İnsan ve Toplum Bilimleri Araştırmaları Dergisi
Journal of the Human and Social Science Researches
[2147-1185]

[itobiad], 2019, 8 (3): 2256/2271

# Comparative Analysis of The Competitiveness of Turkey's Iron-Steel Industry

Türkiye'nin Demir Çelik Sektörünün Rekabet Gücünün Karşılaştırmalı Analizi

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## Makale Bilgisi / Article Information

| | |
|---|---|
| **Makale Türü / Article Type** | **:** Araştırma Makalesi / Research Article |
| **Geliş Tarihi / Received** | **:** 11.06.2019 |
| **Kabul Tarihi / Accepted** | **:** 30.09.2019 |
| **Yayın Tarihi / Published** | **:** 30.09.2019 |
| **Yayın Sezonu** | **:** Temmuz-Ağustos-Eylül |
| **Pub Date Season** | **:** July-August-September |

**Atıf/Cite as:** KESGİNGÖZ, H, DİLEK, S, YELDAN, M. (2019). Comparative Analysis of The Competitiveness of Turkey's Iron-Steel Industry. İnsan ve Toplum Bilimleri Araştırmaları Dergisi, 8 (3), 2256-2271. Retrieved from http://www.itobiad.com/tr/issue/47378/576164

**İntihal /Plagiarism:** Bu makale, en az iki hakem tarafından incelenmiş ve intihal içermediği teyit edilmiştir. / This article has been reviewed by at least two referees and confirmed to include no plagiarism. http://www.itobiad.com/

# Comparative Analysis of The Competitiveness of Turkey's Iron-Steel Industry[1]


## Abstract

The values of the Grubel-Lloyd, Vollrath and CEP indices are important indices used to show the countries' competitiveness levels. Turkey wants to prove and maintain its presence in the iron and steel sector, which has been the locomotive sector of industrialization for years. Turkey's iron and steel industry competitiveness, to a comparative analysis with other countries Grubel-Lloyd, volrath and Kip indices were calculated for the years 2001-2017. As a result of analysis, Turkey; it operates in-industry trade against the USA, Germany, China, Britain and Russia. In Addition, it has a comparative advantage in the field of iron and steel and its competitiveness is quite high. The country where we have the highest competitive power and export share from these 5 countries is USA, considering the intra-industry trade values. The USA is followed by China, Britain, Germany and Russia respectively. In industrial trade, which is the feature of Industrialised Country, Turkey sells significant amounts of iron-steel out and also buys it from outside. Considering these analyses; In the iron and steel sector, which is a capital intensive sector, iron-steel sector investments should be encouraged in order to maintain the increase continue in competitiveness observed against the USA, Germany, China, Britain and Russia and to increase its competitiveness. For this, financial arrangements such as the necessary infrastructure investments and tax incentives appear to be a viable policy.


**Keywords:** Iron and Steel, Competition, Comparative Advantages, Grubel-Lloyd, Volrath, Comparative Export Performance (CEP) Indices

# Türkiye'nin Demir Çelik Sektörünün Rekabet Gücünün Karşılaştırmalı Analizi


## Öz

Grubel-Loyd, Volrath ve Kip endeksleri değerleri ülkelerin rekabet düzeylerini göstermekte kullanılan önemli endekslerdir. Türkiye yıllar itibariyle sanayileşmenin lokomoif sektörü olan demir-çelik sektöründe varlığını dünyaya ispatlamak ve sürdürmek istemektedir. Türkiye'nin demir-çelik sektörünün rekabet gücünü ülkelerle karşılaştırmalı olarak analiz etmek için Grubel-Loyd, Volrath ve Kip endeksleri 2001-2017 yılları için hesaplanmıştır. Yapılan analiz sonucunda Türkiye; ABD, Almanya, Çin, İngiltere ve Rusya'ya karşı endüstri içi ticaret gerçekleştirmektedir. Ayrıca demir-çelik alanında karşılaştırmalı üstünlüğe sahip ve rekabet gücü oldukça yüksektir. Bu 5 ülkeden en yüksek rekabet gücü ve ihracat payına sahip olduğumuz ülke endüstri içi ticaret değerlerini de düşünürsek ABD'dir. ABD'yi sırasıyla Çin, İngiltere, Almanya ve Rusya izlemektedir. Sanayileşmiş ülke özelliğini olan endüstri içi ticarette Türkiye önemli miktarlarda demir-çeliğini dışarıya satmakta ve yine dışardan da satın almaktadır. Bu analizler göz önüne alınırsa; sermaye yoğun bir sektör olan demir-çelik sektöründe ABD, Almanya, Çin, İngiltere ve Rusya'ya karşı gözlemlenen rekabet gücündeki artışı devam ettirebilmek ve rekabet gücünü artırabilmek için demir-çelik sektörü yatırımlar teşvik edilmelidir. Bunun için gerekli altyapı yatırımları ve vergi teşvikleri gibi mali düzenlemelerin yapılması uygun bir politika olarak gözükmektedir.


