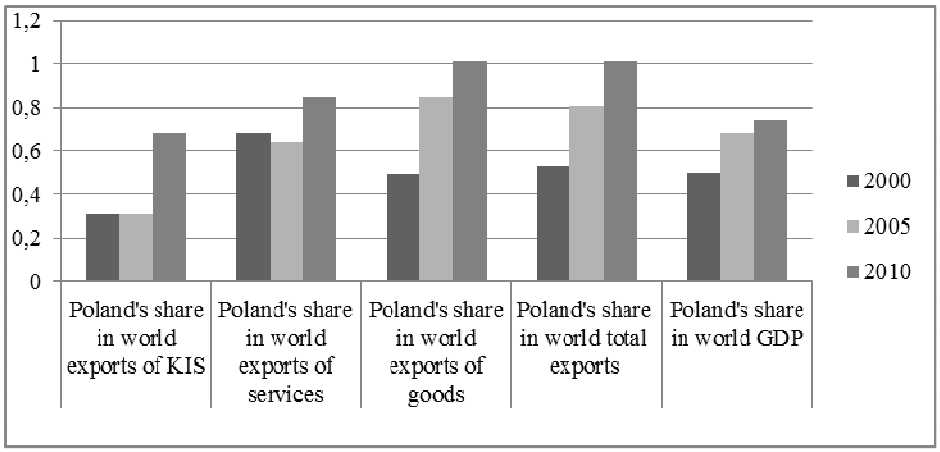
Table 1. World exports of KIS compared with world exports of services, goods and GDP

	World value (in mln $)		Relation to world GDP (in %)		2010/2000x100	
					World	Poland
Exports:	2000	2010	2000	2010	2010/00	2010/00
of KIS	637,900	1,927,300	2.0	3.1	**302.1**	**659.6**
of services	1521700	3835000	4.8	6.1	252.0	314.9
of foods	6456000	15274000	20.5	24.2	236.6	503.1
GDP	31492776	63048823			200.2	297.1

Source: World GDP: World Bank, 2002/2007/2011. Total GDP 2000/2005/2010, World Development Indicators database, World Bank, http://www.pdwb.de/archiv/ weltbank/ gdp00.pdf; http://www.fts.uner.edu.ar/catedras03/economia/archivos_ts/PBIBanco Mundial.pdf; http://siteresources.worldbank.org/DATASTATISTICS/Resources/GDP.pdf., World KIS /services /goods exports: WTO, Time series on international trade, http://stat. wto.org/ Home/WSDBHome. aspx?Language=E.

The growth dynamic of KIS exports in Poland was more than twice that of the world KIS exports, total services exports and GDP in Poland, as well as higher than merchandise exports in Poland (Table 1). In a result, with more than 6.5-times growth, KIS increased their share in Polish services exports from 19% in 2000 to 40% in 2010.

Graph 1. Poland's share in world KIS/services/goods exports and in world GDP – 2000-2010



Source: Own calculations based on the source as in Table 1.

In Graph 1 we can see that between 2000-2005, Poland's share in world KIS exports remained at the same level (in case of total services it decreased slightly), whereas between 2005-2010 it increased more than twofold (in total services by 33%). With respect to merchandise trade, the situation was reversed. In a further part of the paper we explore the relation of this growth to Poland's accession to the EU.

According to the data in Table 2, we can see that Poland has increased its position in world KIS exports from 29th place in 2000 to 26th place in 2010, and its share in world KIS exports from 0.31% to 0.68% respectively. However, it should be mentioned that Poland's place actually was lower, both in 2000 and in 2010.[6] In 2010 Poland managed to achieve a better position than Australia, Czech Republic, Portugal and Turkey, but we don't know if Poland was ranked higher than Egypt, Israel, Malaysia and Mexico (no data on 'Other business services' for these countries). Thus, we can suppose that in 2010 Poland was ranked at more or less the same position as in world commercial services exports (30th) and in world merchandise exports (28th). Poland's share in world KIS exports (0.68%) was lower than its share in world services exports (0.9%) and world merchandise exports (1.0%). (WTO, 2012, pp. 24, 26)

[6] In 2000 Belgium and Luxembourg were treated as one country, and four countries were probably ranked higher: Denmark and Finland – no data on KIS exports, India and Russia – data incomplete (lack of data on Other business services, and in the case of India also on Computer and information).

