

**FOREIGN TRADE SPECIALIZATION LEVEL OF THE FRAGILE FIVE ECONOMIES:  
COMPARATIVE SECTORAL ANALYSIS<sup>1</sup>**

***KIRILGAN BEŞLİ EKONOMİLERİN DIŞ TİCARET UZMANLAŞMA DÜZEYİ:  
KARŞILAŞTIRMALI SEKTÖREL ANALİZ***

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**ABSTRACT**

In this study, it is aimed to measure the level of foreign trade specialization and the global competitiveness of the Fragile Five Economies (Brazil, India, Indonesia, South Africa and Turkey) most affected decision of the FED in the May 2013. In this context, the Net Trade Index and the Export-Import Ratio Index with reference to the foreign trade of the countries in question are calculated. Scores obtained as a result of analysis of the indices in question show that the Fragile Five Economies are predominantly specialized in exports of raw materials and labor intensive sectors. This shows that the mentioned economies do not have competitiveness in the production and exports of high value added sectors (products).

**Keywords:** Fragile Five, Specialization, Net Trade Index, Export-Import Ratio Index.

**ÖZET**

Çalışmada, 2013 Mayıs ayında FED'in kararından en fazla etkilenen ülkeler olan Kırılgan Beşli ekonomilerin (Brezilya, Hindistan, Endonezya, Güney Afrika ve Türkiye) dış ticaret uzmanlaşma düzeylerinin ve küresel rekabet güçlerinin ölçülmesi amaçlanmıştır. Bu bağlamda, sözü edilen ülkelerin dış ticaretlerine ilişkin Net Ticaret Endeksi ve İhracat-İthalat Oranı Endeksi hesaplanmıştır. Endeks analiz sonuçları, Kırılgan Beşli ekonomilerin ağırlıklı olarak hammadde ve emek yoğun ürünlerin ihracatında uzmanlaştığını göstermektedir. Bu da, sözü edilen ekonomilerin katma değeri yüksek ürünlerin (sektörlerin) üretiminde ve ihracatında rekabet gücüne sahip olmadıklarını göstermektedir.

**Anahtar Kelimeler:** Kırılgan Beşliler, Uzmanlaşma, Net Ticaret Endeksi, İhracat-İthalat Oranı Endeksi.

**1. INTRODUCE**

On May 22, 2013, some countries were adversely affected by the Federal Reserve's (FED) announcement that it would reduce the liquidity offered to the market by expanding monetary policy (Quantitative Easing). Morgan Stanley, in a report to be published on August 1, 2013 stated that Brazil, India, Indonesia, South Africa and Turkey had been the most affected economies by this decision and called the countries "Fragile Five".

The Fragile Five economies which are among the developing countries have become dependent on dollar which is the international reserve currency while adapting to the globalizing market. This dependence made them fragile. Macroeconomic problems that cause the Fragile Five's to gather in the same group are high current account deficit, high inflation rate, low economic growth, weak performance in foreign trade balance, low employment rate, high unemployment rate.

<sup>1</sup> This study has derived from the master thesis titled "Foreign Trade Competitiveness of the Fragile Five: Comparative Analysis" completed by Şule Batbaylı under the consultancy of Assoc. Prof. Dr. Birol Erkan on 22.06.2017.

In this study, firstly, the emergence and general macroeconomic characteristics of fragile quintiles are mentioned. Then, the situation of the Fragile Five in the real market has been examined and the level of specialization of these countries in foreign trade has been analyzed on product basis. Thus, it has been tried to show whether the Fragile Five economies are specializing in high added value products or low added value products. In this direction, the level of specialization in foreign trade of the mentioned economies has been analyzed and Net Trade Index and Export-Import Ratio Index has been used for this analysis.

## 2. THE EMERGENCE AND GENERAL CHARACTERISTICS OF THE FRAGILE FIVE

Because the dollar which became the sovereign currency in the globalizing world is used as international reserve money, the decisions taken by the FED affected the less developed, developing and developing economies of other countries (Erşin, 2014:45).

On May 22, 2013, Ben Bernanke, Chair of the Federal Reserve, announced that they would follow a tighter monetary policy. Bernanke reported that the liquidity supplied to the market would be decreased (Nechio, 2014). Upon this, the current balances of the countries were negatively affected and economic growth slowed down. However, in relation to falling commodity prices, high inflation and rising real exchange rates, some countries begun to lose global competitiveness. The developments that emerged were a sign that reserve accumulations would reverse in the long run. (Stanley, 2013).

Besides these, the countries also have a worsening budget balance and an increasing external debt burden (Hayaloğlu, 2015:133). In addition, the economies in question begun to lose momentum in unemployment. All of these economies were in middle income and their income levels were low. Because of the difficulties of access to external financing that emerged after the FED's disclosure, national currencies of mentioned economies began to depreciate more rapidly than other economies. (Eğilmez, 2015).