**Anahtar Kelimeler**: Demir-Çelik, Rekabet, Karşılaştırmalı Üstünlükler, Grubel-Loyd, Volrath, Kip Endeksleri.

[1] Fourth International Iron and Steel Symposium (UDCS'19) April 4-6, 2019, is an extended version of the paper presented.

## Introduction

Competition is an increasingly important phenomenon in today's conjuncture. Competition can be defined as the studies to obtain position or scarce thing instantly against more than one competitor in fair conditions (Dilek, 2017:198). Countries have to increase their competitiveness in order to sell their goods in the current market. Competitiveness refers to a steady increase in the ability and capacity of a country's production. The aim of measuring International Competitiveness is to demonstrate the economic performance of the company, sector or country. To measure the comparative superiority and competitiveness of the iron and steel sector, which is the locomotive of the manufacturing industry, especially in the industrial sector of Turkey, numerous researches have been conducted at national and international levels.

In this study, Turkey's exports and imports iron and steel industry in the provision of Turkey's iron and steel industry in mind the competitiveness of countries in the world situation was investigated. For this purpose, the USA, Germany, China, Britain and Russia were included in the study. Turkey's competitiveness in comparison with these countries have been analysed with the help of international indices. These indices are Grubel-Lloyd, Volrath, CEP Indices. By using foreign trade data for the years 2001-2017, the competitiveness of Turkey in the relevant chapters for the iron and steel sector was analysed. In this Study, the data on exports and imports of Turkey has been addressed primarily after the conceptual competitiveness of the information is given. Then, information is given about the countries of export and import. It is Then explained how the Grubel-Lloyd, Volrath, CEP Indices are calculated. Later, Turkey's iron and steel sector analysis performed for the respective chapters indices were calculated and interpreted. In the Conclusion part, the study was generally evaluated and completed.

## 1- Conceptually Competitive Power

Industry-level competitiveness is the ability of an industry to achieve the same or higher level of productivity as its competitors, the ability to maintain that level of productivity, or the ability to produce and sell the same or lower cost than its competitors (Markusen, 1992: 8). It means increasing the competitiveness of a country or region. The competitiveness of a country is the ability to create and sustain an environment that enables countries to create more value for their companies and to sustain more prosperity for their people (Atik, 2005: 21; Dilek, 2017:208). Moreover,

international competitiveness is that countries' companies and industries can have the best possible environmental conditions such as price and non-price conditions necessary to achieve competitive advantage in the international arena.

Cost, price advantage and efficiency, non-price competitive advantage reflects the company's level of competitiveness; when the foreign trade performance is added to these, industrial competitiveness; when the real mileage per capita income performance and quality of life performance are included, the concept of international competitiveness is reached (Aktan ve Vural 2004).

Foreign trade is divided into 2 sectors, between industries and in-industry trade. When it comes to the foreign trade of products belonging to different industries in interindustrial trade, it expresses the foreign trade of products belonging to the same industry in the in-industry trade. In-industry trade is called trade between industrialized countries with similar factor equipment (Zhang 2004: 10). In Addition, the high level of in-industry trading in an industry indicates that there is no apparent comparative superiority, and that countries have similar levels of sophistication in the relevant sectors. Therefore, the number of sectors in which foreign trade between countries is high in the industrial trade level increases, and the development levels between countries can be discussed (Şahin 2015: 52). Today, most of the world trade is carried out in-industry trade (Erün 2010: 72; Şahin 2016a: 178). In response to the question of why in-industry trade is so important for countries, it is of great importance that it brings a different perspective to the factors that directly affect the welfare levels of countries such as the creation of a competitive industrial structure and the development of international commercial gains (Küçüksakarya 2016: 28). In the Globalizing world, the type of in-industry trade, which forms a large part of foreign trade, is particularly common among developed countries. Countries such as Germany, France, Japan and USA both export and imports consist of the same sector and products belonging to the same chapter.

## 2- The Competitiveness of Turkey in the Iron and Steel Sector

With increasing competition in the World's conjuncture, foreign trade is becoming more and more challenging every day. One of the most important factors for the realization of foreign trade is that it has comparative advantage among countries. The basis of Competition is the costs. In order to see the competitiveness of Turkey in the iron and steel sector in the world conjuncture, we must see its export and import values according to the

chapters. In Table 1, the export values of Turkey according to the chapters are given.