Table 2. Leading World KIS exporters in 2000 and in 2010

	In mln $*	In %		In mln $	In %
	2000			2010	
World	637,900	100	World	1,927,300	100
1. USA	134,343	21.06	1. USA	324,048	16.81
2. United Kingdom	77,317	12.12	2. United Kingdom	180,942	9.39
3. Germany	36,850	5.78	3. Germany	129,299	6.71
4. Japan	33,482	5.25	4. Ireland	88,432	4.59
5.Belgium/Luxembourg	29,520	4.63	5. Japan	75,969	3.94
6. France	27,927	4.38	6. China	75,729	3.93
7. Hong Kong, China	21,348	3.35	7. India	72,007	3.74
8. Canada	20,737	3.25	8. Singapore	64,093	3.33
9. Italy	17,867	2.80	9. Luxembourg	58,252	3.02
10. Switzerland	15,776	2.47	10. France	55,653	2.89
11. Spain	13,292	2.08	11. Hong Kong, China	53,856	2.79
12. Ireland	12,423	1.95	12. Belgium	47,987	2.49
13. Taipei, Chinese	11,912	1.87	13. Spain	45,558	2.36
14. Sweden	11,674	1.83	14. Italy	44,210	2.29
15. Singapore	11,421	1.79	15. Sweden	43,534	2.26
16. China	9,641	1.51	16. Canada	39,803	2.07
17. Korea, Rep. of	9,196	1.44	17. Switzerland	38,548	2.00
18. Austria	8,172	1.28	18. Austria	26,077	1.35
19. Norway	5,804	0.91	19. Korea, Rep. of	24,935	1.29
20. Australia	5,780	0.91	20. Taipei, Chinese	21,263	1.10
21. Malaysia	5,685	0.89	21. Finland	20,453	1.06
22. Brazil	5,514	0.86	22. Brazil	19,416	1.01
23. Israel	4,135	0.65	23. Norway	18,915	0.98
24. Mexico	3,383	0.53	24. Russia	18,099	0.94
25. Turkey	2,991	0.47	25. Denmark	16,502	0.86
26. Egypt	2,604	0.41	26. Poland	13,040	0.68
27. Czech Republic	2,222	0.35			
28. Portugal	2,069	0.32			
29. Poland	1,977	0.31			

*At current prices. India: data on Computer & information and Other business services from 2009.

Source: WTO, Time series on international trade (as in Table 1).

6. Poland's competitiveness in KIS export in the light of its accession to the EU

From the data in Table 3, we can observe that in Poland KIS accounted for more or less the same (slightly higher) share in total exports as did high-technology products, whereas in the EU high-tech products recorded a higher share. It seems important to note that KIS increased their share in EU exports, whereas high-technology products decreased – as a result the difference between them in 2010 was much smaller than in 2000. In Poland, both KIS and high-technology products more than doubled their share in total exports, but in both cases they were lower than in the EU.

Table 3. KIS exports in comparison with high-tech products exports as a share of total exports in Poland and in the EU-27

	KIS exports as a share of total exports			High-tech products exports as a share of total exports		
	2003/04	2005	2010	2000	2005	2010
Poland	3.1	3.4	6.8	2.8	3.2	6.0
EU-27	10.8	11.3	13.1	20.4	18.7	16.1

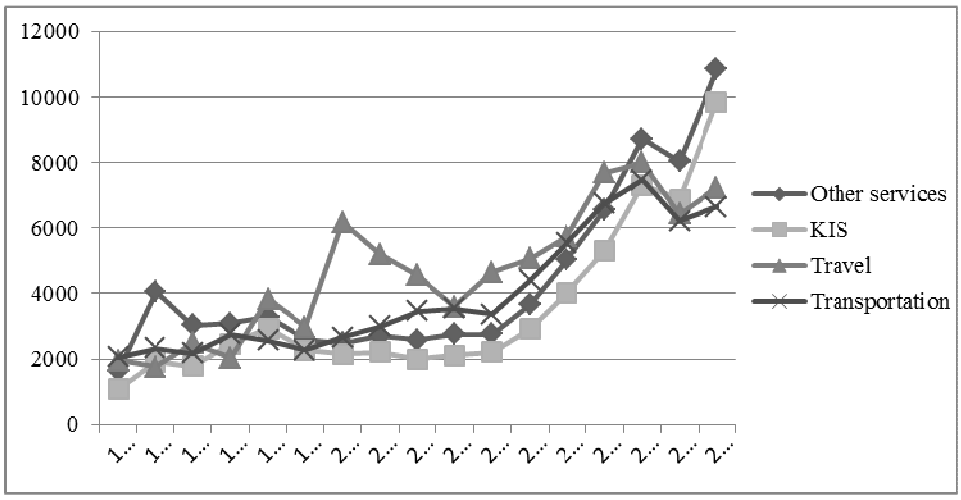
Source: Exports of high technology products as a share of total exports (1995-2006, SITC Rev. 3)/(from 2007, SITC Rev. 4), http://epp.eurostat.ec.europa.eu/portal/page/portal/science_ technology_ innovation/data/database, Exports of KIS as a share of total exports – own calculations based on: International trade in services, geographical breakdown: International trade in services (since 2004)/(from 1985 to 2003), http://epp.eurostat.ec. europa. eu/portal/page/portal/balance_ of_payments/data/database.

