

УДК 339.9

## **BILATERAL TRADE INTENSITY BETWEEN AZERBAIJAN AND POLAND (2003-2016 PERIOD)**

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### **Abstract**

The main purpose of this study is to determine intensity and range of trade between Poland and Azerbaijan. The study is an attempt to analyze strength of bilateral trade during the period from 2003 to 2016 by using such indexes as trade intensity, export intensity and import intensity. We put forward the thesis that there is a large potential for economic exchange between the two countries.

**Keywords:** bilateral trade intensity, trade relation between Azerbaijan and Poland, Trade intensity Index, Export intensity Index, Import intensity Index.

## **ДВУСТОРОННЯЯ ТОРГОВАЯ ИНТЕНСИВНОСТЬ МЕЖДУ АЗЕРБАЙДЖАНОМ И ПОЛЬШЕЙ (2003-2016 гг.)**

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### **Аннотация**

Основная цель данного исследования – определить интенсивность и диапазон торговли между Польшей и Азербайджаном. Исследование представляет собой попытку проанализировать силу двусторонней торговли в период с 2003 по 2016 г. с использованием таких показателей, как интенсивность торговли, интенсивность экспорта и интенсивность импорта. Мы выдвигаем тезис о том, что существует большой потенциал для экономического обмена между двумя странами.

**Ключевые слова:** интенсивность двусторонней торговли, торговые отношения между Азербайджаном и Польшей, индекс интенсивности торговли, индекс интенсивности экспорта, индекс интенсивности импорта.

## **АЗЕРБАЙДЖАН МЕНЕН ПОЛЬШАНЫН ОРТОСУНДАГЫ ЭКИ ТАРАПТУУ СООДА МАМИЛЕЛЕРИ (2003-2016-жж.)**

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### **Кыскача мүнөздөмө**

Изилдөөнүн негизги максаты Польша жана Азербайжандын ортосундагы соода тыгыздыгын аныктоо. Изилдөөнүн жүрүшүндө 2003-жылдан тартып 2016-жылга чейинки мезгил ичинде соода тыгыздыгы, экспорт жана импорттун тыгыздыгынын көрсөткүчтөрүн колдонуу менен эки тараптуу соода күчүн анализдөө болуп саналат. Жыйынтыгында эки

өлкөнүн ортосундагы экономикалык алмашуу үчүн зор мүмкүнчүлүктөр бар экениндиги сунуш кылынды.

**Негизги сөздөр:** эки тараптуу соода тыгыздыгы, Польша жана Азербайджан эки өлкө ортосундагы соода-сатык, соода тыгыздыгынын индекси, экспорт тыгыздыгынын индекси, импорт тыгыздыгынын индекси.

### **Introduction**

Bilateral relations between Azerbaijan and Poland have long-established historical roots. Very interesting is the fact that the first commercial contacts dates back to the 15th century when the ruler of Aq Qoyunlu Uzun Hassan established diplomatic relations with Polish king Jogaila ([www.wspolnota-polska.org.pl](http://www.wspolnota-polska.org.pl), accessed: 01.05.2018). From that time Polish capital and engineering staff can played a important role in the development of the oil industry in Baku in the late 19th and early 20th centuries (Eliyev, 4th. October 2017; 8). Poland recognized the independence of the Republic of Azerbaijan on 27<sup>th</sup> December 1991 (Arastu Habibbeyli, 2017: 29-48) and then bilateral diplomatic relations between Poland and Azerbaijan were established on 21st February 1992. The Polish embassy was opened in Azerbaijan in 2001 and the Azerbaijani embassy in Poland in 2004 respectively ([www.baku.msz.gov.pl](http://www.baku.msz.gov.pl), accessed: 01.05.2018). In order to increase development and cooperation between two countries high level visits and meetings has been organised, as well as inter-parliamentary relations, economic and humanitarian cooperation has been conducted. On August 26-28, 1997, while President of the Republic of Azerbaijan Heydar Aliyev visited officially the Polish President Aleksander Kwasniewski, both of presidents made discussions on the development of bilateral relations and international situation, and then have signed documents named "Declaration on the development of friendly relations and cooperation between the two countries", "Convention on elimination of double taxation and evasion of payment of incomes and estate taxes", "Protocol on cooperation between the ministries of foreign affairs of the two countries", "Agreement on cultural and scientific cooperation", "Agreement on mutual encouragement and protection of investments", "Agreement in the sphere of civil transportation", and "Agreement on cooperation in the sphere of tourism" on friendship and cooperation between the Republic of Azerbaijan and the Republic of Poland. Later, President of Azerbaijan Ilham Aliyev and President of Poland Lech Kaczynski signed the Regulations of the "Counsel Committee of the presidents of the Republic of Azerbaijan and the Republic of Poland"; subsequently "Protocol of intention" between the State Oil Company of Azerbaijan and "Grupa Lotos" joint stock company of Poland, and "Cooperation schedule for 2009-2010" between the Security Council of Azerbaijan and National Security Bureau of Poland were signed as well. Thus the relationship between both of countries have been continuing all over sectors (<http://library.aliyev-heritage.org/en/7202360.html>, accessed: 01.05.2018). On the basis of signed agreements and contracts an extremely important project was created: Odessa-Brodi-Plock-Gdansk oil pipeline, worth 2 million euros, through which from central Asia via Baku to Gdansk crude oil will be carried. So, contacts between the two countries have a long history and have recently gone to the strategic stage of development.