**Table 1: Exports of Turkey According to Chapters 2019-2001 (Thousand Dollars)**

| Years | 72. Chapter | 73. Chapter |
|---|---|---|
| 2019 (first 2 months) | 1 818 762 | 988 623 |
| 2018 | 11 547 161 | 6 534 643 |
| 2017 | 8 230 403 | 5 598 990 |
| 2016 | 6 180 353 | 4 964 336 |
| 2015 | 6 556 416 | 5 465 334 |
| 2014 | 9 244 173 | 6 356 117 |
| 2013 | 9 918 794 | 6 148 046 |
| 2012 | 11 332 482 | 6 093 117 |
| 2011 | 11 225 329 | 5 748 004 |
| 2010 | 8 740 067 | 4 850 216 |
| 2009 | 7 641 010 | 4 545 275 |
| 2008 | 14 946 358 | 5 742 363 |
| 2007 | 8 372 266 | 4 129 749 |
| 2006 | 6 273 353 | 3 336 371 |
| 2005 | 4 973 475 | 2 731 357 |
| 2004 | 5 359 512 | 2 226 923 |
| 2003 | 2 969 012 | 1 391 047 |
| 2002 | 2 269 813 | 1 243 852 |
| 2001 | 2 069 932 | 975 727 |

Source: TUIK

Table 1 shows an upward trend in Chapter 72 from 2001 to 2008. Although the value of our exports decreased with 2008 global financial crisis, it increased in 2010, 2011 and 2012. The decline in 2015 was replaced by a rising trend in the following years. 2008 is the year of the Summit. After the global financial crisis, this value has not yet been reached. 73. Chapter also watched a course like the 72 chapter. The Only difference was the year 2018 of the summit. According to the chapters, if we look at the import figures;

**Table 2: Imports of Turkey According to Chapters 2019-2001 (Thousand Dollars)**

| Years | 72. Chapter | 73. Chapter |
|---|---|---|
| 2019 (first 2 months) | 2 076 232 | 375 581 |
| 2018 | 18 401 466 | 2 825 007 |
| 2017 | 16 761 929 | 2 957 422 |
| 2016 | 12 575 460 | 2 982 520 |

| | | |
|---|---|---|
| 2015 | 14 775 094 | 2 742 274 |
| 2014 | 17 575 890 | 2 617 511 |
| 2013 | 18 690 888 | 2 757 735 |
| 2012 | 19 642 041 | 2 367 176 |
| 2011 | 20 424 235 | 2 521 135 |
| 2010 | 16 120 796 | 1 966 864 |
| 2009 | 11 351 640 | 1 526 071 |
| 2008 | 23 160 241 | 2 227 429 |
| 2007 | 16 182 379 | 1 836 715 |
| 2006 | 11 525 251 | 1 488 786 |
| 2005 | 9 457 831 | 1 184 644 |
| 2004 | 8 031 522 | 928 097 |
| 2003 | 4 747 844 | 827 360 |
| 2002 | 2 904 980 | 709 226 |
| 2001 | 1 797 367 | 844 630 |

Source: TUIK

In Table 2, the import value for Chapter 72 tends to increase from 2001 to 2008 to the global financial crisis.
The summit value was realized in 2008. The following years have followed a wavy cruise. For Chapter 73, the trend shows a trend in the same trend as export figures. After looking at the value of Turkey's exports and imports, we need to look to his distribution of exports and imports by country. In Table 3 shows the breakdown of exports by country of Turkey.

**Table 3: Iron and Steel Exports of Turkey by Country**

| Countries | 2015 | 2016 | 2017 | Share in 2017 | 2017 (January-May) | 2018 (January-May) | Change 2017/2018 (%) |
|---|---|---|---|---|---|---|---|
| Italy | 337 | 388 | 765 | 5,5 | 168 | 323 | 92,3 |
| Germany | 590 | 621 | 786 | 5,7 | 171 | 264 | 54,4 |
| USA | 1246 | 1160 | 1184 | 8,6 | 350 | 266 | -24 |
| Israel | 406 | 493 | 660 | 4,8 | 137 | 222 | 62 |
| United Kingdom | 514 | 504 | 675 | 4,9 | 172 | 192 | 11,6 |
| Spain | 211 | 258 | 509 | 3,7 | 139 | 190 | 36,7 |
| Romania | 375 | 412 | 617 | 4,5 | 118 | 191 | 61,9 |
| Belgium | 104 | 116 | 244 | 1,8 | 69 | 171 | 147,8 |
| Netherland | 206 | 253 | 339 | 2,5 | 68 | 128 | 88,2 |
| Yemen | 348 | 246 | 154 | 1,1 | 107 | 136 | 27,1 |
| Total list | 4337 | 4451 | 5933 | 57,1 | 1499 | 2083 | 39 |
| Total | 12022 | 11145 | 13829 | 100 | 5737 | 6906 | 20,8 |

In Table 3, the highest shares of Turkey's iron and steel exports are in 2015 to USA, Germany and the Britain respectively. In 2016, the first three ranks are in the USA, Germany and Britain. In 2017, while the USA, Germany maintained its first two ranks, Britain was replaced by Italy. By 2018, the reduction of exports to USA is explained by Turkey's expansioning to new markets. In 2018, Italy, Israel and Romania took the share of the USA.