Examining Graphs 2 and 3 below, we can see that Polish KIS exports recorded two periods of increase: between 1994 and 1998 (with the exception of 1996), and since 2004 (with the exception of 2009). It's important to note that the first period of increase began when Poland entered into its association agreement with the EU, and the second when Poland entered the EU. It is also not surprising that the second period of increase has been much stronger than the first, because following the accession most barriers in services trade between Poland and the EU were removed. Lack of data on Polish service transactions with the EU countries before 2004 makes it more difficult to assess the impact of EU integration on Poland's competitiveness in services exports. But nevertheless it seems justified to relate this growth in KIS exports to the integration processes.

Graph 2 yields additional important information - that the chart for Other business services (OBS) exports is very similar to the chart for KIS exports. OBS is the major category in KIS trade, and thus their high export growth was the main engine of the growth in KIS exports. While the other two categories - Computer and information services (C&IS) and Royalties and license fees

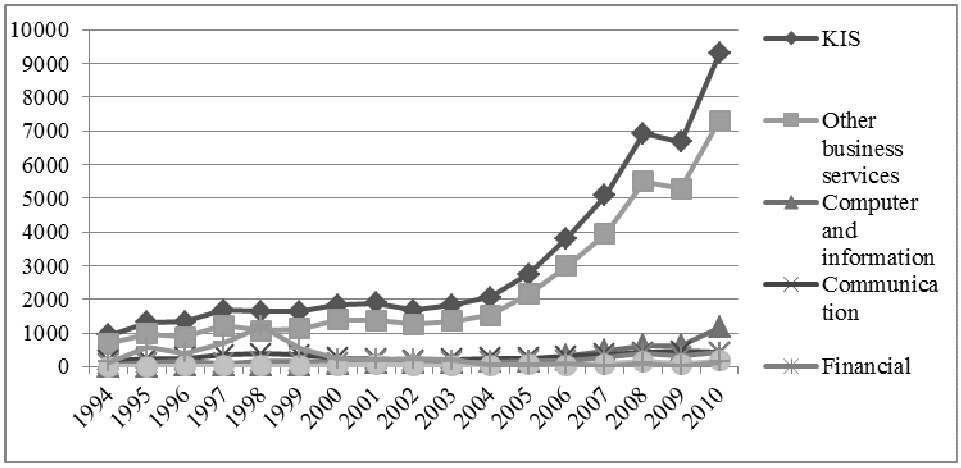
(R&LF) – achieved even higher growth rates, they contributed to a much lesser extent to the increase in KIS exports, because they have a relatively low share in Polish KIS exports (particularly in the case of R&LF).

Graph 2. The growth of KIS exports in comparison with the growth of exports in other main services categories in Poland between 1994-2010



Source: as in Table 3.

Graph 3. The growth of KIS exports in comparison with the growth of exports in KIS categories, in Poland between 1994-2010



Source: as in Table 3.

Table 4. International services transactions in Poland between 1994-2010 (mln EUR)

		1994	2003	2005	2007	2010	2010/94
Communication	Credit	175.7	215.9	249.1	368.7	419.8	238.9
	Debit	134.5	216.8	293.1	510.6	488.9	363.5
	Net	41.2	-0.9	-44.0	-141.7	-68.8	
Insurance	Credit	127.8	192.1	54.4	14.0	134.9	105.6
	Debit	198.4	365.3	311.0	335.4	278.4	140.3
	Net	-70.6	-173.2	-256.5	-321.4	-143.4	
Financial	Credit	58.0	142.1	175.0	285.7	419.8	723.7
	Debit	106.8	252.3	309.5	375.3	642.1	601.4
	Net	-48.8	-110.2	-134.5	-89.6	-222.6	
Computer & information	Credit	1.7	118.2	158.6	483.4	1162.8	69172.6
	Debit	29.4	310.5	337.1	635.6	1255.9	4268.3
	Net	-27.7	-192.3	-178.5	-152.2	-93.1	
Royalties & licence fees	Credit	0.8	25.7	50.5	72.7	177.2	21074.3
	Debit	15.1	658.9	833.7	1144.1	1692.0	11181.5
	Net	-14.3	-633.3	-783.3	-1071.4	-1514.8	
Other business services	Credit	695.2	1351.9	2156.1	3930.5	7296.2	1049.4
	Debit	896.2	2185.4	2553.8	3616.8	5570.9	621.6
	Net	-200.9	-833.5	-397.7	313.7	1725.0	
Personal, cultural and recreational	Credit	11.8	53.4	75.3	140.6	232.6	1976.0
	Debit	10.9	113	127.8	219.6	650.6	5953.1
	Net	0.8	-59.6	-52.5	-79.0	-418.1	
KIS	Credit	**1071.0**	**2099.3**	**2919.0**	**5295.6**	**9843.3**	**919.1**
	Debit	**1391.3**	**4102.2**	**4765.9**	**6837.5**	**10578.8**	**760.3**
	Net	**-320.3**	**-2002.9**	**-1846.9**	**-1541.6**	**-735.7**	
Services	Credit	5631.7	9881.4	13102.7	13102.7	24717.5	438.9
	Debit	3244.2	9418.4	12515.3	12515.3	22381.2	689.9
	Net	2387.5	463.0	587.4	587.4	2336.4	
Transport	Credit	2049.6	3533.3	4393.5	4393.5	6637.8	323.9
	Debit	1147.5	2031.8	2684.1	2684.1	4644.4	404.7
	Net	902.0	1501.5	1709.4	1709.4	1993.4	
Travel	Credit	1954.6	3598.1	5056.4	5056.4	7223.6	369.6
	Debit	269.0	2476.6	4485.0	4485.0	6510.1	2420.0
	Net	1685.6	1121.5	571.5	571.5	713.5	
Other services	Credit	1627.6	2750.0	3652.5	3652.5	10850.4	666.7
	Debit	1827.6	4909.5	5346.5	5346.5	11219.4	613.9
	Net	-200.1	-2159.5	-1694.1	-1694.0	-369.2	

