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An Analysis on Turkish Exports During Covid-19 Pandemic

Covid-19 Salgını Sürecinde Türk İhracatına İlişkin Bir Analiz

Volkan Sezgin*

Abstract: This paper analyzes the impacts of the Covid-19 pandemic on the exports of Turkey. A data set compiled from Turkish Exporters Assembly's export database is used for our study. The research is based on the applications of selected trade indices such as the sectoral Hirschmann index, sectoral trade concentration ratio, sectoral trade intensity and technological classifications on Turkish sectoral exports during the outbreak. Our results indicate that Turkish sectoral Hirschmann index which amounted to 0.66 between March and May 2019 decreased to 0.62 in the same time frame in 2020 demonstrating that the sectoral exports have broadened the export base, and Turkey currently has a more balanced sectoral export dispersion. Because of the outbreak, the automotive and textiles exports, which can be considered as the engines of Turkish economy, plummeted by 53% and 45% respectively, while the exports of fresh fruits and vegetables increased by 14%. Investigations of trade concentrations and technological intensities of the exports reveal that the shares of high tech and medium-high tech products in the whole export basket decreased and Turkey's dependence particularly on exports of automotive and textiles plummeted during Covid-19 crisis. Sectoral trade intensity findings infer that some international markets like Ukraine have become more important for selected Turkish exports. As Turkish economy reopened as of June 1, 2020, increasing world demand compounded by the recent depreciation of the Turkish lira against foreign currencies can create a new opportunity for Turkey to rebalance her economy in the future and pivot to a high-tech, surplus-generating export base by benefiting more from the re-organization of global and regional value chains while mitigating economic impacts of the crisis.

Structured Abstract: Covid-19 pandemic hit the global economy hard recently. The outbreak pushed some of the economies into recession while others were strained by financial difficulties due to continuous fight against the disease. Like other emerging market economies, Turkey aimed at protecting her economy and domestic market by applying different types of restrictions which included flight cancellations, border closures, export and import bans, limitations on social gatherings, application of curfews, among others. After the outbreak burst out, Turkey immediately closed most of its border crossings and halted all international flights to and from the country. Covid-related developments have caused tourism and trade activities come to a standstill.

The pandemic continues to test Turkish trade recently as well. In this period, Turkish exports faced major challenges such as demand contraction in the European market - which has been the main export market for Turkey for many years- and supply problems in the global and regional value chains. Other drawback for Turkey has been reaching raw materials and intermediate goods which are required for sustaining the

* Dr., Roma Tor Vergata Üniversitesi, İktisat Bölümü
Ph.D., University of Rome Tor Vergata, School of Economics
ORCID 0000-0001-7642-7674
volkansezginhds@gmail.com

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production activities taking into account that Turkish exports heavily depend on imports. The high concentrations of imports in some sectors have made Turkey vulnerable to changes in policies by exporters throughout this period.

In this framework, the purpose of this paper is to analyze the impacts of the Covid-19 pandemic on Turkish exports. The reason why Turkey was chosen for the study is that Turkey has been a very active user of trade actions to fight the disease, and it has been affected by the pandemic remarkably. Besides, very few studies and statistical analysis exist that have assessed how outbreak influenced Turkish trade.

The analysis is based on applications of various trade indices such as the sectoral Hirschmann index (SHI), sectoral trade concentration ratio (STCR), sectoral trade intensity (STI) evaluation and Nomenclature statistique des activités économiques dans la Communauté Européenne (NACE) technological classifications of the exports. The study is based on the data compiled from Turkish Exporters Assembly's (TIM) database. The following question is aimed to be answered: *"How has Covid-19 affected the sectoral exports in Turkey so far?"* As far as it is known, our paper is one of the first papers investigating how Turkish sectoral exports reacted to the Covid-19 pandemic using numerous indices.

Our results indicate that Turkish SHI which amounted to 0.66 between March and May 2019 decreased to 0.62 in 2020 demonstrating that the sectoral exports have broadened the export base and Turkey currently has a more balanced sectoral export dispersion. Because of the outbreak, the automotive and textiles exports, which can be considered as the engines of Turkish economy, plummeted by 53% and 45% respectively, while the exports of fresh fruits and vegetables increased by 14% during the period under consideration. Investigations of trade concentrations and technological intensities of the exports reveal that the shares of high tech and medium-high tech products in the whole export basket diminished during Covid-19 time. STI findings infer that some international markets like Ukraine have become more important destinations for selected Turkish exports.