As a result of these developments, international investment bank Morgan Stanley issued a report (Akel, 2015:76) and declared Brazil, India, Indonesia, South Africa and Turkey as "Fragile Five" on August 1, 2013 (Önder, 2015).

The state of local currencies of Fragile Five whose currency was the most depreciating against the US dollar are given in Table 1.

Table 1. Changes in Currency Units and Policy Rates of Fragile Five<sup>2</sup>

Countries	1 USD		Changes (%)	Central Bank Policy Interest Rate (%)
	2013	2017		
Brazilian Real	2,05	3,13	52	9,25
Indian Rupee	55,82	64,02	14	6
Indonesia Rupiah	9,77	13,34	36	6,5
South African Rand	9,57	13,16	37	6,75
Turkish Lira	1,84	3,47	88	8

Source:<http://www.global-rates.com/interest-rates/central-banks/central-banks.aspx> (Date of access: 26.08.2017), <http://www.dovizkurlar.nm-devises.com/hesaplama/inr-usd.html> (Date of access: 26.08.2017).

Table 1 shows the values of the national currencies of the Fragile Five against the dollar in May 2013 and August 2017. In addition, in the table, the percentages of the currencies against the dollar during the period from 2013 to 2017 are given. In addition, the interest rates imposed by the central banks are also included in the table.

In the period between 2013 and 2017, that is, within four years, Among the currencies in question, the most depreciated against the dollar was the Turkish Lira (%88). It means that the most sensitive currency among the Fragile Five was the TL. However, it is seen that Brazil had the highest central

<sup>2</sup> The Central Bank interest rates are given at various times for the year 2017, but Central Bank interests of Turkey and Indonesia belong to 2016.

bank interest rate. Moreover, Table 1 shows that India had a relatively good position in terms of the central bank interest rate, as well as the value of the money.

The central banks of the countries in question, after the period of 2013, went on their way to raising interest rates in order to protect their national currency quickly. However, this has led to speculative capital flows and high interest borrowing. This also accelerated the depreciation of the national currency (Göçer ve Akın, 2016).

Table 2. Economic Growth Rates of Fragile Five in 2010-2015 (%)

Countries	2010	2011	2012	2013	2014	2015
Brazil	7.5	4	1.9	3	0.5	-3.8
India	10.3	6.6	5.5	6.4	7.5	8
Indonesia	6.2	6.2	6	5.6	5	4.9
South Africa	3	3.3	2.2	2.5	1.7	1.3
Turkey	8.5	11.1	4.8	8.5	5.2	6.1

Source: <http://www.data.worldbank.org/indicator> (Date of access: 26.08.2017).

Table 2 shows the percentage change in economic growth rates of the fragile Five through 2010-2015.

Table 3. Some Macroeconomic Indicators of Fragile Five<sup>3</sup>

Countries	Population (Million)	GDP (billion USD, PPP)	GDP Per Capita (USD, PPP)	Unemployment* (%)	Inflation (%)
Brazil	204	3.192	15.614	6.8	9
India	1292	7.965	6.161	4.9	4.9
Indonesia	255	2.842	11.125	6.2	6.4
South Africa	55	723	13.165	25.1	4.6
Turkey	77	1.588	20.437	10.2	7.7

Source: World Economic Forum, The Global Competitiveness Report 2016-2017, <http://www.heritage.org/index/ranking>, 2017, <http://databank.worldbank.org/data/> (Date of access: 27.08.2017)

When the figures for 2010 are examined, the growth rates in other countries except South Africa are remarkable. Because capital inflow was the highest in this period.

With the FED decision, growth rates began to fall after 2013. By the year 2015, there was a decline in the growth rates of countries outside of India. India recovered quickly after May 2013. The sharpest decline in the post-FED decade was in Brazil. Likewise, the rate of economic growth in Brazil in 2015 was -3.8 percent. In general, it can be said that economic growth in these countries was unstable.

Table 3 where the most prominent figures bring together the Fragile Five shows that the GDP and GDP Per Capita values calculated based on the purchasing power parity were low. However, it can be said that India's economy (GDP) was relatively large from the countries in question. According to information from the Heritage database of 186 countries (Erkan, 2009), compared to China, which had \$ 19.392 billion GDP (PPP), the economic size of the countries in question was relatively low. However, when GDP Per Capita data are analyzed, it is observed that highest score belonged to Turkey. Another point that attracts attention within the countries is that India's GDP Per Capita was the lowest while the GDP was the highest. When the Fragile Five's unemployment rate is examined, it is observed that South Africa ranked first with 25.1 percent. Nevertheless, compared to the country group mentioned, India's unemployment rate (4.9 percent) appears to be satisfactory. In addition, when the inflation rates are examined in Table 3, it is seen that the highest rate belongs to Brazil with 9 percent.

