Measuring Türkiye's Competitiveness by Revealed Comparative Advantages According to Factor Intensities (1996-2022)

Aslıhan KOCAEFE*

ABSTRACT

This study aims to analyze Türkiye's competitiveness between the years 1996-2022 with the help of the Revealed Comparative Advantage Index (RCA). Index calculations are based on the separation of goods according to factor densities (SITC.Rev.3) with Germany, Brazil and United Arab Emirates (UAE) over 3 regions. Findings of the study; Türkiye is advantageous against Germany in raw material and labor-intensive industries, and disadvantaged in capital-intensive industries and research and development (R&D) intensive industries that are easy and difficult to imitate Compared to Brazil, Türkiye is advantageous in labor-intensive industries and disadvantaged in the raw material and manufacturing industry. In all other titles, there is a general advantage. In Türkiye-United Arab Emirates (UAE) comparison; Türkiye, mineral fuels, oils, etc. It has the upper hand in all raw material-intensive sectors, Labor-intensive and Capital-intensive industries, excluding products from distillation. On the other hand, advantageous and disadvantageous goods groups vary in R&D Intensive Industries.

Key Words: *Competitiveness, Revealed Comparative Advantage Index, Balassa, Factor Intensity*

JEL Classification: *M31*

Türkiye'nin Rekabet Gücünün Faktör Yoğunluklarına Göre Açıklanmış Karşılaştırmalı Üstünlükler ile Ölçülmesi (1996-2022)

ÖZ

Bu çalışma, Türkiye'nin 1996-2022 yılları arasındaki rekabet gücünü Açıklanmış Karşılaştırmalı Üstünlükler Endeksi (AKÜ) yardımıyla analiz etme amaçlıdır. Endeks hesaplamaları 3 bölge üzerinden Almanya, Brezilya ve Birleşik Arap Emirlikleri (BAE) ile malların faktör yoğunluklarına göre ayrıştırılmasına (SITC.Rev.3) dayalıdır. Çalışmanın bulguları; Türkiye'nin Almanya karşısında hammadde ve emek yoğun endüstrilerde avantajlı, kolay ve zor taklit edilebilir araştırma geliştirme (AR-GE) yoğun endüstriler ile sermaye yoğun endüstrilerde dezavantajlı olduğu yönündedir. Türkiye, Brezilya karşısında, emek yoğun endüstrilerde avantajlı hammadde ve imalat sanayinde dezavantajlıdır. Bunun dışındaki diğer tüm başlıklarda genel anlamda bir avantaj söz konusudur. Türkiye- Birleşik Arap Emirlikleri (BAE) karşılaştırmasında ise; Türkiye, mineral yakıtlar, yağlar vb. damıtılmasından elde edilen ürünler hariç tüm hammadde yoğun sektörlerde, Emek yoğun ve Sermaye yoğun endüstrilerin genelinde üstünlük sahibidir. Kolay Taklit Edilebilen ve Zor Taklit Edilebilen AR-GE Yoğun Endüstrilerde ise avantaj ve dezavantajlı mal grupları değişkenlik göstermektedir.

Anahtar Kelimeler: *Rekabet Gücü, Açıklanmış Karşılaştırmalı Üstünlükler Endeksi, Balassa, Faktör Yoğunluğu*

JEL Sınıflandırması: *M31*

*Dr., Freelance Researcher, aslihan.kocaefe@gmail.com , ORCID Number: 0009-0009-4733-3826

(Makale Gönderim Tarihi: 10.10.2023 / Yayına Kabul Tarihi:06.11.2023)
Doi Number: 10.18657/yonveek.1373955
Makale Türü: Araştırma Makalesi

INTRODUCTION

According to David Ricardo, countries go down the path of importing the goods they need because they lack the power to produce every good or produce them cheaper. In fact, this situation is one of the answers to the question of why foreign trade is carried out. With the phenomenon of globalization, barriers to trade have started to be removed, and competition between countries has accelerated over time. With the increase in competition, countries have started to investigate how they can be more profitable from foreign trade. For this purpose, the work of determining the goods to be imported and exported has been put on the forefront. More numerous index calculations developed to measure competitiveness have also been put forward out of this need.

Due to the ease of making measurements with realized trade figures, the Revealed Comparative Advantages Index (RCA) described in the literature is often used.

As an indicator of specialization in international trade, it has been applied in academic publications as well as in reports such as UNIDO 1986, World Bank 1994 and OECD 2011 reports (Laursen, 2015, p. 100).

RCA is formulated as follows;

$RCAij_k = (Xij_k / Xit_k) / (Xwj_k / Xwt_k)$ Xij^k ;

Xit^k; in the period k, the total exports of country i

Xwj^k; country/region/world exports of j goods compared in period k

Xwt^k; the total exports of the country/ region /world compared in period k

The Balassa index results are evaluated according to ”1". If the coefficient is less than 1, it is interpreted as the country not having an advantage over the other country; if it is greater than 1, it is interpreted as having an advantage. If the result is 1, the country does not have any superiority and weakness over the other country (Balassa, 1965, p.99-124).

I.METHOD

A.Theoretical framework and Aim

In this study, measurement was made with the Balassa Index by using the trade data realized in this study. The index calculations were made by taking the first three countries with the highest number of Türkiye's exports from the European Union (EU), Middle East-North African Countries (MENA) and Latin American countries. In the selection of the regions, the fact that the EU is the largest partner in trade, and in the selection of the Middle East-North African Countries (MENA) and Latin America, efforts to get closer to each other through commercial cooperation, especially after 2005, were effective.

The preferred interval in the study is between January 1, 1996, which is the beginning of many structural changes in commercial policies by Türkiye's entry into the Customs Union (CU) and 2022. It was thought to be the most ideal time period to examine the competitiveness of Turkish foreign trade objectively and in real terms, which has gone through various stages until this date.

Among the selected regions, the countries where trade is carried out most intensively are Germany, Brazil and Iraq. However, since the data on Iraq are not published consistently, the comparisons were made over the United Arab Emirates (UAE). However, since the data of the country in question is available in the United Nations' (UN) Comtrade database between 1999 and 2021, this range is taken as the basis. Index calculations, on the other hand, are based on the fact that goods are divided according to factor densities.

The export figures of Turkey between 1996 and 2022 will be analyzed by categorizing them according to the International Standard Trade Technology into "raw material-intensive, labor-intensive, capital-intensive, easy-to-imitate and difficult-to-imitate, research and development-intensive industries."

II.THE LITERATURE

The literature is quite rich in terms of index calculations made using the Balassa Index. Some of these studies are given below.

Yeldan, for the years 2010-2020, compared Turkey's competitiveness in the defense industry with that of the United States, Russia, China, France, and Germany. The findings indicate that Turkey has a comparative advantage in the armored vehicle product group. However, there is no superiority in the missile product group. Ship production and exports, on the other hand, follow a fluctuating trend. It is emphasized that Turkey needs to enhance its competitiveness in the international defense industry market by prioritizing technology-based R&D projects, increasing the allocation to R&D, and supporting companies in this regard (Yeldan, 2023).

Karagöz, for the period 2015-2019, examined Turkey's strength in the glass industry by categorizing it according to SITC. Rev.3. The findings suggest that Turkey has competitiveness in some groups within the glass industry, while in some groups, it does not (Karagöz, 2021).

In the study conducted by Kuşat and Denli in 2021 using the RCA (Revealed Comparative Advantage) index, they compared the competitiveness of Turkey with the BRICS countries, which are defined as the emerging economies of the 21st century. The findings indicate that Turkey has a competitive advantage over the BRICS countries in only one commodity group, namely the "Food and Live Animals Commodity Group."

