Analysis of Competitiveness of Turkey and Commonwealth of Independent States in their Automotive Market

Dr. Emre Güneşer Bozdağ (Gazi University, Turkey)
Ph.D. Candidate Sıtkıcan Saraçoğlu (Gazi University, Turkey)

Abstract

Automotive sector is a driving sector for countries due to forward and backward linkages and employment and value added it creates. Starting from this point, this study aims to analyze the competitiveness of CIS and Turkey automotive sector in their market. The competitiveness of the countries should be assessed with their production potential. The countries subject to the study are thirteen Eurasian countries, Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyz Republic, Republic of Moldova, Russian Federation, Tajikistan, Turkey, Turkmenistan, Ukraine and Uzbekistan. The data from UNCTAD for 1995-2011 period for these countries and Liesner Index (RCAL), Balassa Index (RCA), Relative Trade Advantage Index (RTA) and Relative Competitiveness Index (RC) are used and the rank correlation between the outcomes are checked via Spearman Rank Correlation coefficient. According to the outcomes, Belarus, Turkey and Uzbekistan have higher comparative advantage compared to the other countries. The cooperation of these countries with Russia and Ukraine on production and trade of automotive sector will enhance their comparative advantage against third countries.

1 Introduction

After 1980, the acceleration of globalization in line with the changing world order, increased the importance of international competitiveness. Countries taking the opportunities and threats in the global market into consideration, focused on increasing their competitiveness to participate or increase their share in the global market. According to Deppreu and Cerrato (2005), increasing or conserving the competitiveness of a country depends on the competitiveness level of the firm and related industry on the micro level; and competitiveness level of the country on the macro level. The strategies applied by a firm effect the competitiveness initially of the firm and spillover to the industry it belongs, and determine the competitive power of the country in the global markets. Within this context, automotive sector, which had an increasing importance in line with globalization, became a key sector to push competitiveness of a country in the global markets. Automotive sector is a driving sector for both developed, and developing countries due to forward, and backward linkages and employment and value added it creates and its potential for export revenues. For Commonwealth of Independent States (CIS) and Turkey which have the same development path, belong to the same geography and possess a certain level of industrial accumulation, automotive sector supplies the opportunity to earn momentum for economic development with the effect of internalizing technology and upgrading in dynamic comparative advantage. It is important to know whether Eurasian countries as Turkey and CIS countries reached a certain level of trade in this sector, namely their trade potential and competitiveness. This gives some idea about the competitiveness against the other exporting countries in their own markets. Starting from this point, this study aims to analyze the competitiveness of Turkey and CIS countries automotive sector in their market. The competitiveness of the countries should be assessed with their production potential. In the second section of the study, the indices used to measure competitiveness are defined and their characteristics are expressed. In the third section, the literature on the international competitiveness of the automotive sector is briefed. In the fourth section, the foreign trade volumes of the CIS countries and Turkey is analyzed. In the fifth section, the competitiveness of the related countries on the sub groups of automotive sector is analyzed. The outcomes and policy recommendations are given in the conclusion.

2 Methods of Measuring International Competitiveness

2.1 Liesner Index

In Liesner (1958), the competitiveness of United Kingdom was questioned for 60 products exported to Western Europe for the period 1953-1956. The aim of Liesner was to find out the sectors which United Kingdom was competitive against European Common Market (Liesner, 1958). The formula Liesner developed for this aim is the following (Utkulu and Seymen, 2004):

$$RCA = \frac{X_{ij}}{X_{nj}}$$

In the formula, “X” refers to exports; “i” refers to the country subject to the analysis; “n” refers to the competing country and “j” refers to the product subject to the analysis.

2.2 Balassa Index

In Balassa (1965) the competitiveness of 74 commodities produced by the developed economies such as Canada, France, Italy, Japan, United Kingdom, Germany and United States of America was calculated (Balassa, 1965). The index developed by Balassa is the following (Balassa, 1989):

$$RCA = \frac{X_{ij} / \sum X_{i}}{X_{wj} / \sum X_{w}}$$

In the equation, "X_{ij}" refers to the export volume of commodity j by country i; "X_i" refers to the total volume of country i; "X_{wj}" referes to the total world export of commodity j. The index value is greater than '1' indicates the comparative advantage and the value is less than '1' refers to the comparative disadvantage in the related commodity(Aynagöz Çakmak, 2005).

2.3 Vollrath Index

According to Vollrath, the competitiveness calculations of Liesner and Balassa were constrained on the country and commodity axes and were concentrated on the commodities produced and on the developed countries. These researches ignored the low or middle income countries and agricultural products. Furthermore the previous indices take into consideration only the exports but not the imports (Vollrath, 1991). Vollrath (1991) developed the Relative Trade Advantage (RTA) index involving export and import volumes and net trade effect. This index was defined as the difference between Relative Export Advantage (RXA) index and Relative Import Penetration (RMP) index.