*1994 – mln ECU.

Source: International trade in services (as in Table 3).

It is also worth stressing that OBS and C&IS recorded only slight declines in exports in 2009, while international trade in services suffered from a deep decline due to the world financial crisis. What's more, the following year they not only recovered to the growth rates from the period before the crisis, but they even increased them (e.g. C&IS doubled their value between 2009-10). R&LF were more heavily affected by the decline in 2009, but the following year they recorded their highest growth, particularly in exports to the third countries. As far as the other KIS categories are concerned, all of them - except for Insurance - increased their credit and debit transactions within the analyzed period, and they also quickly recovered after a one-year-decline in 2009.

As we mentioned in section 2, a net trade balance is an important indicator of a country's competitiveness in international trade. The data in Table 4 shows that throughout the entire analyzed period Poland recorded a deficit in KIS trade, which indicates a rather poor level of competitiveness in this field. Generally, during this time Poland enjoyed a surplus in total services trade, but this was thanks to a surplus in transactions in Transportation and Travel, whereas in transactions in Other services Poland suffered a deficit. However, it is important to stress that there has been an improvement in the competitiveness of Poland in KIS trade in recent years. After a six-year period of growing deficits in KIS trade, since 2004 Poland has recorded reductions in this deficit. This was mainly due to the high export growth in OBS. This was the only KIS category that has enjoyed a trade surplus since 2007, and what's more this surplus has grown 5.5 times (following a fourfold growth in its deficit during the association period). C&IS and Communications services have also recorded reductions in their deficits (following a sevenfold growth in the deficit during the association period), whereas R&LF, Personal, cultural and recreational services (PC&RS) and Financial services have recorded increases in their deficits, with the highest deficit taking place in transactions in R&LF.

In order to effectively assess the impact of Poland's accession to the EU on its competitiveness in KIS trade, we should have data on Polish service transactions with the EU before and after 2004. Unfortunately, there is no such data before 2004, thus we can't say if there was a shift from extra-EU to intra-EU trade following the accession. From the data in Table 5 we can observe that since 2004, on average about 75% of Polish transactions have been intra EU-trade, both in exports and imports and in both KIS trade and total services trade. Thus we can say that Poland's services trade has been greatly dominated by transactions with EU countries. However, since 2007 we can observe a shift from intra-EU to extra-EU transactions in Polish KIS exports, owing primarily to OBS. OBS exports have recorded high growth, both to the third countries and to the EU member states, but exports to third countries have increased eight

times, twice more than the corresponding exports to the EU. As a result, in 2010 their share in extra-EU services exports reached the level of 36%, 10 p.p. higher than in services exports to the EU (Table 6). The other two categories with the highest growth rates (C&IS and R&LF) have increased their shares in the EU markets to a greater extent.

Table 5. Percentage shares of trade with the EU-27 countries in Polish international transactions in KIS and in total services for the period 2004-2010

	Credit							Debit						
Year	04	05	06	07	08	09	10	04	05	06	07	08	09	10
KIS	76	76	77	75	70	69	66	75	76	77	76	77	78	77
S	73	74	75	74	73	73	70	76	76	75	76	76	77	77

S – Services.

Source: Own calculations based on the source as in Table 4.

Table 6. Trade in each KIS category as a percentage of total services trade (in 2004 and 2010), and its growth between 2004-2010; in Poland – with the EU and with third countries

	EU (27)			Extra EU (27)			EU (27)			Extra EU (27)		
Year	04	10	G*	04	10	G	04	10	G	04	10	G
	Credit						Debit					
C	2.5	1.9	167	1.5	1.2	202	2.7	2.3	180	1.3	1.8	282
I	0.3	0.6	484	1.0	0.4	99	2.2	1.6	152	1.1	0.1	22
F	1.3	2.0	331	0.9	1.0	308	2.6	2.8	233	3.2	3.0	186
C&I	1.2	4.6	854	2.3	5.0	553	2.9	5.4	390	4.0	6.4	320
R&LF	0.2	0.6	804	0.4	0.9	652	5.6	6.5	244	9.5	11.5	232
OBS	15.1	26.6	386	11.6	36.5	814	19.0	26.8	299	17.2	18.6	215
PC&R	0.7	1.0	336	0.8	0.8	279	0.9	2.3	571	1.4	4.9	276

* Growth: 2010/2004*100.

