

АКТУАЛЬНІ ПРОБЛЕМИ СВІТОВОЇ ЕКОНОМІКИ ТА МІЖНАРОДНИХ ЕКОНОМІЧНИХ ВІДНОСИН

UDC 339 (447 + 438)

Pawlas I.,

Ph.D., Associate Professor at the Department of International Economic Relations, University of Economics in Katowice, Poland

THE EVALUATION OF POLISH-UKRAINIAN TRADE RELATIONS BETWEEN 2010 AND 2015

Abstract. Although Ukraine is located so close to Poland, its significance as Poland's trade partner is rather limited. This article aims at analysing the evolution of Poland's trade relations with Ukraine over the 2010-2015 period. The line of reasoning consists of three essential elements. At first, the economies of Poland and Ukraine were compared with the use of selected socioeconomic indicators. Engagement of the two countries in international trade and capital transfer was studied, with changes in competitive position of Poland and Ukraine being analysed. The next part focused on the analysis of Polish-Ukrainian trade in goods (value, dynamics and commodity pattern). Finally, competitiveness of the Polish goods in the Ukrainian market was studied with the implementation of the Balassa revealed comparative advantage indicator (RCA) and the Grubel-Lloyd intra-industry trade indicator (IIT).

Key words: Poland, Ukraine, international trade, revealed comparative advantage, intra-industry trade

Павляс І.,

Ph.D., доц., кафедра міжнародних економічних відносин, Економічний Університет в м. Катовіце, Республіка Польща

ОЦІНКА ЗОВНІШНЬОЇ ТОРГІВЛІ МІЖ ПОЛЬЩЕЮ ТА УКРАЇНОЮ У 2010-2015 РР.

Анотація. Хоча Україна близька територіально, її значення як торговельного партнера Польщі доволі обмежене. У даній статті зроблено спробу проаналізувати розвиток польсько-українських торговельних відносин в 2010-2015 рр. Розглянуто три проблеми. Спочатку зроблено порівняльний аналіз економік Польщі та України, що враховує участь у міжнародній торгівлі та потоках капіталу, а також зміни у конкурентній позиції. Далі проаналізовано обсяги і товарну структуру польсько-української торгівлі. Статтю завершено розглядом конкурентності польських товарів на українському ринку за допомогою індикаторів виявленої порівняльної переваги Балаша (RCA) та міжгалузевої торгівлі Грубеля-Ллойда (IIT).

Ключові слова: Польща, Україна, міжнародна торгівля, порівняльна перевага, міжгалузева торгівля.

Introduction. Openness of an economy is reflected (among others) in its international trade relations [3; 14]. Engagement in regional economic integration processes results in higher specialization, trade creation and trade diversion effects [10; 20]. Economic transition and gradual opening of Poland have resulted in considerable structural changes of the Polish economy, with integration into the EU structures being one of the primary objectives of Poland's transformation [13]. The accession to the EU in 2004 created more favourable conditions for the development of economic cooperation with other EU economies [2]. Poland became member of the single European market which intensified the economic relations with other EU member states and influenced

trade diversion effect [17; 18]. Undoubtedly, the market of the EU is crucial for the Polish exporters and it is very important for Poland's imports, too. Foreign trade with Ukraine is not that easy because it is not a member of the EU. On the other hand, close geographical location and cultural proximity should result in strong economic co-operation between Poland and Ukraine, all the more that due to the WTO membership [16]. Since May 2004, Poland's co-operation with Ukraine has been based on the Partnership and Cooperation Agreement between the European Communities and their Member States, and Ukraine [22]. It seems important to note that Poland's first initiative in the EU was the Eastern Partnership programme and strengthening of EU relations with

Ukraine in general. In addition, promoting EU-Ukraine association became one of the priorities of Poland's Presidency in the Council of the EU [23]. As Ukraine had been treated by the EU as an important partner within European Neighbourhood Policy, it was planned to deepen the relations with Ukraine. In 2012 the EU initiated talks on free trade and political association with

The Polish economy should be seen as a relatively stable country against the background of other European countries (including other EU Member States) at the time of global economic crisis and in the post-crisis period [24]. On the other hand, Ukraine must be seen as a transition country with huge political and economic problems.

Table 1

Poland and Ukraine in 2015 – selected socioeconomic indicators

Specification	Poland	Ukraine
Total area (thousand sq. km)	312.68	603.55
Population (million)	38.5	44.2
Natural increase (‰) 2014	-1.1	-6.4
Life expectancy (years)	77.6	71.8
Infant mortality rate (‰)	4.5	8.0
GDP (USD million)	474783	90615
GDP <i>per capita</i> (USD) (2013-2015)	13536	2968
GDP <i>per capita</i> (PPP USD) (2015)	26500	7500
Real GDP dynamics (%)	3.6	-9.9
Harmonised index of consumer prices (%)	-0.19	48.7

Source: WTO [30; 31], Central Statistical Office [4], CIA World Factbook [5; 6].