The competitiveness between China and the USA between 1995 and 2018 was examined by Yurttançıkmaz et al. in terms of main commodity groups. In the study, findings were found that China has a trade surplus against the world and specifically against the USA, and that it is at a disadvantage in competitive comparison in products that are heavy but cheap, but this may turn into an advantage in the future. China is also in a strong position in various manufactured goods with machines and vehicles as subheadings in labor-intensive sectors. The biggest factor underlying this situation is cheap labor (Yurttançıkmaz, Reziwanguli, Emsen, 2020).

In the study published by Bakan et al. in 2019, they analyzed Turkey's transportation sector using the Revealed Comparative Advantage (RCA) method for the period 2005-2017. The findings indicate that, for four different

transportation product groups, the competitiveness value for the product group of rail transport vehicles (product code 806) fluctuated, while for ships and floating structures (product code 809), the competitiveness was very high (ranging between 4.5 and 3.5) between 2005 and 2008. During the same period, a sharp decline in the competitiveness of motor vehicles (product code 807) was observed. The analysis of the product group of air and spacecraft (product code 808) showed that the competitiveness ratio remained below 1 for the period considered, with a strong upward trend in competitiveness observed from 2014 onwards (Engin, 2019).

Özdemir, in his study, examined Turkey's competitiveness in the plastic sector for the period 2001-2018. The findings suggest that Turkey has partial competitiveness in the global market in the plastic sector and at the first-level sub-product groups. However, according to Vollrath's RCA index, Turkey is at a disadvantage. It was also noted that competitiveness advantage was lost against 19 out of 20 countries that are strong in plastic production (Özdemir, 2019).

In their study, Alakbarov and Erkan compared Türkiye and Azerbaijan for the period 2000-2015. The exports of the two countries were examined according to SITC.Rev.3 and measured with the Revealed Comparative Advantages Index. The findings obtained indicate that both Azerbaijan and Türkiye are not strong in international markets in technological goods exports. On the other hand, while Türkiye is advantageous in labor-intensive and capital-intensive sectors, Azerbaijan is in an advantageous position in raw material-intensive sectors (Alakbarov and Erkan, 2017, pp.28-47).

Kalaycı examined Türkiye's comparative advantages with the countries with which free trade agreements were signed between 2012 and 2016. The result of the study is that Türkiye is advantageous in live animals, foodstuffs, beverages and tobacco and various manufactured goods groups, but is disadvantaged in inedible raw materials excluding fuel, animal, vegetable fats and oils, candles and the chemical industry and related industrial products not specified elsewhere (Kalaycı, 2017, pp.133-147).

In the studies of Gümüş and Hiziroğlu, the comparative competitiveness of the selected services in Türkiye with the European Union and the selected EU countries was examined. Within the scope of the study, Porter's Diamond Model and the resulting three different comparative advantage indices were used. The findings indicate that Türkiye has a strong comparative advantage in the construction, tourism and transportation sectors. Although the Turkish finance and insurance, communication and computer informatics sectors seem weak compared to the EU, they have a significant development potential (Gümüş and Hiziroğlu, 2015, pp. 195, 213).

In his study, Şahin, D. compared the competitiveness of Türkiye and China in the textile and ready-wear clothing sector using the Balassa Index. The results of the study; Both Türkiye and China are strong in these sectors; Türkiye has more advantages than China (Şahin, 2015, pp. 155-171).

Erkan et al. measured Türkiye's power in vegetable exports according to comparative advantages declared between 1993 and 2012. Accordingly, Türkiye has a comparative advantage in international markets in the trade of vegetables and vegetable subgroups. However, the advantageous position in vegetable subgroups is gradually decreasing (Erkan, Arpacı, Yaralı, Güvenç, 2015).

In their 2014 study, Yalçınkaya et al. examined the position of the Chinese economy in global trade and its impact on the Turkish economy using Balassa's Revealed Comparative Advantage Index. According to the findings, as of the end of 2013, five industries were identified with an RCAB (Revealed Comparative Advantage Index) greater than 0.5. These industries were determined to be metal ore mining and other mining and quarrying; the manufacture of food products and beverages; and the collection, reclamation, and disposal of waste in the water supply, waste management, and remediation activities industry (Yalçınkaya, Çılbant, Erataş, Hartoğlu, 2014).

Altıntaş and Akpolat compared Türkiye's competitiveness against the EU-27 through the textile sector. Findings obtained; It is stated that Türkiye was superior to the EU-27 in the said sector in the period 2004-2011 (Altıntaş and Akpolat, 2013).

In his master's thesis, Engin focused on the corrugated cardboard sector, which is among the most developing industries in Turkey in recent years. The study, based on data from 2000 to 2011, utilized the Revealed Comparative Advantage (RCA) method. The findings from the study suggest that Turkey has a competitive advantage in the corrugated cardboard packaging sector (Engin, 2013).

Erkan measured Türkiye's competitiveness in the textile and clothing industry with Balassa, Vollrath and export-import ratio index. Between 1993 and 2009, Türkiye had an export advantage in 43 categories of the textile industry and 34 sub-product groups of the ready-wear clothing industry (Erkan, 2013, pp. 93-109).

Erkan conducted a study comparing the Revealed Comparative Advantages and competitiveness of Turkey and Syria. This study covers the years 2000-2008 and is based on 2-digit data from the SITC Rev3. According to the findings, Turkey has a revealed comparative disadvantage against Syria in 9 out of a total of 66 product groups. The product groups where Syria has a revealed comparative advantage against Turkey are mostly in "0 Group Live Animals and Foodstuffs" and "2 Group Non-edible Raw Materials, Except Fuels." Additionally, Turkey has a clear revealed comparative advantage against Syria, with strong comparative advantages in 45 product groups.

In Şahinli's study, the competitiveness of Turkey's cotton sector is examined across all subgroups of the sector. The study covers the years 2001-2009. The findings indicate that Turkey has a comparative advantage in products with codes 52, 5208, 5205, 5209, 5211, 5210, 5206, 5202, 5204, and 5207. However, for products with codes 5201, 5212, and 5203, it is observed that Turkey is sometimes disadvantaged and sometimes advantaged in different years (Şahinli, 2011, pp. 227-240).

Sandalcılar analyzed the competitiveness between Turkey and Syria based on "Broad Economic Categories" (BEC) and the "International Standard Trade Classification" (SITC.3 Rev.). The findings suggest that, except for 2-digit Non-edible Raw Materials Except Fuels (SITC. Rev.3), Turkey is superior to Syria in all other sectors (Sandalcılar, 2011).

Veeramani has studied China and India in terms of competitiveness. In the study, SITC 3-digit numbers were used. The findings show that India is superior in exporting especially agricultural raw material-intensive products and mineral resource-intensive and unskilled labor-intensive products; China is superior in unskilled labor intensive and agricultural raw material intensive goods (Veeramani, 2006, pp. 1-20).

Buturac et al. included Croatia and 6 Eastern European countries in their study. Accordingly, in 2001, Croatia did not have an advantage in any product group (Buturac, Lovrincevic, Teodorovic, 2004).

Prasad measured Fiji's competitiveness with the Balassa index, as a result, competitive advantage was detected in very few goods, and there is generally a weak advantage (Prasad, 2004, pp. 1-40).

III. Comparison between Türkiye and Germany according to the Balassa Index (1996-2022)

A.Comparison in Raw Material Intensive Sectors

Raw material intensive industries; Live Animals and Foodstuffs (0), Edible Raw Materials Excluding Fuel Oil (except 26), Mineral Fuels, Oils, etc. It consists of Distillation Products (except 35), Animal, Vegetable Fats and Oils, Waxes, Fertilizers (except 272).