Source: Own calculations based on the source as in Table 4.

As was mentioned in section 2, the RCA index is recognized as a reliable indicator for measuring competitiveness in services trade. In Table 7, RCA indexes for Polish KIS exports are presented – separately for exports to the EU, to third countries, and for total exports.

A country enjoys a comparative advantage in exports of a given product if the of RCA index value is above 1. In 2000, the RCA indexes in Polish KIS exports could be calculated only for total trade (on the basis of statistics from the WTO database). They showed that Poland enjoyed a comparative advantage in the export of Insurance and Communications services (in the latter case the RCA index had a border value). However, in the following years the RCA indices

reflected a decreasing trend in both categories, with particularly high decreases in Insurance. In OBS and C&IS the trend was reversed, both with respect to exports to the EU and to the third countries. As a result, in 2010 Poland achieved comparative advantages in both categories, but interestingly only to the EU in the case of exports of C&IS, and only to third countries in the case of exports of OBS (the RCA index more than doubled its value with respect to third countries).

Table 7. RCA indexes in Polish KIS exports to the EU countries; to the third countries; and in total exports (in 2005 and 2010)

	In exports to the EU (27)		In exports to the third countries		In total exports		
Type of services	2005	2010	2005	2010	2000	2005	2010
Total KIS	0.48	0.75	0.42	0.83	0.44	0.47	0.78
Communications	0.75	0.60	0.72	0.61	**1.00**	0.81	0.68
Insurance	0.16	0.28	0.25	0.15	**1.17**	0.21	0.25
Financial	0.32	0.46	0.12	0.11	0.15	0.19	0.23
Computer & information	0.37	**1.24**	0.28	0.65	0.18	0.28	0.82
Royalties and license fees	0.05	0.08	0.13	0.15	0.06	0.06	0.11
Other business	0.63	0.97	0.62	**1.40**	0.57	0.68	**1.14**
PC&R	0.33	0.68	0.55	0.70	0.30	0.45	0.79

Source: Own calculations based on the source as in Table 4.

7. Determinants of Poland's competitiveness in the export of Other business services and Computer and information services

Competitiveness in KIS exports, including OBS exports, is mainly determined by a country's endowment in human capital, as well as by the costs and productivity of labour. Comparing the data on employment in HRST-core[7] as percentage of total employment, we can see that Poland generally enjoyed an advantage over the EU-27 countries in the service industries (including KIS), whereas in manufacturing the situation was reversed. It's also worth stressing that between 2004-2010 this advantage increased, particularly in KIS, where it amounted to 10 percentage points (49% in Poland; 39% in the EU-27). Poland's largest advantage was in Financial services, Information and communication

[7] HRST-core employment - persons fulfilling at least one of the following two conditions: (1) have successfully completed a university level education; (2) are employed in a science and technology occupation as 'Professionals' or 'Technicians and associate professionals'.

(I&C) and Professional, scientific and technical activities (PS&TA). To compare the costs and productivity of labour we can use the data on Wage adjusted labour productivity[8] (WALP). On the basis of the relation between WALP in Poland and in the EU-27, we can say that Poland has an advantage over the EU-27 in OBS, since 2008 in PS&TA (that replaced OBS) and in Post & telecommunications, since 2008 in I&C (that replaced P&T). WALP in Poland was higher than in the EU-27 by 10% in OBS and 33% in P&T (2007), 22% in PS&TA and 31% in I&C (2010) (Eurostat, 2013).

While analysing competitiveness in the services trade we shouldn't forget about the process of out-sourcing/off-shoring. This mainly refers to computer and business activities, where Poland has advantages over the EU-27. Thus, Poland should be an interesting location for out-sourced/off-shored activities, which in turn may enhance its export performance in these sectors. From the data on FDI in Poland, we can observe that between 1996-2009 the FDI inflows into Real estate and business activities increased by 16 times, whereas total FDI inflows increased by only 2.7 times. As a result their share in total FDI inflows increased from 3% to 21% (26% in 2008). On the basis of new classifications, we can see that in 2010 Real estate activities accounted for 11%, and PS&TA for 36% of total FDI inflows into the Polish economy. The share of C&I in total FDI inflows was very small, although it recorded the highest growth (from 0.01% to 3%). Thus, we can say that in both sectors FDI inflows can have a positive impact on export performance. However, we should add that on average 87% of FDI inflows came from the EU countries, so they mainly generate increased export opportunities to the EU markets (NBP, 2004/2008/2010).