Ukraine. Unfortunately, because of political instability in Ukraine the political part of the Association Agreement was signed on 21 March, 2014 (though it was planned to do it much earlier) and the economic part of the Ukraine–European Union Association Agreement was signed later on 27 June, 2014. Then Ukraine joined the Deep and Comprehensive Free Trade Area with the EU on 1 January, 2016. What's more, the economic instability and political uncertainty in Ukraine (resulting from Russian invasion of Crimean Peninsula in 2014 and the on-going aggression in eastern Ukraine) have hurt economic growth, reduced development possibilities and created considerable obstacles for foreign economic co-operation.

Purpose. We aim to evaluate the development of Polish-Ukrainian trade over the 2010 to 2015 period. It is attempted at comprehensive analysis of the value, dynamics, balance and commodity pattern of bilateral trade between Poland and Ukraine. Competitiveness of the Polish goods in the Ukrainian market is studied in order to determine fields of revealed comparative advantage as well as to measure intensity of intra-industry trade.

Results. Poland and Ukraine are two European countries, two neighbouring countries with similar demographic potential and cultural proximity [9]. Although both countries had been under the Iron Curtain in the past, in the 21st century they are in a completely different political and socioeconomic situation. For the purpose of comparative analysis, selected socioeconomic indicators for Poland and Ukraine are presented in Table 1.

Population of Poland is a bit smaller than that of Ukraine: 38 m versus 44 m, but Ukraine is twice as big in terms of total area: Poland's total area is 312 thousand sq. km and Ukraine's total area is over 603 thousand sq. km. In 2014, both Poland and Ukraine noted negative natural increase rate, but it was much lower in Ukraine: natural increase in Poland equalled minus 1.1‰ and in Ukraine it was minus 6.4‰. Infant mortality in Poland was rather low (4.5‰), while in Ukraine it was quite high (8.0‰). Life expectancy in Poland was almost 6 years longer than in Ukraine (77.6 years versus 71.8 years).

In 1990, GDP of Poland was lower than GDP of Ukraine (USD 64.5 bn and USD 81 bn respectively) and GDP per capita for the two countries was more or less the same (USD 1690 in Poland and USD 1570 in Ukraine). In 2015, the situation of the two economies was completely different: Poland's GDP was close to USD 475 bn; Ukraine's GDP equalled USD 90 bn (or less than 20% of the Polish GDP). The difference in the levels of economic development between Poland and Ukraine is reflected in their GDP per capita (PPP): As of 2015, Poland's GDP per capita reached 26500 USD PPP, while Ukraine's GDP per capita stood at just 7500 USD according to PPP.

In 2015, real GDP dynamics in Poland was 3.6% while in Ukraine real GDP was reduced by 9.9%. In the same year, harmonized index of consumer prices in Poland declined by 0.19% and Ukraine noted 48.7% rise in consumer prices in 2015.

The engagement of Poland and Ukraine in international merchandise trade, commercial services trade and capital flows in 2015 is presented in Table 2. Even though the intensity of Poland's international trade activity was not high as compared with most EU

Member States, it was several times higher than that one of Ukraine. Merchandise exports of Poland amounted to USD 200 bn, while Ukraine's merchandise exports did not even reach USD 40 bn in 2015.

Poland's share in the world merchandise exports equalled 1.2%, with that of Ukraine's at just 0.23%; Poland took the 24th position in the world merchandise exports, while Ukraine was the 53rd on the list of world merchandise exporters. At the same time Poland's merchandise imports amounted to USD 197.7 bn and the Ukrainian merchandise imports exceeded USD 36 bn. Poland's share in the world merchandise imports equalled 1.15% and it can be compared with the Ukraine's share at 0.22%. As a result, Poland was classified at the 24th place on the list of the world largest merchandise importers and Ukraine took the 59th position.

among world commercial services exporters and as the 62nd one among world commercial services importers.

Transition of the Polish economy, its gradual opening and in particular its membership in the EU resulted in considerable rise in its investment attractiveness. What's more the Polish investors got more and more active in international markets. In 2015, foreign investors invested USD 7.5 bn in the form of FDI in Poland and inward FDI stock in Poland exceeded USD 231 bn. The Polish investors invested USD 2.9 bn in the form of FDI in international markets and outward FDI stock from Poland was close to USD 28 bn. Poland's share in world inward FDI flows equalled 0.4% and its share in world inward FDI stock accounted for 0.85%; the share of Poland in world outward FDI flows stood for 0.2 % and its share in world outward FDI stock

Table 2

Poland and Ukraine in international trade and capital flows, 2015

Specification	Poland	Ukraine
Merchandise exports (bn USD)	200,3	37,9
Merchandise imports (bn USD)	197,7	36,3
Share in world merchandise exports (%)	1.20	0.23
Share in world merchandise imports (%)	1.15	0.22
Rank in world merchandise exports	24	53
Rank in world merchandise imports	24	59
Commercial services exports (bn USD)	43,4	12,1
Commercial services imports (bn USD)	32,4	9,8
Share in world commercial exports (%)	0.91	0.26
Share in world commercial imports (%)	0.70	0.21
Rank in world commercial exports	27	52
Rank in world commercial imports	31	62
Inward FDI flows (bn USD)	7,5	3,0
Outward FDI flows (bn USD)	2,9	-0,05
Share in world inward FDI flows (%)	0.42	0.17
Share in world outward FDI flows (%)	0.20	-
Inward FDI stock (bn USD)	213,1	61,8
Outward FDI stock (bn USD)	27,8	9,6
Share in world inward FDI stock (%)	0.85	0.25
Share in world outward FDI stock (%)	0.11	0.04

Source: UNCTAD [26; 27], WTO [30; 31].

