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## The competitiveness and trade potential of Poland in the merchandise trade with Turkey

### Introduction

The slowdown of the economic growth in the European Union countries and a dynamic development of many other economies in other regions of the world have been the main reason behind the changes in Polish government policy of exports support. In 2012 the Ministry of Economy decided to expand the scope of promotional actions, hitherto concentrated on the markets of Poland's main trade partners (the so-called priority markets), towards the "prospective markets". Turkey was one on the first five countries deemed to be prospective for Poland.<sup>1</sup>

The aim of this paper is to define the trends of the trade between Poland and Turkey and evaluate the competitiveness and the potential of exports in Poland's trade with Turkey. The resulting research problem can be reduced to the attempts at answering the following questions: in what branches does Poland hold a competitive advantage in the trade with Turkey, and what is the potential for increasing Polish exports to Turkey?

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<sup>1</sup> In 2012, twelve countries were selected as prospective for Polish economic interests. Out of those, the Ministry of the Economy selected five: Algeria, Brazil, Canada, Kazakhstan, and Turkey. In 2014 UAE and Mexico were added to the list. See *Promocja polskiej gospodarki na rynkach perspektywicznych 2012–2015*, [www.mg.gov.pl/files/upload/15634/Rynki%20perspektywiczne%202012-2015.pdf](http://www.mg.gov.pl/files/upload/15634/Rynki%20perspektywiczne%202012-2015.pdf) (accessed 10.07.2015); *Promocja polskiej gospodarki na rynkach perspektywicznych w ramach programów promocji o charakterze ogólnym*, [www.mg.gov.pl/Fundusze+UE/POIG/Dzialania/Dzialanie+651/Programy+promocji+o+charakterze+ogolnym/Promocja+polskiej+gospodarki+na+rynkach+perspektywicznych](http://www.mg.gov.pl/Fundusze+UE/POIG/Dzialania/Dzialanie+651/Programy+promocji+o+charakterze+ogolnym/Promocja+polskiej+gospodarki+na+rynkach+perspektywicznych) (accessed 10.07.2015).

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The first part of the work outlines of the scale, the dynamics, and the account balance of the trade, the second part discusses its commodity structure, the third one presents the results of the analysis of the competitive position, and the fourth is an attempt to evaluate the potential of the exports from Poland to Turkey.

The statistical information comes from the UNCTAD database. Literature studies were undertaken in order to select a method of analysis, of presentation and of interpretation of the results. The statistical analysis tools – such as the community structure analysis and dynamic phenomenon analysis – were used in order to define the development trends of the trade between Poland and Turkey. The evaluation of Poland's trade competitiveness relies on the corrected trade coverage index  $TC_i$  and the revealed comparative advantage index  $RCA_i$ . The evaluation of the exports potential was obtained by means of the indicative trade potential index ITP.

The research covers the years 2000–2014. This is because the detailed statistical data regarding Polish-Turkish trade available in the UNCTAD database cover the 1995–2014 period. The final decade of the previous century was ignored both because the economies in question underwent deep structural reforms, and some data included in the trade statistics of both countries (on which the UNCTAD statistics on the bilateral Poland-Turkey trade were based) are not reliable.<sup>2</sup>

### **1. The scale, the dynamics, and the account balance**

In the years 2000–2014 the trade turnover between Poland and Turkey rose from \$332.1 million to \$5.8 billion (a 17-fold increase). This was a result of an increase of Polish exports to Turkey from \$128.7 million to \$3.1 billion (a more than 25-fold increase) and of Polish imports from Turkey from \$203.4 million to \$2.7 billion (more than a 13-fold increase). The data are presented in Table 1.

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<sup>2</sup> One example is the fact the value of Turkish exports to Poland in the Turkish statistics sometimes tripled the value of Polish imports from Turkey as registered in Polish statistics.. Cf. *UNCTADstat*, <http://unctad.org/en/Pages/Statistics.aspx> (accessed 15.08.2015).

Table 1  
The volume and the dynamics of Poland-Turkey trade turnover  
in the years 2000–2014

Years	Exports			Imports		
	\$ million	2000 = 100 (%)	previous year = 100 (%)	\$ million	2000 = 100 (%)	previous year = 100 (%)
2000	128.7	100.0	152.3	203.4	100.0	105.1
2001	133.4	103.7	103.7	385.5	189.5	189.5
2002	249.8	194.1	187.3	613.2	301.5	159.1
2003	351.5	273.1	140.7	855.1	420.4	139.4
2004	901.4	700.4	256.4	1111.1	546.3	129.9
2005	1197.2	930.2	132.8	1314.4	646.2	118.3
2006	1304.5	1013.6	109.0	1576.0	774.8	119.9
2007	1508.2	1171.9	115.6	2137.6	1050.9	135.6
2008	1772.1	1376.9	117.5	2520.0	1238.9	117.9
2009	1755.1	1363.7	99.0	1925.8	946.8	76.4
2010	2483.1	1929.4	141.5	2120.0	1042.3	110.1
2011	3291.2	2557.3	132.5	2324.1	1142.6	109.6
2012	3099.8	2408.5	94.2	2137.7	1051.0	92.0
2013	3042.7	2364.2	98.2	2400.2	1180.0	112.3
2014	3129.5	2431.6	102.8	2691.0	1323.0	112.1

Source: own work based on *UNCTADstat*, <http://unctad.org/en/Pages/Statistics.aspx> (accessed 15.08.2015).