The new world order which might be expected to emerge following Covid-19 crisis will be most probably characterized by stricter economic rules, newly created trade and investment barriers, higher localization requirements. Stronger welfare states will come into prominence instead of a world order run through international organizations. The pandemic will definitely create structural changes in economic globalization, trade relations and organizations of supply chains. Covid-19 crisis might also raise Turkish markets importance in global trade relations which can allow Turkey to strengthen its position in the global and regional value chains, and diversify its exports basket.

As Turkish economy reopened as of June 1, 2020, increasing world demand compounded by the recent depreciation of the Turkish lira against foreign currencies can create a new opportunity for Turkey to rebalance the economy and pivot to a high-tech, surplus-generating export base by benefiting more from the re-organization of global and regional value chains while mitigating economic impacts of the crisis. The main challenge for Turkey will be finding a permanent *modus operandi* to increase the unit values of its exports.

Keywords: international economics, sectoral exports, sectoral Hirschmann index, trade concentration ratio, Covid-19, Turkey.

Öz: Bu makale Covid-19 salgınının Türkiye ihracatı üzerindeki etkilerini incelemektedir. Çalışmamızda kullanılan veriler Türkiye İhracatçılar Meclisi ihracat veri tabanından alınmıştır. Araştırmamız sektörel Hirschmann endeksi, sektörel ticari yoğunlaşma oranı, sektörel ticaret yoğunluğu ve ihracatın teknolojik sınıflandırmaları gibi seçilmiş ticaret endekslerinin salgın dönemindeki Türk sektörel ihracatına uygulanmasına dayanmaktadır. Sonuçlarımız, Mart-Mayıs 2019 tarihleri arasında 0,66 olan Türkiye sektörel Hirschmann endeksinin 2020 yılı aynı zaman aralığında 0,62'ye düştüğünü, sektörel ihracatın tabanının genişlediğini ve Türkiye'nin şu anda daha dengeli bir sektörel ihracat dağılımına sahip olduğunu göstermektedir. Salgın nedeniyle, Türk ekonomisinin motoru olarak kabul edilebilecek otomotiv ve tekstil ihracatı sırasıyla %53 ve %45 oranlarında düşerken, taze meyve ve sebze ihracatı %14 artmıştır. İhracatın yoğunlaşma oranı ve teknolojik yoğunluğunun araştırılması sonucunda yüksek teknoloji ve orta-yüksek teknoloji ürünlerinin tüm ihracat sepetindeki paylarının düştüğü ve Türkiye'nin özellikle Covid-19 krizinde otomotiv ve tekstil ihracatına bağımlılığının azaldığı ortaya koyulmuştur. Sektörel ticaret yoğunluğu rakamları, Ukrayna gibi bazı uluslararası pazarların seçilmiş Türk ihracatı için önemlerini arttırdığını göstermektedir. 1

Haziran 2020 itibarıyla yeniden açılan Türkiye ekonomisi, artmakta olan küresel talep ile yakın zamanda Türk lirasının yabancı para birimleri karşısındaki değer kaybıyla birlikte, küresel ve bölgesel değer zincirlerinin yeniden düzenlenmesinden daha fazla yararlanarak krizin ekonomik etkilerini azaltırken, önümüzdeki dönemde dengelenme sürecine girerek ülkenin yüksek teknoloji, katma değer üreten bir ihracat üssüne dönüşmesi için yeni bir fırsat oluşturabilir.

Anahtar Kelimeler: uluslararası ekonomi, sektörel ihracat, sektörel Hirschmann endeksi, ticari yoğunlaşma oranı, Covid-19, Türkiye.

1. Introduction

COVID-19 pandemic will be long remembered for its human cost and disruption to the global economies. The outbreak pushed some of the economies into recession while others were strained by financial difficulties due to continuous fight against the disease. The Economist, for instance, declared that the outbreak could have detrimental effects on the economies of the developing countries. In this period, most of the developing countries had difficulties in reaching international cash flows and experienced declines in the revenues generated by tourism and services trade.