The Relative Export Advantage (RXA) index was calculated by the export share of a country on a specific commodity in international markets divided by the total export share of that country in all exported commodities. With this formula, the countries and commodities subjected to the analysis were not included in the total volume of the world export in order to avoid double counting and the Relative Export Advantage (RXA) index is defined as below (Frohberg and Hartmann, 1997):

$$RXA_{ij} = \frac{\sum X_{ij} / \sum_{l,l\neq j} X_{il}}{\sum_{k,k\neq i} X_{kj} / \sum_{k,k\neq i}\sum_{l,l\neq j} X_{kl}}$$

In the formula, "X" refers to the export, "i" and "k" refers to the commodity categories, "j" and "l" refers to the countries subject to the analysis. The index value is greater than '1' indicates that the country in the related commodity owns the comparative advantage and the index value is less than '1' indicates comparative disadvantage.

Relative Import Penetration (RMP) index is formulated in a similar way with the relative export advantage, but the main difference is, export is replaced with import and it is interpreted as export's as in an opposite way. Consequently, a value greater than '1' refers to a relative disadvantage while the value less than '1' refers to relative advantage. (Aktan and Vural, 2004). Relative Import Penetration (RMP) index is formulated as below (Frohberg and Hartmann, 1997):

$$RMP_{ij} = \frac{\sum M_{ij} / \sum_{l,l\neq j} M_{il}}{\sum_{k,k\neq i} M_{kj} / \sum_{k,k\neq i}\sum_{l,l\neq j} M_{kl}}$$

Relative Trade Advantage (RTA) index is defined as the difference between Relative Export Advantage (RXA) index and Relative Import Penetration (RMP) index. Because of the Relative Export and Relative Import values being weighted in this index, marginal values of export and import levels do not make an important effect on the index, and the index is formulated as the following (Frohberg and Hartmann, 1997:8):

$$RTA_{ij} = RXA_{ij} - RMP_{ij}$$

The positive value of the index refers to comparative advantage, and negative value refers to comparative disadvantage (Aktan and Vural, 2004).

Relative Competitiveness (RC) index is defined as below, and the negative value of RC refers to comparative disadvantage and positive value of RC refers to comparative advantage (Utkulu and Seymen, 2004:11):

$$RC = In\,RXA - In\,RMP$$

3 Literature Survey

Utkulu and Seymen (2004), Erlat and Erlat (2005), and Küçükkiremitçi (2006) calculated the competitiveness of Turkey in different sectors and automotive sector was among these sectors. Utkulu and Seymen (2004) calculated the competitiveness of Turkey against European Union (EU) within the international trade and bilateral trade contexts for before and after the customs union agreement between Turkey and EU, using EUROSTAT and Undersecretariat of Foreign Trade statistics via Relative Trade Advantage (RTA) index, Relative Export Advantage (RXA) index and Relative Competitiveness (RC) index. Automotive sector was not competitive in either periods. Erlat and Erlat (2005) calculated the international competitiveness of Turkey and EU-15 for 1990-2000 period using UNCTAD-ITC and OECD statistics via Revealed Comparative Advantage (RCA) index. The Revealed Comparative Advantage (RCA) index for the "road vehicles" was 1.60 for the whole period; 1.39 for the first eight years and 2.15 for the last three years. According to the outcomes, after 1997 an important progress in "road vehicles" was earned. Küçükkiremitçi (2006) calculated the competitiveness in 130 sectors subject to foreign trade was calculated for the period 1995-2005 using Turkey Statistical Institute via Revealed Comparative Advantage (RCA) index. The outcomes indicated that the "Road Vehicles and Motors" sector competitiveness index increased both in the whole period and the last three years.

Bekmez and Komut (2006), Kaya and Altın (2008), Başkol (2011), and Özdamar and Albeni (2011) in their researches calculated the competitiveness of Turkish Automotive Sector. Bekmez and Komut (2006) calculated Turkish Automotive Sector competitiveness against EU-15 for the period 1995-2004 using OECD and WTO data via Revealed Comparative Advantage (RCA) index. For the period 1995-2000, Turkish Automotive Industry was net importer while in 2001 and 2002 the index signaled that Turkey increases her competitiveness against EU-15 countries. Although in 2003 and in 2004 the value of the index decreased, still kept on marginal level. Kaya and Altın (2008) calculated the competitiveness of Turkish Machine and Transportation Equipment sector in EU market and international markets using UN-COMTRADE data and Balassa index for the period 1994-2005. In global markets, the index value for the sub commodity group with SITC code 78 (Road Vehicles) moved from 0.28 in 1994 to 1.55 in 2005 and stayed greater than '1' after 2003. In EU market, the index value for the mentioned sector moved from 0.25 in 1994 to 1.15 in 2005 and stayed greater than '1' after 2004. Başkol (2011) calculated the competitiveness of Turkish Automotive Sector in global markets via several indices including Revealed Comparative Advantages (RCA) index for the period 1996-2010 using the data from Chamber of Automotive Manufacturers and Turkish Statistics Institute. According to the index values, automotive sector did not have comparative advantage between 1996 and 1998, and index value increased after 1999 except for 2009 and 2010. For the period 2003-2010 the index value was greater than '1' and it referred to the comparative advantage. The index value moved from 0.39 in 1996 to 1.77 in 2010. Özdamar and Albeni (2011), calculated the competitiveness of Turkish Automotive Sector in global markets via several indexes developed on the Balassa index and using UN-COMTRADE data for the period 1990-2008. The research included the passenger car sector with 781 code in SITC Rev.3, goods and specialised vehicles with 782 code in SITC Rev.3, and road motor vehicles n.e.s. with 783 code in SITC Rev.3. Turkish Automotive Sector achieved comparative advantage in group 781 after 2002, in group 782 after 2000 and in group 783 after 1994.