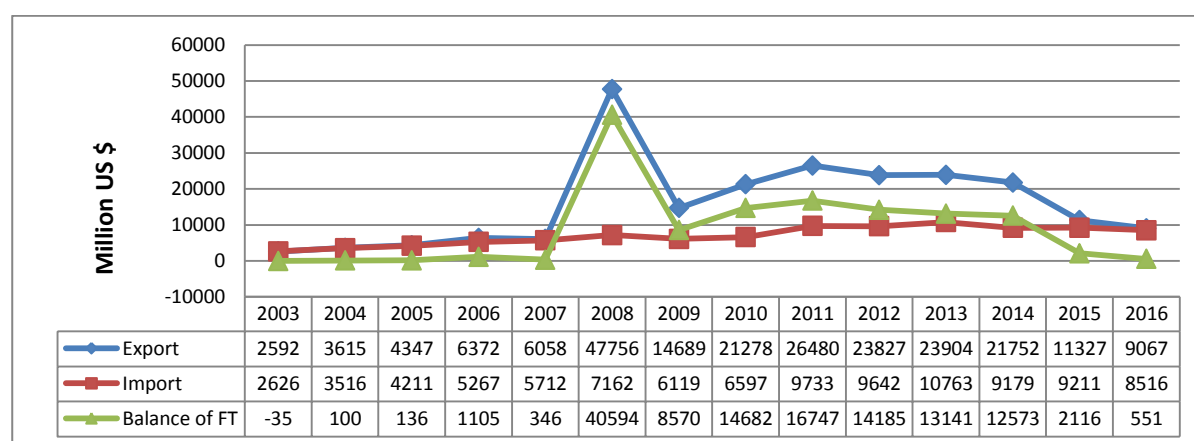
### **1. View of Azerbaijan - Poland Foreign Trade Relation**

In 2016 the top 5 countries that have exported to Azerbaijan there were Russian Federation, Turkey, China, the USA and Italy, and the top 5 countries have imported from Azerbaijan there were Italy, Turkey, Taiwan, Israel, and Germany ([www.stat.gov.az](http://www.stat.gov.az), accessed: 02.01.2018). The total export and import, trade volume and balance of Azerbaijan with the world between 2003 and 2016 are shown in the table 1.

According to data in table 1, during the period of 2003-2016 Azerbaijan's total export to the world has increased 3,5 times, and the total import has increased to 3,2 times. Moreover total foreign trade turnover has increased 3.3 times over the analysed years. In 2008, Azerbaijan's export to the world has reached the highest level of 47 million USD and there are two reasons of the increase in Azerbaijan`s exports in 2008: Firstly, increase in crude oil prices in the world market ([www.statista.com](http://www.statista.com), accessed: 01.05.2018) namely that 97% of the export of Azerbaijan has

consisted of petroleum oils and oils obtained from bituminous minerals, crude in the year. Secondly, increase in some countries' demand for petroleum oils and oils obtained from bituminous minerals, crude. it has increased volume of import for petroleum oils and oils obtained from bituminous minerals, crude of Italy from \$641,875 thousand to \$19,010,827 thousand, of Israel from \$277,628 thousand to \$3,417,675 thousand, of Indonesia from \$390,282 thousand to \$1,411,071 thousand, of India from \$144,855 thousand to \$2,431,586 thousand, of France from \$152,703 thousand to \$2,280,556 thousand, of Spain from \$39,816 thousand to \$1,481,865 thousand, of Netherlands from \$0 thousand to \$1,326,881 thousand, of United States of America from \$211,427 thousand to \$5,971,556 thousand, and of some other countries in 2008 compared to 2007 (www.trademap.org, accessed: 01.05.2018).

Table 1. Azerbaijan's Total Foreign Trade with the World (Million USD)



Source: Calculated by authors, www.comtrade.un.org, (accessed: 02.01.2018).

Table 2. Azerbaijan's Top 10 Products with the World (Million \$)

Product Label Exported Azerbaijan	2003	2016	Total	Ratio %	Product Label Imported Azerbaijan	2003	2016	Total	Ratio %
All products	2592	9067	223065	100	All products	2626	8516	98254	100
Mineral fuels, mineral oils and products of their distillation; bituminous substances; mineral	2229	7956	206564	92,6	Machinery, mechanical appliances, nuclear reactors, boilers; parts thereof	491	1435	19997	20,4
Edible fruit and nuts; peel of citrus fruit or melons	43	244	2044	0,9	Articles of iron or steel	386	852	8616	8,8
Animal or vegetable fats and oils and their cleavage products; prepared edible fats; animal	41	17	1729	0,8	Electrical machinery and equipment and parts thereof; sound recorders and reproducers, television	194	579	8188	8,3
Sugars and sugar confectionery	0	62	1669	0,7	Vehicles other than railway or tramway rolling stock, and parts and accessories thereof	113	252	7927	8,1
Plastics and articles thereof	34	99	1335	0,6	Cereals	116	345	4000	4,1
Ships, boats and floating structures	3	44	1133	0,5	Iron and steel	71	266	3333	3,4

Aluminium and articles thereof	26	98	890	0,4	Mineral fuels, mineral oils and products of their distillation; bituminous substances; mineral ...	296	274	3246	3,3
Edible vegetables and certain roots and tubers	6	129	804	0,4	Tobacco and manufactured tobacco substitutes	18	153	2782	2,8
Articles of iron or steel	3	57	707	0,3	Optical, photographic, cinematographic, measuring, checking, precision, medical or surgical	52	183	2579	2,6
Commodities not elsewhere specified	3	5	649	0,3	Plastics and articles thereof	52	282	2555	2,6
Rest of Products	204	356	5542	2,5	Rest of Products	837	3894	35032	35,7

Source: Calculated by authors, [www.trademap.org](http://www.trademap.org), (accessed: 02.01.2018).

\*Total - Total Volume of products between 2003-2016.

\*\* Ratio - Ratio by product type to Total Volume between 2003-2016.

In 2011-2012, import of Azerbaijan from the world have reached the highest level of \$ 9,7 million which was consisted of machines and electrical machinery, equipment and parts thereof. In 2008, balance of foreign trade has jumped from \$35 million deficit to \$40594 surplus million and After 2012 at the following years due to the decrease in crude oil prices in the world market, the decline in the volume of export in Azerbaijan decreased and thus the trade balance decreased. it has been \$551 million dollars in 2016.