According to Türkiye and Germany RCA index calculations made using actual export data; Türkiye is in a strong position in all sectors against Germany in Raw Material Intensive Industries. In the fertilizers group, which is heading number 56, while there was a disadvantage between 1996 and 2009, a stable advantage is observed after 2018. The reason why there is no fixed advantage or disadvantage in this group only under the heading of fertilizers is that there is a high dependence on raw material imports in fertilizer production and raw material prices are especially affected by the volatility in exchange rates (Tarım ve Orman Bakanlığı, 2018, p.34).

In summary, according to the RCA Index results, it can be said that Türkiye is in an advantageous position against Germany in raw material-intensive sectors.

Table 1. Türkiye - Germany RCA Index Coefficients in Raw Material Intensive Sectors

Year	0	2 (excluding 26)	3 (excluding 35)	4	56
1996	3,63	1,81	0,97	4,08	0,36
1997	3,90	1,67	0,66	4,05	0,15
1998	3,53	1,72	1,00	3,05	0,27
1999	3,25	1,77	1,31	3,80	0,17
2000	3,11	1,39	0,75	1,97	0,14
2001	2,91	1,24	1,02	2,88	0,37
2002	2,39	1,21	1,41	1,15	0,63
2003	2,44	1,29	1,44	2,76	0,29
2004	2,42	1,20	1,26	1,72	0,41
2005	2,46	1,11	1,67	3,23	0,29

2006	2,21	1,20	1,90	3,37	0,27
2007	2,11	1,26	2,35	1,95	0,47
2008	1,81	1,19	2,57	2,12	0,58
2009	1,97	1,41	2,23	2,15	0,43
2010	2,21	1,58	2,37	1,58	1,02
2011	2,13	1,34	2,35	2,63	0,72
2012	1,86	1,42	2,28	2,53	1,10
2013	1,96	1,91	2,05	3,01	0,80
2014	2,05	1,71	1,89	2,96	1,26
2015	2,27	1,70	1,61	2,72	1,32
2016	2,13	1,84	1,50	2,70	1,62
2017	2,09	1,85	1,74	2,91	0,89
2018	2,09	1,75	1,68	3,11	1,13
2019	2,04	1,66	2,26	2,99	1,40
2020	2,05	1,59	1,67	3,70	1,60
2021	2,03	1,38	1,71	3,41	1,27
2022	2,01	1,43	2,48	4,98	1,40

Source: Calculations have been made with the figures taken from UN Comtrade.

B.Comparison in Labor-Intensive Sectors

In Labor-Intensive Industries, there are Woven Fibers and Their Residues (26), Processed Goods Divided into Main Classes (except 62,67,68) and Various Finished Goods (except 87,88). In this group, Türkiye's position against Germany is that Türkiye is strong compared to Germany in all export groups and this continues steadily.

Table 2. Türkiye - Germany RCA Index Coefficients in Labor-Intensive Sectors

Year	26	6 (excluding 62, 67, 68)	8 (excluding 87, 88)
1996	3,44	1,79	4,62
1997	2,53	1,94	4,65
1998	2,80	2,01	4,67
1999	3,36	2,08	4,41
2000	2,77	2,32	4,85
2001	1,73	2,21	4,18
2002	1,54	2,14	4,24
2003	2,03	2,19	4,32
2004	1,88	2,19	3,92
2005	1,55	2,10	3,48
2006	1,75	2,03	3,13
2007	1,75	2,04	3,02
2008	1,53	1,97	2,47
2009	1,64	2,13	2,39
2010	2,07	2,23	2,63
2011	2,68	2,21	2,51
2012	2,66	2,09	2,47
2013	2,63	2,26	2,76
2014	2,56	2,26	2,89
2015	2,99	2,28	2,89
2016	3,36	2,23	2,83
2017	3,58	2,09	2,52
2018	4,85	2,06	2,43
2019	4,48	2,13	2,45
2020	4,26	2,23	2,36
2021	5,49	2,18	2,37
2022	4,58	2,13	2,52

Source: Calculations have been made with the figures taken from UN Comtrade.

C. Comparison in Capital Intensive Sectors

Capital Intensive Sectors consist of Beverages and Tobacco (1), Electrical Energy, Products Used in Debagat and Dyeing (35) Essential Oils, Perfumes, Cosmetics, Toilet Preparations (53), Rubber Goods (55), Rubber Goods (62), Iron and Steel (67), Non-Ferrous Mines (68) and Land Vehicles (78).

Table 3. Türkiye - Germany RCA Index Coefficients in Capital Intensive Industries

Year	1	35	53	55	62	67	68	78
1996	4,61	0,46	0,27	1,59	1,18	2,83	0,77	0,24
1997	4,66	0,35	0,29	1,72	1,13	2,82	0,71	0,18
1998	3,88	0,44	0,32	1,45	1,28	2,33	0,78	0,19
1999	3,34	0,48	0,28	1,25	1,36	2,72	0,71	0,32
2000	3,22	0,90	0,30	1,29	1,56	2,74	0,72	0,34
2001	2,20	0,55	0,29	1,09	1,63	3,35	0,66	0,43
2002	1,69	0,46	0,30	0,99	1,52	3,32	0,56	0,49
2003	1,55	0,40	0,29	0,97	1,54	3,11	0,61	0,58
2004	1,52	0,66	0,30	0,96	1,42	3,68	0,62	0,77
2005	1,38	1,51	0,35	0,94	1,44	2,76	0,67	0,75
2006	1,37	0,36	0,38	0,97	1,49	2,81	0,72	0,84
2007	1,10	0,51	0,40	0,84	1,62	2,87	0,71	0,89
2008	0,95	0,15	0,43	0,84	1,54	4,07	0,74	0,88
2009	1,07	0,34	0,51	0,89	1,58	3,56	0,78	0,84
2010	1,01	0,50	0,56	0,92	1,66	3,59	0,91	0,77
2011	0,82	0,40	0,56	0,91	1,79	3,58	0,89	0,70
2012	0,90	0,37	0,57	0,87	1,48	3,43	0,85	0,59
2013	1,01	0,06	0,63	0,93	1,52	3,34	0,89	0,67
2014	1,14	0,18	0,62	1,02	1,59	3,19	0,90	0,65
2015	1,11	0,17	0,63	1,00	1,51	2,76	0,97	0,66
2016	1,14	0,04	0,55	0,92	1,53	2,80	1,00	0,76
2017	1,05	0,22	0,44	0,89	1,50	2,88	0,91	0,84
2018	1,14	0,23	0,54	0,86	1,61	3,63	1,04	0,92
2019	1,06	0,23	0,58	0,85	1,63	3,33	0,98	0,89
2020	1,20	0,20	0,63	1,05	1,57	3,38	1,00	0,85
2021	0,91	0,22	0,62	0,83	1,56	4,02	1,21	0,74
2022	0,96	0,10	0,78	0,91	1,55	2,87	1,43	0,67

Source: Calculations have been made with the figures taken from UN Comtrade

According to the RCA results of this group; Türkiye exhibits a stable superiority over Germany in the iron and steel industry numbered 67 with Rubber Goods numbered 62. On the other hand, in the number 1 drinks and tobacco group, although some years are advantageous and some years are disadvantageous, the disadvantaged situation is noticeable in recent years. It is in a disadvantaged position against Germany in exports of Land Vehicles numbered 78, Electrical Energy numbered 35th, non-ferrous minerals numbered 68th, and Products Used in Tanning and Painting numbered 35th. However, there is a stable advantage in Non-Ferrous Minerals (68), especially in the last three years. It can be said that the main reason behind this situation is the increase in global demand for these products.

D.Comparison in Easily Imitable R&D Intensive Sectors

Easily Imitated R&D Intensive Industries, Organic Chemical Products (51), Inorganic Chemical Products (52) Medical and Pharmaceutical Products (54) Non-Primary Plastics (58), Chemical Substances Not Elsewhere Specified (59), Products Office Machines and It consists of Automatic Data Processing Machines (75), Devices and Tools for Communication, Voice Recording and Reproducing Voice (76).