The crucial element behind the inflationary process in the Fragile Five economies was the pressure on the exchange rates of capital outflows as a result of the change in the monetary policy of the FED.

<sup>3</sup> Population, GDP and GDP per capita are data from the Heritage 2017 report. In terms of unemployment and inflation data, since the current data of some of the countries have not been found, 2015 is selected as the joint year, and India's unemployment rate is related to 2014.

Because, exchange rate changes play an important role in the transfer mechanism of monetary policy and have an important effect on consumer prices. In the inflation targeting regime, real expectations of interest rates should be at least positive if inflation is expected to exceed the target (Çeviş ve Ceylan, 2015).

Table 4. Foreign Trade Indicators of Fragile Five<sup>4</sup> (2015)

Countries	Export (million USD)	Import (million USD)	Balance of Foreign Trade (billion USD)	Current Account Deficit/GDP (%)	Trade Openness <sup>5</sup>
Brazil	191.134	178.798	6.90	-3.3	21
India	267.147	391.977	-31.85	-1.1	32
Indonesia	150.282	142.695	5.32	-2.0	34
South Africa	81.673	90.357	-9.61	-4.3	59
Turkey	143.883	207.199	-30.56	-4.5	49

Source: <http://data.worldbank.org/> (Date of access: 10.07.2017), <http://unctadstat.unctad.org/EN/Index.html> (Date of access: 26.07.2017).

It is understood from the export and import data above that the Fragile Five played an active role in international markets. In this context, when the foreign trade balance of the economies is examined in Table 4, it is seen that net exports of India, Turkey and South Africa were negative. India, with 31.85 billion USD, was the country with the highest foreign trade deficit. India was followed by Turkey with 30.56 billion USD foreign trade deficit. Among the mentioned economies, Brazil was the country with the most balanced foreign trade. However, it is evident that the Fragile Five economies are known as countries with high current deficit. In this regard, as seen in Table 4, it is striking that India had the lowest and Turkey had the highest current account deficit in the Fragile Five. In addition, although the South African foreign trade volume was relatively low, the trade openness was the highest. As seen in Table 3, the reason for this is that South Africa had the lowest GDP. However, the country with the highest foreign trade volume among the Fragile Five is India.

### 3. COMPARATIVE ADVANTAGE AND CONCEPT OF REVEALED COMPARATIVE ADVANTAGE

Ricardo's Theory of Comparative Advantages, one of the earliest theories of international trade, which is the view that classical economics has shaped since the end of the 18th century and the beginning of the 19th century bases foreign trade on international relative costs (Utkulu, 2005:1).

In this direction, The Theory of Comparative Advantages can be explained as follows:

If a country is productive at a higher rate than other goods in the production of certain goods, that is, if the costs are lower in such goods, they do not want to waste producing goods that are less superior.

The best policy in this context is to specialize in the production of goods for which the relevant country is the most comparative. As a matter of fact, the country should export these goods. The country must also import goods from other countries that are relatively expensive. In this case, countries use their scarce resources in the most economical way and maximize their economic prosperity (Seyidoğlu, 1999:18-19).

While Ricardian Theory explains the comparative advantage at cost, Heckscher-Ohlin Theory considers factor price differences (Bender ve Li, 2002:1). According to Heckscher-Ohlin Theory, the less similar the countries are to each other, the more they trade. In other words, The more similar the factor equipments, the less trade will be made between them (Utkulu, 2005:22).

The main problem in measuring comparative advantage is that the pre-trade relative prices are unknown. Therefore, comparative advantage can be explained by observing existing trade. Accordingly, mathematical calculations are used to measure the competitiveness of the country

<sup>4</sup> Since there is no current data for some countries, all data are from 2015.

<sup>5</sup>  $((\text{Export} + \text{Import})/\text{GDP} \times 100)$ , It is calculated by us using information from <http://data.worldbank.org/> data.

concerned (Utkulu, 2005:14, 19). In this perspective, one of the most widely used numerical methods for measuring competitiveness is the Revealed Comparative Advantages (RCA) (Çınar ve Özçalık, 2013:4).

The RCA measures the changes in comparative advantages on the basis of the index. However, the RCA index can not distinguish improvements in the factor hardware of the country. (Çınar ve Özçalık, 2013:5). Therefore, factor intensities of goods subject to foreign trade need to be interpreted separately. Moreover, the RCA index does not measure the reason for the comparative superiority. It measures whether the country has a comparative advantage expressed in a product's exports (Urhan, s. 4).

