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Dynamics of Turkey's Export Performance: A Constant Market Share Analysis

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Abstract

This article evaluates the changes in Turkey's share in its export markets and in the world market over the past decade. Based on a constant market share (CMS) analysis, changes in Turkey's market share is decomposed into market-related and commodity-related effects. The results reveal that Turkey's share in its main export markets, except the United Arab Emirates (UAE) and Russia, has increased and a large portion of this increase was due to the market share effect, which indicates the strong competitiveness of Turkey in these markets. Moreover, all the market-related and commodity-related effects are positive for the EU market, which is traditionally the most important trade partner of Turkey. The same is true for Ukraine. On the other hand, Turkey faces a poor match between the commodity composition of its exports and the import demand of the target markets such as Morocco, Egypt, China, Lebanon, Azerbaijan and China. However, for Morocco, Egypt and Lebanon, Turkey is successful in quickly adapting its commodity composition to the changes in the import profile of these markets. Finally, the results show that Turkey's share in a single world market has increased over time and this increase is largely resulted from the increasing competitiveness of Turkey. Also, Turkey's current trade partners are rapidly-growing markets in

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world trade, and most likely this will benefit to Turkey in the future. However, Turkey faces difficulties in adapting its market composition to rapidly growing new target markets.

Keywords: Turkey, export performance, constant market share analysis, commodity composition, competitiveness.
JEL Codes: *F10, F14, F15.*

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Özet

Türkiye'nin İhracat Performansı Dinamikleri: Bir Sabit Pazar Payı Analizi

Bu makale, Türkiye'nin son on yılda ihraç pazarlarında ve dünya pazarındaki payında meydana gelen değişiklikleri incelemektedir. Sabit pazar payı (CMS) analizine dayanarak, Türkiye'nin pazar payındaki değişiklikler pazarla ve ürünle ile ilgili etkilere ayrıştırılır. Analiz sonuçlarına göre Türkiye'nin son on yıl içinde Birleşik Arap Emirlikleri (BAE) ve Rusya dışındaki temel ihracat pazarlarında ihracat payı artmaktadır ve bu artışın büyük bir kısmı pazar payı etkisinden kaynaklanmaktadır. Bu da Türkiye'nin ihracat pazarlarındaki yüksek rekabet gücüne işaret etmektedir. Bunun yanı sıra, geleneksel olarak Türkiye'nin en önemli ticaret ortağı olan AB pazarı için piyasa ve ürün ile ilgili tüm etkiler pozitiftir. Ukrayna için de aynı durum geçerlidir.. Öte yandan Türkiye, ihracatının ürün kompozisyonu ile Fas, Mısır, Çin, Lübnan, Azerbaycan ve Çin gibi pazarların ithalat talebi arasında zayıf bir eşleşme ile karşı karşıyadır. Ancak, Fas, Mısır ve Lübnan bazı pazarlarda Türkiye, ürün kompozisyonunu hedef pazarların ithalat profilindeki değişikliklere hızlı bir şekilde adapte etmekte başarılı olmuştur. Son olarak sonuçlar, Türkiye'nin bir bütün olarak dünya pazarındaki payının da zamanla arttığını ve bu artışın büyük ölçüde Türkiye'nin artan rekabet gücünden kaynaklandığını göstermektedir. Ayrıca, Türkiye'nin mevcut ticaret ortakları dünya ticaretinde hızla büyüyen pazarlardır ve bu durum gelecekte fayda sağlayacaktır. Ancak Türkiye, pazar yapısını hızla büyüyen yeni hedef pazarlara doğru uyarlamakta güçlük çekmektedir.

Anahtar Kelimeler: *Türkiye, ihracat performansı, sabit piyasa payı analizi, ürün kompozizasyonu, rekabet gücü.*
JEL Kodları: *F10, F14, F15.*

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Dynamics of Turkey's Export Performance: A Constant Market Share Analysis
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I. Introduction

As a result of the globalization process, almost all countries have to participate in the world's main export markets. This is also valid for Turkey, which has been targeting economic growth by increasing its exports for nearly forty years. This study aims to analyze Turkey's participation in the world markets and reveal the main challenges the

country faces in this process.in the last 10 years. To do so, changes in Turkey's export share in world markets are examined in the country and commodity level based on a constant market share (CMS) analysis that has been developed by Fagerberg and Solie (1987) and slightly modified by Gilbert and Muchova (2018).

According to 'World Development Indicators' data by the World Bank, Turkey's total exports grew by an average of 5.9 percent annually in the last 10 years. This increase has been one of the most important factors in Turkey's GDP per capita growth, which is average of 4.6 percent annually in the last 10 years. Hence, the expansion of Turkey's exports in world markets is a very important part of its growth and development strategy. As a part of this strategy, the government has formulated many trade liberalizations reforms and has implemented free- trade agreements with its main trading partners. However, Turkey's export performance is not only dependent on factors within the country, but also closely related to developments in the world markets. Trade liberalization and the increasing number of exporters and importers make competition strong and severe in world markets. Therefore, Turkey's export performance is closely linked to the export performance of its competitors and importing ability of its trading partners.