Similarly, Poland's participation is significantly higher in international commercial services trade. The value of the Polish commercial services exports exceeded USD 43 bn and its imports amounted to USD 32.5 bn in 2015. At the same time Ukraine exported commercial services worth of USD 12 bn and imported USD 9.8 bn of commercial services. Poland's share in world commercial services trade accounted for 0.91% with regard to exports and 0.7% in the case of imports; Ukraine's share in world commercial services trade was a bit over 0.2% (0.26% for exports and 0.21% for imports). Poland was classified as the 27th country on the list of world commercial services exporters and it took the 31st position on the list of world commercial services importers. Ukraine was classified as the 52nd country

equalled 0.11%. Ukraine's investment attractiveness was limited due to economic uncertainty and political instability, therefore inward FDI flows and stock were really low; the activity of the Ukrainian investors in international markets was marginal. In 2015, foreign investors invested just USD 2.9 bn in the form of FDI in Ukraine and inward FDI stock in Ukraine amounted to USD 61.8 bn. The Ukrainian investors did not make new investment in the form of FDI in the world in 2015 and the value of the Ukrainian outward FDI stock amounted to USD 9.6 bn in 2015. In 2015, Ukraine's share in world inward FDI stock equalled 0.25% and its share in world outward FDI stock was 0.04% only.

Changes in competitive position of Poland and Ukraine between 2010 and 2015 are presented in Table 3.

The Lausanne-based Institute for Management Development positioned Poland between the 32nd and 36th place in the analysed period. In 2015 and 2016 Poland was classified as the 33rd economy (out of 61 countries). Ukraine was classified much lower at the 49th and the 60th places, the lowest positions in the years 2015-2016. Another competitiveness ranking by the Geneva-based World Economic Forum (WEF) classified Poland between 36th and 43rd places, while the highest position of Poland was observed in *The Global Competitiveness Report 2016-2017*. Competitive position of Ukraine was assessed much lower, between the 73rd and 89th place (in *The Global Competitiveness Report 2016/2017* it took the 79th place).

As of 2010, Poland exported goods worth of USD 3.91 bn to Ukraine. Poland's exports to Ukraine gradually rose between 2010 and 2013 up to USD 5.71 bn. In 2014-2015, a downward tendency in Polish exports to the Ukrainian market has been observed, with a decrease in its value to USD 3.30 bn in 2015.

Poland's total imports experienced a marked rise from USD 178.1 bn in 2010 to USD 212.3 bn a year later. The year 2012 brought a considerable reduction in Poland's total imports to USD 198.5 bn. The next two years marked a significant rise in Poland's total imports up to USD 225.9 bn in 2014. However, the value of Poland's total imports dropped to USD 197.7 bn in 2015. The analysis of the Polish imports from Ukraine

Table 3

Competitiveness of Poland and Ukraine, 2010–2016

Country	Competitive position according to IMD						
	2010	2011	2012	2013	2014	2015	2016
Poland	32	34	34	33	36	33	33
Ukraine	57	57	56	49	49	60	59
	Competitive position according to WEF						
	2010/ 2011	2011/20 12	2012/ 2013	2013/ 2014	2014/ 2015	2015/20 17	2016/20 17
Poland	39	41	41	43	43	41	36
Ukraine	89	82	73	76	76	85	79

Source: IMD [11], WEF [28].

Table 4

Poland's exports (bn USD), 2010–2015

Specification	2010	2011	2012	2013	2014	2015
Total exports	159.8	190.2	184.7	206.1	222.4	200.3
Exports to Ukraine	3.9	4.7	5.3	5.7	4.2	3.3

Source: Own calculations based on data from Central Statistical Office [4].

Table 5

Poland's total imports (bn USD), 2010–2015

Specification	2010	2011	2012	2013	2014	2015
Total imports	178.1	212.3	198.4	208.8	225.9	197.7
Imports from Ukraine	1.8	2.8	2.6	2.2	2.3	1.7

Source: Central Statistical Office (various issues) [4].

TRADE BETWEEN POLAND AND UKRAINE AGAINST THE BACKGROUND OF POLAND'S TRADE WITH THE WORLD – VALUE AND DYNAMICS. Tables 4 and 5 present Poland's foreign trade volumes from 2010 to 2015. One can observe a significant rise of Poland's total exports between 2010 and 2011. In 2010, Poland's total exports amounted to USD 159.8 bn, and it increased to USD 190.2 bn in the next year. In 2012, Poland's total exports had slightly declined to USD 184.7 bn, but in a year there was an increase in total exports up to USD 222.3 bn. Unfortunately, the year 2015 marked a 10% reduction in Poland's total exports to USD 200.3 bn.

demonstrates a huge rise between 2010 and 2011, with a considerable downward tendency in the successive years. The Polish imports from Ukraine amounted to USD 1.82 bn in 2010 and it rose to USD 2.79 bn in 2011. The next years, however, did not bring further rise in Poland's imports from Ukraine as there was a considerable reduction to below USD 2.3 bn in 2013-2014. As of 2015, the value of Ukrainian goods on the Polish market was further reduced to USD 1.70 bn.