Instead of the concept of comparative advantage explained in the literature, the concept of competitiveness can be used. In this context, competitiveness determines the strengths and weaknesses of the relevant country in a particular product exports. In comparative advantage, relative strengths and weaknesses of the relevant product are determined for a specific country (Yılmaz, 2008:4). In this direction, a rise in the value of RCA means an increase in the foreign trade competitiveness of the country (Jing, 2005:10). In the end, both concepts essentially mean comparative costs. In this context, if a country has comparative advantages in international markets, it can be commented that the country has also competitiveness (Erkan, 2011:4).

#### 4. METHODOLOGY

In this study, It is aimed to determine the specialization levels of Fragile Five in foreign trade. The study is related to the years 2000-2014 and the Revealed Comparative Advantages are used. Net Trade Index and Export Import Rate Index are used as RCA index. to determine the domestic specialization of Fragile Five economies.

In the study, the analyzes are made according to SITC Rev 3, 2-digit product classification. In this context, the level of specialization in the export of 66 product groups of the mentioned countries have been calculated. <https://comtrade.un.org/db/default.aspx> was used as the database<sup>6</sup>.

The RCA coefficients of the countries are calculated on the basis of "appropriate average" values. The appropriate mean refers to the result obtained by taking the arithmetic average of the remaining series by sifting the highest and lowest values in a slab (<http://www.statistics.com/resources/glossary/t/trimmean.php>). If only arithmetic average is used, the export / import figures of some sectors (and thus the Revealed Comparative Advantage Coefficients calculated) may be lower or higher than expected periodically. Therefore, the "appropriate average" is calculated so that the assessment can be healthier (Küçükkiremitçi, 2006:11).

When the scores obtained as an analysis of foreign trade specialization levels are evaluated according to factor intensity, the SITC Technology Classification has been taken into consideration.

There are five different product groups used by Hufbauer and Chilas (1974) to compare international competition power in terms of factor intensity (Kösekahyaoğlu and Özdamar, 2011:38-39). Bunlar, SITC Teknoloji Sınıflandırması adıyla Ek Tablo 2'de yer almakta olup, sözü edilen sınıflandırmaya göre mallar; hammadde yoğun, emek yoğun, sermaye yoğun, kolay taklit edilebilen ve zor taklit edilebilen araştırma bazlı mallar şeklinde gruplanmaktadır (Hufbauer and Chilas, 1974).

##### 4.1. Net Trade Index (NTI)

Net Trade Index, one of the Revealed Comparative Advantage coefficients, demonstrates only the commercial performance of the country concerned (Kafalı, Dündar, Eşiyok ve Karaca, 2006:3).

In an open economy, it is necessary to consider import values as well as export values while measuring the competitiveness of the country in terms of development and competition strategies

<sup>6</sup> X; export, M; import, t; period, k; product (sector), j; country

(Eşiyok, 2014:98). In this context, the sectoral structure of the export and import of the country is determined.

Net Trade Index can be formulated as follows (Kafalı, Dündar, Eşiyok ve Karaca, 2006:7):

$$NTI_{kt}^j = \left[ \frac{X_{kt}^j - M_{kt}^j}{X_{kt}^j + M_{kt}^j} \right]$$

$X_{kt}^j - M_{kt}^j$  : Foreign trade balance of country j

$X_{kt}^j + M_{kt}^j$  ; Foreign trade volume of country j

The index is between -1 and +1. The mark of the Net Trade Index indicates the level of specialization of foreign trade in that product. Negative values indicate that imports in the sector are more important, while positive values are more important in exports. In addition, if the index value is -1, there is a full import situation and there is no domestic specialization. If index is 1, full exports are available and domestic specialization is complete. If index value is 0, there is a balanced trade. In other words, it can be said that there is a maximum intra-industry trade (Amighini, 2005).

#### 4.2. Export-Import Ratio Index (EIRI)

Another index for determining the level of specialization in foreign trade of an country is the Export Import Ratio Index (EIRI), which includes imports of countries together with their exports. However, in the years when there is no export or import data of the relevant country, the index gives an undefined result (Kafalı, Dündar, Eşiyok, ve Karaca, 2006:6). The EIRI is formulated as follows (Kızıltan ve Ali, 2011:111):

$$EIRI_{kt}^j = \ln \left[ \frac{X_{kt}^j / X_t^j}{M_{kt}^j / M_t^j} \right]$$

The interpretation of the logarithmic state of the index is given in Table 5 (Sandalcılar, 2011:223);

Table 5. Interpretation of the RCA Index

$\ln \dot{I}O_{kt}^j > 0,50$	The country has specialization.
$-0,50 < \ln \dot{I}O_{kt}^j < 0,50$	The country's specialization is at marginal limit.
$\ln \dot{I}O_{kt}^j < -0,50$	The country has not specialization.

Source: Sandalcılar, 2011:223; Kafalı, Dündar, Eşiyok, Karaca, 2006:5-6

The specialization means that the export performance of the product group is high. In other words, there is a specialization of the country in that product group.