This study evaluates the change in the shares of Turkey's exports in world markets and the factors contributing to these changes. The study is based on a CMS analysis that decomposes the change in Turkey's market share between the years 2007-2009 and 2017-2019. The analysis considers the performance of other exporters as well as the import demand of the destination market. As different from the previous ones, the study includes nearly all of Turkey's trade partners and all products. All in all, the study reveals a detailed analysis of the competitive position of Turkey, points to the sources of this position in terms of destination markets, products and competitors. The study is organized as follows: Section 2 presents a literature review, Section 3 presents data and methodology, Section 4 presents results and section 5 presents the conclusion.

II. Literature Review

The CMS model has been utilized to analyze the change in market shares of the exported products. The conventional CMS model was first used by Tyszynski (1951) and then it has been modified in various ways by different studies (e.g. Leamer and Stern, 1970, Fagerberg and Solie, 1987; Batista, 2008). The revisions were generally made to the components of the CMS model. For example, Tyszynski (1951) decomposed the change in the market share of a country into two effects, the competitiveness effect and the structural effect. Leamer and Stern (1970) modified these components as the commodity effect, the market distribution effect and the competitiveness effect while Fagerberg and Solie (1987) decomposed market share growth into the market share effect, the commodity composition effect, the commodity adaptation effect, the market composition effect and the market adaptation effect.

Both conventional and modified models have been applied in many studies. For example, the conventional CMS model was used by Drysdale and Lu (1996) and by Brownie and Dalziel (1993) in order to analyze Australia's and New Zealand's export performance, respectively. Kamal et al. (2020) evaluate Pakistan's export performance in the Central Asian region based on an extension of the CMS model by Leamer and Stern (1970). Ahmadi-Esfahani (1994) evaluates the market share change of Australia's processed food exports to South-East Asia for the period 1980–2003. Batista (2008) developed another modified CMS model which accounts for changes in the market share of a country relative to its competitors in a specific market. Shuquan (2019) analyzes the competitiveness of ASEAN-5 members and China in the US market based on the modified CMS model by Batista (2008). Braja and Gemzik-Salwach (2020) evaluate the export performance of high-tech products in the European Union (EU) by using the CMS model as used in Skriner (2009). Gilbert (2010) developed another version of the CMS model in order to analyze the export performance of six ASEAN countries between 2000 and 2009. He decomposed market share growth into four components, world trade effect, commodity effect, market effect and competitiveness

effect. Gilbert and Muchova (2018) analyze the change in market share of the Central and Eastern European Countries (CEECs).

CMS model and its versions are utilized also in Turkey's export performance analysis. CMS model by Leamer ve Stern (1970) were applied in Baykara (1990) for the period 1985 and 1987 and Togan (1994) for 1980-1988. Later studies have also used the CMS model by Leamer ve Stern (1970). For example, Kotan (2000) compare the export performance of Turkey and the European Union in the South East Asian region based on the CMS model by Leamer ve Stern (1970). Kotan (2000) concluded that the competitiveness effect, one of the three components of the model, has the most significant effect on Turkey's market share growth compared to the other two effects, especially in the garment, textile and technology-intensive sectors. Similarly, Aytemiz (2011), in her study based on the CMS model developed by Leamer ve Stern (1970), finds that the competitiveness effect is the most remarkable component of market share growth of Turkish manufacturing exports between 1995-2010. In contrast, another study using Leamer ve Stern (1970) version of the CMS model, Temiz (2002), concluded that the competitiveness effect in Turkey's agricultural export share growth was negative between 1989 and 1998. Klasra and Fidan (2005) also analyze Turkey's export performance of fishery products in world markets according to the CMS model and compare this performance with the main exporters of these products. Aytun and Kılıçaslan (2018) evaluate the export performance of eighteen countries including Turkey for each sub-sector with different technology intensities based on a CMS model developed by Laursen (1999).

In the literature, there are also studies for Turkey that use the CMS model modified by Fagerberg and Solie (1987). For example, Lohrmann (2000) evaluates Turkey's export performance in the OECD market since the 1980s by utilizing Fagerberg and Solie (1987) model. The results of the study show that the market share effect for Turkey is positive, but the other four effects are negative. Therefore, Lohrmann (2000:87) concludes that "Turkey did not sell right products to the right markets". Also, Erlat and Erlat (2012) evaluate Turkey's export performance in the Middle East North Africa

countries based on Fagerberg ve Sollie (1987) model and they reveal that Turkey losses its market share in those countries because of the commodity adaptation effect. Atış et al. (2013) analyze Turkey's export performance with its major trading partners. Their analysis considers the market share effect, commodity composition effect and commodity adaptation effect between 1995 and 2011. They conclude that market share and commodity composition effects positively contribute to Turkey's market share growth while the commodity adaptation effect has a negative contribution to it.

This study considers the dynamics of Turkey's export performance based on the CMS model developed by Fagerberg and Sollie (1987). The study differs from the previous studies in the sense that it takes into account the recent years, all the export markets of Turkey and all the export sectors.