As the health crisis unfolds, some economists have argued that trade policies can be part of the solution or part of the problem (Baldwin and Eiichi, 2020; Bown, 2020; Gonzalez, 2020; Evenett, 2020; Mattoo and Ruta, 2020). The ways that the pandemic will change the global trade relations seem very complicated. We recently saw that the countries have applied various types of export restrictions on personal protective equipment (PPE) to meet the domestic demand. Export bans/restraints have caused the local prices to increase and limit the supply of health supplies in the world.

Trade actions also involved import restrictions to protect the domestic producers due to contracted global demand. A major concern announced by World Trade Organization (WTO) regarding these restrictions was that they can be contagious. Due to high demand on PPEs, there were steep increases in the prices of these products which triggered governments to impose export limitations to mitigate price rises. These actions have aggregate consequences, exacerbating the initial shock and leading to further price escalation -a “multiplier effect” that has been documented in the 2008-11 food crisis (Giordani, Rocha, Ruta, 2016).

In short, trade policy applications mostly aimed at offsetting internal shortages but they caused disruptions in global supply and value chains. In the past, it has proven difficult to multilaterally discipline abuse of these restrictions, despite the harm they do to exporters and importers alike by discouraging investment, and provoking retaliation. (Gonzalez, 2020).

Like other emerging market economies, Turkey strived to protect its economy and domestic market by applying different types of restrictions which included flight cancellations, border closures, export and import bans, limitations on social gatherings, application of curfews among others. After the outbreak burst out, Turkey immediately closed most of its border crossings and halted all international flights to and from the country. Covid-related developments have caused tourism and trade activities come to a standstill. Total debts particularly owned by the private sector compounded with the temporary pause of the economy have continued to pose a threat to Turkish economy during this unprecedented time. In accordance with these developments, the Global Market Report published by the World Bank in June, 2020 predicted Turkish economy to shrink by 3.8 percent by the end of the year.

The pandemic keeps testing Turkish exports recently as of today. Turkish trade faced major challenges such as demand contraction in the European market - which has been the main export market for Turkey for many years- and supply problems in the global and regional value chains.

Other drawback for Turkey was reaching raw materials and intermediate goods which are required for sustaining the production activities taking into account that Turkish exports heavily depend on imports. The high concentrations of imports in some sectors have made Turkey vulnerable to changes in policies by exporters throughout this period. One major positive development which supported exports during this period was the devaluation of Turkish Lira (TL) against foreign currencies.

Regarding trade actions, Government of Turkey (GoT) announced that it temporarily raised import tariffs in the range of 2% to 50% for more than 4000 products in total in order to support domestic producers and protect employment. As of June 15, 2020, Turkey continues to impose export restrictions on PPEs such as masks, gowns, gloves, glasses and coveralls.¹

As noted above, the purpose of this paper is to analyze the impacts of the Covid-19 pandemic on Turkish exports. The reason why Turkey was chosen for analysis is that Turkey has been a very active user of various trade actions to fight the disease, and it has been affected by the pandemic remarkably. Besides, very few studies and statistical analysis exist that have assessed the impacts of outbreak on Turkish trade. The analysis is based on applications of various trade indices such as the sectoral Hirschmann index (SHI), sectoral trade concentration ratio (STCR), sectoral trade intensity (STI) evaluation and Nomenclature Statistique des Activités Economiques dans la Communauté Européenne (NACE) technological classifications of the exports. The analysis is based on the data compiled from TIM's database, which uses International Standard Industrial Classification (ISIC Rev.4), and the research question is: *"How has Covid-19 affected the sectoral exports in Turkey so far?"*. Within our knowledge, this paper is one of the first papers investigating how Turkish exports reacted to the Covid-19 pandemic. However, it is rather early to evaluate the real impacts of the outbreak on different aspects of the international trade which causes objective of this text to be limited.

The paper is organized as follows: Section 1 introduces the topic, Section 2 presents the literature review, Section 3 analyzes Turkish exports at a glance during the pandemic, Section 4 specifies the methodology and results of the data analysis, and Section 5 conveys the conclusions.

2. Literature Review

The impacts of the Covid-19 crisis over the global trade and commercial relations between the countries have been subject of studies in the last couple of months as economists made valuable contributions to the existing literature. To illustrate it, a seminal study by Maliszewska et al. (2020) simulated the potential effects of Covid-19 on gross domestic product and trade, using a standard global computable general equilibrium model and found that the biggest negative shock was on the output of domestic services affected by the pandemic, as well as in traded tourist services.