#### 5. LITERATURE REVIEW

As a result of the literature review, there has not been found any publication to determine the level of foreign trade specialization of the Fragile Five. In this perspective, the most important factor that distinguishes this study is the analysis of the real markets of the Fragile Five economies. In this respect, it was aimed to measure the level of specialization and competition of the mentioned countries by using Net Trade Index and Export-Import Ratio Index.

Kösekahyaoglu and Özdamar (2005) analyzed sectoral specialization levels of Turkey, Czech Republic, Hungary, Poland and Estonia by using Export Import Ratio Index. According to the analysis results, Turkey, Czech Republic, Hungary and Poland specialized in labor-intensive sectors (Kösekahyaoglu & Özdamar, 2005). However, they did not specialize in the export of research-based goods. Karpavicius, H. (2007) also determined the competitiveness of Lithuania's exports to the EU between 2004 and 2008. Net Trade Index was used. Lithuanian specialization and competitiveness were concentrated in the medium value product groups with less value (Karpavicius, 2007).

Lim, K. T. (1997), in the study, used Net Trade Index and examined the Revealed Comparative Advantages of North Korea's foreign trade between 1970 and 1992. Results obtained showed that

North Korea specialized in the production and export of Ricardo products. In other words, the country was successful in improving the natural resource economic infrastructure of products (produced by natural sources) such as food, minerals and crude oil (Lim, 1997). Özçalık and Okur (2013) used Net Trade Index in their study as well, and analyzed Turkey's textile and apparel export competitiveness across EU countries. As a result of the analyzes, it was revealed that Turkey had a competitiveness in the export of apparel and textile industry in the 1996-2000 period. In the export of apparel sector, Turkey had a competitive advantage against all countries except Portugal (Çınar & Özçalık, 2013).

Yılmaz and Ergün (2003) used Export Import Ratio Index and researched the level of specialization of the EU candidate countries (Turkey, Bulgaria, Hungary, Romania, Poland, Czech Republic) and EU-15 countries between 1996-2000 (Yılmaz & Ergun, 2003). According to this, all countries had a competitive disadvantage in the export of raw materials intensive goods except Hungary. The six countries in question had comparative disadvantages in the export of research-based goods. The EU-15, on the other hand, had a competitive advantage in the export of capital-intensive and research-based goods. Xinhua, Y. (2008) used both Export Import Ratio Index and Net Trade Index and tried to find out the level of specialization of Asian countries in shrimp exports between 1990-2003 (Yuan, 2008).

## 6. ANALYSIS AND FINDINGS

### 6.1. Net Trade Index (NTI) Analysis

Scores obtained for the NTI analysis are interpreted as there is specialization or there is no specialization. However, the level of domestic specialization of the country in the production of a commodity is also indicative of the presence of export competitiveness. At the same time, the NTI results of countries will also be an important indicator of global competition.

Table 6. Factor Intensity of Fragile Five by NTI Results

	Product code	NTI 2000-2007 average	NTI 2008-2014 average	NTI appropriate average	Specialization Status	Factor Intensity
BRAZIL	97	1,00	0,66	1,00	existent	Unspecified
	06	0,98	0,98	0,98	existent	Group 1
	12	0,96	0,97	0,96	existent	Group 3
	01	0,96	0,96	0,96	existent	Group 1
	22	0,93	0,74	0,96	existent	Group 1
	24	0,97	0,61	0,95	existent	Group 1
	93	0,71	0,66	0,92	existent	Unspecified
	08	0,91	0,93	0,92	existent	Group 1
	07	0,89	0,90	0,90	existent	Group 1
	61	0,78	0,63	0,86	existent	Group 2
INDIA	01	1,00	1,00	1,00	existent	Group 1
	84	0,99	0,63	0,97	existent	Group 2
	03	0,98	0,96	0,97	existent	Group 1
	04	0,85	0,95	0,93	existent	Group 1
	12	0,91	0,93	0,92	existent	Group 3
	22	0,91	0,64	0,88	existent	Group 1
	08	0,82	0,83	0,83	existent	Group 1
	83	0,92	0,46	0,83	existent	Group 2
	85	0,88	0,50	0,82	existent	Group 2
	35	1,00	0,33	0,77	existent	Group 3
INDONESIA	32	0,99	0,66	0,99	existent	Group 1
	42	0,99	0,66	0,99	existent	Group 1
	97	0,99	0,63	0,97	existent	Unspecified
	84	0,98	0,59	0,94	existent	Group 2