III. Data and Methodology

The data source used in this study is the United Nations Commodity Trade Statistics ("UNCOMTRADE") database. The data period covers the years 2007-2009 and 2017-2019. The calculations are based on 2-digit products in the HS-2002 classification. It covers 98 export products. All export destinations of Turkey are included in the analysis but the results are presented for Turkey's most important trade partners. In order to make uniform and consistent calculations, the import data of the target market are used instead of the export data of the exporting countries. However, CMS analysis could not be performed for Iraq because Iraq, as a reporter country, does not present export data and import data at product-level.

In the methodology part, firstly each export market is considered independently. In this case, the change in share of Turkish exports in a targeted market can be decomposed into three effects. Formally,

$$\Delta MS_j = \sum_{i \in I} \Delta MS_{ij} \beta_{ij}^0 + \sum_{i \in I} \Delta \beta_{ij} MS_{ij}^0 + \sum_{i \in I} \Delta MS_{ij} \Delta \beta_{ij} \quad \forall\, j \in J \quad (1)$$

where $\Delta MS_j = MS_J^{\,1} - MS_J^{\,0}$ is the change in Turkey's share in target market j between period 0 and period 1. Let J be the set of markets, indexed by j, to which Turkey exports, and I be the set of Turkey's exported goods, indexed by i, Also, let x_{ij} be exports of good i from Turkey to market j, X_{ij} be world exports of good i to market j, M_{ij} be total imports of good i from the world to market j, and $M_j = \sum_{j \in J} M_{ij}$ is total imports of market j from the world. In this case, $MS_{ij} = x_{ij}/M_{ij}$ is the share of Turkey's good i exports to market j in total good i imports of market j, and $\beta_{ij} = X_{ij}/M_j$ is the share of world good i exports to market j in total imports of market j. Similarly, $\Delta MS_{ij} = MS_{ij}^{\,1} - MS_{ij}^{\,0}$ is the change in the share of Turkey's good i exports to market j in total good i imports of market j between period 0 and period 1, and $\Delta\beta_{ij} = \beta_{ij}^{\,1} - \beta_{ij}^{\,0}$ is the change in the share of good i exports from world to market j in total imports of market j between period 0 and period 1.

According to Equation (1), change in Turkey's market share can be decomposed into three components:

i) The first term on the right-hand side is the **'market share effect'**. This effect is considered at the world market level in Gilbert and Muchova (2018). Therefore, as slightly different from Gilbert and Muchova (2018), the 'market share effect' at the market level shows the effect of changes in Turkey's market shares by commodity and target market, weighted by the commodity composition of each market in the base year. In other words, the market share effect shows how a change in Turkey's market share would occur only if the share of Turkey's goods i exports to market j in world exports of good i to market j changed. Gilbert and Muchova (2018) claim the market share effect is an indicator of competitiveness. Lohrmann (2000) attributes this effect to supply-side conditions and trade policies of the country in question.

ii) The second term on the right-hand side is the **'commodity composition effect'**. Commodity composition effect. This effect is due to the change in the shares of commodities imported by the target market from the world. In other words, the

commodity composition effect shows to what extent Turkey's share in a target market changes only if the share of good i exports from the world to market j in overall imports of market j changes. Since this effect is explained only by changes in β_{ij}, unlike the market share effect, this is a demand-side effect. More specifically, commodity composition effect shows how the market share of Turkey is affected by the changes in demand conditions of good i in the targeted market. Gilbert and Muchova (2018: 81) argue, in their analysis at the world market level, that "this effect will be positive if the initial commodity composition of exports favors those goods in which world trade is growing relatively rapidly ". Inspired by them, we can claim that the positive commodity composition effect shows that Turkey's commodity composition in the initial period favors the products with increased demand in the target market.

iii) The third term on the right-hand side of equation (1) is the **'commodity adaptation effect'.** This effect indicates to what extent Turkey has adapted the change in the composition of goods in market j. In other words, it shows the ability of Turkey in adapting its commodity composition to the changes in the demand in the target market. If the change in the share of Turkey's good i exports to market j in total good i imports of market j, ΔMS_{ij}, and the change in the share of good i exports from world to market j in total imports of market j, $\Delta\beta_{ij}$, are in the same direction, then the commodity adaptation effect will be positive.

Similar to the decomposition at the market-level given in Equation (1), the change in market level can be decomposed both at the commodity and market level. Equation (2) gives the decomposition of the change in Turkey's market share at the market-commodity level.

$$\Delta MS_{ij} = \Delta MS_{ij}\beta_{ij}^{0} + \Delta\beta_{ij}MS_{ij}^{0} + \Delta MS_{ij}\,\Delta\beta_{ij} \qquad \forall\, i \in I, j \in J \qquad (2)$$

Calculations based on Equation (2) and interpretation of components are the same as Equation (1). The only change is that the calculations are made separately for each commodity exported to the target market, without being aggregated at the target market level.