Another interesting study by Baldwin and Eiichi (2020) investigated how Covid-19 changed commercial relations from different perspectives. The authors found that there is a danger of permanent damage to the trade system driven by policy and firms' reactions, and the supply-chain disruptions that are likely to be caused by Covid-19 could lead to a push to repatriate supply chains.

Gruszczynski (2020) examined short and long-term consequences of amid pandemic. As a result of his research, he stressed that although some of the short-term consequences of the Covid-19 pandemic for international trade are definitively serious, they do not appear to be unmanageable. However, in a different time frame, the potential impact of the pandemic may be more profound than initially anticipated, leading to structural changes in the process of economic globalization.

Apart from international studies, Acikgoz and Gunay (2020) concentrated on analyzing the effects of the Covid-19 on Turkish economy. In their review article, they summarized the current

¹ For instance, prices of masks in Turkey skyrocketed since the restrictions limited the availability of certain PPEs and increased prices for local consumers causing a drastic welfare loss.

discussions about the economic consequences, and found that the pandemic will lead to permanent shifts including trade, employment, agriculture, manufacturing goods production. Interestingly, they also noted that Turkish economy will be destroyed in the short term as soon as the virus would be under control, and this would bring sustainable growth with the accelerating rise in manufacturing exports, tourism revenue and foreign investment.

3. Turkish Exports at a Glance during the Pandemic

3.1 General View of the Exports

The economic reflections of the pandemic began to be explicit in Turkey starting from mid-March when most of the places of manufacture and factories were temporarily closed down especially after March 13. The pandemic exacerbated the economy's existing vulnerabilities as plenty of small and medium enterprises (SME) suffered due to economic losses during this period while some of the workers lost their jobs. It can be claimed that Turkish trade also faced a major slowdown. According to TIM's data, Turkey's total exports amounted to 29.713.110 thousand U.S. Dollar (USD) between March-May, 2020 while this figure was 44.457.164 thousand USD in the same period last year, which corresponds to a 33.2 % fall.

The exports data released by TIM for the first five months of the year revealed that Germany topped the list of Turkey's biggest trading partners with a 17.7% share, followed by the United Kingdom (UK) (11.1%) and the U.S. (10.4%). The fall in exports to traditional EU trading partners was remarkable: Italy (-30%), Germany (-17%), and the UK (-22%), France (-28%) and Spain (-36). The decrease in exports to other main export destinations were somewhat less remarkable when compared with European markets but still significant: Iraq (-14%), USA (-8%), Russia (-3%) and Israel (-12%). We think that Turkish export especially to European markets plummeted since Covid-19 has severely hit EU economies like Italy, Spain, UK and France as these countries continue to lead the list of countries in numbers of cases and deaths with USA, India and Brazil. Tables 1 and 2 show total exports to top 10 major export partners in January-May, 2020 and 2019.

Table 1: Total Exports of Turkey by Countries, Jan.-May, 2019-2020 (Value, % Change)

Country	2019 /Jan.-May	2020/Jan.-May	Change (%)
Germany	6.403.226,86	5.279.516,62	-17,55%
UK	4.286.011,53	3.311.409,89	-22,74%
USA	3.356.065,44	3.099.435,51	-7,65%
Italy	4.034.358,99	2.823.803,77	-30,01%
Iraq	3.037.029,78	2.591.376,68	-14,67%
France	3.229.843,89	2.313.926,67	-28,36%
Spain	3.528.343,84	2.224.440,03	-36,96%
Netherlands	2.056.250,81	1.925.494,07	-6,36%
Israel	1.851.842,83	1.632.387,37	-11,85%
Russia	1.469.988,86	1.420.574,58	-3,36%

Source: TIM

Table 2: Monthly Exports to Top 10 Export Destinations, January-May, 2020 (Value)

Country	January	February	March	April	May
Germany	1.270.172,56	1.197.272,39	1.161.516,16	798.831,64	851.723,87
UK	835.367,38	828.010,96	773.976,30	340.134,29	533.920,96
USA	640.196,82	663.296,37	703.386,33	595.286,72	497.269,28
Italy	845.000,28	718.329,89	507.572,83	379.312,61	373.588,16
Iraq	622.110,65	630.754,53	373.201,44	460.754,72	504.555,35
France	618.247,95	602.726,51	464.385,20	226.083,26	402.483,75
Spain	589.671,57	613.434,96	476.654,79	289.836,61	254.842,09
Netherlands	473.217,71	420.725,98	458.459,41	264.833,14	308.257,84
Israel	365.229,08	376.848,03	389.648,48	240.916,43	259.745,34
Russia	331.906,91	367.858,05	309.816,45	188.988,69	222.004,47