List of the 10 products forming the main of import and export of Azerbaijan with the world between 2003- 2016 are shown in the table 2.

Each country offers key export products - in the case of Azerbaijan 97,4% of the top 10 products forming export during period 2003-2016 contained of mineral fuels, mineral oils and products of oil distillation. The data show that except oil products ratio, the rest of top 9 products has been less than 1%. On the other hand, the top 10 products forming the import of Azerbaijan from the world contains in 64% of iron or steel articles and machineries and vehicles; the rest encircles nuclear reactors, appliances, boilers, railways or tramways rolling stock and parts thereof.

The top 5 partner countries that have exported to Poland in 2016 have been Germany, China, Russian Federation, Italy and France, while the top 5 countries which have imported from Poland

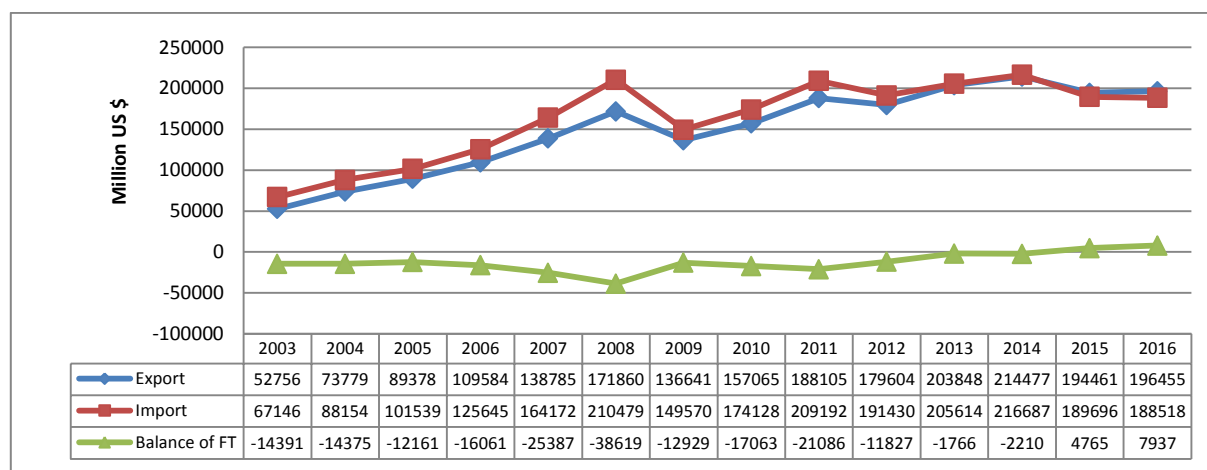
have been Germany, United Kingdom, Czech Republic, France and Italy ([www.stat.gov.pl](http://www.stat.gov.pl), accessed: 03.01.2018). The total export and import, trade volume and balance of Poland with the world between 2003 and 2016 are shown in the table 3.

Poland's export and import has generally followed increase in parallel. According to data in table 3, during the period of 2003-2016 Poland's total export has increased 3,7 times and the total import has increased 2,8 times. Moreover, total foreign trade value have increased 3,2 times over the analysed years. In 2008, Poland's export has ranged between \$52,756-214,477 million and import has ranged between \$67,146-216,687 million. For many years Poland's import have been bigger than export, but after 2015 we can observe surplus of exports over imports and a positive trade balance.

In case of Poland, the list of the 10 the most valuable products forming import and export between 2003-2016 is shown in the table 4.

It is worth emphasizing that the top 10 products forming export and import of Poland contains about 62-63%. On the other hand, the most often goods imported to Poland were again products from the category machinery, mechanical appliances, nuclear reactors, boilers. The total export and import, trade volume and balance of trade exchange abtween Azerbaijan and Poland in 2003-2016 are shown in the table 5.

Table 3. Poland's Total Foreign Trade with the World (Million \$)



Source: Calculated by authors, [www.comtrade.un.org](http://www.comtrade.un.org), (accessed: 03.01.2018).

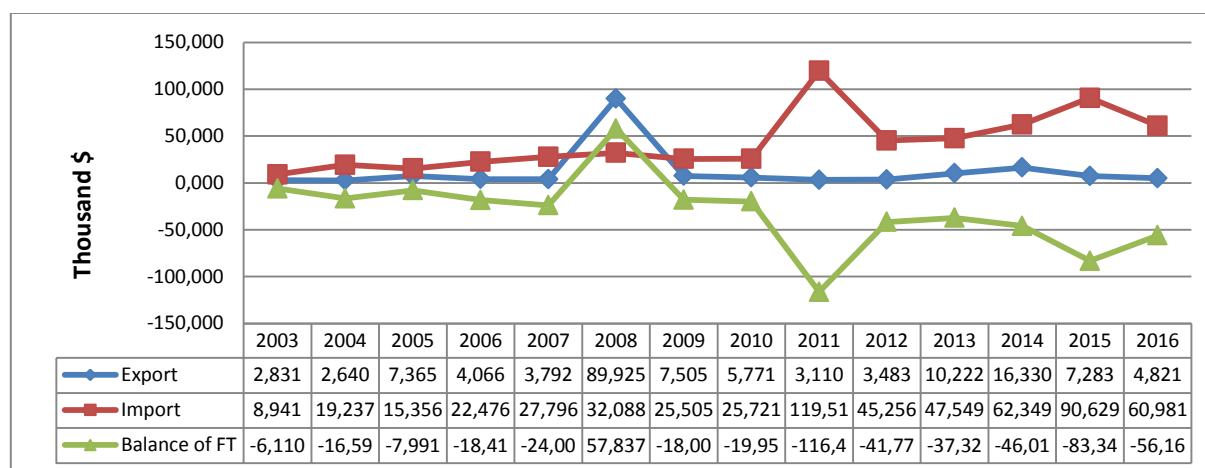
Table 4. Poland's Top 10 Products with the World (Million USD)