8. Conclusions

1. In the most recent decade the growth of world KIS exports was higher than that of world services exports, world merchandise exports, and world GDP. In Poland the growth of KIS exports was more than twice higher than that of world KIS exports, Polish total services exports, and Polish GDP, as well as higher than the growth of Polish merchandise exports.
2. Poland has improved its position in world KIS exports, and in 2010 this was higher than Poland's position in world merchandise or world services exports. However, if we take into account Poland's share in world KIS exports (0.68%) it was lower than Poland's share in world merchandise (1%) or world services exports (0.9%).

[8] WALP – apparent labour productivity by average personnel costs.

3. Despite the high growth rate in KIS exports, in 2010 the share of KIS in total trade was in Poland still nearly twice lower than in the EU (in case of high-technology products it was even three times lower). But the disparity between Poland and the EU has diminished significantly.
4. Poland has enjoyed a surplus in services trade, but despite the high growth rate in KIS exports Poland still hasn't managed to achieve a surplus in this field. On the other hand, we can note an improvement in Poland's competitiveness in KIS trade, mainly thanks to OBS exports. This was the only KIS category where Poland has enjoyed a surplus since 2007, with a 5.5-time growth rate since then. OBS was also the only category where Poland managed to achieve a comparative advantage – with respect to third countries, and nearly so in the EU and in total exports. In 2010, despite its trade deficit, Poland also achieved a comparative advantage in exports of C&IS, but only to the EU market. It is worth stressing that, during the times of the global crisis, which adversely affected international trade, in Poland transactions in KIS trade recorded only a single-year decline, after which then they returned to a path of growth, in some cases with even higher growth rates.
5. Poland's competitiveness in the export of OBS and C&IS is positively affected by its advantage over the EU-27 in wage adjusted labour productivity and HRST-core employment, as well as by FDI inflows.

References

Antonelli C. (1998), *Localized technological change, new information technology and the knowledge-based economy: The European evidence*, "Journal of Evolutionary Economics", Springer-Verlag, no. 8

Baláž V. (2004)], *Knowledge-intensive business services in transition economies*, 'The Service Industries Journal', Volume 24, Issue 4

Bieńkowski W. (2008), *Konkurencyjność gospodarki kraju; próba rewizji determinant i miar; Przyczyny zmian znaczenia czynników konkurencyjności* (*Competitiveness in national economies: and attempt to revise determinants and measures; reasons for changes in competitiveness factors*), [in:] W. Bieńkowski, Z. Czajkowski, M. Gomułka, B. Brocka-Palacz, E. Latoszek, J. Misala, M.J. Radło, M. Weresa, *Czynniki i miary międzynarodowej konkurencyjności gospodarek w kontekście globalizacji*, SGH, Instytut Gospodarki Światowej, Warszawa

Borchsenius V., N. Malchow-Møller, J.R. Munch, J. Rose Skaksen (2010), *International Trade in Services – Evidence from Danish Micro Data*, NationaløkonomiskTidsskrift, no. 148

Brinkley I. (2007), *Trading in Ideas and Knowledge. A report prepared for the Knowledge Economy Programme*, The Work Foundation, London, available at: http://www.thework foundation. com/assets/docs/publications/62_ke_trading.pdf

Chen L. (2011), *Research on Knowledge-Intensive Services Trade Competitiveness, Advances in Education and Management*, "Communications in Computer and Information Science", no. 211

Chojna J., K. Barteczko, E. Duchnowska, P. Ważniewski, Z. Wołodkiewicz-Donimirski (2008), *Przewidywane i rekomendowane kierunki proeksportowej restrukturyzacji polskiej gospodarki do 2012 r. w kontekście szans na dynamiczny wzrost eksportu netto towarów i usług o wysokiej wartości dodanej (Envisioned and recommended changes in pro-export restructurization of the Polish economy until 2012 in the context of opportunities for dynamic export growth with respect to goods with high added value)*, Instytut Badań Rynku, Konsumpcji i Koniunktur/Ministerstwo Gospodarki, Warszawa

Cockburn J., E. Siggel, M. Coulibaly, S. Vezina (1999), *Measuring Competitiveness and its Sources: The Case of Mali's Manufacturing Sector*, "Canadian Journal of Development Studies", Vol. XX, No. 3

De la Guardia C.D., J. Molero, P. Valadez (2004), *International Competitiveness in Services in Some European Countries: Basic Facts and a Preliminary Attempt at Interpretation*, Instituto Complutense de Estudios Internacionales, Madrid, available at: http://ideas.repec.org/p/ucm/ wpaper/01-05.html

Di Cagnoa D., V. Meliciani (2005), *Do inter-sectoral flows of services matter for productivity growth? An input/output analysis of OECD countries*, "Economics of Innovation and New Technology", 14(3), pp. 149–71