The rate of growth of the trade between Poland and Turkey was higher than the dynamic of Poland’s global trade turnover. The scale of growth in Poland-Turkey turnover (both treated jointly and divided into exports and imports) was three times higher than the scale of Poland’s global foreign trade growth (cf. Figure 1).

As result of the high growth in Polish-Turkish trade in the years 2000–2014, the share of Turkey in the Polish foreign trade increased from 0.4% to 1.5% in exports and from 0.4% to 1.2% in imports. The share of Poland in the Turkish trade was growing in a similar way. This indicates that the trade between Poland and Turkey was characterized by a specific double symmetry – a similar role of Turkey in the Polish exports and imports, and also in the lack of disproportion between the significance of Turkey in Polish foreign trade and the role of Poland in Turkish foreign trade (cf. Table 2).

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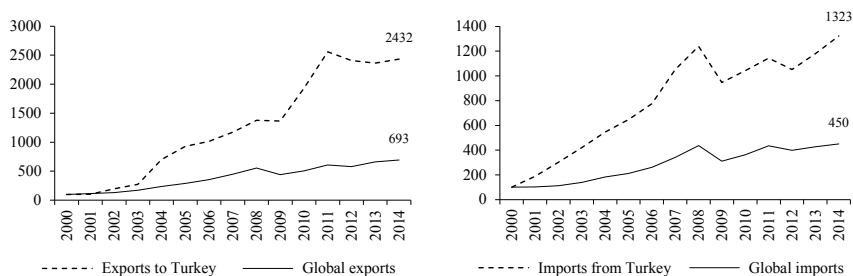


Figure 1. The indexes of the dynamics in the Polish-Turkish trade compared with the growth in Poland's global trade turnover in 2000–2014 (2000 = 100)

Source: own work based on *UNCTADstat*, <http://unctad.org/en/Pages/Statistics.aspx> (accessed 15.08.2015).

Table 2

The position of Turkey in Poland's foreign trade and that of Poland in Turkey's global trade (%)

Years	Turkey's share in the Poland's turnover		Poland's share in the Turkey's turnover	
	exports	imports	exports	imports
2000	0.4	0.4	0.6	0.3
2001	0.4	0.8	0.8	0.4
2002	0.6	1.1	1.0	0.5
2003	0.7	1.3	1.0	0.6
2004	1.2	1.3	1.1	1.0
2005	1.3	1.3	1.1	1.1
2006	1.2	1.3	1.2	1.0
2007	1.1	1.3	1.3	1.0
2008	1.0	1.2	1.2	1.0
2009	1.3	1.3	1.3	1.3
2010	1.6	1.2	1.3	1.4
2011	1.7	1.1	1.3	1.5
2012	1.7	1.1	1.2	1.3
2013	1.5	1.2	1.4	1.3
2014	1.5	1.2	1.5	1.3

Source: own work based on *UNCTADstat*, <http://unctad.org/en/Pages/Statistics.aspx> (accessed 15.08.2015).

An important change occurred in the Polish-Turkish trade balance during the period under scrutiny. In 2000–2009 Poland noted a deficit in the trade with Turkey, while in the next five years the balance of the trade became positive. This fact is all the more significant given the fact that Poland had a negative global foreign trade balance during the whole period under analysis (cf. Table 3).

Table 3

The balance of the Polish-Turkish trade as compared to the Poland's global trade balance, both absolute and relative, 2000–2014

Years	Polish-Turkish trade		Global Polish trade	
	balance (\$ million)	exports/imports (%)	balance (\$ million)	exports/imports (%)
2000	-74.7	63.3	-17171.7	64.3
2001	-252.1	34.6	-14080.3	71.5
2002	-363.4	40.7	-14012.4	74.2
2003	-503.6	41.1	-14390.6	78.6
2004	-209.7	81.1	-14375.5	83.7
2005	-117.2	91.1	-12160.7	88.0
2006	-271.5	82.8	-16061.2	87.2
2007	-629.4	70.6	-25387.5	84.5
2008	-747.9	70.3	-38618.6	81.7
2009	-170.7	91.1	-12928.5	91.4
2010	363.1	117.1	-17062.6	90.2
2011	967.1	141.6	-21086.5	89.9
2012	962.1	145.0	-11826.5	93.8
2013	642.5	126.8	-1765.9	99.1
2014	438.5	116.3	-2210.5	99.0

Source: own work based on UNCTADstat, <http://unctad.org/en/Pages/Statistics.aspx> (accessed 15.08.2015).