Product label Exported Poland	2003	2016	Total	Ratio %	Product label	2003	2016	Total	Ratio %
All products	52,8	196,5	2106,8	100	All products	67,1	188,5	2282,0	100
Machinery, mechanical appliances, nuclear reactors, boilers; parts thereof	6,0	25,8	265,3	12,6	Machinery, mechanical appliances, nuclear reactors, boilers; parts thereof	10,0	23,7	296,3	13,0
Vehicles other than railway or tramway rolling stock, and parts and accessories	5,3	24,0	259,7	12,3	Electrical machinery and equipment and parts thereof; sound recorders and reproducers, television ...	6,9	23,8	257,3	11,3
Electrical machinery and equipment and parts thereof; sound recorders	5,9	22,5	248,7	11,8	Vehicles other than railway or tramway rolling stock, and parts and accessories thereof	6,9	18,7	200,1	8,8
Furniture; bedding, mattresses, mattress supports, cushions and similar stuffed	4,1	11,8	120,8	5,7	Mineral fuels, mineral oils and products of their distillation; bituminous substances; mineral	6,2	11,8	238,8	10,5
Plastics and articles thereof	1,7	9,2	88,9	4,2	Plastics and articles thereof	4,1	11,3	130,4	5,7
Articles of iron or steel	2,2	5,9	75,4	3,6	Iron and steel	1,9	6,6	89,5	3,9
Mineral fuels, mineral oils and products of their distillation; bituminous substances;	2,3	5,0	87,5	4,2	Pharmaceutical products	2,3	5,5	66,7	2,9
Iron and steel	1,3	3,3	54,0	2,6	Articles of iron or steel	1,8	4,6	59,0	2,6
Rubber and articles thereof	1,1	4,6	49,4	2,3	Optical, photographic, cinematographic,	1,2	4,2	53,8	2,4

					measuring, checking, precision, medical or surgical				
Meat and edible meat offal	0,6	4,3	38,6	1,8	Paper and paperboard; articles of paper pulp, of paper or of paperboard	2,0	4,0	51,6	2,3
Rest of Products	20,1	80,7	801,9	38,1	Rest of Products	23,8	74,3	838,5	36,7

Source: Calculated by authors, [www.comtrade.un.org](http://www.comtrade.un.org), (accessed: 04.01.2018).

Table 5. Azerbaijan's Bilateral Trade with Poland (Thousand \$)



Source: Calculated by authors, [www.comtrade.un.org](http://www.comtrade.un.org), (accessed: 04.01.2018).

According to data in table 5, during the period of 2003-2016 Azerbaijan's total export to Azerbaijan increased about 70% and the total import from Azerbaijan has increased 6,7 times. In turn, total foreign trade value between Azerbaijan and Poland has increased 3,2 times over the last years. Statistical data show that value of Azerbaijan's import from Poland has increased from \$8,941 to \$60,981 thousand and trend curve in 2011 has been maximum by \$119,510 thousand. Azerbaijan's import of machinery, mechanical appliances, nuclear reactors, boilers and parts thereof have increased from \$6,792 to \$63,12 thousand and of electrical machinery and equipment and parts thereof; sound recorders and reproducers, television have increased from \$0,950 to \$23,746 thousand in 2011 compared to 2010. Azerbaijan's export to Poland has been minimal \$2,640 thousand 2004 and maximum \$89,925 in 2008 thousand. In general Azerbaijan's export to Poland has been less than expected, except 2008. Azerbaijan's export of mineral fuels, mineral oils and products of their distillation; bituminous substances; mineral and organic chemicals have increased respectively from \$0 to \$85,61 thousand and from \$0 to \$2,447 thousand in 2008 compared to 2007 ([www.trademap.org](http://www.trademap.org), accessed: 01.05.2018). Azerbaijan's trade balance with Poland has been changeable and deficit, except of 2008. In 2008, surplus of Azerbaijan's trade balance has been \$57,837 thousand.

List of the 10 products forming the main trade exchange between Azerbaijan and Poland in 2003-2016 are shown in the table 6.

Top 10 products forming the main export of Azerbaijan to Poland that these contains about 99% and what of more 51% of the total products exported to Poland has consisted of mineral fuels, mineral oils and products of their distillation and bituminous substances that the volume has been variable during period 2003-2016. Respectively in the second and third place organic chemicals, edible fruit and nuts, peel of citrus fruit or melons exported have followed and have contained 26,4% and 15,8% of total export. The data show that except the 3 products, ratio of the rest of total products exported has been about 7%. According to analysis Azerbaijan's economy and export seems to be dependent on mineral fuels, mineral oils and products of their distillation and

bituminous substances being the only type of product. The top 10 products forming the main of total import of Azerbaijan from Poland that these contains about 81,8% and rest of products have been 28,2%. Machinery, mechanical appliances, nuclear reactors, boilers, electrical machinery and equipment, pharmaceutical products, articles of iron or steel and parts thereof being the most imported products from the world has consisted of 27%, 12%, 8% and 6% of total import respectively and ratio of the top 4 of products at total import of Azerbaijan from Poland has been about 45%.