Durand M., C. Giorno (1987), *Indicators of international competitiveness: Conceptual aspects and evaluation*, OECD economic studies, available at <http://www.oecd.org/eco/economicoutlook analysisandforecasts/33841783.pdf

Durand M., J. Simon, C. Webb (1992), *OECD's indicators of international trade and competitiveness*, 'Economics Department Working Paper', OECD, Paris, No. 120

Eurostat (2011a), *High-tech industry and knowledge-intensive services, Reference Metadata in Euro SDMX Metadata Structure (ESMS)*, last updated 16.12.2011, available at <http://epp.eurostat.ec.europa.eu/cache/ITY_SDDS/en/htec_esms.htm>

Eurostat (2011b), *Glossary: Knowledge-intensive services – Statistics Explained*, last modified on 8 March 2011, available at <http://epp.eurostat.ec.europa.eu/statistics_explained/

Eurostat, *Aggregations of manufacturing based on NACE Rev 1.1*, available at: <http://epp.eurostat.ec.europa.eu/cache/ITY_SDDS/Annexes/htec_esms_an2.pdf>

Guerrieri P., V. Meliciani (2005), *Technology and international competitiveness: The interdependence between manufacturing and producer services*, 'Structural Change and Economic Dynamics', 16, pp. 489–502

Javalgi R. G., A. C. Gross, W. B. Joseph, E. Granot (2011), Assessing competitive advantage of emerging markets in knowledge intensive business services, 'Journal of Business & Industrial Marketing', Vol. 26, Issue 3

Katsoulacos Y., N. Tsounis (2000), *Knowledge-Intensive Business Services and Productivity Growth: the Greek Evidence*, [in:] Boden M., Miles I. (eds) *Services and Knowledge-Based Economy*. London: Continuum

Laursen K., I. Drejer (1999), *Do Inter-Sectoral Linkages Matter for International Export Specialisation?*, 'Economics of Innovation and New Technology', 8 (4), 311-330

Laursen K. (1998), *Revealed Comparative Advantage and the Alternatives as Measures of International Specialisation*, 'DRUID Working Papers', Copenhagen, No. 98-30, available at: <http://ideas.repec.org/p/aal/abbswp/98-30.html> [accessed on 5.09.2012]

Massini S., M. Miozzo (2010), *Outsourcing and offshoring of knowledge intensive business services: implications for innovation*, [in:] F. Gallouj, F. Djellal, *The Handbook of innovation and services*, Edward Elgar

Misala J. (2001), *Współczesne teorie wymiany międzynarodowej i zagranicznej polityki ekonomicznej (Contemporary theories of international and foreign economic policies)*, SGH, Warszawa

NBP, *Zagraniczne inwestycje bezpośrednie w Polsce w 2003/2007/2009/roku (Foreign investment in Poland in the years 2003/2007/2009)*, NBP, Warszawa, 2004/2008/2010, available at: http://www.nbp.pl/home.aspx?f=/publikacje/zib/zib.html

Nusbaumer J. (1987), *Services in the Global Market*, Kluwer Academic Publishers

OECD (1999), *Main Trends Towards Knowledge-based Economies*, OECD, Paris

OECD (2005), *Competitiveness in International Trade, The OECD Economic Outlook: Sources and Methods*, OECD, Paris

Oral M. (1993), *A methodology for competitiveness analysis and strategy formulation in the glass industry*, "European Journal of Operational Research", no. 68

Peterson J., R. Barras (1987), *Measuring International Competitiveness in Services*, 'The Service Industries Journal', Vol. 7, Issue 2

Porter M. (1990), *The competitive advantage of Nations*, 'Harvard Business Review', March/April, No. 2

Siggel, E. (2007), *The Many Dimensions of Competitiveness, International Competitiveness and Comparative Advantage: A Survey and a Proposal for Measurement*, CESifoVenice Summer Institute

Turner A., S. Golub (1997), *Towards a System of Unit Labor Cost-Based Competitiveness Indicators for Advanced, Developing and Transition Countries*, 'Staff Studies for the World Economic Outlook', IMF

University of International Business & Economics (2010), *Services trade technology spillover effects and the mechanism through which it affects China's economic growth*; paper presented

during 2010 7th International Conference on Tang Bi: Service Systems and Service Management (ICSSSM), Beijing, China

Windrum P., M. Tomlinson (1999), *Knowledge-intensive Services and International Competitiveness: Four Country Comparison*, 'Technology Analysis & Strategic Management', 11/3

WTO (1995), *General Agreement on Trade in Service. Annex 1b*, WTO, available at: http://www.wto.org/english/docs_e/legal_e/26-gats.pdf

WTO (2007/2012), *International Trade Statistics 2007/ International Trade Statistics 201*, WTO, Geneva, available at: www.wto.org.statistics [accessed on 3.09.2012]