## 2. The commodity structure of the turnover

During the period of fifteen years under analysis, Polish exports to Turkey displayed a rather stable commodity structure. The biggest share of the trade consisted in machinery and transport equipment. Furthermore, the share of this group in the trade is rising. The second and the

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third place belong respectively to the manufactured goods and to the chemicals and related products. The exports of both of these two groups displayed a downward trend. In the whole period the three aforementioned groups of goods were responsible for 82–92% of Poland's exports to Turkey (cf. Table 4).

Table 4

The commodity structure of the exports from Poland to Turkey according to the SITC sections in the years 2000–2014 (%)

Section code	Section description	2000	2003	2006	2009	2012	2013	2014
0	Food and live animals	3.3	2.4	2.7	3.8	6.6	2.2	2.5
1	Beverages and tobacco	0.6	0.1	0.8	3.2	1.5	0.7	1.0
2	Crude materials, inedible, except fuels	0.7	5.0	0.6	1.6	1.8	1.6	1.4
3	Mineral fuels, lubricants and related materials	3.0	3.8	0.7	4.1	0.6	1.0	0.4
4	Animal and vegetable oils, fats and waxes	–	–	0.0	0.0	0.0	0.0	0.0
5	Chemicals and related products, n.e.s.	16.4	12.9	7.7	10.2	11.3	11.7	12.5
6	Manufactured goods	26.9	17.0	11.3	11.7	14.9	17.3	17.7
7	Machinery and transport equipment	45.6	56.5	73.1	62.1	60.0	61.7	60.0
8	Miscellaneous manufactured articles	3.3	2.4	3.0	3.2	3.3	3.7	4.4
9	Commodities and transactions, n.e.s.	0.3	0.0	0.2	0.0	0.0	0.0	0.1
0–9	Total all products	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: own work based on *UNCTADstat*, <http://unctad.org/en/Pages/Statistics.aspx> (accessed 15.08.2015).

The biggest share of the imports belongs to the machinery and transport equipment, with the manufactured goods coming in the second position, and miscellaneous manufactured articles in the third. Those three main groups of goods covered from 74% to 91% of the importations in the period of 2000–2014. The share of the chemicals and related products was much lower than in the case of the exports, occupying the fifth position, behind food and live animals (cf. Table 5).

Table 5

The commodity structure of the imports from Turkey to Poland according to the SITC sections in the years 2000–2014 (%)

Section code	Section description	2000	2003	2006	2009	2012	2013	2014
0	Food and live animals	9.8	4.0	9.8	7.1	8.0	8.3	8.2
1	Beverages and tobacco	4.0	0.3	0.8	1.2	1.1	0.8	0.6
2	Crude materials, inedible, except fuels	2.3	1.1	0.7	1.1	1.8	1.9	1.9
3	Mineral fuels, lubricants and related materials	–	–	0.0	0.0	0.0	0.0	0.0
4	Animal and vegetable oils, fats and waxes	–	–	0.0	0.0	0.0	0.0	0.0
5	Chemicals and related products, n.e.s.	9.7	3.9	3.5	4.1	6.1	6.4	6.5
6	Manufactured goods	33.2	26	27.3	24.2	28.8	26.4	26.1
7	Machinery and transport equipment	28.2	48.9	44.7	42.1	37.1	40.1	37.9
8	Miscellaneous manufactured articles	12.8	15.8	12.8	19.7	17.1	16.1	18.7
9	Commodities and transactions, n.e.s.	0.0	0.0	0.3	0.5	0.0	0.0	0.0
0–9	Total all products	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: own work based on *UNCTADstat*, <http://unctad.org/en/Pages/Statistics.aspx> (accessed 15.08.2015).

The commodity structure analyzed at the SITC sections level shows that Poland and Turkey traded mainly in industrial goods – in a large part the highly processed ones that obtained an important share of added value. The trade between Turkey and Poland can thus be qualified as relatively modern, typical of relatively highly-developed economies, with a high degree on complementarity inside the branches.

This evaluation is further largely confirmed by the results of the analysis of the turnover structure following the factor intensity of the products analyzed.<sup>3</sup> The largest share of Polish exports to Turkey belonged

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<sup>3</sup> A taxonomy used in the works of Z. Wykosińska was used here. She differentiates five groups of goods according to the factor intensity: material-intensive (SITC 0, 2-26, 3-35, 4, 56), labor-intensive (SITC 26, 6-62-67-68, 8-87-88), capital-intensive, technology-intensive – easy to imitate (SITC 51, 52, 54, 58, 59,

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to the technology-intensive goods (52% of the exports in 2000–2014). The second position belonged to the capital-intensive goods (a 29% share). The labor-intensive and the material-intensive goods both played a smaller role and displayed a downward trend (cf. Table 6).