Freinkman et al. (2004), Ahrend (2006), Cooper (2006), Shelburne and Pidufala (2006), Garanina (2008), and Khatibi (2008) were among the researches measuring the international competitiveness of different countries and different sectors for the Commonwealth of Independent Countries. Freinkman et al. (2004) calculated the competitiveness of the CIS countries within the CIS market and global market using WITS and COMTRADE data for the year 2000 via Revealed Comparative Advantage (RCA) index. For the "road vehicles", Belarus with 3.1 index value, Uzbekistan with 1.1 index value, and Kyrgyz Republic with 1.0 index value, had comparative advantage against other CIS countries. Russia and Ukraine followed these countries with 0.5 index value. However in the global markets, none of the CIS countries were competitive. Ahrend (2006) calculated the competitiveness of Russia for the period 1997-2004 using UN-COMTRADE data and Revealed Comparative Advantage (RCA) index. The Revealed Comparative Advantage (RCA) index in this study was Balassa Index multiplied by 100. According to the outcome, in "Road Vehicles" main group Russia did not have comparative advantage with the index value moving from -3.7 in 1997 to -9.6 in 2004. Furthermore, "Road Vehicles" was among the sectors in which Russia had the highest comparative disadvantage. Cooper (2006), calculated the competitiveness of Russia against the selected countries and in the global markets for the period 2000-2004 using UN-COMTRADE data and Balassa index. For the "the passenger car" sector with SITC 781 code the index values of 2004 were 0.06 for Russia, 0.01 for China, 0.17 for India, 0.48 for USA, 0.66 for Brazil and 1.16 for Turkey. According to these values, Turkey had comparative advantage compared to the other countries. In 2004, index values of Russia in global markets were 0.057 for group 781, 0.313 for group 782 and 0.240 for group 783. The index values for sectors with group 782 and 783 increased compared to their 2000 level (0.142 and 0.140 respectively) and the index value for the sector with group 781 decreased compared to the 2000 value (0.070). Shelburne and Pidufala (2006), calculated the comparative advantage of the CIS countries within the CIS market and in global markets using 2004 UN-COMTRADE data and Balassa Index in manufacturing industry. In the group 783 Belarus had comparative advantage with 10.9 index value against CIS countries and

5.3 in the global markets. Garanina (2008), calculated the comparative advantage of Russia for the 1998-2006 period using UN-COMTRADE data and Revealed Comparative Advantage (RCA) index. Although the index value for "Road Vehicles" main commodity group moved from -0.14 in 1998 to 0.26 in 2006, it indicated that Russia could not have comparative advantage in this commodity group against CIS countries. Khatibi (2008), calculated the comparative advantage of Kazakhstan against EU-27 in several sectors using EUROSTAT data and Revealed Comparative Advantage (RCA) index. The index value for "Road Vehicles" main commodity group moved from 0.01 in 1999 to 0.00 between 2000-2006 and indicated that Kazakhstan did not have comparative advantage in this commodity group against EU-27.

Country	781 Average	781 Growth	782 Average	782 Growth	783 Average	783 Growth	Total (781+ 782+783) Average	Total (781+ 782+783) Growth
Armenia	598	24%	628	15%	163	14%	1,389	18%
Azerbaijan	847	1%	5,470	-8%	499	18%	6,816	-7%
Belarus	13,684	15%	597,587	20%	207,259	37%	818,530	22%
Georgia	48,503	108%	3,674	19%	1,026	51%	53,203	42%
Kazakhstan	6,566	6%	9,872	6%	1,635	2%	18,073	6%
Kyrgyzstan	3,518	22%	10,585	29%	2,464	1%	16,567	25%
Moldova	2,110	10%	508	-4%	827	16%	3,446	8%
Russia	474,946	-1%	500,960	8%	123,643	9%	1,099,548	3%
Tajikistan	935	-7%	449	-8%	412	-9%	1,796	-8%
Turkey	3,153,722	23%	1,762,669	33%	686,814	14%	5,603,204	23%
Turkmenistan	314	15%	663	26%	243	15%	1,219	23%
Ukraine	123,745	21%	88,376	1%	29,879	4%	242,000	8%
Uzbekistan	441,243	64%	2,561	16%	2,837	19%	446,640	60%
Turkey and CIS Total	4,270,731	16%	2,984,002	18%	1,057,701	15%	8,312,434	17%
World	414,953,193	7%	79,654,215	7%	26,200,536	7%	520,807,944	7%