In R&D-intensive sectors that can be imitated easily, according to the Türkiye-Germany comparison; Türkiye has never been able to gain an advantage over Germany in sectors 51, 54, 59 and 75. In plastics that are not in the first shape number 58, the advantageous position is maintained steadily between 2008

and 2022. While there may be a slight transition to superiority in the commodity groups numbered 52 and 76 in some years, there is generally a disadvantage.

Table 4. Türkiye-Germany RCA Index Coefficients in R&D Intensive Industries that Can Be Easily Imitable

Year	51	52	54	58	59	75	76
1996	0,17	0,82	0,21	0,35	0,12	0,04	0,57
1997	0,13	0,95	0,19	0,42	0,12	0,04	0,71
1998	0,13	1,02	0,17	0,46	0,12	0,06	1,37
1999	0,15	1,26	0,17	0,47	0,12	0,08	1,05
2000	0,18	0,18	0,23	0,59	0,14	0,08	1,17
2001	0,19	0,54	0,15	0,65	0,13	0,06	0,99
2002	0,19	0,27	0,16	0,60	0,15	0,04	1,39
2003	0,17	0,24	0,15	0,65	0,13	0,03	1,52
2004	0,19	0,24	0,12	0,72	0,13	0,03	1,50
2005	0,14	0,26	0,11	0,83	0,15	0,03	1,36
2006	0,16	0,25	0,10	0,91	0,17	0,04	1,26
2007	0,15	0,26	0,09	0,99	0,18	0,05	1,11
2008	0,16	0,24	0,08	1,04	0,17	0,05	1,00
2009	0,16	0,24	0,08	1,13	0,19	0,04	1,15
2010	0,23	0,31	0,10	1,19	0,20	0,06	0,98
2011	0,20	0,30	0,10	1,24	0,19	0,06	0,93
2012	0,21	0,35	0,09	1,24	0,21	0,06	0,94
2013	0,18	0,34	0,10	1,39	0,23	0,07	0,80
2014	0,16	0,42	0,10	1,41	0,22	0,07	0,84
2015	0,09	0,84	0,11	1,34	0,24	0,08	0,79
2016	0,10	0,90	0,11	1,23	0,25	0,07	0,68
2017	0,13	0,75	0,11	1,14	0,22	0,07	0,65
2018	0,13	1,08	0,12	1,20	0,23	0,06	0,59
2019	0,13	1,09	0,13	1,23	0,26	0,06	0,50
2020	0,15	0,92	0,15	1,31	0,35	0,05	0,41
2021	0,20	0,74	0,12	1,24	0,28	0,04	0,42
2022	0,20	1,13	0,10	1,25	0,30	0,07	0,35

Source: Calculations have been made with the figures taken from UN Comtrade

E.Comparison in R&D Intensive Sectors that are Difficult to Imitate

R&D Intensive Industries That Are Difficult to Imitate According to Their Factor Intensities; Primary Plastics (57) are Machinery and Transportation Vehicles 7 (except 75,76,78), Professional, Scientific, Control Tools and Devices Not Specified Elsewhere (87) and Animal, Vegetable Fats and Oils, Waxes (88).

In this group, Türkiye has no superiority over Germany in any period. This state of disadvantage also continues to be stable. Of course, the biggest reason behind this situation is; The industrial sector and R&D activities have a high share of the national product.

Table 5. Türkiye-Germany RCA Index Coefficients in R&D Intensive Industries that are Difficult to Imitate

Year	57	7 (Excluding 75,76,78)	87	88
1996	0,19	0,27	0,06	0,04
1997	0,16	0,29	0,06	0,04
1998	0,16	0,30	0,08	0,05
1999	0,17	0,37	0,07	0,06
2000	0,16	0,42	0,07	0,07
2001	0,21	0,43	0,07	0,06
2002	0,17	0,38	0,06	0,06
2003	0,17	0,44	0,08	0,06
2004	0,16	0,43	0,08	0,05
2005	0,16	0,45	0,07	0,04
2006	0,22	0,50	0,08	0,05
2007	0,22	0,56	0,09	0,06
2008	0,23	0,53	0,09	0,06
2009	0,30	0,55	0,09	0,07
2010	0,37	0,53	0,09	0,07
2011	0,40	0,54	0,09	0,07
2012	0,35	0,48	0,10	0,08

2013	0,37	0,53	0,12	0,08
2014	0,39	0,53	0,12	0,10
2015	0,38	0,53	0,13	0,10
2016	0,36	0,52	0,12	0,11
2017	0,45	0,55	0,14	0,13
2018	0,55	0,54	0,14	0,12
2019	0,58	0,55	0,15	0,10
2020	0,58	0,58	0,19	0,09
2021	0,73	0,58	0,15	0,08
2021	0,73	0,58	0,15	0,08

Source: Calculations have been made with the figures taken from UN Comtrade

IV.Comparison between Türkiye and Brazil according to the Balassa Index (1996-2022)

A.Comparison in Raw Material Intensive Sectors

Although Türkiye and Brazil are two countries that are regionally distant from each other and have different historical and cultural characteristics, they are countries that are frequently compared in the literature within the framework of developing countries. In general, Brazil stands out with its strong structure in the raw materials and manufacturing industry.

Table 6. Türkiye - Brazil RCA Index Coefficients in Raw Material Intensive Industries

Year	0	2 (excluding 26)	3 (excluding 35)	4	56
1996	0,69	0,19	1,23	0,54	0,65
1997	0,72	0,16	1,15	0,72	0,26
1998	0,69	0,14	1,31	0,46	0,52
1999	0,55	0,15	1,44	0,58	0,39
2000	0,62	0,11	0,60	0,42	0,23
2001	0,53	0,10	0,38	0,54	0,61
2002	0,44	0,10	0,38	0,18	0,80
2003	0,43	0,09	0,39	0,29	0,29
2004	0,42	0,09	0,47	0,20	0,38
2005	0,48	0,10	0,58	0,44	0,35
2006	0,42	0,12	0,52	0,50	0,37
2007	0,38	0,12	0,56	0,22	0,47
2008	0,37	0,10	0,60	0,29	0,71
2009	0,38	0,09	0,45	0,44	0,51
2010	0,40	0,10	0,38	0,37	1,13
2011	0,42	0,09	0,45	0,64	0,97
2012	0,37	0,10	0,44	0,67	0,72
2013	0,42	0,11	0,58	1,10	0,39
2014	0,42	0,10	0,40	0,97	0,60
2015	0,41	0,09	0,41	0,72	0,62
2016	0,39	0,10	0,34	0,92	0,99
2017	0,43	0,09	0,31	0,92	1,46
2018	0,49	0,08	0,24	0,94	1,84
2019	0,44	0,08	0,32	1,14	3,18
2020	0,44	0,07	0,22	1,46	3,09
2021	0,48	0,07	0,26	0,93	2,63
2022	0,41	0,09	0,37	0,92	4,36

Source: Calculations have been made with the figures taken from UN Comtrade

As a general evaluation, Türkiye does not have an advantage over Brazil in Raw Material Intensive Industries, according to the Declared Comparative

Advantage Index results. However, as of 2017, it has been concluded that Türkiye has moved to an advantageous position in the fertilizers group, which is heading number 56.

B.Comparison in Labor-Intensive Industries

Türkiye steadily maintains its advantageous position against Brazil in Labor Intensive Industries in heading number 6, Processed Goods Divided into Major Classes (excluding 62,67,68) and heading number 8, Miscellaneous Finished Goods (excluding 87,88). A strong advantage is seen especially in commodity groups number 8.