**Table 4: Turkey's Iron and Steel Imports by Country**

| Countries | 2015 | 2016 | 2017 | Share in 2017 | 2017 (January-May) | 2018 (January-May) | Change 2017/2018 (%) |
|---|---|---|---|---|---|---|---|
| Russia | 2753 | 2247 | 3380 | 17,1 | 1013 | 1452 | 43,3 |
| USA | 1194 | 863 | 1331 | 6,7 | 299 | 549 | 83,6 |
| Germany | 994 | 1024 | 1271 | 6,4 | 361 | 546 | 51,2 |
| United Kingdom | 1196 | 797 | 1198 | 6,1 | 308 | 511 | 65,9 |
| Ukraine | 1642 | 1162 | 1220 | 6,2 | 370 | 505 | 36,5 |
| Belgium | 638 | 710 | 914 | 4,6 | 284 | 425 | 49,6 |
| Netherland | 472 | 683 | 1010 | 5,1 | 273 | 363 | 33 |
| China | 2121 | 1589 | 1236 | 6,3 | 393 | 361 | -8,1 |
| France | 651 | 657 | 949 | 4,8 | 259 | 324 | 25,1 |
| Korea R. | 1029 | 1001 | 990 | 5,0 | 284 | 308 | 8,5 |
| First 10 | 12690 | 10733 | 13499 | 68,5 | 3844 | 5344 | 39 |
| Total | 17517 | 15558 | 19720 | 100 | 6985 | 9649 | 39,3 |

In Table 4, the highest shares of Turkey's iron and steel imports are in 2015 to Russia, China, Ukraine, USA, Germany and the Britain respectively. In 2016, it is still in Russia, China, Ukraine, USA, Germany and the Britain respectively. According to 2017 market share, Russia, USA, Germany, China, Ukraine, Britain and Netherlands are listed. By 2018, the highest increase percentage in USA compared to 2017 and the lowest percentage of the decline was realized with China.

## 3- Methods to Be Used In The Analysis

There are some indices used to compare competitiveness for countries. In This study, the Grubel Lloyd Index, the Comparative Export Performance Index and the Volrath Index were used to measure competitiveness. The results of the analysis were evaluated by calculating these indices for iron-steel and 73 chapter, which are chapter 72.

- **Grubel Lloyd Index**

$$GLak= \Sigma(Xak+Mak) - \Sigma\, Xak-Mak \;\big|\; / \;\; \Sigma(Xak+Mak)$$

GLak; "A " refers to the trade level of the country in the "J " sector.

Xak; "A" refers to the export of the country in the "K" sector.

Mak; "A" refers to the imports of the country in the "K" sector.

The Grubel Lloyd index is worth between 0 and 1.

The value approaching 1 means in-industry trading. If it approaches 0, it means trading between industries (Bashimov, 2017).

- **Comparative Export Performance Index (CEP)**

It compares the total of a country's exports in one sector and its location within the world exports of goods in that sector (Altıntaş & Akpolat, 2013).

CEPtrk = (Xtk / Xrk) / (ΣXtc / ΣXrc)

CEPtrk = (Xtk / Xrk) / (ΣXtc / ΣXrc)

CEPtrk; "T " in the face of rival countries of the country, "R" , "K" describes the coefficient of performance in the goods group.

Xtk; "T" describes the exports of his country in the goods group K.

Xrk; Describes the exports of competing countries or country groups in the "k" goods group.

ΣXtc; Describes the total exports of the country "T ".

ΣXrc; Describes the total exports of competing countries.

If CEP>1 Competitive position.

If CEP<1 is It does not have the Competitive advantage.

- **Vollrath Index**

Vollrath (1991) suggested alternative methods for calculating the Explained Comparative Superiors that Balassa calculated. The Relative Trading Advantage, which is related to Export and import data, is equal to the difference between the Relative Export Advantage and the Relative Import Advantage, which is equivalent to Balassa's index. The RXA index shows the Relative Export Advantage and the RMA shows the relative import advantage. The Volrath index causes a wide range of use by competing countries, which have both asymmetry and similar factor density, to compare competitiveness with respect to their export performance in the same target market (Altay; 2008:226).

RXA = (Xij / Xit) / ( Xnj / Xnt)

RMA = (Mij / Mit) / ( Mnj / Mnt)

RCij = Ln (RXAij) – Ln (RMAij)

The export and import of "X " and "M " respectively, "i " represent the selected country, "J " is the property of the measure, "t " represents the total amount of goods, and "n " is the country or country group in comparison. The competitive advantage index is equal to the difference between the relative Export Advantage logarithm and the logarithm of the Relative Import Advantage. "RCij " is the relative competitive advantage index in the "I " property of the "J " country. If the result of the Vollrath index value is greater than 0 it can be said that the country has a comparative advantage in the relevant sector. The fact that it is less than 0 indicates that it has a comparative disadvantage.