Table 6. Azerbaijan's Top 10 Products with Poland (Thousand \$)

Product Label Exported Azerbaijan	2003	2016	Total	Ratio %	Product label Imported Azerbaijan	2003	2016	Total	Ratio %
All products	2831	4821	169144	100	All products	8941	60981	603401	100
Mineral fuels, mineral oils and products of their distillation; bituminous substances; mineral ...	0	12	86964	51,4	Machinery, mechanical appliances, nuclear reactors, boilers; parts thereof	1533	6517	165182	27,4
Organic chemicals	1027	1748	44639	26,4	Electrical machinery and equipment and parts thereof; sound recorders and reproducers	538	5377	73069	12,1
Edible fruit and nuts; peel of citrus fruit or melons	1025	2307	26708	15,8	Pharmaceutical products	216	2569	46822	7,8
Preparations of vegetables, fruit, nuts or other parts of plants	23	362	5393	3,2	Articles of iron or steel	637	4755	39470	6,5
Machinery, mechanical appliances, nuclear reactors, boilers; parts thereof	746	81	1781	1,1	Paper and paperboard; articles of paper pulp, of paper or of paperboard	301	340	27843	4,6
Plastics and articles thereof	0	105	1175	0,7	Preparations of cereals, flour, starch or milk; pastrycooks' products	776	4403	18844	3,1%
Inorganic chemicals; organic or inorganic compounds of precious metals, of rare-earth	0	0	567	0,3	Wood and articles of wood; wood charcoal	1070	1632	16436	2,7
Furniture; bedding, mattresses, mattress supports, cushions and	0	0	459	0,3	Miscellaneous manufactured articles	3	1393	16286	2,7

similar stuffed furnishings									
Beverages, spirits and vinegar	0	31	308	0,2	Essential oils and resinoids; perfumery, cosmetic or toilet preparations	220	7284	15199	2,5
Aluminium and articles thereof	0	91	239	0,1	Tools, implements, cutlery, spoons and forks, of base metal; parts thereof of base	6	1641	14105	2,3
Rest of Products	10	84	911	0,5	Rest of Products	3641	25070	170145	28,2

Source: Calculated by authors, [www.comtrade.un.org](http://www.comtrade.un.org), (accessed: 04.01.2018).

## 2. Literature Review

We will research the literature about the 3 indexes - trade intensity index, export intensity index and import intensity index we have used when conducting the literature review. We will research trade intensity index which measures the bilateral trade intensity there are many international studies.

In the study researched by Anurag Anand and Krishna Garg in 2016, it has been analyzed that India's Trade Intensity with UAE between 1991-2014 and examined the overview of their trade relations. This study reveals that whether India's trade with UAE is more or less than the world does on average (Anurag Anand, Krishna Garg, 2016: 22-28). Sabaruddin and Nugrahaningsi has examined Indonesia-Chile bilateral trade intensity and has measured with trade intensity index for 1989-2012 period (Sabaruddin, Nugrahaningsi, 2013: 49). Lisandra Patrice Colley has examined the evolution of bilateral trade using trade intensity indices between the Caribbean Community (CARICOM) and China between 2004-2013 in order to quantitatively estimate trade potential (Lisandra Patrice Colley, 2015: 104-119). In the study by Bhattacharyay and Mukhopadhyay in 2015, trade intensity between India and Japan has been analyzed using trade intensity index for 1990-2009 period (Bhattacharyay ve Mukhopadhyay, 2015: 97). This study has aimed to investigate trend of bilateral trade between Turkey and Israel, with using trade intensity index values for 1995-2014 period. The study has revealed that whether Turkey's trade with Israel is more or less than the world on average (Miraç Yazıcı, 2016: 103-115) The aim of the study examined by Nevzat Şimşek and Others is to represent sector based trade information between Turkey and Russia in order to provide a comprehensive analysis of bilateral trade of the two countries between 1992-2010 (Nevzat Şimşek and Others, 2017: 1-26). Trade intensity indices have been calculated bilateral trade between India and Japan for the period from 2001 to 2011. Both countries' bilateral trade relationship described in terms of intensity indices shows to identify how intensively the countries are trading with each other (Sundar Raj & Ambrose, 2014: 1-28).

## 3. Research Method and Data

In this study, for the period from 2003 to 2016 under Ilham Aliyev's presidency bilateral trade relations between Azerbaijan and Poland were investigated. Data was collected from UNCOMTRADE statistics database and trade statistics for international business development for the period from 2003 to 2016. To order to analyze bilateral trade relations between Azerbaijan and Poland, trade intensity index, export intensity index and import intensity index are used in the



study. Between 2003 and 2016, trade intensity index, export intensity index and import intensity index by using data of exports and imports of these countries for measuring of intensification of bilateral trade levels and relations between Azerbaijan and Poland are tried to be determined.

In order to analysis trade, import and export intensity indices between Azerbaijan and Poland from 2003 to 2016, data used in the study are seemed in the following table 7.

Table 7. Bilateral trade Volumes between Azerbaijan and Poland

	Azerbaijan's export to Poland	Azerbaijan's import from Poland	Azerbaijan's export to world	Azerbaijan's import from World	Poland's export to World	Poland's import from World	World total export	World total import
2003	4,611	26,712	2,591,719	2,626,427	52,755,502	67,146,113	7,486,202,969	7,701,147,992
2004	7,078	45,337	3,615,450	3,515,861	73,778,928	88,154,397	9,099,996,891	9,392,556,197
2005	11,062	52,533	4,347,151	4,211,207	89,378,069	101,538,809	10,340,808,338	10,608,314,856
2006	6,487	69,896	6,372,165	5,266,744	109,584,113	125,645,308	11,956,245,297	12,260,317,052
2007	4,449	69,361	6,058,319	5,712,178	138,784,983	164,172,482	13,785,800,756	14,099,299,811
2008	167,174	104,925	47,756,229	7,161,847	171,859,898	210,478,513	15,976,458,177	16,348,916,641
2009	10,295	82,892	14,688,728	6,119,060	136,641,305	149,569,836	12,348,789,149	12,628,046,381
2010	10,365	134,277	21,278,420	6,596,797	157,064,948	174,127,590	15,092,232,380	15,316,947,985
2011	4,324	126,3	26,480,189	9,732,869	188,105,090	209,191,546	18,079,139,500	18,303,306,874
2012	4,333	122,826	23,827,186	9,641,724	179,603,599	191,430,112	18,391,910,328	18,494,109,901
2013	20,055	129,365	23,904,108	10,763,392	203,847,918	205,613,793	18,877,617,021	18,881,222,168
2014	31,384	140,309	21,751,737	9,178,588	214,476,794	216,687,292	18,861,782,278	18,878,915,192
2015	14,208	120,851	11,326,841	9,211,126	194,461,157	189,696,474	16,405,186,866	16,561,037,420
2016	41,585	60,458	9,066,506	8,515,807	196,455,270	188,517,819	15,952,214,723	16,053,620,150

Source: Calculated by authors, [www.trademap.org](http://www.trademap.org), (accessed: 05.01.2018).