Table 6

The structure of the Polish exports to Turkey for the years 2000–2014 divided by the factor intensity of the goods\* (%)

Products group	2000	2003	2006	2009	2012	2013	2014
Material-intensive (MI)	9.7	11.5	3.9	9.6	9.0	4.8	4.3
Labor-intensive (LI)	19.5	13.3	10.2	9.3	10.7	11.6	13.1
Capital-intensive (CI)	24.3	13.0	37.5	26.9	27.3	33.1	32.6
Technology-intensive( TI):							
– easy to imitate (TI1)	5.5	4.6	5.4	20.1	26.3	17.2	18.0
– difficult to imitate (TI2)	40.7	57.5	42.9	34.0	26.7	33.2	31.8

\* The sum of the columns does not add to 100%, as there are goods that cannot be classified as belonging to any of the groups.

Source: own work based on *UNCTADstat*, <http://unctad.org/en/Pages/Statistics.aspx> (accessed 15.08.2015).

The imports from Turkey consisted mainly of labor-intensive goods (around 38% on average in the years 2000–2014), with the capital-intensive goods coming in the second position (around 30% of the imports). The share of both these groups displayed a downward trend, while the share of technology-intensive goods rose from 16.8% in 2000 to 23.6% in 2014. The lowest share of the imports (an average of 8.5%) belonged to the resource-intensive goods (see Table 7).

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75,76), technology-intensive – difficult to imitate (SITC 57, 7-75-76-78, 87, 88). See for example Z. Wysokińska, J. Witkowska, *Integracja europejska. Rozwój rynków*, PWE, Warszawa–Łódź 1999, p. 380; Z. Wysokińska, *Aspekty technologiczne konkurencyjności międzynarodowej Unii Europejskiej oraz Polski*, “Studia Europejskie” 1997, nr 2, [www.ce.uw.edu.pl/pliki/pw/2-1997\\_Wysokinska.pdf](http://www.ce.uw.edu.pl/pliki/pw/2-1997_Wysokinska.pdf) (accessed 28.07.2015).



Table 7

The structure of the Polish imports from Turkey for the years 2000–2014 divided by the factor intensity of the goods\* (%)

Products group	2000	2003	2006	2009	2012	2013	2014
Material-intensive (MI)	11.7	4.8	10.3	7.8	8.9	9.3	9.4
Labor-intensive (LI)	40.3	38.8	35.6	39.8	36.2	35.0	37.0
Capital-intensive (CI)	31.2	32.5	29.6	23.8	31.4	31.3	29.9
Technology-intensive (TI):							
– easy to imitate (TI1)	10.1	4.9	4.5	9.0	5.9	5.8	4.8
– difficult to imitate (TI2)	6.7	19	19.6	19.1	17.6	18.6	18.8

\* The sum of the columns does not add to 100%, as there are goods that cannot be classified as belonging to any of the groups.

Source: own work based on *UNCTADstat*, <http://unctad.org/en/Pages/Statistics.aspx> (accessed 15.08.2015).

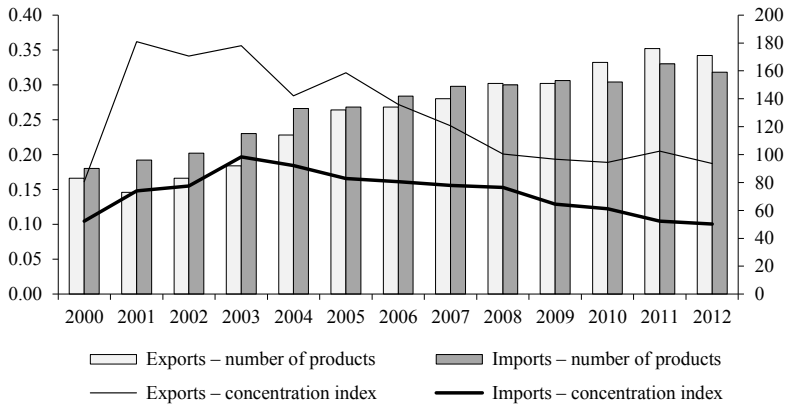


Figure 2. The indexes of market concentration for Polish-Turkish bilateral trade in the years 2000–2012, (left scale – concentration index, right scale – number of products)

Source: *UNCTADstat*, <http://unctad.org/en/Pages/Statistics.aspx> (accessed 15.08.2015).

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In the first four years of the analyzed period, the indexes of market concentration<sup>4</sup> in the trade between Poland and Turkey were rising. Since 2003, however, there was a definite downward trend. In 2012 the HHI reached the level of 0.187 in the Poland to Turkey exports and 0,101 in Turkey to Poland exports. The number of goods whose value either exceeded 100,000\$ or whose share was bigger than 0.3% rose in course of the years 2000–2012 from 83 to 171 in the Polish exports to Turkey and from 90 to 159 in the Turkish exports to Poland. As the trade turnover grew, the degree of diversity of goods also rose (c.f. Figure 2).