## 4- Literature Review

There are many researches which used Vollrath index in literature.

In the research of Gürpınar and Barca (2007) index values for furniture industry are below 1 between the years of 2001 and 2004 while they are above 1 in 2005 and 2006. This means that Turkish furniture industry became stronger between the years of 2001 and 2006. The industry was not competitive in 2001 and 2004 however it becomes competitive in 2005.

Altay (2008), found that Turkey has competitive advantage toward rival countries such as Poland, Romania, Portugal, Indıa etc. in labour and raw material products. In this research Ballasa and Vollrath indexes are used.

Erkan (2012) searched competitive advantages of Turkey in export of agricultural products by using Balassa and Vollrath indexes. As a result of this research it is found that Turkey has comparative advantages in figs, raisins, nuts, pistachios, dried apricots. However Turkey has disadvantages in export of almond, walnut.

Erkekoğlu et.al (2014) studied competitive advantages of Kayseri furniture industry by using Vollrath indexes and found that Kayseri furniture export has revealed comparative advantage and strong competitive power.

Kaya and Oduncu (2016) used Balassa and Vollrath indexes to calculate revealed comparative advantage coeeficients in textile industry by using 2006-2013 data. According to RTA and RCA values, Turkey has competitive advantages in Textile industry.

Şahin (2016b), compared China and Turkey according to their competitiveness by using Balassa index and its' derivatives. The analysis is conducted between the years of 2000-2013. As a result of this research it is found that China is more competitive than Turkey in electrical and

electronics industry. At the same time both Turkey and China is highly competitive in textile and garment industry.

Bozdoğan and Erkan (2019) used several indexes including Vollrath indexes to measure the specialization and competitive advantage of Shanghai Cooperation Organization. According to the results of this research, Shanghai Cooperation Organization countries have competitive advantages in low added value products such as labour and raw materials intensive products. They except China have not competitive advantage in export of high value added products.

Kara et.al (2019), calculated several index coefficients such as Balassa and Vollrath indexes in their research to investigate competitive advantage of Turkey in wood and wood products industry. During 2008-2017 period, it is reached that Turkey has competitive advantage in 4 items of total 14 items. However in other 10 items, Turkey has competitive disadvantages.

## 6-Result of Analysis

The first index for determining the international competitiveness of Turkey's iron and steel sector is the Grubel-Lloyd index. In table 5, the index value for chapter 72 and 73 chapter was calculated.

**Table 5: Grubel-Lloyd Index Value**

| Chapters | Index Value |
|---|---|
| 72. Chapter | 0.947907964 |
| 73. Chapter | 0.717280348 |

In Table 1, looking at the value of Grubel Lloyd, if this value approaches 1, then intra-industry trade is done. If it is approaching 0, it means there is inter-industry trade. For 72 chapters, it is very close to 1, approaching 1 in 73 chapters. For both chapters, there is in-industry trade. This means that in the iron and steel sector of Turkey, 72 And 73 in the Chapters, both the exporter position and the importer are located. This is the case for most of the trade between industrialized countries. The first 5 chapters in which Turkey's most exported products in 2018 were as follows, respectively. Motor vehicles and trailers are the main metal industry, machinery and equipment, textile products and apparel. The first 5 chapters in which Turkey's most imported products in 2018 were as follows, respectively. Chemical substances and products, the main metal industry, machinery and equipment, motor

vehicles and trailers and petroleum products-are nuclear fuels. Exports and imported products are considered to be valid in-industry trade (TUIK).

Turkey from 2001 to 2017, with TÜIK and INTRACEN data, in the iron and steel sector (72 and 73. In the Chapters), Turkey, USA, Germany, China, Britain and Russia, which are the countries that can be considered in exports, are competing with the competition and the degree of this competition will be measured. In Table 6, the CEP and Vollrath indices are shown.

**Table 6: CEP and Vollrath Indices for USA**

| Years | CEP 72. Chapter | CEP 73. Chapter | Vollrath 72 fasıl | Vollrath 73. Chapter |
|---|---|---|---|---|
| 2001 | 9.660 | 2.731 | 9.660 | 2.731 |
| 2002 | 8.638 | 2.991 | 8.638 | 2.991 |
| 2003 | 6.864 | 2.609 | 6.864 | 2.609 |
| 2004 | 7.646 | 3.044 | 7.646 | 3.044 |
| 2005 | 5.350 | 2.963 | 5.350 | 2.963 |
| 2006 | 6.026 | 2.998 | 6.026 | 2.998 |
| 2007 | 5.307 | 3.009 | 5.307 | 3.009 |
| 2008 | 6.174 | 3.191 | 6.174 | 3.191 |
| 2009 | 5.133 | 3.408 | 5.133 | 3.408 |
| 2010 | 4.948 | 3.361 | 4.948 | 3.361 |
| 2011 | 4.861 | 3.409 | 4.861 | 3.409 |
| 2012 | 5.028 | 2.919 | 5.028 | 2.919 |
| 2013 | 5.237 | 2.897 | 5.237 | 2.897 |
| 2014 | 5.117 | 2.887 | 5.117 | 2.887 |
| 2015 | 4.706 | 2.907 | 4.706 | 2.907 |
| 2016 | 4.888 | 2.889 | 4.888 | 2.889 |
| 2017 | 5.049 | 2.997 | 5.049 | 2.997 |