### 3.1. Trade Intensity Index

The simple approach called trade intensity index was developed by Brown (1949) and then was revised and improved by Kojima (1964). The trade intensity index has been used to measure the share of one country comparing their trade with other country. It demonstrates whether the country exports more to its partner country than the world on average (Brown 1949, Kojima 1964: 19).

#### Mathematical definition

The Trade intensity index used between Azerbaijan and Poland in the analysis ( $TII_{ijt}$ ) is defined as follows: (Yamazawa, 1970:62)

$$TII_{ijt} = \frac{(X_{ij} / X_{it})}{(X_{wj} / X_{wt})}$$

$TII_{ijt}$ - Trade intensity index of Azerbaijan with Poland

$X_{ij}$  - Exports of country i to country j       $X_{it}$  - Total exports of country i to the world

$X_{wj}$  - Total exports of country j to the world       $X_{wt}$  - Total world exports

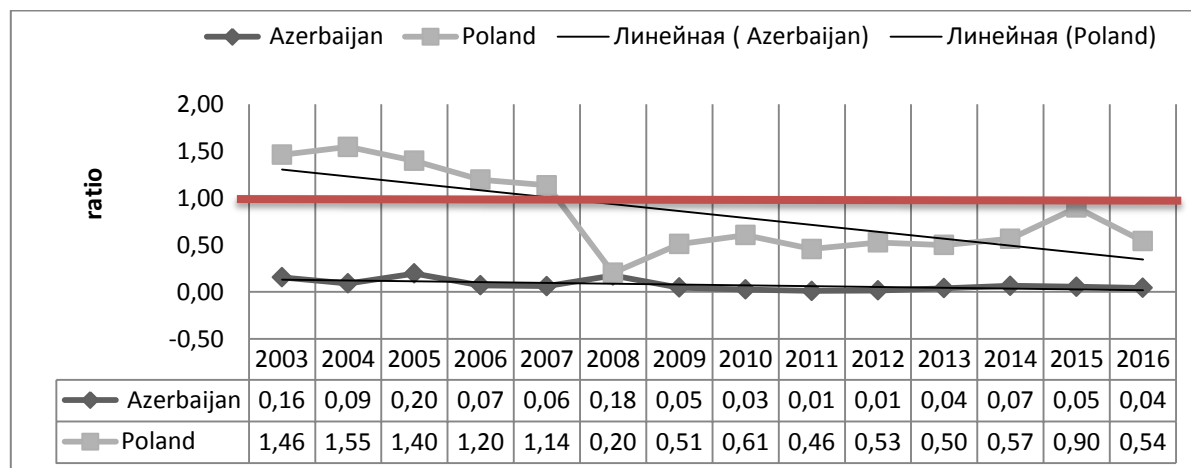
Trade intensity index value varies between  $0 < TII < 1$ . If the value is  $TII = 0$ , there is not bilateral relationship between the countries and if the value is  $TII = 1$  or near 1, it demonstrates to have balanced trade relations and performance is significant. If the value is between  $0 < TII < 1$ , it is indicated that country i's trade with other country is less than on the average of the world and vice versa and If TII is higher than 1 ( $TII > 1$ ), it is indicated that country i's trade with other country is higher than on the average of the world and vice versa.

Intensity of trade between Azerbaijan and Poland has calculated by trade intensity index and the results of the analysis from 2003 to 2016 have shown in table 8.

According to table 8, the trends of Trade intensity index of both Azerbaijan and Poland have declined linearly over the years. Poland's trade intensity with respect to Azerbaijan has declined significantly over the years, which may be seen from the fact that trade intensity index has decreased from 1,46 during 2003 to 0,54 during 2016. In terms of Poland, between 2003-2007 according to the result of the analysis has been  $TII > 1$  so that bilateral trade intensity between Azerbaijan and Poland over these years has seemed more than the world average. The following

years has been  $0 < TII < 1$  so that has seemed less than the world average. In terms of Azerbaijan, according to the result of the analysis of the trade intensity index has been  $0 < TII < 1$  between 2003-2016 so that bilateral trade intensity between Azerbaijan and Poland has seemed less than the world average (Kojima 1964 : 16-36).

Table 8. Azerbaijan - Poland Trade Intensity Index between 2003-2016



Source: Calculated by authors, [www.trademap.org](http://www.trademap.org), (accessed: 07.01.2018).

### 3.2. Export Intensive Index

Export intensive index illustrates whether the country exports more to its partner country than the world on average. The index is used to measure export intensity and level between two or more countries that export is more or less than the world on average.

#### Mathematical definition

In the study, the export intensity index, which measures the intensity of exports between Poland and Azerbaijan is formulated as follows:

$$EII_{ijt} = \frac{(X_{ij} / X_{it})}{(M_{jt} - M_{ji}) / (M_{wt} - M_{it})}$$

$EII_{ijt}$  - Export intensity index of Azerbaijan with Poland

X – Export, M - Import

$X_{ij}$  - Exports of country i to country j  $X_{it}$  - Total exports of country i to the world

$M_{jt}$  - Total imports of country j from the world  $M_{ji}$  - Imports of country j from country i

$M_{wt}$  - Total world imports  $M_{it}$  - Total imports of country i from the world