Finally, Turkey's market share dynamics can be evaluated at the world-market level instead of individual separate markets. In this case, the world market constitutes from the sum of separate individual markets to which Turkey exports. When Turkey's export share in the world market is considered, two new effects are included in the decomposition, 'world market composition and world market adaptation effects. The complete decomposition of the change in Turkey's share in the world market can be calculated as in Equation (3):

$$\Delta MS = \sum_{j\in J}\sum_{i\in I} \Delta MS_{ij}\, \beta_{ij}^{0}\, \delta_{j}^{0} + \sum_{j\in J}\sum_{i\in I} \Delta\, \beta_{ij}\, MS_{ij}^{0} \delta_{j}^{0} + \sum_{j\in J}\sum_{i\in I} \Delta MS_{ij} \Delta\, \beta_{ij}^{0}\, \delta_{j}^{0}$$
$$+ \sum_{j\in J} \Delta\delta_{j} MS_{j}^{0} + \sum_{j\in J} \Delta MS_{J} \Delta\delta_{j} \qquad (3)$$

where $\Delta \mathrm{MS} = \mathrm{MS}^{1} - \mathrm{MS}^{0}$ is the change in Turkey's market share in world market between period 0 and period 1. Let $\mathrm{x} = \sum_{\mathrm{j}\in\mathrm{J}} \sum_{\mathrm{i}\in\mathrm{I}} \mathrm{x_{ij}}$ be the total exports of Turkey to the world market, $\mathrm{M} = \sum_{\mathrm{j}\in\mathrm{J}} \sum_{\mathrm{i}\in\mathrm{I}} \mathrm{M_{ij}}$ be total world imports. Then, Turkey's total share in the world market is $\mathrm{MS} = \mathrm{x} / \mathrm{M}$. Also, $\delta_{\mathrm{j}} = \mathrm{M_{j}} / \mathrm{M}$ is the import share of market j in total world imports, and it shows the market composition of world trade.

According to Equation (3), change in Turkey's export share in the world market can be decomposed into five components. The interpretation of the first three effects is the same as in Equation (1), except that the market is defined at the world market level rather than an individual target market. Therefore, the components of Equation (3) is as follows:

i) The first term on the right-hand side is the **'market share effect'**. Similar to the market share effect given in Equation (1), the world market share effect shows the effect of changes in Turkey's market share, weighted by the commodity composition of each market and the market composition of world trade in the base year. Like in the market share effect, the world market share effect is an indicator of the competitiveness of

Turkey in the world market, given the market composition of world trade in the base year.

ii) The second term on the right-hand side is the **'commodity composition effect'**. Similar to commodity composition effect in Equation (1), the positive commodity composition effect shows that Turkey's commodity composition in the initial period favors the products with increased demand in the world market.

iii) The third term on the right-hand side is the **'commodity adaptation effect'.** It shows the ability of Turkey in adapting the commodity composition of its exports to changes in the world market demand.

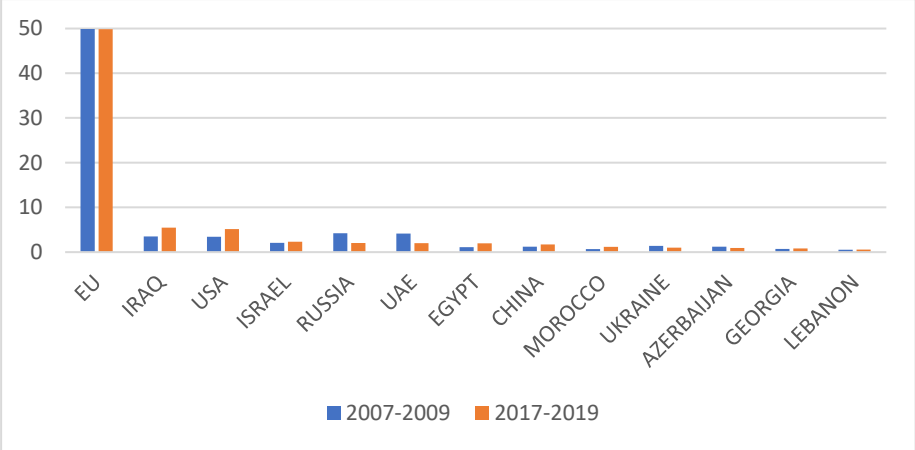
iv) The fourth term on the right-hand side is the **'world market composition effect'.** This effect is peculiar to trade in the world market rather than an individual market. In other words, it is related to the changes in the shares of individual markets to which Turkey exports in the world market trade. The 'world market composition effect' will be positive if Turkey's target markets in the initial period consist of the countries whose imports in the world market have been increasing.

iv) The fifth term on the right-hand side is the '**world market adaptation effect'**. This effect shows Turkey's ability to diversify its target markets in favor of the markets whose import demand in the world market has been increasing quickly.

IV. Results

We first provide some general descriptive statistics concerning Turkey's exports to the target markets. Figure-1 presents the shares of destination markets in Turkey's total exports for the period 2007-2009 and 2017-2019, on average. These markets constitute nearly 75 percent of Turkey's total exports.