If CEP > 1 is in a competitive position while CEP < 1 does not have the competitive advantage. In Addition, the result of the Vollrath index value greater than 0 is an indication that the country has a comparative advantage in the relevant sector. The fact that it is less than 0 indicates that it has a comparative disadvantage. Table 7 is that increased competitive advantage over the USA in Turkey. It has a comparative advantage. Vollrath and CEP index values are above 1. Table 7 shows the competitiveness of Germany.

**Table 7: CEP and Vollrath Indices for Germany**

| Years | CEP 72. Chapter | CEP 73. Chapter | Vollrath 72. Chapter | Vollrath 73. Chapter |
|---|---|---|---|---|
| 2001 | 3.4247 | 1.6210 | 3.42 | 1.62 |
| 2002 | 3.2635 | 1.7584 | 3.26 | 1.76 |
| 2003 | 3.2696 | 1.6158 | 3.27 | 1.62 |
| 2004 | 3.7650 | 1.8471 | 3.76 | 1.85 |

| | | | | |
|---|---|---|---|---|
| 2005 | 2.8138 | 1.6946 | 2.81 | 1.69 |
| 2006 | 2.8999 | 1.6848 | 2.90 | 1.68 |
| 2007 | 2.8984 | 1.6321 | 2.90 | 1.63 |
| 2008 | 4.2216 | 1.7906 | 4.22 | 1.79 |
| 2009 | 3.6069 | 1.7647 | 3.61 | 1.76 |
| 2010 | 3.3058 | 1.8498 | 3.31 | 1.85 |
| 2011 | 3.4603 | 1.8284 | 3.46 | 1.83 |
| 2012 | 3.3384 | 1.7448 | 3.34 | 1.74 |
| 2013 | 3.2456 | 1.7460 | 3.25 | 1.75 |
| 2014 | 3.0281 | 1.7960 | 3.03 | 1.80 |
| 2015 | 2.6287 | 1.7547 | 2.63 | 1.75 |
| 2016 | 2.6868 | 1.6496 | 2.69 | 1.65 |
| 2017 | 2.8919 | 1.6978 | 2.89 | 1.70 |

Table 8 that Turkey has become more of a competitive advantage over Germany. It has a comparative advantage. Vollrath and CEP index values are above 1. Table 9 shows the competitiveness of China.

**Table 9: CEP and Vollrath Indices for China**

| Years | CEP 72. Chapter | CEP 73. Chapter | Vollrath 72. Chapter | Vollrath 73. Chapter |
|---|---|---|---|---|
| 2001 | 7.856 | 1.378 | 7.86 | 1.38 |
| 2002 | 8.774 | 1.551 | 8.77 | 1.55 |
| 2003 | 8.058 | 1.366 | 8.06 | 1.37 |
| 2004 | 4.356 | 1.523 | 4.36 | 1.52 |
| 2005 | 3.418 | 1.488 | 3.42 | 1.49 |
| 2006 | 2.828 | 1.411 | 2.83 | 1.41 |
| 2007 | 2.383 | 1.278 | 2.38 | 1.28 |
| 2008 | 3.029 | 1.285 | 3.03 | 1.29 |
| 2009 | 6.668 | 1.583 | 6.67 | 1.58 |
| 2010 | 4.185 | 1.717 | 4.19 | 1.72 |
| 2011 | 3.961 | 1.580 | 3.96 | 1.58 |
| 2012 | 4.103 | 1.458 | 4.10 | 1.46 |
| 2013 | 3.737 | 1.560 | 3.74 | 1.56 |
| 2014 | 2.476 | 1.558 | 2.48 | 1.56 |
| 2015 | 2.106 | 1.427 | 2.11 | 1.43 |
| 2016 | 2.103 | 1.408 | 2.10 | 1.41 |
| 2017 | 2.767 | 1.414 | 2.77 | 1.41 |

Table 9 that Turkey has become more of a competitive advantage over China. It has a comparative advantage. Vollrath and CEP index values are above 1. Table 10 shows the competitiveness of UK.