Table 6

Poland's trade balance, 2010–2015 (bn USD)

Specification	2010	2011	2012	2013	2014	2015
Trade balance	-18.3	-22.1	-13.8	-26.4	-35.6	27.6
Trade balance with Ukraine	2.1	1.9	2.7	3.5	1.9	1.6

Source: Central Statistical Office (various issues) [4].

As presented in Table 6, Poland registered trade deficit till the year 2014, with a peak at USD 22 bn in 2011. In 2012, trade deficit was reduced to USD 13.8 bn; and then to above USD 2.6 bn in 2013 and to USD 3.6 bn in 2014. The year 2015 was the very first one with trade surplus for Poland (USD 2.66 bn). When it comes to Poland's relations with Ukraine, the situation is completely different, with a trade surplus ranging from USD 1.6 bn in 2015 to USD 3.5 bn in 2013.

The share of Ukraine accounted for less than 3% of Poland's total exports (Table 7); with the maximum level at 2.86% in 2012 and the lowest one in 2015 at 1.65%. Ukraine's share in the Poland's total imports was even smaller ranging from 0.86% to 1.31%. The highest share of Ukraine in Poland's total imports was registered at 1.3% in 2011 and the lowest one at 0.86% in 2015.

2011 and the minimum one of -12.5% in 2015. The Polish imports from Ukraine increased by 1.84% on average (with its maximum in 2011 at as high as 53.5% and its minimum in 2015 at as low as -25.6%).

COMMODITY PATTERN OF POLAND'S TRADE WITH UKRAINE. Tables 9 and 10 present commodity pattern of Polish-Ukrainian trade as it is provided by CN sections. There were four leading sections in Poland's exports to Ukraine: XVI – Machinery and mechanical appliances, electrical and electrotechnical equipment, XV – Base metals and articles thereof, VI – Products of the chemical industry, VII – Plastics and rubber and articles thereof. On aggregate they accounted for about 53.4% in 2010 and about 47.2% in 2015. It is important, however, to note that the significance of sections XV, VI and VII has been gradually decreasing. It is worth

Table 7

The share of Ukraine in the Poland's foreign trade (%), 2010–2015

Specification	2010	2011	2012	2013	2014	2015
Share of Ukraine in Poland's total exports	2.45	2.46	2.86	2.77	1.89	1.65
Share of Ukraine in Poland's total imports	1.02	1.31	1.29	1.06	1.01	0.86

Source: Own calculations based on data from Central Statistical Office (various issues) [4].

Table 8

Dynamics of Poland's foreign trade (%), 2011–2015

Specification	2011	2012	2013	2014	2015
Total exports	19.1	-2.9	11.6	7.9	-9.91
Exports to Ukraine	19.7	12.5	8.4	-26.4	-21.5
Total imports	19.2	-6.5	5.2	8.2	-12.5
Imports from Ukraine	53.5	-8.5	-13.1	2.9	-25.6

Source: Own calculations based on data from Central Statistical Office (various issues) [4].

Dynamics of Poland's total trade and trade with Ukraine in particular is presented in Table 8. The average growth rate for Poland's exports equalled 5.16%, with its maximum at 19.1% in 2011 and the minimum of -9.9% in 2015. The average growth rate for Poland's exports to Ukraine amounted to -1.46%, being at its highest in 2011 (19.7%) and the lowest in 2014 (-26.4%). Poland's total imports increased by 2.72% on average, with the maximum rate amounting to 19.2% in

noting that Section XVI – Machinery and mechanical appliances, electrical and electrotechnical equipment alone represented almost 20% of Poland's exports to Ukraine in the analysed period. Three more sections should be mentioned as far as Poland's exports to Ukraine is concerned: V – Mineral products (its share ranged from 5% in 2010 to around 14.5% in 2015); XI – Textiles and textile articles (its share accounted for 5.5% to 6% in the analysed period); XVII – Transport

equipment (its share ranged from 5.6% in 2010 to more than 10% in 2012). The above mentioned seven CN sections represented more than 69% of Poland's exports to Ukraine in 2010 and they stood for around 76% of Poland's exports to the Ukrainian market in 2015.

On the imports side the following two sections were prevailing: V – Mineral products and XV – Base metals and products. Altogether they stood for 60% in 2010 and for more than 43% of Poland's imports from Ukraine in 2015.