### 3. Competitiveness of Polish trade in the Turkish market

The growth in Poland's share in Turkish foreign trade and the improvement of trade balance with Turkey indicate an increased competitiveness of Poland in the Turkish market.<sup>5</sup> The direction of changes in the commodity structure of Polish-Turkish exchange, particularly the increase in the share of technology-intensive goods and the diminishing role of material- and labor-intensive goods, as well as the growing diversification of exported goods, can also be understood as signs of improvement in Poland's competitiveness in trade with Turkey.<sup>6</sup>

According to M.E. Porter, the international competitiveness of national economies should be considered at the level of individual industries (sectors) and their sections, rather than in terms of national economy

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<sup>4</sup> The Herfindahl-Hirschman Index takes the value of the range from 0 to 1, where 1 means a maximum concentration. See *Unctad Handbook of Statistics 2014*, UNCTAD, New York–Geneva 2014, p. 190; *UNCTADstat...*

<sup>5</sup> The share in trade and trade balance are considered as fundamental measures of the international competitive position of a country. Cf., e.g. J. Misła, *Międzynarodowa konkurencyjność gospodarki narodowej*, PWE, Warszawa 2011, pp. 300–305.

<sup>6</sup> Cf. M. Maciejewski, *Zmiany w strukturze towarowej polskiego handlu zagranicznego a deficytowość wymiany handlowej*, Zeszyty Naukowe Uniwersytetu Ekonomicznego w Krakowie nr 777, Kraków 2008, p. 78; P. Misztal, *Dywersyfikacja i koncentracja eksportu a wzrost gospodarczy w Polsce w okresie 1995–2009*, Zeszyty Naukowe Wydziału Nauk Ekonomicznych Politechniki Koszalińskiej nr 15, Koszalin 2011, pp. 53–55.

taken as a whole.<sup>7</sup> Analysis of Poland's competitiveness in the Turkish market was carried out based on the classification of different product groups (the SITC classification and absorption of factors of production). In order to identify competing sectors, commonly used measures of competitive advantages were employed: adjusted indicator of the coverage of imports by exports ( $STC_i$ )<sup>8</sup> and the index of revealed comparative advantage ( $RCA_i$ )<sup>9</sup>.<sup>10</sup>

Analysis of the data in Tables 8 and 9 indicates that during the entire study period Poland had a significant competitive advantage in goods from the section 7 (machinery and transport equipment) ( $STC_i > 0$  and  $RCA_i > 100$ ), but not in the section 6 (manufactured goods classified chiefly by material) and the section 8 (miscellaneous manufactured articles) ( $STC_i < 0$  and  $RCA_i < 100$ ). A positive change was observed in goods from the section 1 (beverages and tobacco), in which Poland gained a competitive advantage during the study period, both in terms of  $STC_i$  and  $RCA_i$ . In each year of the 2000–2014 period, Poland also had an advantage in products from the section 3 (mineral fuels, lubricants and related materials) and 5 (chemicals and related products), but only in terms of the  $STC_i$  indicator ( $RCA_i < 100$ ). Therefore, this advantage was 'internal' because the  $STC_i$  index illustrates export-import relationships in Polish foreign trade, as opposed to  $RCA_i$ , which also shows 'external' competitiveness, i.e., relative to other countries exporting to the Turkish market (cf. Tables 8 and 9).

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<sup>7</sup> According to M. Porter, no country can be competitive in every field. Even the most developed countries have sectors with uncompetitive domestic companies. Cf. M.E. Porter, *Porter o konkurencji*, PWE, Warszawa 2001, p. 199.

<sup>8</sup>  $STC_i$  indicators were calculated by the following formula:  $STC_i = X_i/X_n - M_i/M_n$ , where  $X$  is Polish exports to Turkey,  $M$  – Polish imports from Turkey,  $i$  – a given product group,  $n$  – all product groups.

<sup>9</sup>  $RCA_i$  indicators were calculated by the following formula:  $RCA_i = X_{pi}/X_{pn} : X_w/X_{wn}$ , where  $X_p$  is Polish exports to Turkey,  $X_w$  – global export to Turkey,  $i$  – a given product group,  $n$  – all products; expressed as a percentage (multiplied by 100).

<sup>10</sup> For more on this topic see, e.g. J. Misala, *op.cit.*; E. Sieggel, *International Competitiveness and Comparative Advantage: A Survey and a Proposal for Measurement*, "Journal of Industry, Competition and Trade" 2006, Vol. 6, No. 2; A. Cieślak, *Nowa teoria handlu zagranicznego w świetle badań empirycznych*, Wydawnictwo Naukowe PWN, Warszawa 2000.