**Table 10: CEP and Vollrath Indices for UK**

| Years | CEP 72. Chapter | CEP 73. Chapter | Vollrath 72. Chapter | Vollrath 73. Chapter |
|---|---|---|---|---|
| 2001 | 5.089 | 2.644 | 5.09 | 2.64 |
| 2002 | 4.612 | 2.850 | 4.61 | 2.85 |
| 2003 | 3.721 | 2.233 | 3.72 | 2.23 |
| 2004 | 3.662 | 2.692 | 3.66 | 2.69 |
| 2005 | 2.861 | 2.757 | 2.86 | 2.76 |
| 2006 | 3.503 | 2.957 | 3.50 | 2.96 |
| 2007 | 2.877 | 2.365 | 2.88 | 2.36 |
| 2008 | 4.017 | 2.826 | 4.02 | 2.83 |
| 2009 | 3.931 | 2.743 | 3.93 | 2.74 |
| 2010 | 3.615 | 3.359 | 3.62 | 3.36 |
| 2011 | 3.781 | 3.499 | 3.78 | 3.50 |
| 2012 | 3.661 | 2.997 | 3.66 | 3.00 |
| 2013 | 3.534 | 3.400 | 3.53 | 3.40 |
| 2014 | 2.916 | 2.899 | 2.92 | 2.90 |
| 2015 | 2.923 | 2.913 | 2.92 | 2.91 |
| 2016 | 3.330 | 2.709 | 3.33 | 2.71 |
| 2017 | 3.328 | 2.962 | 3.33 | 2.96 |

Table 10 that Turkey has become more of a competitive advantage over UK. It has a comparative advantage. Vollrath and CEP index values are above 1. Table 11 shows the competitiveness of Russia.

**Table 11: CEP and Vollrath Indices for Russia**

| Years | CEP 72. Chapter | CEP 73. Chapter | Vollrath 72. Chapter | Vollrath 73. Chapter |
|---|---|---|---|---|
| 2001 | 1.189 | 3.983 | 1.189 | 3.983 |
| 2002 | 1.035 | 4.885 | 1.035 | 4.885 |
| 2003 | 1.003 | 3.740 | 1.003 | 3.740 |
| 2004 | 0.957 | 4.428 | 0.957 | 4.428 |
| 2005 | 0.915 | 4.586 | 0.915 | 4.586 |
| 2006 | 1.239 | 5.410 | 1.235 | 5.391 |
| 2007 | 1.302 | 5.437 | 1.302 | 5.437 |
| 2008 | 1.852 | 6.588 | 1.852 | 6.588 |
| 2009 | 1.533 | 4.327 | 1.533 | 4.327 |
| 2010 | 1.625 | 12.143 | 1.625 | 12.143 |
| 2011 | 1.957 | 10.637 | 1.957 | 10.637 |
| 2012 | 1.725 | 6.859 | 0.173 | 0.686 |
| 2013 | 1.717 | 6.208 | 1.717 | 6.208 |
| 2014 | 1.420 | 6.368 | 1.420 | 6.368 |
| 2015 | 1.030 | 5.657 | 1.030 | 5.657 |
| 2016 | 0.877 | 4.393 | 0.877 | 4.393 |
| 2017 | 1.002 | 3.715 | 1.004 | 3.723 |

Table 11 that Turkey has become more of a competitive advantage over Russia. It has a comparative advantage. Vollrath and CEP index values are above 1.

## 7- Results

After analyzing the values of Grubel-Lloyd, Volrath and CEP indices, Turkey has the advantage of competing with the USA, China, Britain, Germany and Russia in the export and import of iron and steel. These countries have a comparative advantage as compared to other countries. The highest competitive power and export share from these 5 countries is USA, considering the in-industry trade values. The USA is followed by China, Britain, Germany and Russia respectively. In the Industrialised country, in-industry trade, Turkey sells significant amounts of iron-steel out and also buys it from the outside. If These analyses are taken into consideration; In the iron and steel sector, which is a capital intensive sector, investments in the iron and steel sector should be encouraged in order to sustain the increase in competitiveness observed against the USA, Germany, China, Britain and Russia and to increase the competitiveness. For This, financial arrangements such as the necessary infrastructure investments and tax incentives appear to be a viable policy.

Referring generally to the results of analysis performed using GL index, Turkey's iron and steel product differentiation and diversification is taking place at the beginning of the main reasons to both exporting and importing. However, the Export-import of the aforementioned products, processed and processed, also triggers this situation. Furthermore, the fact that the GL index values of these products have been relatively high in years are indicative of the fact that the foreign trade of these products will be more active over time. Moreover, in industry-based competitively competitive industries in manufacturing industry low EIT is realized and high EIT is realized in competing industries based on quality. It is possible for countries to develop their foreign trade more frequently with bilateral relations.

The International competitiveness level of a country; Affects foreign exchange rates, interest rates, public deficits, labour costs, taxation, natural resources and government policies. The competitiveness of the country shows that the goods produced by the country are capable of competing with goods of other countries, such as price, quality, design, reliability and timely delivery. Turkey's attention to These factors is a factor that increases the level of international competitiveness.