Table 7. Türkiye - Brazil RCA Index Coefficients in Labor-Intensive Sectors

Year	26	6 (excluding 62,67,68)	8 (excluding 87,88)
1996	7,19	1,79	5,39
1997	5,54	1,99	5,87
1998	5,44	2,18	6,42
1999	6,86	2,06	5,75
2000	4,19	2,23	5,30
2001	1,15	2,23	4,97
2002	1,41	2,21	5,64
2003	1,12	2,06	6,00
2004	0,70	2,05	5,54
2005	0,62	2,28	5,94
2006	0,89	2,24	6,11
2007	0,67	2,35	6,35
2008	0,52	2,68	6,38
2009	0,36	2,98	6,81
2010	0,45	3,27	8,41
2011	0,47	3,86	10,20
2012	0,25	3,35	9,49
2013	0,43	3,51	11,33
2014	0,31	3,15	11,23
2015	0,32	2,70	10,30
2016	0,35	2,70	9,75
2017	0,38	3,25	9,28
2018	0,39	3,58	10,26
2019	0,21	3,78	9,99
2020	0,15	4,16	12,17
2021	0,25	4,03	11,89
2022	0,30	4,26	12,15

Source: Calculations have been made with the figures taken from UN Comtrade

While Türkiye had a strong superiority over Brazil in the number 26 woven fibers and their residues between 1996 and 2000, this superiority continued to decrease between 2001 and 2003. Türkiye lost its advantageous position as of 2004. As of 2022, the disadvantageous situation continues.

C.Comparison in Capital Intensive Sectors [a]

For the period under review, Türkiye has a consistent disadvantage over Brazil in the No. 1 beverages and tobacco products category. Apart from this, there is a general advantage in all other titles. The details of the titles are given below.

[a] Brazil's export data in the 35th commodity group was not included in the calculations in 17 years of the examined period, as it was too low to be included in the index calculations.

Table 8. Türkiye - Brazil RCA Index Coefficients in Capital Intensive Industries

Year	1	35	53	55	62	67	68	78
1996	0,93	-	0,86	3,08	0,85	0,95	0,38	0,60
1997	0,87	-	0,85	4,09	0,86	1,16	0,41	0,33
1998	0,75	-	0,80	3,40	0,96	0,95	0,54	0,33
1999	1,07	-	0,77	2,61	0,97	1,01	0,38	0,74
2000	1,16	-	0,84	2,61	1,13	1,02	0,42	0,69
2001	0,87	-	0,84	2,40	1,38	1,48	0,53	0,99
2002	0,69	-	1,21	2,10	1,38	1,22	0,38	1,25
2003	0,67	-	1,09	1,96	1,35	1,04	0,39	1,33
2004	0,61	-	1,14	1,99	1,41	1,30	0,42	1,58
2005	0,67	-	1,36	1,98	1,48	1,04	0,56	1,38
2006	0,72	-	1,38	1,93	1,45	1,23	0,56	1,59
2007	0,51	-	1,45	1,72	1,36	1,41	0,58	1,90
2008	0,47	2,33	1,64	1,83	1,42	1,85	0,77	1,94
2009	0,44	0,19	1,99	1,95	1,52	1,83	0,83	2,21
2010	0,54	0,90	2,25	2,01	1,84	1,99	1,40	2,02
2011	0,56	0,51	2,39	2,16	2,27	1,94	1,61	2,22
2012	0,52	0,74	2,32	2,10	1,86	1,87	1,71	1,93
2013	0,56	-	2,88	2,54	2,12	2,04	1,58	1,94
2014	0,74	-	2,75	2,45	2,16	1,44	1,68	2,64
2015	0,70	-	2,49	2,14	1,97	1,08	1,38	2,41
2016	0,74	0,67	2,39	1,86	1,95	1,15	1,45	2,34
2017	0,74	8,84	2,39	1,82	2,08	1,11	1,77	2,20
2018	0,84	-	2,62	1,95	2,35	1,37	2,32	2,85
2019	0,67	-	2,82	2,20	2,28	1,22	2,07	3,55
2020	0,85	51,72	3,34	2,66	2,67	1,38	2,87	3,99
2021	0,90	14,31	3,05	2,38	2,78	1,63	3,58	3,51
2022	0,67	1,12	3,61	2,40	2,50	1,29	4,16	2,88

Source: Calculations have been made with the figures taken from UN Comtrade

While Türkiye was at a disadvantage against Brazil in terms of products used in tanning and dyeing, number 53, from 1996 to 2001, it is in a strong position between 2002 and 2022. This advantage situation continues to increase. While there was a disadvantage for the 68 non-ferrous minerals group until 2009, an advantage has been achieved in this group since 2010. Türkiye's superiority in exports of commodity groups number 55 continues steadily. A strong position was achieved in the rubber goods sector numbered 62 after 1999, in the iron and steel sector numbered 67 after 1998, and in the motor vehicles sector numbered 78 after 2001.

D.Comparison in R&D Intensive Sectors that Can Be Easily Imitate

Türkiye has never been able to gain an advantage over Brazil in organic chemical products, numbered 51. On the other hand, the superiority of Products No. 52 and No. 59 in recent years is noteworthy.

Table 9. Türkiye Brazil RCA Index Coefficients in R&D Intensive Sectors that Can Be Easily Imitate

Year	51	52	54	58	59	75	76
1996	0,20	0,73	1,06	1,48	0,26	0,12	1,38
1997	0,16	1,03	1,06	1,91	0,25	0,17	1,52
1998	0,14	1,18	0,92	2,16	0,22	0,23	2,70
1999	0,16	1,32	0,82	2,25	0,25	0,23	1,88
2000	0,20	0,17	1,11	2,30	0,34	0,26	1,17
2001	0,26	0,61	1,02	2,36	0,30	0,25	1,02
2002	0,20	0,30	0,97	2,46	0,31	0,28	1,51
2003	0,18	0,24	1,08	2,39	0,31	0,23	1,81
2004	0,20	0,25	1,12	2,71	0,32	0,24	2,96
2005	0,14	0,29	1,00	3,05	0,40	0,23	1,64
2006	0,13	0,34	0,86	3,39	0,48	0,29	1,47
2007	0,12	0,34	0,74	3,78	0,49	0,64	1,75
2008	0,13	0,32	0,67	4,14	0,53	0,55	1,25
2009	0,12	0,32	0,61	4,09	0,55	0,39	1,55
2010	0,21	0,41	0,78	4,65	0,66	0,65	2,19
2011	0,19	0,39	0,75	5,02	0,71	0,67	3,17
2012	0,18	0,45	0,71	5,63	0,69	0,65	4,69
2013	0,17	0,50	0,81	5,88	0,79	0,79	4,88
2014	0,17	0,56	0,73	5,38	0,75	1,06	6,57
2015	0,10	1,01	0,89	4,34	0,75	1,12	5,70
2016	0,12	0,81	0,88	4,82	0,81	0,77	7,22
2017	0,15	0,76	1,02	6,27	0,75	0,34	6,64
2018	0,16	0,88	1,39	6,62	0,81	0,44	6,19
2019	0,16	1,08	1,45	6,30	0,81	0,39	4,65
2020	0,20	1,33	2,00	6,27	1,13	0,93	4,26
2021	0,30	1,28	2,02	6,52	1,06	0,97	5,00
2022	0,30	1,65	1,70	6,93	1,08	0,89	3,87

Source: Calculations have been made with the figures taken from UN Comtrade

Türkiye has an absolute advantage in commodity groups number 58 and group 76. In the product group number 75, superiority can be mentioned in only two years of the examined period, while Brazil has an advantage over Türkiye in all other years. It is seen that Türkiye has achieved a stable superiority in medical and pharmaceutical products number 54 as of 2017.