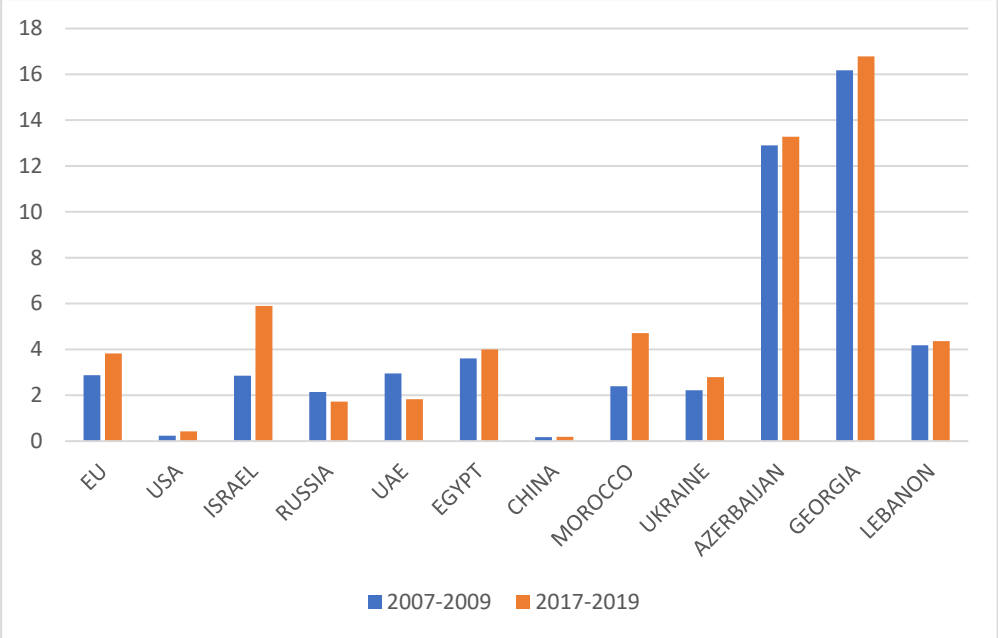
Figure-1 Share of Target Markets in Turkey's Total Exports (%)



According to Figure-1, about half of Turkey's exports go to the EU market, and this has been the case for at least the last ten years. The countries whose share in Turkey's total exports has increased in the last period are Iraq, the United States (USA), Egypt, Israel, China, Morocco, Georgia and Lebanon. On the other hand, shares of Russia, the United Arab Emirates (UAE), Ukraine and Azerbaijan in total exports of Turkey have decreased over time.

Figure-2 presents the share of Turkish exports in total imports of the given markets. According to Figure-2, Georgia and Azerbaijan are the markets where Turkey has the highest share as compared to the other markets. For example, in the 2017-2019 period, the share of Turkish exports in total imports of Georgia and Lebanon was 17 percent and 13 percent, respectively. Also, similar to Figure-1, Figure-2 shows that the share of Turkey in total imports has increased in the second sub-period for all countries except Russia and the UAE. According to the figure, this increase is relatively higher in Israel and Morocco than in other markets.

Figure-2 Share of Turkey's Exports in Total Imports of Destination Markets (%)



From now on, we focus on CMS analysis to analyze Turkey's export performance over the past 10 years. First, we consider each targeted market individually and present the results at the market level. In this case, decomposition of the change in market shares consists of only three effects, i.e. market share, commodity composition and commodity adaptation effects, as given in equation (1). Table-1 presents the results based on equation (1) in terms of percentage changes in the market share, that is, both sides of equation (1) divided by the initial market share. The last column in the table shows the total change in market share for each target market between 2007-2009 and 2017-2019. The ranking is based on the last column.

Table-1 CMS Analysis at the Market Level, Percentage Change in Average Market Share, 2007-2009 and 2017-2019.

	Market Share Effect	Commodity Composition Effect	Commodity Adaptation Effect	Total
ISRAEL	119.36	11.04	-23.91	106.49
MOROCCO	93.09	-10.22	12.75	95.62
USA	75.05	5.91	-0.03	80.92
EU	18.57	14.91	0.12	33.60
UKRAINE	16.47	5.41	3.94	25.82
EGYPT	24.14	-19.48	6.32	10.98
CHINA	15.75	-5.90	-4.45	5.39
LEBANON	6.42	-3.10	1.16	4.48
AZERBAIJAN	26.53	-3.45	-20.19	2.89
GEORGIA	6.91	-1.02	-5.62	0.27
RUSSIA	-22.03	-0.45	3.06	-19.42
UAE	-44.30	-33.86	40.09	-38.07

The first point of attention in Table-1 is that the market share effect has the highest share among the other three effects for all markets. The market share effects are highest in Israel and Morocco, in line with the highest changes in total market share as pointed out in Figure- 2. Also, the magnitude of the market share effect in proportion to the total effect is relatively higher for Georgia, Azerbaijan, China and Egypt than the other markets. On the other hand, the market share effect is negative only for two markets, e.g. Russia and the UAE, in which Turkey's market share has decreased between the two periods.

Therefore, it can be concluded from Table-1 that the highest positive contribution to total market share change of Turkey has resulted from the market share effect, which is expressed as an indicator of competitiveness. Also, based on Lohrmann (2000), this result can be considered as supply-side conditions of Turkey is appropriate for export competitiveness. However, the table shows that the decline in Turkey's total market share between the two periods in the Russian and the UAE markets was largely due to the negative market share effects. This result may indicate the supply-side problems in Turkish exports to these markets.