In addition to that significant importance of four more sections for Poland's imports from Ukraine must be underlined:

- section II – Vegetable products (its share increased from 6.8% in 2010 to 10%-12% in 2012-2015);
- section IV – Prepared foodstuffs (it accounted for around 5% in 2010-2011 and for as much as 9.4% in 2015);
- section IX – Wood and articles of wood (till 2014 its share ranged from 5.1% to 8% while in 2015 it equalled 11.2%);
- section XVI – Machinery and mechanical appliances, electrical and electrotechnical equipment (its share ranged from 5.5% to 7.6% in the analysed period of time).

The above mentioned six CN sections stood for more than 86.5% of Poland's imports from Ukraine in

2010 and for around 83% of Poland's imports from Ukraine in 2015. The analysis of commodity pattern of Poland's imports from Ukraine implies that Poland imported from Ukraine mostly raw materials intensive goods (the only exception is Section XVI – Machinery and mechanical appliances etc.).

THE EVALUATION OF REVEALED COMPARATIVE ADVANTAGE OF POLISH GOODS ON THE UKRAINIAN MARKET. Export competitiveness can be measured with the application of a number of indices, including index of revealed comparative advantage [29; 15]. In order to determine the areas of revealed comparative advantage in Poland's trade with Ukraine, B.Balassa's formula was used:

$$RCA_{iy} = \frac{\frac{Ex_{iy}}{\sum Ex_{iy}}}{\frac{Im_{iy}}{\sum Im_{iy}}}$$

where: *i* is for commodity section, *y* is for the trade partner, Ex is for exports, Im is for imports. If RCA is higher than one, one may assume that the analysed country achieves comparative advantage in trade with *y* trade partner in case of commodity section *i*. [25; 1]. The results of calculations are presented in Table 11.

Table 9

Commodity pattern of Poland's exports to Ukraine, 2010–2015 (%)

CN Section	2010	2011	2012	2013	2014	2015
I	3.20	2.32	3.52	2.73	2.50	2.17
II	4.31	3.72	4.58	3.78	3.97	3.17
III	0.03	0.03	0.04	0.06	0.05	0.12
IV	4.34	4.37	4.02	4.05	4.87	4.53
V	5.05	5.36	9.07	11.10	11.89	14.53
VI	11.16	10.21	9.02	8.56	9.81	9.97
VII	11.59	11.24	9.92	9.46	10.26	10.54
VIII	0.56	0.96	0.95	1.12	1.45	1.92
IX	2.37	2.33	1.81	1.86	1.82	1.05
X	7.78	6.92	3.71	3.65	3.90	3.78
XI	5.55	5.50	5.38	5.96	6.63	6.14
XII	1.31	1.43	1.31	1.42	1.43	1.07
XIII	3.66	3.66	3.30	3.35	2.76	2.18
XIV	0.08	0.09	0.11	0.00	0.00	0.00
XV	11.84	10.88	9.11	8.92	9.24	8.51
XVI	18.84	19.06	17.46	18.45	18.54	18.23
XVII	5.63	8.86	10.11	8.76	5.07	8.12
XVIII	0.69	1.02	1.63	1.06	0.87	0.93
XIX	1.92	1.98	4.71	4.95	4.82	2.91
XX	0.08	0.03	0.22	0.64	0.00	0.00
XXI	0.01	0.01	0.01	0.11	0.13	0.12
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0

Description of CN sections: I – Animal products; II – Vegetable products; III – fats and oils; IV – Foodstuffs; V – Mineral products; VI – Chemicals; VII – Plastics and rubber products; VIII – Raw hides and skins; IX – Wood and products; X – Pulp of wood, paper etc.; XI – Textiles; XII – Footwear, headwear etc.; XIII – Articles of stone, ceramic products, glass; XIV – Pearls, precious stones and metals; XV – Base metals and products; XVI – Machinery and mechanical appliances etc.; XVII – Transport equipment; XVIII – Optical instruments etc.; XIX – Miscellaneous manufactured articles, XX – Works of art etc., XXI – Articles not classified elsewhere.

Source: Own calculations based on data from [4].

Table 10

Commodity pattern of Poland's imports from Ukraine, 2010–2015 (%)

CN Section	2010	2011	2012	2013	2014	2015
I	0.36	0.42	0.59	0.96	1.21	1.12
II	6.79	9.73	12.34	10.33	10.22	11.18
III	2.67	3.02	4.51	2.90	2.75	3.38
IV	5.31	4.91	8.37	6.78	7.05	9.39
V	35.26	28.93	24.76	28.49	22.25	16.69
VI	5.96	8.23	6.81	4.06	4.12	3.74
VII	0.51	0.89	0.36	0.34	0.52	1.09
VIII	0.41	0.33	0.29	0.71	0.69	0.39
IX	6.84	5.73	5.44	5.11	7.98	11.24
X	0.72	0.53	0.47	0.79	0.79	0.74
XI	0.71	0.35	0.46	0.47	0.94	1.41
XII	0.05	0.04	0.03	0.04	0.04	0.04
XIII	0.73	0.73	0.71	0.93	1.14	2.10
XIV	0.00	0.00	0.00	0.00	0.00	0.00
XV	24.79	28.56	28.20	30.99	30.52	26.74
XVI	7.61	6.54	5.11	5.48	6.94	7.56
XVII	0.49	0.50	0.54	0.37	0.51	0.52
XVIII	0.02	0.04	0.04	0.04	0.08	0.11
XIX	0.67	0.54	0.95	1.16	2.15	2.47
XX	0.11	0.00	0.01	0.01	0.00	0.00
XXI	0.02	0.01	0.00	0.05	0.08	0.09
TOTAL	100.00	100.00	100.00	100.00	100.00	100.00

Source: Own calculations based on data from Central Statistical Office (various issues) [4].