Table 1. *Average and Growth Rate of Automotive Sectors Exports of the Countries to Global Markets in thousand dollars, in the Period of 1995-2011, annually.* ***Source****: Calculated by authors from unctadstat.unctad.org.*

Filiztekin and Karaata (2010) and Karaalp (2011) calculated the comparative advantage of Turkey against CIS market. Filiztekin and Karaata (2010) calculated comparative advantage of Turkey on different sectors and automotive sector was among these sectors and "Motor road vehicles" commodity group was analyzed through Relative Export Advantage (RXA) index. Turkey and Russia were involved in the analysis. The Relative Export Advantage (RXA) index of Turkey was volatile for 1995-1997 but continuously increased for 1998-2008 and reached over the average of the other countries. The index value of Turkey moved from 0.37 in 1995 to 1.09 in 2003 and to 1.68 in 2008. Namely, Turkey had comparative advantage in "Motor Road Vehicles" commodity group in 2003 and after. The index value of Russia was 0.10 for the period 2004-2008 and this indicated that Russia did not have comparative advantage in this sector. Karaalp (2011), calculated the comparative advantage of Turkey against CIS and in global markets for several sectors using 1996-2008 WTO data and several indices including Balassa Index. The Balassa Index indicating the comparative advantage of Turkish Automotive Industry in the global markets moved from 0.37 in 1996 to 1.76 in 2008. Balassa Index value showed that comparative advantage of Turkish Automotive Industry accelerated from 1999 on and after 2003 this movement was more apparent. Furthermore Turkey was more competitive against CIS. The Balassa index of Turkish Automotive Industry against CIS was greater than 2.00 after 2000.

Automotive Trade between Turkey and Commonwealth of Independent States

For the 1995-2011 period among Turkey and CIS countries exporting group 781 to the global markets, Turkey ($ 3,153,722 thousand), Russia ($ 474, 946 thousand) and Uzbekistan ($ 441,243 thousand) were the first three countries. Uzbekistan increased its group781 export rapidly. Within the same period, the export of Russia declined. Turkey had a stable increase in export volume (23 %) although not as high as Uzbekistan (64 %) and Georgia (108 %) (Table 1).

Within the same period, the first three countries exporting group 782 such as trucks and pickups were Turkey ($ 1,762,669 thousand), Belarus ($ 597,587 thousand) and Russia ($ 500,960 thousand) (Table 1).

Turkey had the highest level of increase in group 782 exports within this period (33 %). Kyrgyz Republic (29 %) and Turkmenistan (26 %) were the second and the third. The export volume growth of Belarus (20 %) for the group 782 seems to be reasonable but the export volume growth of Russia (8 %) was not satisfactory for such an important producer (Table 1).

Within the same period, the first three countries exporting group 783 to the global markets were Turkey ($ 686,814 thousand), Belarus ($ 207,259 thousand) and Russia ($ 123,643 thousand) as in the group 782 exports. When the growth of exports in group 783 was analyzed, Georgia (51 %), Belarus (37 %) and Uzbekistan (19 %) had highest growth rates. Although Turkey (14 %) and Russia (9 %) increased their volume of exports, were

falling behind the average export growth of the total of Turkey and CIS countries (Table 1).

Within the same period, the first three countries exporting road vehicles (781+782+783) to the global markets were Turkey ($ 5,603,204 thousand), Russia ($ 1,099,548 thousand) and Belarus ($ 818,530 thousand). The leading countries in intra industry export volume increased among the mentioned countries in road vehicles (781+782+783) were Uzbekistan (60 %), Georgia (42 %) and Kyrgyz Republic (25 %). Turkey (23 %) and Belarus (22 %) increased their volume of exports above the average of the total of Turkey and CIS countries (15 %) in road vehicles (781+782+783). Russian export in road vehicles(781+782+783) increased by (8%) and this ratio was under the average (Table 1).

For the 1995-2011 period, when the share of the related Turkey and CIS countries' export in total world export to Turkey and CIS countries for the group 781 was analyzed (781 CXW), the first three countries with the highest share were Uzbekistan (2.7 %), Russia (2.5 %) and Turkey (1.3 %). The share of the total exports of Turkey and CIS countries to their market, to the world total exports to their market in group 781 was 7.4 %. The first three countries with the highest export volume, the share of their exports to Turkey and CIS countries to their world export in group 781 were, Uzbekistan 99%, Russia 54 % and Turkey 8% (Table 2).

Within the same period in group 782 exports, the share of the related Turkey and CIS countries' exports to all Turkey and CIS countries (782 CXW), Belarus (18.3 %), Ukraine (2.3 %) and Russia (8.8 %) had the highest shares (Table 2).