	34	0,99	0,53	0,93	existent	Group 1
	03	0,95	0,88	0,92	existent	Group 1
	63	0,96	0,55	0,90	existent	Group 2
	85	0,91	0,55	0,87	existent	Group 2
	82	0,95	0,48	0,85	existent	Group 2
	43	0,78	0,65	0,83	existent	Group 1
SOUTH AFRICA	97	0,87	0,66	0,94	existent	Unspecified
	32	0,84	0,57	0,84	existent	Group 1
	68	0,82	0,55	0,83	existent	Group 3
	25	0,82	0,54	0,82	existent	Group 1
	96	0,50	0,62	0,79	existent	Unspecified
	05	0,81	0,75	0,78	existent	Group 1
	21	0,64	0,85	0,75	existent	Group 1
	67	0,74	0,41	0,70	existent	Group 3
	28	0,53	0,58	0,68	existent	Group 1
	35	0,89	0,20	0,62	existent	Group 3
TURKEY	01	0,93	0,62	0,84	existent	Group 1
	05	0,87	0,77	0,82	existent	Group 1
	84	0,89	0,44	0,79	existent	Group 2
	06	0,77	0,70	0,73	existent	Group 1
	96	0,75	0,44	0,69	existent	Unspecified
	35	0,94	0,02	0,63	existent	Group 3
	03	0,58	0,48	0,53	existent	Group 1
	66	0,46	0,27	0,44	existent	Group 2
	11	0,56	0,30	0,44	existent	Group 3
	27	0,31	0,39	0,43	existent	Group 1

Source: The table is tailored according to the analysis results.

Raw material-intensive goods: Group 1

Labour-intensive goods: Group 2

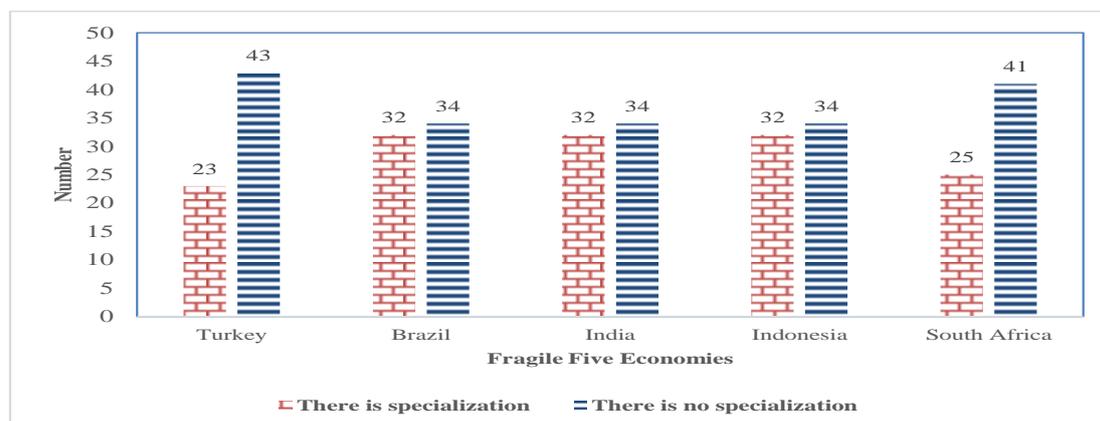
Capital-intensive goods: Group 3

Easy to imitate science-based goods: Group 4

Hard to imitate science-based goods: Group 5

In this part of the study, the NTI of Fragile Five is calculated for SITC Rev 3, 2 digit, 66 product groups and domestic specialization cases are displayed. In addition, first, the average of the two semesters is calculated as 2000-2007 and 2008-2014 in this analysis. Then, average of the NTI of period 2000-2014 is calculated and the obtained scores are evaluated according to the factor intensities of the products.

Graph 1. Fragile Five's Specialization Status According to the NTI (Product Numbers)



Source: The graph is drawn according to the analysis results.

The calculations made according to the NTI analysis of Fragile Five are given in Table 6. The table considers 10 product groups with the highest level of specialization. In this context, the Fragile Five specialized in the foreign trade of raw materials intensive and labor intensive goods, which are mainly low added value.

The Fragile Five were able to provide domestic specialization in capital-intensive goods, which are partly technology-based goods groups. Therefore, in terms of the NTI analysis results, export competitiveness of these countries can be interpreted as predominantly in raw materials, labor and capital intensive goods.

In Graph 1, the number of products with/without specialization according to the NTI of Fragile Five is stated.

According to Graph 1 showing NTI values of Fragile Five, Brazil, India and Indonesia specialized in about half of the products exported. This rate is around 30 percent in Turkey and South Africa. So, products that Turkey and South Africa were dependent on external were numerous.

## 6.2. Fragile Five's Export Import Rate Index (EIRI) Analysis

In the globalizing world, with the aim of measuring the specialization of foreign trade of certain products the EIRI is used.