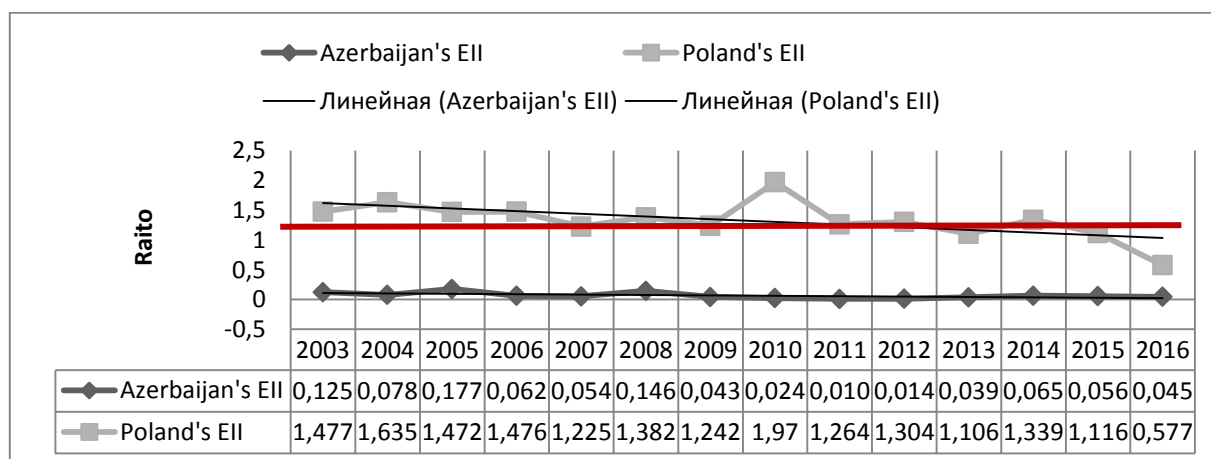
Export intensity index value varies between  $0 < EII < 1$ . If the value is  $EII = 1$  or near 1, it illustrates to have balanced export on average of the world between Azerbaijan and Poland. If the value is between  $0 < EII < 1$ , it is indicated that country j's export with respect to country i is less than on the average of the world and vice versa and if  $EII$  is higher than 1 ( $EII > 1$ ), it is indicated that country j's export with respect to country i is higher than on the average of the world and vice versa. (Dr. Anurag Anand, Krishma Garg 2016 : 26)

Intensity of export between Azerbaijan and Poland has calculated by export intensity index and the results of the analysis from 2003 to 2016 have shown in table 9.

According to the results of the analysis at table 9, the trends of export intensity index of both Azerbaijan and Poland have ranged over the years. Poland's export intensity and volume with respect to Azerbaijan has declined significantly over the years, which may be seen from the fact that export intensity index has decreased from 1,477 during 2003 to 0,577 during 2016 and it has been at 1,970 maximum in 2010 and at 0,577 minimum in 2016. In terms of Poland, between 2003-2015 according to the result of the analysis has been  $EII > 1$  so that bilateral export intensity between

Azerbaijan and Poland over these years has seemed more than the world average. At 2016 year export intensity with 0,577 has been  $0 < EII < 1$  so that has seemed less than the world average. In terms of Azerbaijan, according to the result of the analysis of the export intensity index has been  $0 < EII < 1$  between 2003-2016 so that bilateral export intensity between Azerbaijan and Poland has seemed less than the world average.

Table 9. Azerbaijan - Poland Export Intensity Index between 2003-2016



Source: Calculated by authors, [www.trademap.org](http://www.trademap.org), (accessed: 07.01.2018).

### 3.3. Import Intensive Index

Import intensive index illustrates whether the country imports more to its partner country than the world on average. The index is used to measure import intensity and level between two or more countries that import is more or less than the world on average.

#### Mathematical definition

In the study, the import intensity index, which measures the intensity of imports between Poland and Azerbaijan is formulated as follows:

$$MII_{ijt} = \frac{(M_{ij} / M_{it})}{(X_{jt} - X_{ji}) / (X_{wt} - X_{it})}$$

$EII_{ijt}$  - Export intensity index of Azerbaijan with Poland

$M_{ij}$  - Imports of country i from country j       $M_{it}$  - Total import of country i from the world

$X_{jt}$  - Total exports of country j to the world       $X_{ji}$  - Exports of country j to country i

$X_{wt}$  - Total world exports

$X_{it}$  - Total exports of country i to the world

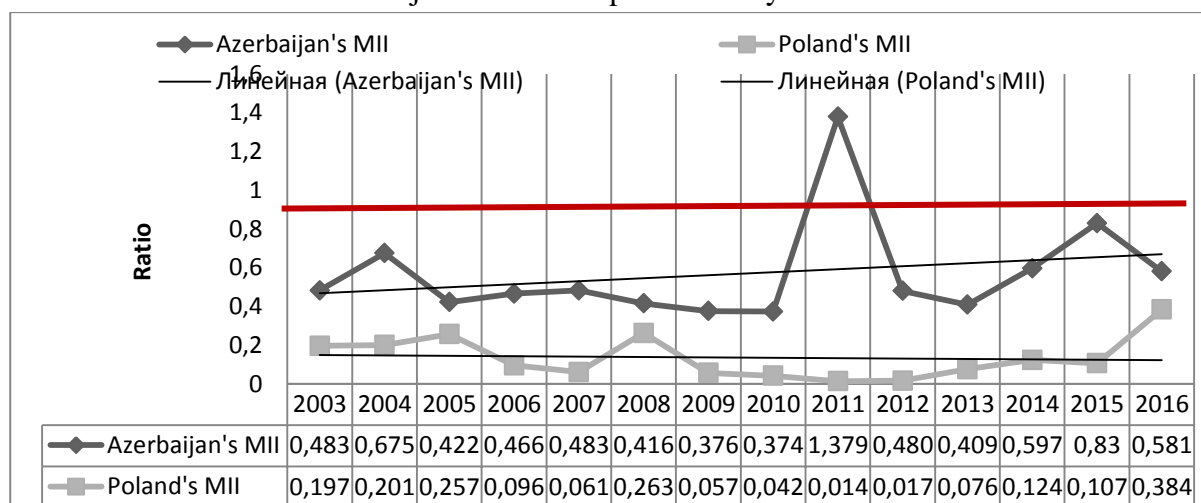
Import intensity index value varies between  $0 < MII < 1$ . If the value is  $MIII = 1$  or near 1, it illustrates to have balanced import on average of the world between two and more countries. If the value is between  $0 < MII < 1$ , it is indicated that country j's import with respect to country i is less than on the average of the world and vice versa and if  $MIII$  is higher than 1 ( $MIII > 1$ ), it is indicated that country j's import with respect to country i is higher than on the average of the world and vice versa. (Dr. Anurag Anand, Krishma Garg 2016 : 26).