Table-1 also shows the share of commodity composition effect in total market share change. This effect has resulted only from the changes in the shares of commodities imported by the target market from the world, while the other effects remain constant. Therefore, this effect is an indicator of the demand of target markets for the products exported by Turkey. According to the table, the commodity composition effect is positive for Israel, the USA, the EU and Ukraine. Among these countries, the share of the effect is the highest for the EU. This result indicates that demand conditions for Turkish exports in the EU market are much favorable. In contrast, the commodity composition effect is negative for Morocco, China, Lebanon, Azerbaijan, Georgia, Egypt, Russia and the UAE. Among these countries, the negative contribution of this effect to the total decline in market share is the highest for the UAE, followed by Egypt.

Table-1 also presents the contribution of commodity adaptation effect to the increase in total market share of Turkey in target markets. According to the table, the commodity adaptation effect is positive for Morocco, EU, Ukraine, Egypt, Russia and the UAE. It refers that Turkey is able to adapt to the changing demand conditions in these countries. On the other hand, the commodity adaptation effect is negative for Israel, the USA, China, Azerbaijan and Georgia.

When the three effects given in Table-1 are evaluated together for each country, it can be seen that all effects are positive for the EU and Ukraine. Therefore, these markets are favorable for Turkey in terms of Turkey's supply conditions, those markets' demand conditions and the ability of Turkey's adaptation to the changes in demand conditions in these markets. On the other hand, the market share effect and commodity composition effects are positive while the commodity adaptation effect is negative for Israel where Turkey's share has increased most as compared to other markets. This result may indicate a risk for Turkey about the strengthening of its share in this market in the long term. A similar claim is also valid for Turkish exports to Egypt. Another market with a negative commodity adaptation effect is the USA. However, the negative contribution of this effect to the overall market share growth of Turkey in this market is negligible.

For Morocco, the market share effect is positive while the commodity composition effect is negative. So, it can be claimed that supply conditions for Turkish exports to this market are smooth while demand conditions of the market are unfavorable. However, the positive commodity adaptation effect shows that Turkey has pursued a rational export policy in this market in line with changing commodity composition of this market.

For China, both the commodity composition and commodity adaptation effects are negative. It may refer to the fact that although export demand in China has declined, Turkey has not followed an export policy suitable for this contraction over the last ten years. The same claim is also valid for Azerbaijan and Georgia for which both the commodity composition and commodity adaptation effects are negative. For Russia and the UAE, both market share effect and commodity effect are negative. It refers that Turkish exports have problematic demand and supply conditions with regard to these markets.

CMS analysis can also be conducted at the commodity level, as given in Equation (2). Table-2 below presents the results of CMS analysis for each region at the commodity level. The analysis was performed for all products, but the results are presented only for the 6 products that Turkey exports the most to the world. The results are presented in terms of percentage changes in the market share, that is, both sides of equation (2) divided by the initial market share. The last column in the table shows the total change in market share for each product between 2007-2009 and 2017-2019. The ranking is based on the last column.

Table-2 shows the decomposition of total market share change for 'HS-87 Vehicles' which is one of the products that Turkey exports most to the world markets. According to the table, all the effects are positive for the EU, USA, Israel, the UAE, China, Morocco and Georgia. Moreover, the highest increase in total market share of Turkish exports realized in Morocco, and this increase has mostly resulted from the market share effect. On the other hand, there is a decrease in the market share of vehicles exported from Turkey to Russia, Saudi Arabia, Azerbaijan and Ukraine. This decrease was due to negative market share and commodity composition effects in Russia,

Azerbaijan and Ukraine, and also due to negative commodity composition and commodity adaptation effects in Saudi Arabia.

According to Table-2, the market share of Turkey's 'HS-84 Nuclear reactors, boilers, machinery and mechanical appliances' exports increased in target markets in the last 10 years. The overall market share of Turkey in this product is positive in all target markets. Moreover, this increase resulted from the market share effect. That's to say, negative commodity effects or negative commodity adaptation effects have been compensated by positive market share effects in some target markets.

Table-2 also shows the decomposition of Turkey's export shares of 'HS-72 Iron and steel' in target markets. The first noticeable thing in the table is that Turkey's market share in this product has increased between two periods only for the EU, the USA, Israel and Ukraine. Moreover, Israel is the only country where all three effects are positive. On the other hand, the market share effect is significantly negative for the UAE market as compared to other markets. The market share effect is also negative for Saudi Arabia and Egypt. At the same time, the commodity composition effect is positive only for Israel and Azerbaijan. Therefore, the results of the analysis point out demand and supply-side problems about Turkey's 'HS-72 Iron and steel' exports to target markets.

Table-2 CMS Analysis at the Product Level, Percentage Change in Average Market Share, 2007-2009 and 2017-2019.