From 2010 to 2015 Poland gained comparative advantage in trade with Ukraine in the following twelve commodity sections: I – Live animals, animal products; VI – Chemicals; VII – Plastics and rubber and articles thereof; VIII – Raw hides and skins; X – Pulp of wood, paper, paperboard and articles thereof; XI – Textiles and textile articles; XII – Footwear, headwear and articles thereof; XIII – Articles of stone, ceramic products, glass; XVI – Machinery and mechanical appliances, electrical and electrotechnical equipment; XVII – Transport equipment; XVIII – Optical, photographic, measuring, checking instruments; XIX – Miscellaneous manufactured articles (furniture, toys).

INTENSITY OF INTRA-INDUSTRY TRADE IN POLISH-UKRAINIAN RELATIONS. Intra-industry trade constitutes an important element of international trade. Intra-industry trade means simultaneous export and import within the same industry [12; 21]. Intra-industry trade flows take a stand permanently; there are no mechanisms which would eliminate them [19]. Some economists claim that the more developed the economies the more intense intra-industry trade between them [7; 8]. The intensity of intra-industry trade in Polish-Ukrainian relations was measured with the application of Grubel–Lloyd's formula for IIT index:

$$IIT_i = \frac{(Ex_i + Im_i) - |Ex_i - Im_i|}{(Ex_i + Im_i)} = 1 - \frac{|Ex_i - Im_i|}{(Ex_i + Im_i)}.$$

IIT index ranges from zero to one. If IIT index is close to one strong intra-industry trade is observed, if it

is close to zero inter-industry trade is the case [3; 25]. The results of analysis are presented in Table 12.

There is an intensive intra-industry trade between Poland and Ukraine from 2010 to 2015 in the following CN sections: II – Vegetable products and IV – Processed foodstuffs. In addition to that one could observe a high intensity of intra-industry trade between Poland and Ukraine for section V – Mineral products since 2012. Also, from 2010 to 2013 intensive intra-industry trade for section IX – Wood and articles of wood had taken place. Last but not least, considerably high intensity of intra-industry trade (though with a downward tendency) for section XV – Base metals and products was observed from 2010 to 2015.

Conclusions. Favourable conditions for the development of Polish-Ukrainian economic co-operation are created by close geographical location, economic potential of the two economies and cultural similarities. However, the existing trade barriers in the EU-Ukraine relations adversely affected the development of Polish-Ukrainian trade co-operation, not to mention economic and political instability in Ukraine following the Russian annexation of Crimean Peninsula in 2014 and the ongoing aggression in the Eastern Ukraine.

Table 11

**Revealed comparative advantage in Poland's trade with Ukraine
from 2010 to 2015**

Section	2010	2011	2012	2013	2014	2015
I	8.95	5.51	5.97	2.85	2.06	1.93
II	0.64	0.38	0.37	0.37	0.39	0.28
III	0.01	0.01	0.01	0.02	0.02	0.04
IV	0.82	0.89	0.48	0.60	0.69	0.48
V	0.14	0.19	0.37	0.39	0.53	0.87
VI	1.87	1.24	1.33	2.11	2.38	2.67
VII	22.73	12.69	27.20	27.76	19.75	9.71
VIII	1.39	2.91	3.29	1.57	2.11	4.91
IX	0.35	0.41	0.33	0.36	0.23	0.09
X	10.85	13.18	7.84	4.63	4.95	5.09
XI	7.85	15.64	11.78	12.73	7.03	4.35
XII	24.96	33.81	42.32	36.77	32.00	24.30
XIII	5.05	5.03	4.63	3.61	2.42	1.04
XIV	134.55	166.64	70.58	-	-	-
XV	0.48	0.38	0.32	0.29	0.30	0.32
XVI	2.48	2.91	3.41	3.37	2.67	2.41
XVII	11.55	17.81	18.67	24.01	9.84	15.50
XVIII	27.75	28.52	44.01	26.95	10.76	8.65
XIX	2.87	3.70	4.96	4.26	2.24	1.18
XX	0.75	9.35	29.59	112.34	-	-
XXI	0.44	1.09	47.82	2.20	1.57	1.45

Source: Own calculations.