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Table 8

STC<sub>i</sub> indicators of Polish trade with Turkey according to the SITC classification in the years 2000–2014

Section code	Section description	2000	2003	2006	2009	2012	2014
0	Food and live animals	-6.52	-1.56	-7.11	-3.32	-1.40	-5.74
1	Beverages and tobacco	-3.41	-0.27	0.00	2.08	0.48	0.41
2	Crude materials, inedible, except fuels	-1.56	3.97	-0.14	0.50	-0.08	-0.47
3	Mineral fuels, lubricants and related materials	3.03	3.78	0.67	4.14	0.59	0.37
4	Animal and vegetable oils, fats and waxes	-	-	0.01	0.00	0.00	0.00
5	Chemicals and related products, n.e.s.	6.66	9.03	4.13	6.12	5.14	5.96
6	Manufactured goods classified chiefly by material	-6.35	-9.00	-15.91	-12.50	-13.88	-8.39
7	Machinery and transport equipment	17.44	7.54	28.37	19.96	22.90	22.09
8	Miscellaneous manufactured articles	-9.52	-13.46	-9.84	-16.47	-13.80	-14.29
9	Commodities and transactions not classified elsewhere in the SITC	0.31	0.00	-0.18	-0.50	0.04	0.04

Source: own work based on *UNCTADstat*, <http://unctad.org/en/Pages/Statistics.aspx> (accessed 15.08.2015).

Table 9

RCA<sub>i</sub> indicators of Polish trade with Turkey according to the SITC classification in the years 2000–2014 (%)

Section code	Section description	2000	2003	2006	2009	2012	2014
1	2	3	4	5	6	7	8
0	Food and live animals	165.0	114.3	207.7	135.7	200.0	71.4
1	Beverages and tobacco	66.7	20.0	200.0	533.3	375.0	200.0
2	Crude materials, inedible, except fuels	13.0	73.5	10.2	25.4	23.1	21.2
3	Mineral fuels, lubricants and related materials	25.6	31.9	4.8	29.1	3.9	2.6

1	2	3	4	5	6	7	8
4	Animal and vegetable oils, fats and waxes	0.0	0.0	0.0	0.0	0.0	0.0
5	Chemicals and related products, n.e.s.	131.2	90.2	59.7	70.3	85.0	86.8
6	Manufactured goods classified chiefly by material	181.8	100.6	66.5	72.7	87.6	98.3
7	Machinery and transport equipment	114.3	169.2	226.3	219.4	219.0	219.0
8	Miscellaneous manufactured articles	55.9	42.9	45.5	46.4	53.2	65.7
9	Commodities and transactions not classified elsewhere in the SITC	4.8	0.0	2.4	0.0	0.0	1.4

Source: own work based on *UNCTADstat*, <http://unctad.org/en/Pages/Statistics.aspx> (accessed 15.08.2015).

The changes in the indicators of competitiveness of Polish products that were classified according to the intensity of the use of production factors show that during the whole study period Poland had both “internal” and “external” competitive advantage ( $STC_i > 0$  i  $RCA_i > 100$ ) in technology-intensive difficult to imitate goods (TI2). The position of Poland changed from uncompetitive to competitive in regard to

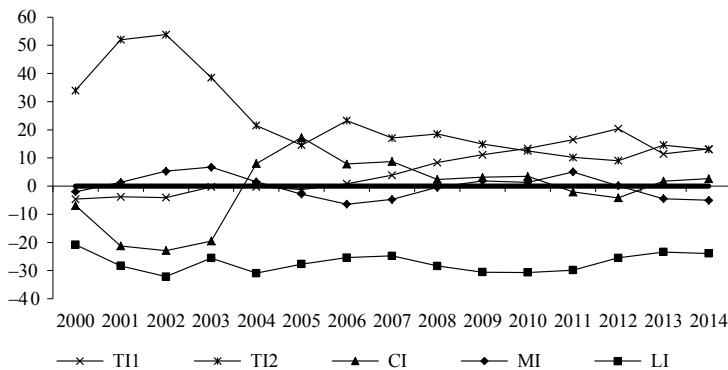


Figure 3.  $STC_i$  indicators of Polish trade with Turkey by the absorption of factors of production in the years 2000–2014

Source: own work based on *UNCTADstat*, <http://unctad.org/en/Pages/Statistics.aspx> (accessed 15.08.2015).

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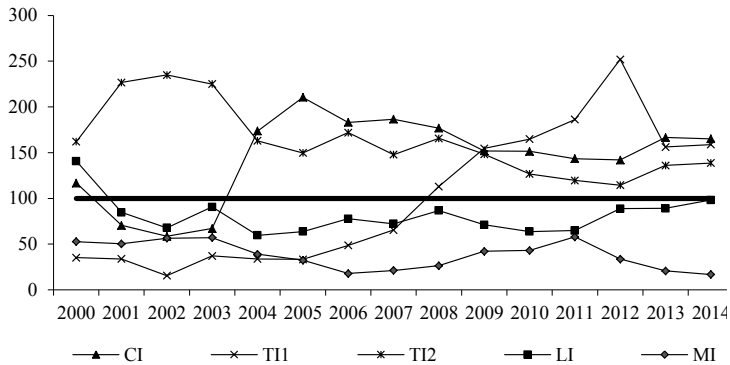


Figure 4.  $RCA_i$  Indicators of Polish trade with Turkey by the absorption of factors of production in the years 2000–2014 (%)

Source: own work based on *UNCTADstat*, <http://unctad.org/en/Pages/Statistics.aspx> (accessed 15.08.2015).

technology-intensive easy to imitate goods (TI1 – since 2008,  $STC_i > 0$  and  $RCA_i > 100$ ). On the other hand, the exports of labor-intensive goods (LI) was permanently uncompetitive as shown by  $STC_i$  as well as  $RCA_i$  (see Figures 3 and 4).