Turkey (1.4 %) was the fourth in group 782 exports within Turkey and CIS countries. The share of group 782 exports among Turkey and CIS countries to the total exports to their countries was 31.7 %. For the first four countries with the highest export volume of 782 exports, the shares of their Turkey and CIS countries exports of their total exports were for Belarus 89 %, for Ukraine 67 %, for Russia 54 % and for Turkey 7% (Table 2).

Within the same period, in group 783 exports, the share of the related Turkey and CIS countries' exports to all Turkey and CIS countries (783 CXW), Belarus (11.2 %), Russia (4.5 %) and Turkey (3.7 %) had highest share rates. Ukraine (1.8 %) was the fourth in group 782 exports in Turkey and CIS countries. The ratio of group 783 exports of Turkey and CIS countries to each other to the world export to Turkey and CIS countries was 21.8 %. For the first four countries with the highest export volume of group 783 exports, the shares of their Turkey and CIS countries exports to their total exports were for Belarus 86 %, for Russia 63 %, for Turkey 13 % and for Ukraine 86 % (Table 2).

Countries	781 CXW	781 Shares	782 CXW	782 Shares	783 CXW	783 Shares	Total (781+782+ 783) CXW	Total (781+782+ 783) Shares
Armenia	0.00	41%	0.02	58%	0.00	46%	0.01	49%
Azerbaijan	0.01	68%	0.26	90%	0.02	74%	0.07	84%
Belarus	0.18	80%	18.31	89%	11.16	86%	5.13	89%
Georgia	0.16	83%	0.09	86%	0.03	59%	0.14	87%
Kazakhstan	0.06	87%	0.25	70%	0.09	80%	0.10	76%
Kyrgyzstan	0.03	89%	0.19	81%	0.21	75%	0.08	79%
Moldova	0.01	63%	0.01	42%	0.02	37%	0.01	53%
Russia	2.48	54%	8.82	54%	4.51	63%	3.90	52%
Tajikistan	0.00	51%	0.00	54%	0.04	99%	0.01	57%
Turkey	1.27	8%	1.35	7%	3.66	13%	1.61	9%
Turkmenistan	0.00	47%	0.02	79%	0.01	69%	0.01	61%
Ukraine	0.47	80%	2.34	67%	1.81	86%	1.06	78%
Uzbekistan	2.71	99%	0.07	91%	0.22	86%	1.94	99%
Turkey and CIS Total	7.38	26%	31.74	46%	21.78	37%	14.05	35%
World	100.00	3%	100.00	4%	100.00	6%	100.00	3%

Table 2. *Averages Shares of the Countries' Automotive Exports in the World Total Automotive Exports to Turkey and the CIS Countries (CXW) and Shares of the Countries Exports in Turkey and the CIS Countries to the all over the World of Automotive Sectors (Shares) in the Period of 1995-2011, annually.* ***Source****: Calculated by authors from unctadstat.unctad.org.*

For the 1995-2011 period, in total road vehicles (781+782+783) exports, the share of the related Turkey and CIS countries' exports to all Turkey and CIS countries (780 CXW), Belarus (5.1 %), Russia (3.9 %) and Uzbekistan (1.9 %) had the highest shares. Turkey (1.6 %) is the fourth after them. The ratio of 783 group exports of Turkey and CIS countries to each other to the world export to themselves was 14.1 %. For the first

four countries with the highest export volume of 783 exports, the shares of their Turkey and CIS countries exports to their total exports were for Belarus 89 %, for Russia 52 %, for Uzbekistan 99 % and for Turkey 9 %. (Table 2).