Tablo 7. Factor Intensity of Fragile Five by EIRI Results

	Product code	EIRI 2000-2007 average	EIRI 2008-2014 average	EIRI (ln)	Specialization Status	Factor Intensity
BRAZIL	97	1.976,41	757,63	7,20	existent	Unspecified
	06	83,70	130,09	4,65	existent	Group 1
	22	53,19	134,76	4,45	existent	Group 2
	01	44,47	52,47	3,88	existent	Group 1
	12	42,92	55,14	3,87	existent	Group 3
	24	50,38	23,27	3,63	existent	Group 1
	61	6,94	51,09	3,12	existent	Group2
	08	17,70	24,11	3,03	existent	Group 1
	00	5,49	41,06	2,91	existent	Group 1
	07	14,27	17,35	2,75	existent	Group 1
INDIA	01	963,39	891,76	6,79	existent	Group 1
	84	200,95	72,93	4,89	existent	Group 2
	03	163,20	89,83	4,76	existent	Group 1
	04	62,40	128,10	4,50	existent	Group 1
	12	34,79	42,76	3,64	existent	Group 2
	22	39,17	23,85	3,37	existent	Group 1
	83	45,14	9,74	3,24	existent	Group 2
	85	24,05	11,39	2,87	existent	Group 2
	08	15,42	18,67	2,78	existent	Group 1
	06	18,07	11,59	2,64	existent	Group 1

Source: The table is tailored according to the analysis results.

The EIRI shows the trade profile and level of specialization of any product group of an individual country. Interpretation of the EIRI results is usually done logarithmically of the index. According to this, Values greater than 0.50 indicate the presence of specialization, values between 0.50 and -0.50 indicate the level of specialization at marginal limits, and values less than -0.50 indicate absence of specialization. The specialization means that the export performance of the product group is high. In other words, specialization has been realized in the exports of that product group.

Tablo 8: Factor Intensity of Fragile Five by EIRI Results (Continuation of the Table)

	Product code	EIRI 2000-2007 average	EIRI 2008-2014 average	EIRI (ln)	Specialization Status	Factor Intensity
INDONESIA	34	1.959,13	15,55	5,39	existent	Group 1
	32	111,73	302,50	5,21	existent	Group 1
	42	98,84	215,81	5,02	existent	Group 1
	97	473,24	38,33	4,89	existent	Unspecified
	84	57,22	16,52	3,60	existent	Group 2
	63	35,12	10,28	3,09	existent	Group 2
	03	27,39	15,27	3,06	existent	Group 1
	82	32,93	6,76	2,89	existent	Group 2
	85	13,01	9,94	2,44	existent	Group 2
	43	6,07	16,79	2,33	existent	Group 1
SOUTH AFRICA	97	32,35	8.052,28	8,01	existent	Unspecified
	68	14,48	12,83	2,62	existent	Group 3
	32	13,96	12,84	2,60	existent	Group 1
	21	9,63	22,73	2,45	existent	Group 1
	25	11,59	10,87	2,43	existent	Group 1
	34	20,83	0,26	2,24	existent	Group 1
	05	11,12	7,51	2,23	existent	Group 1
	28	3,78	14,37	2,13	existent	Group 1
	67	7,98	4,98	1,88	existent	Group 3
	06	8,40	1,58	1,51	existent	Group 1
TURKEY	01	65,79	39,71	3,96	existent	Group 1
	84	30,43	8,01	2,93	existent	Group 2
	05	23,23	12,54	2,88	existent	Group 1
	06	15,69	9,32	2,43	existent	Group 1
	03	6,21	4,56	1,67	existent	Group 1
	35	4,97	5,36	1,57	existent	Group 3
	11	5,91	3,05	1,47	existent	Group 3
	27	3,02	5,84	1,43	existent	Group 1
	66	4,35	3,91	1,43	existent	Group 2
	81	3,07	3,43	1,20	existent	Group 2

Source: The table is tailored according to the analysis results.

Raw material-intensive goods: Group 1

Labour-intensive goods: Group 2

Capital-intensive goods: Group 3

Easy to imitate science-based goods: Group 4

Hard to imitate science-based goods: Group 5

In this part of the study, the EIRI for Fragile Five is calculated for SITC Rev 3, 2 digit, 66 product groups and domestic specialization cases are displayed. In addition, first, the average of the two semesters is calculated as 2000-2007 and 2008-2014 in this analysis. Then, average of the EIRI of period 2000-2014 is calculated and the calculated values are interpreted according to the factor intensities of the products. Comments on the EIRI are made on a logarithmic form.