Table 12

**Intensity of intra-industry trade between Poland and Ukraine
from 2010 to 2015**

Section	2010	2011	2012	2013	2014	2015
I	0.10	0.20	0.15	0.24	0.42	0.42
II	0.84	0.78	0.87	0.97	0.84	0.71
III	0.04	0.04	0.04	0.10	0.06	0.13
IV	0.72	0.80	1.00	0.79	0.88	0.97
V	0.47	0.47	0.86	1.00	0.99	0.74
VI	0.40	0.65	0.53	0.31	0.37	0.32
VII	0.04	0.09	0.03	0.03	0.05	0.10
VIII	0.50	0.34	0.26	0.40	0.41	0.19
IX	0.85	0.81	0.82	0.97	0.59	0.31
X	0.08	0.09	0.12	0.15	0.20	0.18
XI	0.11	0.07	0.08	0.06	0.14	0.21
XII	0.04	0.03	0.02	0.02	0.03	0.04
XIII	0.17	0.21	0.19	0.19	0.36	0.66
XIV	0.01	0.01	0.01	-	-	-
XV	0.99	0.78	0.80	0.85	0.72	0.76
XVI	0.32	0.34	0.25	0.21	0.34	0.35
XVII	0.08	0.06	0.05	0.03	0.10	0.06
XVIII	0.03	0.04	0.02	0.03	0.10	0.11
XIX	0.28	0.28	0.18	0.17	0.39	0.61
XX	0.77	0.12	0.03	0.01	-	-
XXI	0.98	0.71	0.02	0.30	0.51	0.52

Source: Own calculations.

Poland does co-operate with Ukraine in many areas, merchandise trade being one of the most important fields of co-operation. The value of Poland's exports to Ukraine increased from USD 3.9 bn to USD 5.7 bn between 2010 and 2013, though it declined to USD 3.3 bn in 2015. Poland's imports from Ukraine rose from USD 1.8 bn in 2010 to USD 2.8 bn a year later, but a downward tendency has been observed since then. Poland used to have a significant surplus in trade with Ukraine, with the largest surplus being observed in 2013 at USD 3.5 bn. The share of Ukraine in Poland's total exports was close to 2.5% in 2010-2011, but later it was gradually reduced to 1.65% in 2015. Ukraine's share in Poland's total imports ranged from 0.86% in 2010 to 1.31% in 2011. Machinery, electrical equipment, metals, chemicals and plastics accounted for around 50% of Poland's exports to Ukraine. An even stronger concentration was observed in Poland's imports from Ukraine, as mineral products and metals represented 60% of imports in 2010 and more than 40% in 2015.

As implied by the Balassa's RCA index, Poland achieved revealed comparative advantage on the Ukrainian market in the following sections: I, VI, VII, VIII, X, XI, XII, XIII, XVI, XVII, XVIII and XIX, and especially in the sections VII, XII, XVII and XVIII. According to the Grubel-Lloyd's IIT index for Poland's trade with Ukraine, the greatest intensity of intra-industry trade was noted for the CN sections II and IV. It has been really high in the case of section V since 2012. For section IX, a high value of the Grubel-Lloyd's IIT index was noted for the years 2010-2013. As for the section XV, a high intensity of intra-industry trade in Polish-Ukrainian relations was observed either, though with a downward tendency.

It seems that there is still some potential for strengthening Polish-Ukrainian co-operation. The EU-Ukraine Deep and Comprehensive Free Trade Area finally started up on 1 January 2016. It is expected to help Ukraine integrate its economy with Europe by opening up markets and harmonising regulations. Undoubtedly it will stimulate the development of Polish-Ukrainian trade. But the number one barrier for Polish-Ukrainian co-operation is political and economic instability and uncertainty in Ukraine and in its international environment. Future research should focus on a more detailed analysis of Polish-Ukrainian trade relations. Future research should also embrace trade in commercial services and FDI flows between Poland and Ukraine.