Source: TIM

Like many governments, Turkey ordered temporal closures of numerous manufacturing facilities, while some of these facilities took such actions voluntarily by simply diminishing production because of the disruptions in their supply chains. The producers have also been affected by the contraction in total demand as the people have been hesitant to spend their money during this unpredictable period.²

The slide of total exports to the main destinations mainly stemmed from the pause in industrial products' exports during the pandemic, which can be seen in Chart 1. In the first five months of 2020, industrial exports dropped by 1.1 percent compared to the same period in 2019. The sharp falls in automotive and steel exports triggered the decreases in industrial exports.

Chart 1: Shares of Exports by Major Sectors, 2016-2020

Source: TIM

According to TIM's data, the agriculture, industry and mining exports diminished by 7.8%, 37.4% and 23.7% respectively, in March-May, 2020.

² The increased economic uncertainties compounded by the fear of loss of income during this crisis can be considered as the main reasons for the decrease in demand.

3.2 Analysis of Sectoral Exports

Checking the sectoral exports, it is seen that the crisis has struck Turkish automotive sector badly, causing sector's exports to decline by 53.2% to 3.861 million USD during the March - May, 2020 compared to same time frame last year. Automotive sector was followed by leather and leather products, whose exports fell by 48.9% to 245 million USD. Table 3 summarizes the losses of the top 5 sectoral exports.

In order to fight the demand and supply problems throughout the outbreak, the pandemic might encourage global players, -particularly operating in the automotive sector- to prefer applying strategies like diversifying or shortening their supply chains that will allow them to ensure smoother operations and eliminates risk of supply shortages. In this framework, automotive companies in Turkey might also consider shortening their supply chains and scaling up their usage of more Turkey-origin spare parts instead of procuring these parts from distant markets like China or the South East, which can open a new door for Turkish producers to replace other major players in global supply chains.

Table 3: Sectors whose Exports Decreased the Most, (Value, % Change)

Sector	Exports, March-May, 2019	Exports, March-May, 2020	Change (%)
Automotive Industry	8.252.568	3.860.848	-0,53
Leather and Leather Products	480.461	245.372	-0,49
Textiles, Apparel and Clothing	4.797.831	2.626.672	-0,45
Defense/Aviation Industry	728.378	414.823	-0,43
Textiles/Raw Materials	2.204.837	1.261.263	-0,43

Source: TIM

Chart 2: Exports of Automotive Industry (Thousand USD), 2019-2020

Source: TIM

According to the data compiled from TIM's database, export figures for the 3-month period show that only three sub-sectors under the food industry were able to lift their exports. This proves these sectors' strategic importance even throughout the crisis. Table 4 presents the export levels of the sectors which showed increases in the three months following the pandemic.

Table 4: Sectors Whose Exports Increased the Most during Pandemic (Value, % Change)

Sector	Exports, March-May, 2019	Exports, March-May, 2020	Change (%)
Hazelnut and Related Products	404.685	527.525	0,30
Fresh Fruits and Vegetables	397.570	456.480	0,15
Fruit/Vegetable Products	391.722	406.494	0,04

Source: TIM

Chart 3: Exports of Fresh Fruits and Vegetables (in Thousand USD), 2019-2020

Source: TIM

Accordingly, the sub-sector with the highest increase in exports was the hazelnuts whose exports rose by 30.4% to 528 million USD. Total exports of the fresh fruit and vegetable sector³ also increased by 14.8%, and reached 456 million dollars.

4. Methodology and Data Analysis

In this section, numerous methodologies are introduced to investigate effects of the crisis over Turkish sectoral exports. In order to compare export figures, the exports data gathered from TIM's database are used.⁴

For the sake of the analysis, we specifically referred to the figures between March and May, 2020, as the crisis hit Turkish trade particularly starting from March 13.

Firstly, SHI is applied for the sake our study. SHI is a measure of the sectoral concentration of a region/country's exports. It infers the degree to which a region or country's exports are dispersed across different economic activities.⁵

SHI takes values between 0 and 1, and decreases in the index may be used to indicate broadening of the export base. Similarly, higher values refer to export concentration in fewer sectors.