E.Comparison in R&D Intensive Sectors that are Difficult to Imitate

As of 2020, Türkiye has moved from a disadvantaged position to a strong position in the commodity group numbered 57 against Brazil, as of 2006 in coffee, tea, cocoa, spice products numbered 7, as of 2012 in professional, scientific, control tools and devices not mentioned elsewhere numbered 87, as of 2013 in photographic materials, optical goods and watches numbered 88.

Table 10. Türkiye - Brazil RCA Index Coefficients in R&D Intensive Sectors That Are Difficult to Imitate

Year	57	7 (excluding 75,76,78)	87	88
1996	0,40	0,63	0,49	0,07
1997	0,34	0,66	0,51	0,09
1998	0,35	0,65	0,49	0,11
1999	0,37	0,75	0,35	0,09
2000	0,30	0,71	0,39	0,13
2001	0,48	0,78	0,38	0,15
2002	0,38	0,76	0,39	0,22
2003	0,31	0,90	0,59	0,20
2004	0,32	0,76	0,60	0,18
2005	0,29	0,90	0,57	0,19
2006	0,35	1,05	0,58	0,26
2007	0,35	1,10	0,68	0,33
2008	0,52	1,13	0,73	0,43
2009	0,41	1,39	0,79	0,53
2010	0,56	1,43	0,90	0,68
2011	0,61	1,57	0,97	0,89
2012	0,60	1,28	1,07	0,94
2013	0,68	1,20	1,33	1,15
2014	0,65	1,43	1,24	1,33
2015	0,52	1,27	1,28	1,27
2016	0,44	1,10	1,17	1,31
2017	0,61	1,59	1,59	1,98
2018	0,84	1,63	1,51	1,90
2019	0,89	1,79	1,60	1,66
2020	1,09	2,47	3,20	1,89
2021	1,48	2,54	2,57	2,02
2022	1,94	2,58	2,68	1,73

Source: Calculations have been made with the figures taken from UN Comtrade

V.Comparison of Türkiye - UAE according to Balassa Index (1999-2022)

A.Comparison in Raw Material Intensive Industries [b]

As a natural consequence of the United Arab Emirates' economy being based on oil and natural gas, this country has consistently had an advantage over Türkiye in the production of product groups derived from the distillation of number 3 mineral fuels, oils, and similar items throughout the years. In all other sector groups, Türkiye's strong superiority can be mentioned. In particular, the index results under the heading fertilizers No. 56 are noteworthy. Of course, the underlying reason for obtaining these results is the increase or decrease in the actual trade data of the two countries.

[b] UAE data is available in UN Comtrade between 1999 and 2021. Calculations were made based on this range.

Table 11: Türkiye-UAE RCA Index in Raw Material Intensive Industries

Year	0	2 (excluding 26)	3 (excluding 35)	4	56
1999	4,69	2,64	0,02	4,61	6,63
2000	6,33	3,67	0,01	2,53	1,41
2001	5,70	2,72	0,02	4,94	6,47
2002	5,88	3,11	0,04	2,96	12,52
2003	5,59	2,42	0,05	5,82	3,98
2004	6,17	3,42	0,05	4,83	26,86
2005	6,28	3,47	0,08	5,27	4,39
2006	5,80	2,30	0,08	4,19	3,70
2007	5,35	2,59	0,09	2,67	4,42
2008	5,22	2,60	0,11	3,71	5,17
2009	5,23	2,94	0,10	6,50	5,11
2010	4,83	4,51	0,10	3,75	11,66
2011	5,80	4,46	0,11	3,29	11,03
2012	7,12	4,21	0,14	6,85	5,49
2013	7,09	4,79	0,13	9,08	3,26
2014	6,70	4,01	0,13	6,21	3,68
2015	5,95	3,30	0,19	6,76	9,78
2016	5,77	3,39	0,13	6,46	13,12
2017	5,61	4,65	0,13	6,77	4,93
2018	5,13	4,09	0,10	5,74	8,13
2019	4,76	2,59	0,08	4,33	12,88
2020	4,47	2,91	0,05	4,00	24,69
2021	4,63	2,16	0,07	4,11	27,69

Source: Calculations have been made with the figures taken from UN Comtrade

B.Comparison in Labor-Intensive Sectors

In the comparison between Türkiye and the UAE in labor-intensive industries, Türkiye has a strong position against the UAE in all areas. However, as can be seen in Table 12, the RCA index coefficients in woven fibers number 26 and their residues are decreasing rapidly as of 2017. The UAE is rapidly increasing the export volume in this sector.

Table 12. Türkiye-UAE RCA Index Comparison in Labor Intensive Industries

Year	26	6 (excluding 62, 67, 68)	8 (excluding 87, 88)
1999	12,60	3,41	6,48
2000	21,21	3,68	9,67
2001	17,10	3,33	6,31
2002	12,10	3,40	9,20
2003	13,28	4,14	9,09
2004	3,68	3,44	8,76
2005	3,22	3,24	8,12
2006	3,58	4,13	8,34
2007	2,61	3,00	6,14
2008	19,89	2,36	4,81
2009	10,77	2,25	4,72
2010	10,05	1,64	4,83
2011	16,37	1,82	4,69
2012	4,72	2,74	3,11
2013	3,77	2,64	4,00
2014	2,53	2,78	3,55
2015	12,74	2,90	3,91
2016	11,86	2,44	3,11
2017	3,82	2,20	2,37
2018	4,61	2,55	2,64
2019	3,38	2,83	2,60
2020	3,07	3,15	4,04
2021	4,08	2,49	3,53

Source: Calculations have been made with the figures taken from UN Comtrade

C.Comparison In Capital Intensive Industries

In general, Türkiye has a strong position against the UAE in capital-intensive sectors. However, in recent years, it is noteworthy that there has been a decrease in the coefficient of superiority in the commodity group number 67. As a matter of fact, the RCA coefficient, which was 34.90 in 1999, decreased to 7.76 in 2022. The advantage in group 1 turned into a disadvantage between 2012 and 2014. It can be said that Türkiye regained an advantage in the sector between 2015-2017, but could not maintain this advantage between 2017-2021.

Türkiye has an absolute advantage over the UAE in the products used in tanning and painting industry, number 53, in the rubber goods sector, number 62, and in the motor vehicles sector, number 78. While the UAE has the advantage in some years and Türkiye in some years in the non-ferrous minerals group number 68, the advantage is in favor of Türkiye in 2020 and 2021. Türkiye's superiority in essential oils, perfumes, cosmetics, toilet preparations, numbered 55, has turned into a disadvantage as of 2018.