Intensity of import between Azerbaijan and Poland has calculated by import intensity index and the results of the analysis from 2003 to 2016 have shown in table 10.

Table 10 has showed us, the trends of import intensity index of both of the countries have almost ranged under 1 between 2003-2016 years. Poland's import intensity and volume with respect to Azerbaijan has decreased significantly over the years, which may be seen from the fact that it has been at 0,384 maximum in 2016 and at 0,014 minimum in 2011. In terms of Poland, between 2003-2015 according to the result of the analysis has been  $MIII < 1$  so that bilateral import intensity between Azerbaijan and Poland over these years has seemed less than the world average.

Azerbaijan's import intensity and volume with respect to Poland has increased linearly from 2003 to 2016. Import intensity has been less than the world on average except 2008 over the years, and in 2008 it has been  $MII > 1$  so that so that has seemed bilateral export intensity has seemed more than the world average.

Table 10. Azerbaijan - Poland Import Intensity Index between 2003-2016



Source: Calculated by authors, [www.trademap.org](http://www.trademap.org), (accessed: 07.01.2018).

#### 4. Evaluation of Findings and Conclusion

This paper analyzes the bilateral trade relations between Azerbaijan and Poland for the period from 2003 to 2016 in order to reveal the current situation of trade relations with an historical background. Analysis showed us that Azerbaijan's import demand for these products - machinery, mechanical appliances, nuclear reactors, boilers; vehicles other than railway or tramway rolling stock; electrical machinery and equipment and parts thereof being the main export products of Poland are so high. These 3 products contain of 37% of Polish total exports and 36% of Azerbaijan total imports.

Mineral fuels, mineral oils and products of their distillation and bituminous substances contain essential share at Azerbaijan's export and even more over 90% of export and that the share of the products in Poland's imports is 10% and 4th place according to the total import volume. Baku-Odessa-Brodi-Plock-Gdansk oil pipeline has a significant role in the transport of Azerbaijan crude oil to Poland and increasing the share in crude oil imports of Poland. The share of edible fruit and nuts, peel of citrus fruit or melons, edible vegetables and certain roots exported Azerbaijan to Poland has been about 19% between 2003-2016 and that being convenient opportunity producing the fruit and vegetables in Azerbaijan situated in the citrus climate zone and also being market for the produced fruit and vegetables to purchase that It is possible to increase the share of products in exports to Poland.

There is enormous potential opportunity to expand turnover in trade volume between both of countries. Evaluation of enormous potential opportunity, enhancement of relationships and the trade volume between the two countries and development of business possibilities can be realized with business support and encouragement of both of states.

The main findings of analysis of trade intensity index, export intensity index and import intensity index by years are as follows (table 11).

Although the total trade turnover between Azerbaijan and the Poland in 2016 compared with 2003 has multiplied by 3,2 times, the results of analysis of trade intensity index, export intensity index and import intensity index at the table 8 showed that bilateral trade relations' volume between Azerbaijan and Poland has generally been less than the world on average. We can clearly see that there is not a strong trade relationship for Azerbaijan and Poland its intensity is a little lower than expected.

Table 11. Values of TII, MII and EII of Azerbaijan and Poland by Year

Years	Azerbaijan's TII	Poland's TII	Azerbaijan's MII	Poland's MII	Azerbaijan's EII	Poland's EII
2003	0,160	1,460	0,483	0,197	0,125	1,477
2004	0,090	1,550	0,675	0,201	0,078	1,635
2005	0,200	1,400	0,422	0,257	0,177	1,472
2006	0,070	1,200	0,466	0,096	0,062	1,476
2007	0,060	1,140	0,483	0,061	0,054	1,225
2008	0,180	0,200	0,416	0,263	0,146	1,382
2009	0,050	0,510	0,376	0,057	0,043	1,242
2010	0,030	0,610	0,374	0,042	0,024	1,970
2011	0,010	0,460	1,379	0,014	0,010	1,264
2012	0,010	0,530	0,480	0,017	0,014	1,304
2013	0,040	0,500	0,409	0,076	0,039	1,106
2014	0,070	0,570	0,597	0,124	0,065	1,339
2015	0,050	0,900	0,830	0,107	0,056	1,116
2016	0,040	0,540	0,581	0,384	0,045	0,577
	---	2003, 2004, 2005, 2006, 2007	2011	---	---	2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015

According to the results of analysis of trade intensity index, Azerbaijan's trade intensity with respect to Poland has been less than the world on average over the years. Poland's trade intensity with respect to Azerbaijan between 2003-2007 has been more than the world on average and on the following years trade intensity has been less than the world on average.

The results of analysis of import intensity index illustrates us that except Azerbaijan's import intensity with respect to Poland in 2011, in terms of Poland and Azerbaijan between 2003-2016 import intensity has been less than the world on average.

According to the results of analysis of export intensity index, Azerbaijan's export intensity with respect to Poland has always been less than the world on average over the years. Poland's export intensity with respect to Azerbaijan except 2016 has been more than the world on average. There is wide potential for the enhancement of bilateral trade relations between Poland and Azerbaijan in the framework of the eastern partnership program as the past soviet and friend countries.

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