³ See Appendices A and B for the country level details.

⁴ See <https://www.tim.org.tr/tr/ihracat-rakamlari> for the details.

⁵ See <https://artnet.unescap.org/APTIAD/Sectoral%20Hirschmann.pdf> for the details.

The SHI is defined as the square root of the sum of the squared shares of exports of each industry in total exports for the country/region. The formula is denoted as follows:

$$SHI = \sqrt{\sum_i \left(\frac{\sum_d x_{isd}}{\sum_d x_{sd}} \right)^2} \quad (1)$$

where s shows the country of interest, d is the set of all countries in the world, i depicts the sectors of interest, x denotes the commodity export flow and X is the total export flow.

Our results indicate that Turkish SHI, which amounted to 0.66 between March and May 2019, decreased to 0.62 in the same time frame in 2020, demonstrating that the sectoral exports have been broadened the export base and Turkey currently has a more balanced sectoral export dispersion. As can be seen in Table 5, seven sectors are used for our calculation.

Table 5: Sectors Used for SHI Calculation (Value, % Share)

Sectors	Exports, March-May 2019	Sectoral Exports/Total Exports	Exports, March-May 2020	Sectoral Exports/Total Exports
Herbal Products	3.678.538	0,08	3.720.399	0,13
Animal Products	686.150	0,02	527.497	0,02
Wood/Forestry Products	1.475.324	0,03	1.135.004	0,04
Processed Agricultural Products	3.359.478	0,08	1.919.869	0,06
Chemicals / Chem. Goods	5.530.655	0,12	4.011.441	0,14
Industrial Products	28.513.774	0,64	17.472.675	0,59
Mining Products	1.213.245	0,03	926.225	0,03
Total	44.457.164	1,00	29.713.110	1,00
Sectoral Hirschmann Index	0.66		0.62	

Source: Author's calculations using TIM's figures.

After SHI, a STCR analysis has been carried out to reveal the sectors which dominated Turkish exports during the outbreak. Trade concentration ratio (TCR) is a trade index which shows sectoral weights in the general sectoral exports' basket. The ratio expresses total shares of a certain number of firms, products, industries and countries. STCR denotes the trade concentration ratio, and P_i denotes the shares of sector. STCR takes a value between 0 and 1 and can be calculated according to

$$STCR = \sum_{i=1}^k P_i \times 100 \quad (2)$$

In this respect, TCR (1) denotes the share of the one sector which exported the most in total exports. Similarly, TCR (2), TCR (4), TCR (8), TCR (12) show the total shares of top 2, 4, 8 and 12 sectors in the total exports. Chart 4 shows the shares of the different sectors in Turkish total exports.

Chart 4: Shares of Sectoral Exports in Total Exports (%)

Source: TIM

Below, TCR scores have been derived at different levels at 1, 2, 4, 8 and 12:

Table 6: STCR Scores

TCR Scores	March-May, 2019	March-May, 2020
TCR (1)	0,186	0,130
TCR (2)	0,310	0,265
TCR (4)	0,506	0,444
TCR (8)	0,722	0,665
TCR (12)	0,851	0,824

Source: Author's calculations.

The concentrations of TCR (1) and TCR (2) in Turkey decreased during the period under consideration, which demonstrate Turkey's dependence particularly on exports of automotive and textiles plummeted during Covid-19 crisis.

In addition to the concentration ratio, sectoral exports have been investigated based on technological intensities as well. In order to compile statistics on technological economic activities, a similar methodology like Eurostat's has been utilized. Eurostat uses an aggregation of the manufacturing industry according to technological intensity and based on NACE Rev.2. (2 and 3-digits level) for compiling aggregates related to high-technology, medium high-technology, medium low-technology and low-tech.⁶

As such, our analysis indicates that the shares of high-tech and medium-high-tech products in the whole export basket decreased from 47% to 44% during Covid-19 times when compared to

⁶ See https://ec.europa.eu/eurostat/statistics-explained/index.php/Glossary:High-tech_classification_of_manufacturing_industries for the details.

March-May, 2019. One reason behind this change can be the increase (decrease) in exports of fresh fruits and vegetables (automobiles) during the outbreak.