WTO, Time series on international trade, available at: http://stat.wto.org/Home/WSDBHome.aspx?Language=E, [accessed on 3.09.2012]

Wysokińska Z. (1995), *Dynamiczne współzależności wymiany handlowej krajów Europy Środkowej i Wschodniej w świetle teorii integracji i wymiany międzynarodowej (Dynamic interdependence and trad exchange between the Central and Eastern European Countries in light of integration and international exchange theories)*, Uniwersytet Łódzki, Łódź

Wyszkowska-Kuna J. (2004), *Specjalizacja eksportowa w handlu usługami krajów Unii Europejskiej oraz krajów Europy Środkowej i Wschodniej stowarzyszonych ze Wspólnotami Europejskimi w latach 1980-2001 (Export specialization in services trade between the European Union and the Central and Eastern European Countries associated with the European Communities, 1980-2001)*, [in:] *Członkostwo Polski w Unii Europejskiej – aspekty ekonomiczne i społeczne*, Z. Wysokińska, A. Krajewska, W. Kwiatkowska, J. Witkowska (eds.), 'Folia Oeconomica', Uniwersytet Łódzki, Łódź, no. 181

Wyszkowska-Kuna J., (2005), *Handel usługami w procesie integracji europejskiej (Trade in services in the process of European integration)*, Wydawnictwo Uniwersytetu Łódzkiego, Łódź

Wyszkowska-Kuna J. (2013), *Przyczyny mniejszej aktywności firm usługowych w obszarze działalności innowacyjnej (Reasons for the lower activity of services firms in innovative activities)*, [in:] *Gospodarka w okresie globalnego kryzysu*, E. Kwiatkowski, W. Kasperkiewicz (eds.), 'Folia Oeconomica', Uniwersytet Łódzki, Łódź, no. 281

Yap Co C. (2007), *UE Exports of Knowledge-intensive Services and Importing-country Characteristics*, 'Review of International Economics', no. 15(5)

Eurostat (2013), *Statistics by theme*, available at: http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/themes: Balance of payments, Database, International trade in services, geographical breakdown [bop_its]: International trade in services (since 2004) [bop_its_det] and International trade in services (from 1985 to 2003) [bop_its_deth]

Science, technology and innovation, Database, High-tech industries and knowledge-intensive services [htec]: High-tech exports - Exports of high technology products as a share of total exports (1995-2006, SITC Rev. 3) [htec_si_exp] and Exports of high technology products as a share of total exports (from 2007, SITC Rev. 4) [htec_si_exp4]

Human Resources in Science and Technology [hrst]: Annual data on HRST and sub-groups, employed, by sector of economic activity and sex (1994-2008, NACE Rev. 1.1) [hrst_st_nsecsex];Annual data on HRST and sub-groups, employed, by sector of economic activity (from 2008 onwards, NACE Rev. 2) [hrst_st_nsec2]

Structural Business Statistics, Database, SBS – services [serv]: Annual detailed enterprise statistics for services (NACE Rev. 2 H-N and S95) [sbs_na_1a_se_r2] and Annual detailed enterprise statistics on services (NACE Rev. 1.1 H-K) [sbs_na_1a_se]

Streszczenie

KONKURENCYJNOŚĆ W MIĘDZYNARODOWYM HANDLU USŁUGAMI NASYCONYMI WIEDZĄ – PRZYPADEK POLSKI

Celem artykułu jest zbadanie konkurencyjności Polski w międzynarodowym handlu usługami nasyconymi wiedzą. Autorka analizuje tendencje w międzynarodowych transakcjach Polski w usługach nasyconych wiedzą i stara się odpowiedzieć na pytanie, czy Polska przesuwa się w kierunku osiągnięcia przewagi komparatywnej w tym obszarze.

W pierwszej części artykułu przedstawiona jest definicja i klasyfikacja usług nasyconych wiedzą, omówiona jest kwestia pomiaru konkurencyjności w handlu usługami oraz dokonany jest przegląd badań w analizowanym obszarze. Dalsza część pracy ma charakter empiryczny. Autorka wykorzystuje tu tradycyjne mierniki pomiaru konkurencyjności w handlu międzynarodowym, takie jak: wielkość eksportu, saldo transakcji handlowych oraz wskaźniki przewagi komparatywnej RCA. Analiza dotyka również wpływu akcesji Polski do UE na jej konkurencyjność w eksporcie usług nasyconych wiedzą. Na koniec wskazane są możliwe determinanty tej konkurencyjności.

W pracy wykorzystywane są bazy danych Eurostatu i WTO. Analiza obejmuje okres 2000-2010 dla transakcji międzynarodowych, oraz 1994-2010 dla Polski (od 1994 roku wszedł w życie Układ Europejski).

***Słowa kluczowe**: międzynarodowa konkurencyjność, międzynarodowy handel usługami, usługi nasycone wiedzą*