According to the EIRI results, the products that countries had relatively high level of specialization in exports are as follows:

Brazil and South Africa: "97- gold, non-monetary"

Turkey and India: "01 meat and meat products"

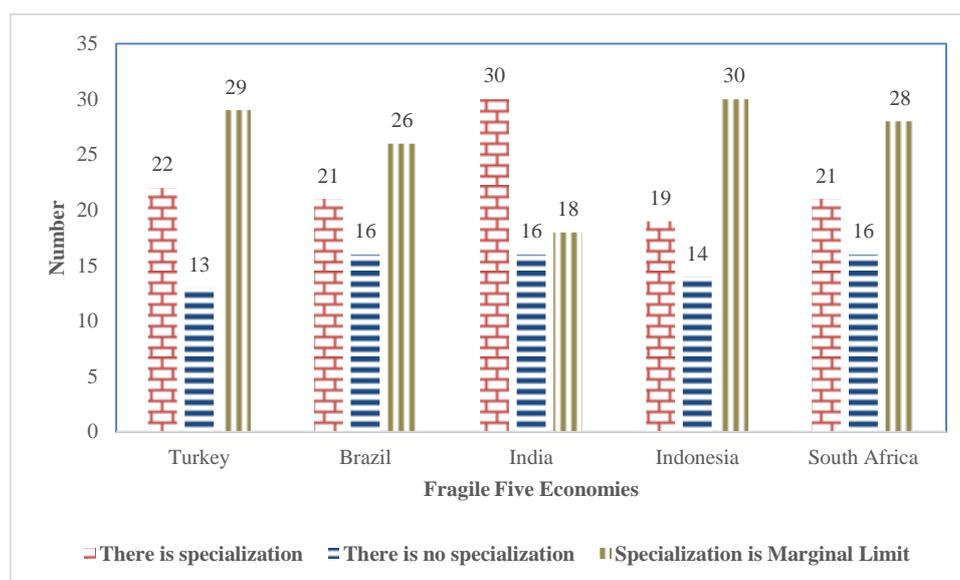
Indonesia: "34- natural gas and manufactured gas"

It is observed that the EIRI scores of such product groups had been decreasing in countries except Indonesia over time.

The Fragile Five are predominantly specialized in the export of raw materials, labor and (in part) capital intensive products. In other words, value-added and technology hardware of products that the countries had high export performance were low. In this context, the results are consistent when domestic specializations are analyzed by NTI and EIRI according to factor intensity of the Fragile Five.

In Graph 2, the numbers of products related to the EIRI scores of the Fragile Five are compared.

Graph 2. Fragile Five's Specialization Status According to the EIRI (Product Numbers)



Source: This chart is prepared by us using the analysis made earlier.

According to Graph 2, India specialized in exporting relatively more products (30 items). India was followed by Turkey with 22 items. Brazil and South Africa specialized in the export of the same number of product groups (21 items). Indonesia was the country that specialized in the export of the least number of product groups with 19 items among the Fragile Five<sup>7</sup>.

## 7. CONCLUSION AND EVALUATION

The Fragile Five, usually assessed from a financial perspective, has been evaluated in terms of sectoral specialization and export competitiveness in this study. In this context, the RCA index (Net Trade Index and Export Import Rate Index) of the Fragile Five is calculated and interpreted. In addition to product-based specialization and export competitiveness analyzes, factor intensity-based analyzes are also conducted using the SITC Technology Classification (raw material-intensive goods, labor-intensive goods, capital-intensive goods, easy to imitate science-based goods and easy to imitate science-based goods). Accordingly, the increase in the specialization and competitiveness of exports of research-based products will have a positive impact on the terms of foreign trade of the Fragile Five economies. This means that it contributes to the welfare of the country through international trade. The Net Trade Index and Export Import Rate Index results show that the Fragile Five mainly specialized in low value added product groups in international trade and had competitiveness. In other words, the factor intensities of the product groups that the mentioned countries specialize can be classified as raw material, labor and partly as capital.

<sup>7</sup> In some years, some product groups did not have export or import values. For this reason, the EIRI values were undefined. So, the corresponding products can not be used in the graph.

According to Net Trade Index results, while the level of specialization in Brazil, India and Indonesia was about 50 percent, this ratio was around 30 percent in Turkey and South Africa. The scores obtained as a result of the analyzes made reveal that Turkey and South Africa were dependent on external. In other words, it can be said that they were net importer.

As a result, Net Trade Index and Export-Import Ratio Index calculated for Fragile Five are consistent with each other. When the inflation rates of the Fragile Five are taken into consideration, the production costs of these countries are also high. Nevertheless, the fact that the technology-based production and exporting problems of the countries in question have emerged as one of the most important obstacles in their development. However, one of the most important ways to become a developed economy is to produce R & D based products and export them.

In today's world, where power balances are constantly changing, and certain emerging economies are becoming more and more involved in global markets, the countries need to invest more in branding, innovation and technology in order to get more share from world exports and added value. In other words, these countries need to follow a strategy a strategy that is less dependent on external. Furthermore, it is clear that the Fragile Five can fight more strongly against external shocks if they diversify and diversify their product groups, which are competitive in the global marketplace. In the face of any economic crisis that may arise, the volatility of the economies of the countries will also decrease.

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