Table 7: Technological Intensities of Turkey's Sectoral Exports (Value, Share)

Sectors	Exports, March-May, 2019	Shares
High-Tech	3.699.649	8%
Medium-High	17.504.322	39%
Medium-Low	9.255.872	21%
Low	13.997.321	31%
Sectors	Exports, March-May, 2020	Shares
High-Tech	2.538.990	9%
Medium-High	10.523.816	35%
Medium-Low	6.720.863	23%
Low	9.929.441	33%
Total Exports	29.713.110	

Source: Author's calculations using TIM's data.

In addition to SHI and STCR, a STI analysis is performed whose formula can be shown as:

$$STI = \left[\frac{\frac{x_{ijk}}{x_{ij}}}{\frac{x_{wk}}{x_w}} \right] \quad (3)$$

In this context, a similar logic has been used to the revealed comparative advantage to observe the importance of international markets for Turkish exports. Our analysis is based on whether a reporter exports more, as a percentage, to a partner than it does on average to the world. It is measured as country i's exports of sector k to country j relative to country i's total exports to destination j, divided by the country i's total exports of sector k relative to the country i's total exports to the world, where x is the value of exports of sector k from origin country i, and X is total exports from i; w indicates the world.

A higher value indicates a relationship more intense than the world average for that specific partner. We applied this methodology to investigate the changes in the importance of top 5 international markets for Turkish origin automotive and fresh fruits & vegetables exports. The results are shown in Tables 8 and 9.

Table 8: STI Scores for Top 5 Automotive Markets

Country	Jan.-May, 2019	Jan.-May, 2020
Germany	1,36	2,09
France	2,03	3,53
UK	1,25	1,93
Italy	1,40	2,14
Spain	1,02	1,97

Source: Author's calculations using TIM's data.

Table 9: STI Scores for Top 5 Fruits and Vegetables Markets

Country	Jan.-May, 2019	Jan.-May, 2020
Russia	12,43	8,53
Romania	3,40	2,91
Ukraine	0,01	4,52
Germany	0,71	0,48
Iraq	1,99	0,94

Source: Author's calculations using TIM's data.

Despite automotive exports plummeted significantly, it is seen from the Table 8 that countries, which are in the list of top 5 automotive export destinations for Turkey, have increased their importance for Turkish exports in 2020. Interestingly, Ukraine has become a significant export destination for Turkish fruits & vegetables, as the STI score for other countries relatively dwindled.

Searching the highest decreases in sub-sectoral exports in the first 5 months of 2019 and 2020, a list of various products has been deduced from different sectors like steel, textiles, automotive and chemicals, as can be seen in Table 10.

Table 10: Highest Decreases in Turkey's Sub-Sectoral Exports (Value, % Change)

Main Sector	Sub-Sector	Exports, Jan.-May, 2019	Exports, Jan.-May, 2020	Change (%)
Automotive Industry	Supply Industry	1.062.175.008	451.180.577	-0,58
Automotive Industry	Basic (Key) Industry	1.681.337.957	736.281.516	-0,56
Textiles, Apparel and Clothing	Clothing Industry (Excluding Underwear)	1.188.729.038	517.075.988	-0,57
Steel	Iron and Steel Products (Including Non- Ferrous Metals)	1.360.728.869	817.768.852	-0,40
Chemicals and Chemical Products	Chemical Plastics and Products	586.667.642	395.142.273	-0,33

Source: TIM

The figures for steel exports demonstrate that steel sector has incurred losses because of the pandemic. According to the statement made by Turkish Steel Exporters Association on June 16, 2020 that Turkey's overall steel exports narrowed 17.8% on an annual basis in January-May amid the coronavirus pandemic. Following this drop, Turkish steel sector determined to set new target markets like Southeast Asia, West Africa and Latin America.

Regarding the impacts of the crisis on sectoral exports -given that the impacts might differ across regions in Turkey-, we also searched whether the effects have been demolishing in Turkey's leading exporting region, namely Istanbul. Table 11 below shows that the attenuations in sectoral level exports of Istanbul which displays somewhat similar figures to Turkey's averages.