Table 13. Türkiye - UAE RCA Index Coefficients in Capital Intensive Sectors

Year	1	35	53	55	62	67	68	78
1999	2,21	-	2,21	1,66	1,92	34,90	0,43	2,49
2000	1,64	-	3,78	1,98	2,82	27,73	0,55	3,12
2001	0,92	-	2,37	0,89	2,16	24,62	0,49	3,16
2002	1,24	-	3,53	1,22	3,28	21,51	0,70	4,72
2003	1,84	-	3,83	1,32	3,75	18,75	0,95	4,57
2004	2,28	-	4,40	1,99	3,13	32,06	1,23	5,22
2005	2,50	-	4,69	1,77	2,75	22,32	0,85	5,02
2006	3,63	-	5,85	1,88	3,46	23,90	1,58	5,46
2007	2,97	-	4,61	1,55	2,81	24,24	0,84	4,21
2008	2,76	-	5,41	2,08	3,77	35,53	0,73	4,57
2009	2,65	-	5,70	2,59	2,95	23,45	4,79	3,62
2010	2,22	-	6,50	2,32	3,21	24,85	4,01	4,04
2011	2,03	-	4,54	2,26	4,23	24,48	2,13	4,63
2012	0,83	-	4,20	1,47	3,18	10,98	1,59	3,30
2013	0,85	-	5,24	1,62	3,80	10,08	1,21	3,70
2014	0,80	-	4,39	1,65	3,96	9,09	1,03	2,78
2015	2,60	-	6,71	2,42	4,53	8,98	0,92	4,36
2016	2,03	-	5,06	2,26	4,57	8,36	0,75	4,99
2017	2,38	-	2,78	1,11	3,50	10,74	0,66	3,73
2018	0,60	-	2,39	0,90	4,63	10,34	0,83	4,54
2019	0,52	-	2,46	0,83	3,81	8,24	0,91	4,58
2020	0,50	-	2,41	0,91	3,68	6,18	1,14	4,18
2021	0,42	-	2,53	0,71	4,04	7,76	1,09	3,92

Source: Calculations have been made with the figures taken from UN Comtrade

D.Comparison in Easily Imitated R&D Intensive Sectors

In the export of Easily Imitable R&D Intensive Goods groups, Türkiye has an advantageous position in the group number 51 in all years except 2019, in products number 52, in products number 54, in plastics number 58, in chemicals number 59. While the UAE has an advantage over Türkiye in the commodity group number 75, the advantage it had before 2012 in the group number 76 turned into a disadvantage between 2012-2021. In the Inorganic chemical products group number 52, the rapid increase in RCA index coefficients after 2015 can be attributed to the decrease in UAE exports and the increase in Türkiye's sector exports.

Table 14. Comparison of Türkiye - UAE in R&D Intensive Sectors that Can be Easily Imitated

Year	51	52	54	58	59	75	76
1999	9,29	7,57	4,44	6,35	1,08	0,26	1,66
2000	15,67	2,45	7,27	6,19	1,18	0,32	2,45
2001	11,97	6,26	5,91	7,74	0,92	0,18	1,14
2002	11,12	3,52	6,33	7,60	2,05	0,14	1,64
2003	10,34	7,60	5,43	9,00	2,40	0,11	1,46
2004	12,21	5,31	4,87	10,98	2,55	0,15	2,00
2005	9,17	5,26	4,75	10,54	2,48	0,12	1,31
2006	9,90	5,76	4,78	13,42	3,51	0,15	1,98
2007	6,64	5,13	3,71	11,15	3,11	0,16	1,38
2008	8,07	7,59	5,23	11,62	3,24	0,17	1,40
2009	4,84	4,05	5,08	10,35	4,05	0,13	1,27
2010	7,41	2,92	6,56	5,00	4,39	0,14	1,06
2011	9,93	6,01	7,39	6,45	1,85	0,15	1,05
2012	2,63	4,65	2,32	6,85	3,00	0,04	0,32
2013	1,98	3,28	2,23	8,35	3,44	0,06	0,20
2014	1,86	2,25	2,22	8,48	2,66	0,06	0,21
2015	3,97	16,97	5,51	11,21	5,26	0,25	0,77
2016	4,19	13,89	4,75	10,63	4,99	0,38	0,76
2017	1,34	5,13	2,26	7,07	3,34	0,03	0,20
2018	1,09	11,60	2,13	7,60	2,81	0,04	0,19
2019	0,83	12,23	2,71	7,49	2,60	0,03	0,15
2020	1,08	10,56	2,33	7,73	2,92	0,03	0,12
2021	1,51	10,62	1,54	7,70	3,42	0,03	0,11

Source: Calculations have been made with the figures taken from UN Comtrade

E.Comparison in R&D Intensive Sectors That Are Difficult to Imitate

The United Arab Emirates has an advantage over Türkiye in R&D Intensive Industries that can hardly be Imitated; in the product group numbered 88. Türkiye has a strong position in the number 7 commodity groups in all years, and in the number 87 group in years except 2012-2014. The weakness seen in the first shape plastics number 57 as of 2012 continues.

Table 15. Difficult To Imitate Türkiye-UAE RCA Index in R&D Intensive Industries

Year	57	7 (excluding 75,76,78)	87	88
1999	5,53	3,90	2,71	0,04
2000	8,91	4,24	2,40	0,15
2001	6,37	2,86	1,31	0,10
2002	1,10	3,40	1,63	0,14
2003	0,80	4,43	2,16	0,11
2004	3,18	4,66	2,47	0,12
2005	0,69	4,66	1,05	0,13
2006	1,05	4,83	2,61	0,17
2007	0,83	5,24	1,33	0,20
2008	0,73	5,30	1,72	0,27
2009	0,75	3,59	2,89	0,28
2010	1,17	2,98	1,32	0,30
2011	1,31	3,93	2,80	0,30
2012	0,64	2,84	0,68	0,12
2013	0,98	2,68	0,97	0,14
2014	0,94	2,48	0,96	0,16
2015	0,87	0,52	1,92	0,34
2016	0,46	4,00	2,61	0,39
2017	0,64	2,48	1,02	0,19
2018	0,88	2,62	1,21	0,21
2019	0,79	2,75	1,23	0,17
2020	0,55	3,13	1,78	0,18
2021	0,75	3,28	1,50	0,14

Source: It was calculated with the data obtained from the UN Comtrade Database.

FINDINGS AND RECOMMENDATIONS

The findings of the study are that Türkiye has an advantage over Germany in Raw Material-Intensive and Labor-Intensive Sectors and maintains this in a stable manner. In Capital Intensive Sectors, while Türkiye has a consistent superiority over Germany in Rubber Goods number 62 and Iron and steel industry number 67, it is at a disadvantage in Land Vehicles, Electrical Energy, non-ferrous mines, Products Used in Tanning and Painting. In easily imitable R&D intensive sectors, Türkiye has never been able to gain an advantage over Germany in sectors 51, 54, 59 and 75. In plastics that are not in the first shape number 58, it is seen that the advantageous position has been maintained steadily between 2008-2022. While in some years there may be a slight transition to superiority in Inorganic Chemical Products No. 52 and Devices and Tools for Communication Voice Recording and Reproducing No. 76, there is generally a disadvantage. In R&D Intensive Sectors that can hardly be deciphered, Türkiye does not have an advantage over Germany. This state of disadvantage also continues in a stable way.

Türkiye is at a disadvantage in Raw Material Intensive Industries compared to Brazil. In Labor Intensive Industries, it maintains its advantageous position steadily between 1996 and 2022 in the heading number 6, Processed Goods Divided into Major Classes (excluding 62,67,68) and heading number 8, Miscellaneous Finished Goods (excluding 87,88). While it had a strong position against Brazil in number 26 woven fibers and their residues between 1996-2000, this superiority continued to decrease between 2001-2003. Türkiye lost its advantageous position as of 2004. As of 2022, the disadvantageous situation continues. For the period under review, Türkiye has a consistent disadvantage over Brazil in the No. 1 beverages and tobacco products category. Apart from this, there is a general advantage in all other titles.

In Türkiye - UAE comparison; The United Arab Emirates has the upper hand in all years in the products obtained from the distillation of mineral fuels, oils, etc. In all other raw material intensive sectors, Türkiye has a strong advantage. In labor-intensive industries and in capital-intensive industries in general, Türkiye is in a strong position against the UAE. In R&D Intensive Sectors that can be Easily Imitated, Türkiye has an advantageous position in the Organic chemical products group numbered 51 in all years except 2019, Inorganic chemical products numbered 52, Medical and pharmaceutical products numbered 54, plastics numbered 58, chemicals not mentioned elsewhere numbered 59. While the UAE has an advantage over Türkiye in office machines and automatic data processing machines numbered 75, the advantage it had before 2012 in communication, voice recording and devices and vehicles serving to reproduce sound numbered 76 has turned into a disadvantage between 2012 and 2021. According to Türkiye-UAE comparison in R&D Intensive Industries that are Difficult to Imitate; UAE is in an advantageous position in photographic equipment, optical goods and watches, number 88. Türkiye is in a strong position in all years, number 7, in machinery and transportation vehicles, and in

professional, scientific, control instruments and devices, number 87, not specified elsewhere, except 2012-2014. It is observed that Türkiye maintains its disadvantaged position in the plastics of the first figure 57 against the UAE as of 2012.