Rank	For 781	RCA L Avr	For 781	RCAL Gwt	For 781	RC A Avr	For 781	RC A Gwt	For 781	RT A Avr	For 781	RT A Gwt	For 781	RC Avr	For 781	RC Gwt
1	Uzb	0.0	Geo	0.7	Uzb	2.7	Geo	0.7	Uzb	2.3	Uzb	1.6	Uzb	1.5	Geo	1.8
2	Rus	0.0	Uzb	0.4	Geo	1.1	Uzb	0.3	Geo	0.9	Geo	1.5	Tur	1.0	Uzb	1.8
3	Tur	0.0	Tur	0.0	Tur	0.7	Arm	0.1	Tur	0.2	Tur	1.5	Geo	-0.4	Tur	1.6
4	Ukr	0.0	Krg	0.0	Rus	0.2	Ukr	0.0	Bel	0.0	Ukr	0.1	Bel	-1.0	Azr	0.1
5	Bel	0.0	Ukr	0.0	Krg	0.2	Krg	0.0	Mol	-0.4	Arm	0.1	Krg	-1.6	Ukr	0.0
6	Geo	0.0	Arm	0.0	Ukr	0.1	Tur	0.0	Krg	-0.5	Azr	0.0	Rus	-2.4	Taj	0.0
7	Kzk	0.0	Bel	0.0	Mol	0.1	Mol	0.0	Tkm	-0.6	Krg	0.0	Ukr	-2.5	Kzk	0.0
8	Krg	0.0	Mol	0.0	Bel	0.1	Bel	0.0	Taj	-0.6	Kzk	0.0	Mol	-2.5	Arm	0.0
9	Azr	0.0	Tkm	-0.1	Azr	0.0	Tkm	0.0	Ukr	-0.6	Mol	-0.1	Kzk	-4.0	Tkm	0.0
10	Mol	0.0	Rus	-0.1	Arm	0.0	Rus	0.0	Kzk	-1.6	Taj	-0.1	Taj	-4.5	Krg	0.0
11	Arm	0.0	Kzk	-0.1	Kzk	0.0	Kzk	-0.1	Rus	-2.2	Tkm	-0.1	Arm	-5.0	Mol	0.0
12	Taj	0.0	Azr	-0.2	Taj	0.0	Taj	-0.2	Azr	-2.6	Bel	-0.6	Azr	-5.2	Bel	-0.6
13	Tkm	0.0	Taj	-0.2	Tkm	0.0	Azr	-0.2	Arm	-3.7	Rus	-0.6	Tkm	-6.3	Rus	-0.6
Rank	For 782	RCA L Avr	For 782	RCAL Gwt	For 782	RC A Avr	For 782	RC A Gwt	For 782	RT A Avr	For 782	RT A Gwt	For 782	RC Avr	For 782	RC Gwt
1	Bel	0.3	Tkm	0.4	Bel	6.3	Tkm	0.9	Bel	6.6	Krg	1.7	Bel	5.4	Krg	1.5
2	Rus	0.1	Tur	0.1	Krg	0.9	Krg	0.1	Tur	0.6	Tur	0.1	Tur	2.4	Rus	0.1
3	Ukr	0.0	Krg	0.1	Azr	0.9	Tur	0.1	Geo	-0.1	Rus	0.1	Geo	-0.3	Mol	0.1
4	Tur	0.0	Bel	0.0	Tur	0.7	Bel	0.0	Krg	-0.2	Arm	0.0	Krg	-0.5	Ukr	0.1
5	Azr	0.0	Geo	0.0	Rus	0.7	Arm	0.0	Mol	-0.3	Bel	0.0	Ukr	-1.0	Tur	0.0
6	Kzk	0.0	Uzb	0.0	Geo	0.6	Geo	0.0	Ukr	-0.8	Tkm	0.0	Azr	-1.5	Bel	0.0
7	Krg	0.0	Arm	0.0	Ukr	0.5	Uzb	0.0	Taj	-1.0	Mol	0.0	Rus	-1.7	Taj	0.0
8	Geo	0.0	Kzk	-0.1	Arm	0.2	Rus	-0.1	Azr	-1.1	Ukr	0.0	Mol	-2.4	Arm	0.0
9	Uzb	0.0	Rus	-0.1	Kzk	0.1	Kzk	-0.1	Arm	-2.1	Uzb	-0.1	Arm	-2.9	Kzk	0.0
10	Tkm	0.0	Ukr	-0.1	Uzb	0.1	Ukr	-0.1	Uzb	-2.5	Kzk	-0.1	Kzk	-3.2	Uzb	0.0
11	Arm	0.0	Taj	-0.2	Mol	0.0	Taj	-0.1	Kzk	-2.8	Taj	-0.1	Taj	-4.1	Tkm	-0.1
12	Mol	0.0	Mol	-0.2	Tkm	0.0	Mol	-0.2	Rus	-3.1	Geo	-0.5	Uzb	-4.3	Geo	-0.5
13	Taj	0.0	Azr	-0.2	Taj	0.0	Azr	-0.3	Tkm	-5.6	Azr	-0.6	Tkm	-6.4	Azr	-0.6