Table 11: Sectoral Level Exports of Istanbul (Value, % Change)

Sectors	Jan.-May, 2019	Jan.-May, 2020	Change (%)
Textiles, Apparel and Clothing	5.287.721,96	3.788.167,28	-28,36%
Chemicals and Chemical Industry	3.983.430,77	3.689.952,22	-7,37%
Steel	3.320.340,34	2.555.363,71	-23,04%
Electric and Electronics	2.472.113,32	1.947.887,39	-21,21%
Automotive Industry	2.727.907,37	1.887.880,21	-30,79%
Total	29.778.486,81	24.096.055,16	-19,08%

Source: TIM

5. Conclusion

This study focuses on the estimation of the effects of Covid-19 pandemic on exports of Turkey, particularly between March - May, 2020. Departing from other studies, this paper is one of the first articles which employs various trade indices such as sectoral Hirschmann index, sectoral trade intensity, and trade concentration ratio for analyzing Turkish case. Our results indicate that Turkish SHI which amounted to 0.66 between March and May 2019 decreased to 0.62 in 2020 demonstrating that the sectoral exports have broadened the export base and Turkey currently has a more balanced sectoral export dispersion. Because of the outbreak, the automotive and textiles exports, which can be considered as the engines of Turkish economy, plummeted by 53% and 45% respectively, while the exports of fresh fruits and vegetables increased by 14% during the period under consideration. Investigations of trade concentrations and technological intensities of the exports reveal that the shares of high tech and medium-high tech products in the whole export basket decreased during Covid-19 time. STI figures infer that some international markets like Ukraine have become more important destinations for selected Turkish exports.

Many of the recent trade actions by the GoT aimed at diluting the bad impacts of the crisis. For instance, Ministry of Trade of Turkey recently announced that it will start supporting participations to the virtual trade missions and membership applications by Turkish exporters to the e-commerce websites. Apart from that, GoT imposed other trade actions such as additional tariffs on the imports of various goods to revive the domestic market and decrease the unemployment. In this period, Turkey increased the production of domestic PPEs and medical devices like ventilators. These actions display that Turkey targets sustaining the growth of its economy in exports through lowering and subrogating the imports in this unprecedented time.

The new world order which might be expected to emerge following Covid-19 crisis will be most probably characterized by stricter economic rules, newly created trade and investment barriers, higher localization requirements. Stronger welfare states will come into prominence instead of a world order run by international organizations. The pandemic will definitely create structural changes in economic globalization, trade relations and organizations of supply chains. Covid-19 crisis might also raise Turkish markets importance in global trade relations which can ensure Turkey to strengthen its position in the global and regional value chains, and diversify its exports basket. It can also be claimed that agriculture might continue playing an important role both for the internal dynamics of Turkey and for its foreign trade in the near future, as proved during the pandemic.

As Turkish economy reopened as of June 1, 2020, increasing world demand compounded by the recent depreciation of the Turkish lira against foreign currencies can create new opportunities for Turkey to rebalance the economy and pivot to a high-tech, surplus-generating export base by benefiting more from the re-organization of global and regional value chains while mitigating economic impacts of the crisis. For instance, Turkey can come to the forefront in producing high-tech health supplies like ventilators in the near future. The main challenge for Turkey will be finding

a permanent *modus operandi* to increase the unit values of its exports as high-technology products like aircraft parts, medical instruments, and satellites account for only 4.3 percent of Turkish exports.

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Appendix A

Sector	Importing Country	2019 / Jan. – May	2020 / Jan.-May	Change (%)
Automotive Industry	Germany	1.881.251,45	1.264.953,61	-32,76%
Automotive Industry	France	1.417.764,34	934.164,34	-34,11%
Automotive Industry	UK	1.159.030,64	732.236,09	-36,82%
Automotive Industry	Italy	1.218.067,88	690.279,52	-43,33%
Automotive Industry	Spain	775.929,00	500.206,67	-35,53%
Total Exports		13.124.753,52	8.778.684,35	-33,11%

Source: TIM

Appendix B

Sector	Importing Country	2019 / Jan. – May	2020 / Jan.-May	Change (%)
Fresh Fruits & Vegetables	Russia	229.774,83	289.000,25	25,78%
Fresh Fruits & Vegetables	Romania	71.330,05	94.582,99	32,60%
Fresh Fruits & Vegetables	Ukraine	50.098,19	77.130,09	53,96%
Fresh Fruits & Vegetables	Germany	57.456,27	61.061,28	6,27%
Fresh Fruits & Vegetables	Iraq	75.973,60	58.419,91	-23,10%
Total Exports		762.616,37	915.367,83	20,03%

Source: TIM