The recent changes in Turkey's export structure notwithstanding, the weight of trade in labor-intensive sectors continues. The export structures of advanced economies consist mainly of high-value-added, high-tech products. Consequently, mutual trade benefits are achieved. Turkey is a strong country in labor-intensive goods. However, the desired structure, similar to advanced economies, involves strength in the production and export of high-value-added products. This requires supporting technological infrastructure, increasing the share of GDP allocated to R&D investments, investing in a qualified workforce, providing incentives to reduce all types of energy costs, implementing tax regulations, placing greater emphasis on branding across all sectors, increasing sector-university collaborations, fostering a macroeconomic and political environment conducive to attracting foreign investments that can facilitate technology transfer, and developing policies for infrastructure investments that support technological development.

Statement of Research and Publication Ethics

All processes of the article were followed in accordance with the research and publication ethics principles of Yönetim ve Ekonomi Dergisi.

Authors' Contribution Rates to the Article

The entire article was written by Dr.Aslıhan Kocaefe.

Statement of Interest

The author has no conflict of interest with any person or organization.

REFERENCES

Alakbarov, N. & Erkan, B. (2017), Türkiye ve Azerbaycan'ın İhracatındaki Karşılaştırmalı Üstünlüklerin Teknoloji Yoğunluğu Bazında Analizi, İnsan Ve Toplum Bilimleri Araştırmaları Dergisi,6(6),pp.28-47

Altıntaş, N. & Akpolat, A.G.(2013), Tekstil Sektöründe Avrupa Birliği ile Türkiye Arasındaki Rekabet Analizi, *Kafkas Üniversitesi, İİBF Dergisi*, 4(6),pp.33-42.

Balassa,B.,(1965).Trade Liberalization and Revealed Comparative Advantage,*Manchester School of Economic and Social Studies*,33,pp. 99-124.

Buturac,G., Lovrincevic,Z. & Teodorovic, I.(2004),*Comparison of the Structure and Development of International Trade Within the Framework of EU Enlargement: the Case of Croatia*, Proceedings of the 65th Anniversary Conference of the Institute of Economics Zagreb-Ekonomski Institut, pp. 315-341.

Engin,E.(2013), Açıklanmış Karşılaştırmalı Üstünlükler Yaklaşımına Göre Türkiye Oluklu Mukavva Ambalaj Sektörünün Rekabet Gücü, *İstanbul Kültür Üniversitesi Sosyal Bilimler Enstitüsü,Yüksek Lisans Tezi*,pp.151.

Erkan,B.(2012), Ülkelerin Karşılaştırmalı İhracat Performanslarının Açıklanmış Karşılaştırmalı Üstünlük Katsayılarıyla Belirlenmesi: Türkiye-Suriye Örneği, *Uluslararası Yönetim iktisat ve işletme Dergisi,*8(15),pp.195-2018.

Erkan,B.(2013), Türkiye'nin Tekstil ve Hazır Giyim Sektörü İhracatında Uluslararası Rekabet Gücünün Belirlenmesi, *Anadolu Üniversitesi S.B.E Dergisi*, 13(1),pp.93-109.

Erkan,B.,Arpacı,B.,Yaralı,F. & Güvenç,İ.(2015),Türkiye'nin Sebze İhracatında Karşılaştırmalı Üstünlükleri,*Tarım ve Doğa Dergisi*,18(4),pp.70-76.

Gümüş,A.& Hiziroğlu,M.(2015), Measuring And Explaining Turkey's Competitiveness in Services Using Balassa Index and Diamond Model, *İşletme Araştırmaları Dergisi*,7(2),pp. 195,213

Kalaycı,C.(2017), Serbest Ticaret Anlaşmalarının Türkiye'nin Dış Ticaretine Etkileri: Açıklanmış Karşılaştırmalı Üstünlükler Endeksi Uygulaması, *Uluslararası Ekonomi ve Yenilik Dergisi*, 3 (2),pp.133-147.

Karagöz, U.(2021). Türkiye Cam Sektörü Rekabet Gücünün Açıklanmış Karşılaştırmalı Üstünlükler Endeksi Kullanılarak Analizi, *Hitit Üniversitesi,Yüksek Lisans Tezi*, pp.1-102.

Kuşat,N.ve Denli,A.(2021), Açıklanmış karşılaştırmalı üstünlüklere göre Türkiye - BRICS rekabet gücü analizi (2008-2019), *Afyon Kocatepe Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi* , 23 (1) , pp. 94-111.

Laursen, K. (2015). Revealed Comparative Advantage and the Alternatives as Measures of International Specialization, *Eurasian Business Review* 5(1), pp.99-115.

Özdemir, A.(2019). Türkiye Plastik Sektöründe Uluslararası Rekabet Gücünün Açıklanmış Karşılaştırmalı Üstünlükler Kuramı Açısından Analizi, *Celal Bayar Üniversitesi, Sosyal Bilimler Enstitüsü*, Yüksek Lisans Tezi,1-139.

Prasad,N.R.(2004), Fiji's Export Competitiveness: A Comparison with Selected Small Island Developing States", *Economics Department Reserve Bank of Fiji-Working Paper*, pp.1-40.

Sandalcılar, A. (2011).Türkiye-Suriye Dış Ticaretinin Sektörel Analizi, *Atatürk Üniversitesi İktisadi ve İdari Bilimler Dergisi,* 25,(3-4), pp.213-229.

Şahin,D.(2015),Türkiye ve Çin'in Tekstil ve Hazır Giyim Sektöründe Rekabet Gücünün Analizi, *Akademik Bakış Dergisi*, Sayı:47,pp.155-171.

Şahin,M.A.(2011), Açıklanmış Karşılaştırmalı Üstünlükler Endeksi: Türkiye Pamuk Endüstrisi Üzerine Bir Uygulama, *The Journal Of Social Economic Research*,11(21),pp.227-240.

Tarım ve Orman Bakanlığı,*Gübre Sektör Politika Belgesi* 2018-2022,p.34.

UN Comtrade, https://comtradeplus.un.org/TradeFlow

Veeramani, C.(2006), *India and China:Changing Patterns of Comparative Advantage?*,India Development Report,pp.1-20.

Yalçınkaya,M & Çılbant,C&Erataş,F&Hartoğlu,D.(2014) Açıklanmış Karşılaştırmalı Üstünlükler Ekseninde Rekabet Gücünün Analizi: Türk-Çin Dış Ticareti Üzerine Bir Uygulama, *Yönetim ve Ekonomi Araştırmaları Dergisi,24.*pp.41-57

Yeldan,S.(2023). Savunma sanayi ürünlerinde Türkiye'nin rekabet gücünün belirlenmesi açıklanmış karşılaştırmalı üstünlükler ve karşılaştırmalı ihracat performansı yöntemi uygulaması, *Hasan Kalyoncu Üniversitesi Sosyal Bilimler* Enstitüsü, pp.1-116.

Yurttançıkmaz,Z.Ç.,Reziwanguli,Y. ve Emsen,Ö.S. (2020). Çin ile ABD arasında ticari gerginlik: Rekabet gücü açısından bir bakış, *Atatürk Üniversitesi, İİBF Dergisi*, 34(2). 649-667