	HS-87 Vehicles				HS-84 Nuclear reactors, boilers, machinery and mechanical appliances			
	Market Share Effect	Commodity Composition Effect	Commodity Adaptation Effect	Total	Market Share Effect	Commodity Composition Effect	Commodity Adaptation Effect	Total
EU	2.17	4.14	0.77	7.07	3.31	1.03	0.44	4.78
USA	8.40	4.08	3.05	15.53	16.14	2.85	3.15	22.14
RUSSIA	-6.16	-6.62	2.02	-10.76	1.07	2.25	0.21	3.53
ISRAEL	6.29	2.78	1.59	10.66	0.04	2.00	0.01	2.06
UAE	0.71	0.04	0.00	0.76	2.99	0.41	0.13	3.53
EGYPT	14.09	-0.26	-0.67	13.16	8.10	-4.73	-2.61	0.76
S. ARABIA	1.85	-5.51	-0.58	-4.24	9.70	-4.77	-3.33	1.60
CHINA	2.90	3.57	1.47	7.93	36.79	-7.88	-8.94	19.98
MOROCCO	16.56	3.11	4.92	24.59	4.41	-1.24	-0.36	2.81
UKRAINE	-0.14	-2.65	0.04	-2.76	4.12	0.67	0.43	5.22
AZERBAIJAN	-0.91	-6.36	0.45	-6.82	10.22	-5.19	-3.33	1.70
GEORGIA	2.84	0.26	0.34	3.44	0.25	0.74	0.02	1.01
LEBANON	21.79	-1.20	-4.76	15.83	3.40	-0.41	-0.13	2.86

	HS-72 Iron and steel				HS-61 Articles of apparel and clothing accessories			
	Market Share Effect	Commodity Composition Effect	Commodity Adaptation Effect	Total	Market Share Effect	Commodity Composition Effect	Commodity Adaptation Effect	Total
EU	2.95	-0.45	-0.49	2.01	-1.34	0.82	-0.15	-0.67
USA	2.24	-1.14	-0.22	0.88	0.94	-0.13	-0.04	0.77
RUSSIA	-0.11	-0.08	0.01	-0.19	0.10	2.12	0.07	2.29
ISRAEL	8.27	0.11	0.09	8.47	0.46	0.92	0.30	1.69
UAE	-50.95	-33.77	32.16	-52.56	0.79	0.16	0.40	1.36
EGYPT	-13.81	-12.35	5.90	-20.26	0.39	0.05	0.78	1.22
S. ARABIA	-25.29	-14.94	11.82	-28.41	0.61	1.12	1.00	2.73
CHINA	-7.56	-7.25	4.13	-10.69	0.59	6.67	0.80	8.06
MOROCCO	1.74	-8.06	-0.67	-6.99	1.79	0.12	1.11	3.03
UKRAINE	6.98	-0.30	-2.13	4.56	0.42	-0.04	-0.01	0.37
AZERBAIJAN	-1.14	0.56	-0.25	-0.83	0.05	2.14	2.07	4.26
GEORGIA	-1.01	-0.95	0.24	-1.72	0.02	0.77	0.01	0.81
LEBANON	-0.51	-4.51	0.11	-4.91	1.38	0.29	0.18	1.85
	HS-85 Electrical machinery and equipment				HS-71 natural or cultured pearls, precious or semi-precious stones, precious metals			
	Market Share Effect	Commodity Composition Effect	Commodity Adaptation Effect	Total	Market Share Effect	Commodity Composition Effect	Commodity Adaptation Effect	Total
EU	-0.86	1.38	-0.21	0.31	1.13	0.05	0.11	1.29
USA	6.20	0.24	0.78	7.21	1.62	0.07	0.03	1.72
RUSSIA	-2.50	1.00	-0.37	-1.88	-0.65	0.24	-0.22	-0.64
ISRAEL	1.19	0.50	0.08	1.77	5.70	-0.85	-2.08	2.76
UAE	-13.53	18.73	-12.01	-6.81	13.81	2.36	2.54	18.71
EGYPT	1.23	1.89	0.36	3.48	0.15	-0.89	-0.11	-0.84
S. ARABIA	-1.04	0.53	-0.03	-0.54	0.38	0.24	0.55	1.18
CHINA	-0.93	0.50	-0.02	-0.45	0.52	0.34	1.93	2.80
MOROCCO	4.31	0.51	0.73	5.55	1.47	0.03	1.77	3.27
UKRAINE	0.16	2.27	0.15	2.57	0.11	-0.22	-0.09	-0.21
AZERBAIJAN	-5.30	-6.88	2.17	-10.00	0.02	0.83	0.92	1.77
GEORGIA	1.65	-0.60	-0.17	0.88	0.00	-0.12	0.00	-0.12
LEBANON	53.23	-0.21	-2.00	51.02	0.24	0.03	0.03	0.30

Table-2 also shows the decomposition of market share change of Turkey's 'HS-61 Articles of apparel and clothing accessories' exports. According to the table, Turkey's market share in this product has decreased only in the EU market. Also, this decrease has resulted from the market share effect and commodity adaptation effects. Therefore, it can be concluded that despite the demand by the EU market for 'HS-61 Articles of apparel and clothing accessories' has increased in the last 10 years, Turkey's performance to meet this demand was unsatisfactory. Furthermore, Turkey has failed to adapt to its commodity composition towards increasing demand by the EU. On the other hand, the commodity composition effect is negative for the USA and Ukraine but the magnitude of these negative effects is negligible. All the other effects are positive for each target market.