### 4. Potential for development of export

Assessment of the export potential of Polish trade with Turkey was based on the indicative trade potential (ITP)<sup>11</sup>, which was calculated using the following formula:

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<sup>11</sup> ITP index, which was presented by I.N. Mukherjii in 2003, has been increasingly used in foreign literature on the subject to estimate the potential development of trade between countries/groups of countries as an alternative or complementary method to the gravity model of trade. Cf. S. Bano, Y. Takahashi, F. Scrimgeour, *ASEAN – New Zealand Trade Relations and Trade Potential: Evidence and Analysis*, “Journal of Economic Integration” 2013, Vol. 28, No. 1, pp. 144–182; C. Helmers, J-M. Pasteels, *Assessing Bilateral Trade Potential at the Commodity Level: An Operational Approach*, ITC Working Paper, November, Geneva 2006; I.N. Mukherjii, *The Bangkok Agreement: A Negative List Approach to Trade Liberalization in Asia and the Pacific*, paper prepared for the nineteenth session of the Standing Committee of the Bangkok Agreement, Bangkok, 19–21 March 2003.

$$ITP = \min (XP_i, MT_i) - XPT_i,$$

where:

- $XP$  – total Polish exports,
- $MT$  – total Turkish imports,
- $XPT$  – Polish exports to Turkey,
- $i$  – product/product group.

The data in Table 10 indicates that goods from section 7 (machinery and transport equipment) had the highest potential for developing Polish exports to Turkey, showing the competitive advantage of Poland in the years 2000–2014. The high value of ITP is also to be found in the section 6 (manufactured goods classified chiefly by material), which gave Poland an “internal” competitive advantage. On the other hand, in some years of the study period its advantage was “external” (cf. Tables 10, 8 and 9).

Table 10  
Potential exports (ITP) from Poland to Turkey according to the SITC classification in 2014 (\$ million)

SITC section code	Section description	Total Polish exports	Total Turkish imports	Polish exports to Turkey	Potential exports (ITP)
0	Food and live animals	22,974.4	6,968.8	78.6	6,890.2
1	Beverages and tobacco	3,375.9	792.1	31.8	760.3
2	Crude materials, inedible, except fuels	5,094.4	16,974.9	43.8	5,050.6
3	Mineral fuels, lubricants and related materials	8,874.9	20,140.1	11.9	8,863.0
4	Animal and vegetable oils, fats and waxes	620.3	2,187.0	0.0	620.3
5	Chemicals and related products, n.e.s.	19,578.5	32,789.4	389.8	19,188.7
6	Manufactured goods classified chiefly by material	42,424.0	38,477.6	553.7	37,923.9
7	Machinery and transport equipment	82,150.7	65,813.6	1,878.6	63,935.0
8	Miscellaneous manufactured articles	29,086.6	15,404.4	139.2	15,265.2
9	Commodities and transactions not classified elsewhere in the SITC	297.1	42,676.2	2.0	295.1

Source: own work based on *UNCTADstat*, <http://unctad.org/en/Pages/Statistics.aspx> (accessed 15.08.2015).

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In order to identify products with the highest potential for exports more accurately, ITP indicators for groups of goods at a lower classification level (three-digit SITC) were calculated. The obtained results allowed to determine a group of 25 products for which the potential value of exports was higher than 1 billion USD (see Table 11).

Table 11  
Products with the highest potential for Polish exports to Turkey  
(ITP > \$ 1 billion) in 2014