REFERENCES

1. Benedictis, L., Tamberi, M. (2001), "A Note on the Balassa Index of Revealed Comparative Advantage". [Cited 20.11.2016.] Available online: <http://docs.dises.univpm.it/web/quaderni/pdf/158.pdf>.
2. Borowiec, J. (2011), *Ekonomia integracji europejskiej*. Wrocław: Wydawnictwo Uniwersytetu Ekonomicznego we Wrocławiu, 566 p.
3. Budnikowski, A. (2003), *Międzynarodowe stosunki gospodarcze*, Warszawa: Polskie Wydawnictwo Ekonomiczne, 421 p.
4. Central Statistical Office (2011-2016), *Yearbook of Foreign Trade Statistics of Poland (various issues)*. Warsaw: Central Statistical Office.
5. CIA World Factbook (2016a), Poland. [Cited 15.12.2016.] Available online: <https://www.cia.gov/library/publications/the-world-factbook/geos/pl.html>.
6. CIA World Factbook (2016b), Ukraine. [Cited 15.12.2016.] Available online: <https://www.cia.gov/library/publications/the-world-factbook/geos/up.html>.
7. Czarny, E. (2003), Intra-Industry Trade – Do We Really Know What It Is? In: "European Trade Study Group" (ETSG), 2003. [Cited 20.10.2016] Available online: <http://www.etsg.org/ETSG2003/papers/czarny.pdf>.
8. Davis, D.R. (1995), Intra-industry trade: A Heckscher-Ohlin-Ricardo approach, "Journal of International Economics", vol. 39, issue 2, pp. 201-226.
9. Fomina, J., Konieczna-Salamatin, J., Kucharczyk, J., Wenerski, Ł. (2013), *Polska-Ukraina. Polacy-Ukraińcy – Spojrzenie przez granicę*, Warszawa: Instytut Spraw Publicznych, 91 p.
10. Gradzewicz, M., Hagemeyer, J., Żółkiewski, Z. (2011), *Globalization and the Polish economy: stylized facts and simulations using a Computable General Equilibrium Model*, MPRA PAPER No. 28228, [Cited 20.11.2016.] Available online: <https://mpra.ub.uni-muenchen.de/28228/>.
11. IMD (2010-2016), *IMD World Competitiveness Yearbook (various issues)*, Lausanne: IMD.
12. Kawecka-Wyrzykowska, E. (2009), Evolving pattern of foreign trade specialization of the new Member States (NMS) of the EU: role of foreign direct investments – case of automotive industry, "European Economy. Economic Papers", No. 364, March 2009, Brussels: European Commission, pp. 1-38.
13. Kołodziejczyk, K. (2016), Poland in the European Union. Ten years of membership, "Revista UNISCI / UNISCI Journal", No. 40 (Enero / January 2016), pp. 9-26.
14. Krugman, P.R., Obstfeld, M. (2007), *Ekonomia Międzynarodowa. Teoria i polityka. Tom 1*, Warszawa: PWN, 418 p.
15. Laursen, K. (2015), Revealed comparative advantage and the alternatives as measures of international specialization, "Eurasian Business Review", vol. 5, issue 1, pp. 99-115.
16. Lewandowska, A., Inglot-Brzęk, E., Harasym, R. (2014), Determinants of Polish Exports to the Ukrainian Market, "Barometr Regionalny", Volume 12, No. 3, pp. 7-15.
17. Małuszyńska, E. (2009), *Nowe państwa członkowskie Unii Europejskiej. Gospodarka, regiony, lobbying. Doświadczenia pierwszych lat członkostwa*, Poznań: Wydawnictwo Uniwersytetu Ekonomicznego w Poznaniu, 271 p.
18. Milleville, J. (2009), Wpływ integracji ekonomicznej na handel ugrupowania regionalnego na przykładzie Unii Europejskiej, "Barometr Regionalny", No. 2 (16), pp. 55-69.
19. Molendowski, E. (2006), Handel wewnątrzgałęziowy krajów CEFTA z państwami Unii Europejskiej, "Gospodarka Narodowa", Nr 5-6, pp. 75-91.

20. Moussis, N. (2015), *Access to the European Union. Law, Economics, Policies*, Cambridge-Antwerp-Portland: Intersentia, 770 p.
21. OECD (2010), Intra-industry trade, In: "Measuring Globalisation: OECD Economic Globalisation Indicators 2010", Paris: OECD Publishing, 232 p.
22. Official Journal of the European Communities (1998): 19.2.1998 - *Partnership and Cooperation Agreement between the European Communities and their Member States, and Ukraine*, 37 p. [Cited 20.12.2016.] Available online: <http://ec.europa.eu/world/agreements/downloadFile.do?fullText=yes&treatyTransId=659>.
23. Pawlas, I. (2011), Polska prezydencja w Unii Europejskiej. uwarunkowania, priorytety, stan przygotowań, In: *Integracja i globalizacja w wybranych dziedzinach współczesnego życia gospodarczego*, ed. T. Sporek, Katowice: Wydawnictwo Uniwersytetu Ekonomicznego, pp. 387-407.
24. Pawlas, I. (2014), *Rozwój polskiej gospodarki na tle pozostałych krajów Unii Europejskiej w okresie niestabilności w gospodarce światowej*, Katowice: Wyd. UE w Katowicach, 266 p.
25. Pluciński, E.M. (2015), *Konkurencyjność strukturalno-czynnikowa polskiego handlu na rynku UE w latach 2002-2012*. Kraków: Oficyna Wydawnicza AFM, 340 p.
26. UNCTAD (2016a): *Country Fact Sheet: Poland*. [Cited 20.11.2016.]. Available online: http://unctad.org/sections/dite_dir/docs/wir2016/wir16_fs_pl_en.pdf.
27. UNCTAD (2016b): *Country Fact Sheet: Ukraine*. [Cited 15.12.2016.]. Available online: http://unctad.org/sections/dite_dir/docs/wir2016/wir16_fs_ua_en.pdf.
28. WEF (2010-2016): *The Global Competitiveness Report (various issues)*, Geneva: WEF.
29. Wydymus, S., Bombińska, E., Pera, B. (2012), *Bezpośrednie inwestycje zagraniczne a konkurencyjność eksportu Polski*, Warszawa: CeDeWu, 227 p.
30. WTO (2016a): *Trade Profile – Poland*. [Cited 15.12.2016.]. Available online: <http://stat.wto.org/CountryProfile/WSDBCountryPFView.aspx?Language=E&Country=PL>.
31. WTO (2016b): *Trade Profile – Ukraine*. [Cited 15.12.2016.]. Available online: <http://stat.wto.org/CountryProfile/WSDBCountryPFView.aspx?Language=E&Country=UA>.