According to Table-2, the market share of one of Turkey's most exported products, 'HS-85 Electrical machinery and equipment' increased in the EU, the USA, Israel, Egypt, Morocco, Ukraine, Georgia and Lebanon. Among these countries, the highest increase belongs to Lebanon, but this rate is due to the tiny market share in the initial period. On the other hand, all three effects are positive for the USA, Israel, Egypt, Morocco and Ukraine. As a most important and traditional trade partner of Turkey, in the EU market, the market share effect and commodity adaptation effect are negative while the commodity composition effect is positive, as in the case of 'HS-61 Articles of apparel and clothing accessories. Thus, based on these results it can be claimed that Turkey needs to revise its trade policies and increase its export supply to the EU market for the products with increasing import demand.

The last product presented in Table-2 is 'HS-71 natural or cultured pearls, precious or semi-precious stones, precious metals. For this product, market share effect is negative only for Russia while commodity composition effect and commodity adaptation effect are negative for Israel, Egypt, Ukraine and Georgia. For the other markets, all three effects are positive. Among these markets, market share effect is the highest for the UAE. Moreover, when the three effects are evaluated together, it is seen that there is no demand or supply-side problem in the UAE market for this product.

Finally, Table-3, presents the decomposition of the change in Turkey's share in the world market based on Equation (3).

Table-3 CMS Analysis at the world market level, percentage change in average world market share, 2007-2009 and 2017-2019**.**

	Market Share Effect	Commodity Composition Effect	Commodity Adaptation Effect	World market composition effect	World market adaptation effect	Total
The world market	14.11	2.00	0.29	1.55	-0.28	17.67

According to Table-3, Turkey's export share in the world market increased by 17.66 percent between 2007-2009 and 2017-2019, on average. This result is promising for

Turkey because many countries experienced a serious decline in export earnings in recent years due to developments such as economic crises and trade wars.

Table-3 also presents the sources of increase in Turkey's share in the world market. According to the table, the main source of this increase is the market share effect. More specifically, 14.11 percent of the total increase is due to the market share effect. This finding reflects the increase in Turkey's competitiveness in the world market.

According to the table, the commodity composition effect is also positive. This result implies that the commodity profile of Turkey's exports in the initial period was well-matched in the commodity composition of the world market. The commodity adaptation effect is also positive, but it makes little contribution to total market share growth of Turkey.

Table-3 also shows that the world market composition effect is positive. This result points out that Turkey's initial trade partners are fast-growing markets in world trade and Turkey can benefit from this potentially increasing export markets. According to the table, the world market adaptation effect is negative, but its impact on total market share growth is infinitesimal. However, the negative world market adaptation effect gives a hint that Turkey is having difficulty in adapting to rapidly growing new target markets.

V. Concluding Remarks

This study analyzes the changes in Turkey's export shares in the targeted markets and the world market for the last 10 years and evaluates the sources of these changes based on a CMS model developed by Fagerberg and Solie (1987) and slightly modified by Gilbert and Muchova (2018). In this model, change in Turkey's market shares in a targeted market between two periods are divided into the market share effect, the commodity composition effect and the commodity adaptation effect. Then, this decomposition is extended from an individual target market to the world market as a

whole. In the extended version, the world market effect and the world market adaptation effect are included in the model.

The descriptive statistics show that the EU market has traditionally been the most important export market of Turkey. Half of Turkey's exports go to the EU market for at least 10 years. The majority of the other half of Turkish exports are directed to Iraq, the USA, Russia, the UAE, Egypt, Israel, China, Saudi Arabia, Morocco, Georgia and Lebanon.

The CMS analysis shows that Turkey's export shares in these markets, except the UAE and Russia, have increased between the first sub-period (average of 2007-2009) and the second sub-period (average of 2017-2019). The decomposition of the changes in market shares of Turkey at the target market level reveal that the large portions of Turkey's market share growth are generally due to the market share effect, which indicates the strong competitiveness of Turkey in the target markets. The results also show that all the three effects, i.e. market share effect, commodity composition effect and commodity adoption effect, are positive for the EU and Ukraine. Therefore, these markets are favorable for Turkey in terms of Turkey's supply conditions, those markets' demand conditions and the ability of Turkey's adaptation to the changes in demand conditions in these markets.

On the other hand, the commodity composition effect is negative for the target markets except for the USA, the EU, Israel and Ukraine. This result shows that the import demand in these markets has changed against Turkish exports. Moreover, the commodity adoption effect is also negative for some of these target markets such as China, Azerbaijan, Lebanon whose import demand from Turkey is decreasing. Therefore, it can be claimed that Turkey is unable to adapt its export goods to the changing demand conditions of these markets.

The decomposition of change Turkey's market share was also conducted at the commodity level. The results point out some demand and supply-side problems in Turkey and the target markets.

Finally, the CMS analysis was utilized at the world market level. According to the results, Turkey's export share in the world market increased by 17.66 percent between 2007-2009 and 2017-2019, on average. This result is promising for Turkey because many countries experienced a serious decline in export earnings in recent years due to developments such as economic crises and trade wars. Moreover, the main source of this increase was the market share effect. This finding reflects the increase in Turkey's competitiveness in the world market. The results also show that all the other effects are positive, except the world market adaptation effect. It refers to the fact that the commodity profile of Turkey's exports in the initial period was well-matched in the commodity composition of the world market, and also Turkey's target markets are fast-growing markets. On the other hand, the world market adaptation effect is negative, but its impact on total market share growth is infinitesimal.

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