Rank	For 783	RCA L Avr	For 783	RCAL Gwt	For 783	RC A Avr	For 783	RC A Gwt	For 783	RT A Avr	For 783	RT A Gwt	For 783	RC Avr	For 783	RC Gwt
1	Bel	0.1	Uzb	0.7	Bel	4.0	Geo	1.3	Bel	3.8	Bel	1.6	Bel	4.3	Bel	1.8
2	Rus	0.1	Geo	0.6	Tur	2.0	Uzb	1.2	Tur	1.9	Taj	0.2	Tur	4.3	Taj	0.2
3	Tur	0.0	Tkm	0.3	Krg	1.2	Tkm	1.1	Krg	0.3	Geo	0.1	Krg	-0.7	Ukr	0.1
4	Ukr	0.0	Bel	0.3	Ukr	0.4	Bel	0.3	Ukr	-0.5	Mol	0.1	Ukr	-0.8	Azr	0.1
5	Krg	0.0	Tur	0.0	Rus	0.3	Arm	0.0	Mol	-0.8	Azr	0.1	Taj	-2.3	Mol	0.1
6	Uzb	0.0	Arm	-0.1	Uzb	0.2	Tur	0.0	Geo	-0.8	Ukr	0.1	Rus	-2.4	Tur	0.0
7	Kzk	0.0	Rus	-0.1	Taj	0.2	Rus	0.0	Taj	-1.0	Arm	0.1	Mol	-2.5	Kzk	0.0
8	Taj	0.0	Ukr	-0.1	Geo	0.2	Ukr	-0.1	Azr	-1.5	Rus	0.0	Geo	-4.0	Arm	0.0
9	Geo	0.0	Krg	-0.1	Mol	0.1	Mol	-0.1	Arm	-1.5	Kzk	0.0	Kzk	-4.0	Rus	0.0
10	Azr	0.0	Kzk	-0.1	Arm	0.1	Kzk	-0.1	Kzk	-2.1	Tkm	0.0	Arm	-4.0	Krg	0.0
11	Mol	0.0	Azr	-0.1	Azr	0.1	Krg	-0.1	Uzb	-2.2	Tur	0.0	Uzb	-4.1	Tkm	-0.1
12	Tkm	0.0	Mol	-0.2	Kzk	0.0	Taj	-0.1	Tkm	-2.5	Krg	-0.1	Azr	-4.3	Geo	-0.1
13	Arm	0.0	Taj	-0.2	Tkm	0.0	Azr	-0.4	Rus	-3.1	Uzb	-0.2	Tkm	-6.5	Uzb	-0.2
Rank	For RV.	RCA L Avr	For RV	RCA L Gwt	For RV	RC A Avr	For RV	RC A Gwt	For RV	RT A Avr	For RV	RT A Gwt	For RV	RC Avr	For RV	RC Gwt
1	Bel	0.1	Uzb	0.4	Uzb	1.9	Uzb	0.3	Bel	1.7	Uzb	1.6	Bel	3.7	Uzb	1.7
2	Rus	0.0	Geo	0.2	Bel	1.7	Tkm	0.2	Tur	0.6	Krg	1.5	Tur	1.7	Geo	1.5
3	Uzb	0.0	Tkm	0.1	Geo	1.0	Geo	0.2	Uzb	0.5	Geo	1.5	Uzb	0.0	Krg	1.4
4	Tur	0.0	Krg	0.1	Tur	0.9	Krg	0.1	Geo	0.5	Rus	0.1	Geo	-0.1	Tur	0.2
5	Ukr	0.0	Bel	0.0	Krg	0.4	Bel	0.0	Mol	-0.4	Tur	0.1	Krg	-0.9	Azr	0.2
6	Geo	0.0	Tur	0.0	Rus	0.3	Arm	0.0	Krg	-0.4	Arm	0.1	Ukr	-1.5	Rus	0.1
7	Kzk	0.0	Arm	-0.1	Ukr	0.2	Tur	0.0	Ukr	-0.8	Azr	0.1	Mol	-2.3	Ukr	0.1
8	Krg	0.0	Ukr	-0.1	Azr	0.2	Mol	0.0	Taj	-0.8	Bel	0.1	Rus	-2.4	Taj	0.0
9	Azr	0.0	Mol	-0.1	Arm	0.1	Rus	0.0	Azr	-2.1	Ukr	0.0	Azr	-3.2	Bel	0.0
10	Mol	0.0	Rus	-0.1	Mol	0.1	Ukr	-0.1	Kzk	-2.1	Tkm	0.0	Kzk	-3.8	Kzk	0.0
11	Taj	0.0	Kzk	-0.1	Kzk	0.1	Kzk	-0.1	Tkm	-2.7	Mol	0.0	Taj	-3.9	Arm	0.0
12	Arm	0.0	Taj	-0.2	Taj	0.0	Taj	-0.2	Rus	-2.8	Kzk	0.0	Arm	-3.9	Mol	0.0
13	Tkm	0.0	Azr	-0.2	Tkm	0.0	Azr	-0.3	Arm	-2.9	Taj	-0.1	Tkm	-6.6	Tkm	0.0