## References

Aktan, C. C. ve Vural, Y.İ. (2004). Rekabet Gücü ve Rekabet Stratejileri. Ankara: TİSK Yayını Rekabet Dizisi.

Altay, H. (2008). "Karşılaştırmalı Üstünlükler Teorisi Kapsamında Türk Endüstrilerinin Avrupa Birliği (15) Pazarındaki Rekabet Gücü Düzeylerinin İncelenmesi: 1995-2007" Dumlupınar Üniversitesi Sosyal Bilimler Dergisi, Yıl: 2008, Sayı: 21, Ağustos 2008, 215-240.

Altıntaş, N. ve Akpolat, A. (2013) "Tekstil Sektöründe Avrupa Birliği ile Türkiye Arasındaki Rekabet Analizi" Kafkas Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi, 4(6): 33-42.

Atik, H. (2005). Yenilik ve Ulusal Rekabet Gücü. Ankara: Detay Yayıncılık.

Bashimov G (2017). Tarım ve gıda ürünlerinde endüstri-içi ticaretin analizi: Türkiye ve Rusya örneği. Abant İzzet Baysal Üniversitesi, Sosyal Bilimler Enstitüsü Dergisi, 17(4), 155-167.

Bozdoğan, E.T. and Erkan , B. (2019), "Şangay İşbirliği Örgütü Üyelerinin Katma Değeri Yüksek Ürün İhracatındaki Uzmanlaşma Düzeyleri", Avrasya Sosyal ve Ekonomi Araştırmaları Dergisi (ASEAD), 6(3), 140-154

Dilek, Serkan (2017), Oyun Teorisi Eşliğinde Sanayi Ekonomisi. Seçkin Yayınları

Erkan, B. (2012), "Türkiye'nin Geleneksel Tarım İhraç Ürünlerinde Uzmanlaşma Düzeyi", Sosyal ve Beşeri Bilimler Dergisi, 4(1), 75-83.

Erkekoğlu, H., Kılıçarslan, Z. And Göknar, H. (2014), "Kayseri İlinin Mobilya Sektörü Rekabet Gücü: Açıklanmış Karşılaştırmalı Üstünlük Teorisi", Erciyes Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi, 44, 1-22.

Erün, Gülay (2010). "Türkiye ile AB, Gıda ve Canlı Hayvan Sektörü Dış Ticaretinde Endüstri-İçi Ticaret Analizi". Ekonomi Bilimleri Dergisi 2 (1): 71-78.

Gürpınar, K. and Barca, M. (2007), "Türk Mobilya Sektörünün Uluslararası Rekabet Gücü Düzeyi ve Nedenleri", Eskişehir Osmangazi Üniversitesi İİBF Dergisi, 2(2), 41-61

Kara, O, Şahin, Ö, Bekar, İ and Kayacan, B. (2019), "Endüstriyel Ağaç ve Ahşap Ürünleri Sektörünün Uluslararası rEkabet Gücü Analizi: Türkiye Örneği", Ekonomik ve Sosyal Araştırmalar Dergisi, 15(1), 15-32.

Kaya, Ö. And Oduncu, A. (2016), "Türk Tekstil Sektörünün Uluslararası Rekabet Gücü Değerlendirmesi", Akademik Bakış Dergisi, 54, 418-428

Küçüksakarya, Sevilay (2016). "Türkiye'nin Serbest Ticaret Anlaşmaları Kapsamında Endüstri-İçi Ticareti Üzerine Bir İnceleme". Aksaray Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi 8 (2): 2741.

Markusen, J. (1992). Productivity, Competitiveness, Trade Performance and Real Income:the Nexus Among Four Concepts.Minister of Supply and Services, Canada, 8.

Şahin, Dilek (2015). "Türk Tekstil ve Hazır Giyim Sektörünün Endüstri içi Ticaretinin Statik Analizi: AB-15 Ülkeleri ile Karşılaştırma". Uşak Üniversitesi Sosyal Bilimler Dergisi 8 (2): 49-66.

Şahin, Dilek (2016a). "Faktör Yoğunluğuna Göre Endüstri-İçi Ticaretin Statik Ölçümü: Türkiye Örneği". Akademik Bakış Dergisi 54: 174-187.

Şahin, Dilek (2016b), "Açıklanmış Karşılaştırmalı Üstünlükler Yöntemi ile Türkiye ve Çin'in Sektörel Rekabet Gücünün Karşılaştırması", Kırıkkale Üniversitesi Sosyal Bilimler Dergisi, 6(1), 127-148

Vollrath, T.L. Weltwirtschaftliches Archiv (1991) 127: 265. https://doi.org/10.1007/BF02707986

Zhang, Zhaoyong (2004). Country Specific Factors and The Pattern of Intra-Industry Trade in China's Manufacturing. Seoul: Korea Institute for International Economic Policy CNAEC Research Series.