SITC group code	Product description	Total Polish exports (\$ mln)	Total Turkish imports (\$ mln)	Polish exports to Turkey (\$ mln)	Potential exports (ITP) (\$ mln)	Exports carried out/ITP (%)
1	2	3	4	5	6	7
781	Motor vehicles for the transport of persons	6,554.7	7,721.0	350.2	6,204.5	5.6
764	Telecommunication equipment, n.e.s.; & parts, n.e.s.	5,826.9	6,231.9	55.0	5,772.0	1.0
784	Parts and accessories of vehicles of groups 722, 781, 782, 783	10,749.7	4,972.0	67.1	4,904.9	1.4
334	Petroleum oils or oils obtained from bituminous minerals > 70 % oil	4,607.2	15,386.0	6.0	4,601.2	0.1
713	Internal combustion piston engines, parts, n.e.s.	4,861.6	3,756.9	432.9	3,324.0	13.0
682	Copper	3,701.6	3,462.2	150.9	3,311.2	4.6
542	Medicaments (incl. veterinary medicaments)	3,265.4	2,972.4	34.3	2,938.1	1.2
752	Automatic data processing machines, n.e.s.	3,472.5	2,804.4	1.7	2,802.8	0.1
641	Paper and paperboard	2,650.4	2,857.9	71.4	2,579.0	2.8
772	Apparatus for switching and protecting electrical circuits; board, panels	2,575.9	2,399.9	42.8	2,357.1	1.8
778	Electrical machinery & apparatus, n.e.s.	3,465.2	2,124.6	41.8	2,082.9	2.0
743	Pumps (excluding liquid), gas compressors & fans; centr.	1,816.1	2,124.4	11.4	1,804.7	0.6
582	Plates, sheets, films, foil & strip, of plastics	1,732.0	1,619.7	23.4	1,596.3	1.5



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1	2	3	4	5	6	7
699	Manufactures of base metal, n.e.s.	4,071.2	1,578.4	25.6	1,552.8	1.6
741	Heating & cooling equipment & parts thereof, n.e.s.	1,359.7	1,564.1	9.9	1,349.8	0.7
684	Aluminium	1,283.7	3,226.8	4.5	1,279.3	0.4
598	Miscellaneous chemical products, n.e.s	1,262.0	1,598.3	8.0	1,253.9	0.6
782	Motor vehicles for transport of goods, special purposes	2,044.8	1,282.9	72.2	1,210.7	6.0
775	Household type equipment, electrical or not, n.e.s.	5,156.9	1,231.7	59.4	1,172.3	5.1
676	Iron & steel bars, rods, angles, shapes & sections	1,733.1	1,169.6	2.9	1,166.6	0.2
728	Other machinery for particular industries, n.e.s.	1,163.3	2,396.6	11.1	1,152.3	1.0
893	Articles, n.e.s., of plastics	4,496.4	1,160.7	17.1	1,143.6	1.5
874	Measuring, analysing & controlling apparatus, n.e.s.	1,129.0	1,938.3	11.6	1,117.3	1.0
575	Other plastics, in primary forms	1,021.6	5,125.5	12.0	1,021.6	1.2
744	Mechanical handling equipment, & parts, n.e.s.	1,021.3	1,440.4	15.1	1,021.3	1.5

Source: own work based on *UNCTADstat*, <http://unctad.org/en/Pages/Statistics.aspx> (accessed 15.08.2015).

Among 25 products with the highest export potential, as many as thirteen belonged to the section of machines, equipment and transport equipment (SITC 7), occupying leading positions in the ranking. Five items were from the section 6 – manufactured goods classified chiefly by material (SITC 6), four products were chemicals (SITC 5), the last two positions in the ranking were occupied by goods from a group of miscellaneous manufactured articles (SITC 8), and one item represented a group of mineral fuels, lubricants and related materials (SITC 3). The list did not include any of the goods from the SITC sections 0, 1, 2 and 4, i.e., agri-food products (cf. Table 11).

Analysis of the specified product groups due to their absorption of factors of production revealed that technology-intensive difficult to imitate goods (575, 713, 728, 741, 743, 744, 772, 775, 778, 874) were prevalent, six items were capital-intensive goods (676, 682, 684, 764, 781,

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784), five belonged to technology-intensive easy to imitate goods (542, 582, 598, 752, 754). Only three groups were labour-intensive goods (641, 699, 893) and only one – material- intensive (334) (cf. Table 11).

The structure of ITP index is based on the assumption that Turkey's entire import demand for a given product may be covered by exports from Poland. As a result, the presented values of Polish export potential to Turkey are, of course, merely indicative. However, they may be an important indicator for enterprises which either start or develop their activity in Turkey, as well as for Polish government promoting the Polish economy in the Turkish market.

### **Conclusions**

On the basis of the conducted analysis it may be stated that the development trend of Polish trade with Turkey in the years 2000-2014 was favourable to Poland, as evidenced by:

- high (in both absolute and relative terms) dynamics of exchange, particularly exports;
- improvement in trade balance (from negative to positive);
- prevalence of manufactured, technology-intensive goods in Polish exports,
- progressive diversification of export goods.

Poland's competitive position in the Turkish market can also be assessed positively, because the observed competitive advantages involved technology- and capital-intensive products. Estimates of Polish export potential show that opportunities for exports to the Turkish market are also favourable, in terms of both size of exports as well as their commodity structure. This assessment of export potential is obviously made *ex post* and is based on the previous trends in Polish exports and Turkish imports, and therefore it does not take into account the possibility of any significant changes in the conditions of the Polish-Turkish exchange, which may result from transformations of the Polish and/or Turkish economy as well as of the global economy.

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