Table 3. *Average Ranks and Comparative Advantage Indices of Turkey and CIS Countries in the Period of 1995-2011 in Automotive Sector* ***Source:*** *Calculated by authors from unctadstat.unctad.org.*

4 The Comparative Advantages of Turkey and Commonwealth of Independent States in their Automotive Market

In order to assess the international competitiveness of Turkey and CIS countries in their automotive market, the four main indices Liesner (RCAL), Balassa (RCA), Relative Trade Advantage Index (RTA) and Relative Competitiveness Index (RC) are calculated. The average (Avr) of these indices for the 1995-2011 period and for the same period the annual average growth rates (Gwt) of these countries are summarized in Table 3. Automotive sector is analyzed in line with the Standard International Trade Code (SITC) Revision 3 with the codes 781, 782, 783 and Road Vehicles (781+782+783). In table 3 the countries are ranked according to their competitiveness in a descending order. The point of focus in the analysis is the share of the countries' exports in Turkey and CIS automotive market. The main automotive manufacturing countries are Russia, Turkey, Belarus, Ukraine, Uzbekistan (Table 3).

In group 781, Uzbekistan has the highest values in all four indices. Georgia follows Uzbekistan. For Georgia, only the RC value is negative but even it increased highly within the period. This continuous increase may take the country to a higher position in RC as well. Turkey is the third country following Georgia in all four indices. The RCAL and RCA values of Russia are high but the RTA and RC values indicate comparative disadvantage. Ukraine has similar values with Russia but all values are increasing which gives an opportunity to increase competitiveness. RCAL and RCA values for Belarus indicate a moderate competitiveness. RTA is high but the decline in RTA indicates a losing comparative advantage (Table 3).

In group 782, Belarus has the highest values in all four indices. Turkey is the second when all four indices are taken into consideration. Russia holds the highest RCAL and RCA values but they are declining and instable. Moreover, Russia has lower values in RTA and RC. Ukraine is parallel with Russia as in 781 group (Table 3).

In group 783, Belarus has the highest values in all four indices. Turkey is the second when all four indices are taken into consideration. Russia has the highest RCAL and RCA values but has comparative disadvantage in RTA and RC. The level of comparative advantage of Ukraine is higher than Russia in group 783. However, RCAL and RCA values of Ukraine are in a decreasing trend (Table 3).

In road vehicles (781+782+783), Uzbekistan has the highest values in all four indices. The main reason of this result for Uzbekistan is the highest comparative advantage in group 781. Due to the increasing automotive production, Uzbekistan achieved a high performance in automotive industry between 1995-2011 and became an exporter rapidly while Uzbekistan previously was an importer. Belarus is the second after Uzbekistan. Turkey is close to Belarus in all four indices. Russia has positive values except RTA and has values in the other three indices indicating moderate comparative advantage. Ukraine is parallel with Russia (Table 3).

The relation of four indices with each other, average Spearman rank correlation coefficient is shown in Table 4. The relation rank correlation coefficient averages for all four indices group 781, group 782, group 783 and Road Vehicles (781+782+783) (RV) are as follows:

Under each coefficient, the number of significant coefficients of 17 years for 1 % and 5 % significance levels are indicated. For example in 781 group, the relation between RCA and RCAL is 16 out of 17. As seen in the table, there is high rank correlation between RCAL and RCA for all four groups. Neither RCAL nor RCA has a rank correlation with RTA except for Road Vehicles. RC has a significant and high rank correlation with the three other indices for each sectors.

For 781	RCAL	RCA	RTA	RC	For 782	RCAL	RCA	RTA	RC
RCAL	1,000				RCAL	1,000			
RCA	0,826	1,000			RCA	0,825	1,000		
	16/17					17/17			
RTA	0,290	0,284	1,000		RTA	0,319	0,513	1,000	
	0/17	0/17				1/17	5/17		
RC	0,763	0,817	0,639	1,000	RC	0,689	0,834	0,808	1,000
	17/17	17/17	13/17			14/17	17/17	17/17	
For 783	RCAL	RCA783	RTA783	RC783	For RV	RCAL	RCA	RTA	RC
RCAL	1,000				RCAL	1,000			
RCA	0,884	1,000			RCA	0,820	1,000		
	17/17					17/17			
RTA	0,340	0,494	1,000		RTA	0,416	0,635	1,000	
	1/17	5/17				3/17	12/17		
RC	0,762	0,902	0,726	1,000	RC	0,719	0,890	0,823	1,000
	14/17	17/17	17/17			17/17	17/17	17/17	

Table 4. *Averages of Spearman's Rank Correlation Coefficients for Index of Automotive Sectors in the Period of 1995-2011* ***Source****: Calculated by authors from unctadstat.unctad.org with SPSS V.20.32bit.*

5 Conclusion

Commonwealth of Independent States and Turkey have a certain level of industrial potential. The shift of the trade between these economies with the above mentioned industrial potential from the sector of low level technology to high technology leads to increase level of growth in the long term. According to the results of this study which aims to measure the competitiveness of automotive sector, one of the industrial branches to enhance technologic opportunities, Uzbekistan has the most comparative advantage in the passenger cars (group 781). Georgia, Turkey, Belarus, Russia and Ukraine follow Uzbekistan. Belarus has the most comparative advantage in goods and specialised vehicles (group 782) and is followed by Turkey, Ukraine and Russia. Belarus has the most comparative advantage in road motor vehicles n.e.s. (group 783) and is followed by Turkey, Ukraine and Russia. For total road vehicles (781+782+783) sector, competitiveness, Uzbekistan has the most comparative advantage and is followed by Belarus, Turkey, Russia and Ukraine respectively. The relationship between the four comparative advantage indices shows that, there are high rank correlations between Liesner (RCAL), Balassa (RCA) and RC. RTA index is only correlated with RC. According to these outcomes of RCAL, RCA and partially of RC indices, the countries which have high production potential and competitive advantage are Uzbekistan, Belarus and Turkey. On the other hand, the countries with high production potential but volatile comparative advantage are Ukraine and Russian Federation. To develop a new strategy against the third party exporters to Turkey and CIS countries markets, the cooperation among the three countries with high comparative advantage and two relatively low comparative advantage is important. Either bilateral or multilateral cooperation of these countries on automotive production policies and trade strategies will be an important step for the development of Turkey and CIS countries markets.

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